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Developing a Faculty-Librarian Community of Inquiry:

A Blended Learning Approach to Facilitate Information Literacy Education

by

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Abstract

The purpose of the study was to explore how disciplinary understanding around Information Literacy (IL) might be achieved between faculty members and librarians through the design and implementation of a blended Community of Inquiry (CoI) (Garrison, 2011) Faculty-Librarians CoI Workshop (FacLibCoI) within a social constructivist epistemology. A mixed methods, design-based research (DBR) approach was used to build and test the FacLibCoI prototype and was based on Pool and Laubscher's (2016) micro/meso iterative-cycle approach to McKenney and Reeves' (2012) Generic Model for Educational Design Research.

An environmental scan of the literature and the university where the study took place comprised phase one of the study. In addition to the review of literature, university reports were reviewed, and focus group interviews were conducted with university faculty members and students. Analysis revealed that faculty viewed research as discovery while students equated it with term papers. Students who had learned IL in general studies writing courses demonstrated good conceptual knowledge but poor implementation skills.

Phase Two comprised the design phase. The FacLibCoI was designed to last two months and include three in-person sessions with accompanying asynchronous online discussions.

The FacLibCoI workshop was implemented and analyzed in phase three. The design changed to four in-person sessions and two asynchronous discussions. Data included before-and-after participant interviews, transcripts, CoI questionnaires, and group artifacts.

All CoI presences and metacognition were achieved in the FacLibCoI. Participants demonstrated group cohesion and disciplinary-based, shared understanding of IL, producing a disciplinary IL Model, IL learning goals mapped to disciplinary and IL standards, and an action plan for IL implementation. A CoI was established in less time than in studies reported in the

literature and holds promise for scaling up. The online portion of the design proved unsustainable, and technology platforms and busy schedules were negative factors. Online collaboration between librarians and faculty may prove successful during a later departmental IL implementation phase. This phase should be considered in future iterations. Consulting participants on selection of a technological platform is advised.

Preface

This thesis is original, unpublished, independent work by the author, A. Melgosa. The design experiment reported in Chapters five and six were covered by Ethics Certificate ID number REB14-1937_REN3, issued by the University of Calgary Conjoint Faculties Research Ethics Board for the project "Developing a Faculty-Librarian Community of Inquiry: A Blended Learning Approach to Facilitate Information Literacy Education" on January 31, 2018.

Acknowledgments

I acknowledge and thank my thesis committee. First, thank you to Dr. D. Randy Garrison. Although he is no longer part of my committee, he was my professor in the doctoral program and served as my thesis supervisor before his retirement. The basic design for a blended CoI took shape under his capable guidance. From the heart, I wish to thank my current supervisor, Dr. Michele Jacobsen, who willingly took over the supervisory role for my study upon Dr. Garrison's retirement. I have appreciated and benefitted from Dr. Jacobsen's expertise in the learning sciences and design-based research (DBR). I especially appreciated Dr. Jacobsen's positive temperament and personal encouragement as I struggled to continue with the dissertation through some professional and family challenges. I want to thank my committee members, Dr. Beaumie Kim and Dr. Alix Hayden. Their willingness to share their expertise with me was invaluable. They provided input and suggestions that enhanced the study, and I have learned much from their wise counsel. Finally, thank you to the external examiners, Dr. Shelley Raffin Bouchal and Dr. Jannette Hughes, and to the Neutral Chair, Dr. Amy Marie Burns.

Next, I wish to acknowledge the faculty members and librarians who voluntarily participated in the study. I greatly respect these dedicated educational professionals who were willing to step beyond university silos and engage in collaborative inquiry around IL. I also wish to thank the former and current directors of the social sciences department and the director of the Library for allowing me to work with their faculty members and librarians. My former colleagues in the library deserve my special thanks. Without doubt, my studies impacted their workloads. I thank university administration and staff for facilitating logistics.

I wish to acknowledge my current employer and my work supervisor, Stephen Filkoski, who provided genuine encouragement. My completion is due to this encouragement.

Dedication

I wish to dedicate this study to my family. First, I thank my parents, Tom and Ann Dunbebin, who instilled in me from a young age the desire to learn and the belief that education was important and valuable. They always encouraged me to pursue learning even if this required me to travel down many diverse and winding roads.

My greatest supporter over these past years, however, is my husband, Julian. He always encouraged my educational and career pursuits, and he gave me the initial courage to begin a doctoral program. He willingly provided the financial backing for six years of tuition. He remained supportive even during times when my motivation stalled but the money kept flowing out of the family accounts. His personal pride in my accomplishments is the encouragement that kept me going. I greatly admire, love, and respect him, always and forever.

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Epigraph

Whether in literary criticism or scientific investigation, the academic mind is best at taking things apart. The complementary arts of integration are far less well developed. This problem is at the core of human ecology. As with any interdisciplinary pursuit, it is the bridging across disparate ways of knowing that is the constant challenge.

Richard J. Borden,
Ecology and experience: Reflections from a
human ecological perspective

The 'Holy Grail' of effective collaboration is creating shared understanding, which is a precursor to shared commitment.

Jeff Conkin,
In K. Christiansen, Building shared understanding
of wicked problems: An interview with
Jeff Conkin

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Chapter One: Introduction

Library science has always had an educational component. In early days, this was termed bibliographic instruction (BI). BI focused on teaching concepts in information categorization and retrieval (e.g. catalogs, indices and classification schemes) to library users. In 1974, Zurkowski, who was an executive in the Information Industry Association, coined the term information literacy (IL) to describe worker training "in the application of information resources" (p. 6). IL grew out of a perceived societal need for workers able to navigate the information terrain.

Responding to information changes in society and exposure to constructivist theories of learning, library science adopted IL terminology and re-envisioned BI into generic lifelong learning skills that could be applied anywhere. The American Library Association (ALA) voted the *Information Literacy Competency Standards for Higher Education* (Association of College and Research Libraries, 2000), referred to hereafter as the *Standards,* as the guide for IL in higher education (HE). The *Standards* (Association of College and Research Libraries, 2000) defined IL as "a set of abilities requiring individuals to 'recognize when information is needed and have the ability to create, evaluate, and use effectively the needed information'" (p. 2). Both the term and its conceptualization as a generic skill have been challenged in library science literature and have continued to develop through this ongoing discussion. This led in 2015, to the *Information Literacy Competency Standards for Higher Education* (2000) being replaced by *The Framework for Information Literacy in Higher Education* (Association of College and Research Libraries, 2015). The progression of how the concept has developed and changed is discussed further in chapter two.

Information Literacy in Higher Education

HE in the United States is structurally and philosophically divided into subject domains. Faculty members *belong* (in terms of domain vocabulary, culture, theoretical affinity, and content) to disciplinary departments or schools (Brint & Clotfelter, 2016; Frost & Jean, 2003; Strober, 2011). They are masters within their own classrooms and work with trusted collegial partners within siloed departments. Further, HE tends to focus on specialist knowledge and research (MacPherson, 2007) with faculty members expected to guide students into the knowledge, culture and thought processes of the subject domain.

More recently, this culture of siloed knowledge increasingly bumps up against a global knowledge society that expects graduates to demonstrate critical thinking and problem-solving across a variety of contexts within environments of collaborative communication. It is no longer enough to simply be proficient in the content, discourse and skills of a narrow profession. In response to this societal demand, interdisciplinary initiatives in HE have increased over the last 30 to 40 years (Brint & Clotfelter, 2016).

Within these parameters of HE, teaching IL can be difficult. Unlike a disciplinary department with its narrow focus, the library provides information to students and faculty across all the various disciplines of the university. Librarians must therefore liaise with faculty members and curriculum committees from various disciplinary departments, and sometimes with administration, to develop and insert IL into the curriculum. Yet, the generalist and inclusive nature of their work which enables librarians to serve varying sectors of the university population, puts them at a disadvantage in the classroom where they are not as proficient in the discipline-specific nature of the curriculum.

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Academic librarians provide IL in various ways. They may offer credit-bearing courses for which the library is responsible. Or they may be guest lecturers invited into classes by faculty members. In some instances, they are invited to co-teach as fully-embedded team teachers. They may also provide online IL tutorials accessible from the library website. A 2015 survey of US academic libraries (Cohen et al., 2016) reported guest lecture IL sessions as the most-used strategy. Other popular methods included embedded assignments and information guides, and tutorials or videos (Charles, 2017; Cohen et al., 2016). These methods are usually customized and specific to individual classes and are not easily implemented more broadly. IL programs thus tend to miss significant numbers of students (Church-Duran, 2017).

Problem

This study explores how librarians and faculty members might foster a shared understanding of IL within a discipline. With a shared understanding of IL, both faculty and librarians might be better prepared to engage students in reflective and critical thinking around IL in order to collaboratively construct knowledge and solve problems (Andrews & Patil, 2007; Association of College and Research Libraries, 2015) within their chosen disciplines.

To address this problem, one must turn to HE and its structures. Although individual universities, or schools within these universities, may use general studies curriculum committees, communities of practice, faculty forums, or other similar bodies, there are few mechanisms or processes within HE whereby faculty members across the institution (let alone faculty members and librarians) may regularly and systematically engage in cross-theoretical discourse. Without such a mechanism, it is nearly impossible for librarians and faculty members to arrive at shared philosophical, theoretical and pedagogical understanding that would release IL from its library-centric focus to collaborative sponsorship, discipline by discipline, across the university.

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Given that faculty members and librarians in HE value inquiry and critical thinking, I chose an inquiry-based process model, the Community of Inquiry Theoretical Framework (CoI), to design and pilot a blended CoI faculty member-librarian workshop on IL.

Research Questions

To what extent might collaborative learning within a design-based, blended community of inquiry (CoI), hereafter referred to as the FacLibCoI, provide an efficient and sustainable way for faculty members from a single discipline and librarians to construct shared understanding of IL?

1. How might inquiry-based learning methods within a design-based FacLibCoI facilitate shared understanding of IL between faculty members and librarians?

2. How might collaborative learning within the FacLibCoI foster shared understanding and collaborative approaches to IL within the discipline?

3. To what extent might a blended, technology-enhanced learning environment (TELE) support efficiency within a FacLibCoI while maintaining the social, teaching, and cognitive presences of the CoI Framework?

A Blended Workshop-design Intervention

For this study, I developed and implemented a technology-enhanced learning environment (TELE) in the form of a blended (face-to-face and online) FacLibCoI workshop with faculty from a social sciences department and university librarians. Brown (2013) defines a TELE as a "complex learning environment that enable[s] appropriate use of technological resources in order to continually enhance the conditions conducive to learning" (p. 304). A blended TELE design offered flexible, asynchronous collaboration, which I posited would shorten the time needed in face-to-face collaboration, an important criterion for engaging busy

faculty members. The intervention included four face-to-face sessions with corresponding online discussions.

Purpose and Rationale

I chose to design and pilot the FacLibCoI workshop that would include as participants faculty members within a single department and librarians. The purpose was to foster theoretical and design propositions that would guide further iterations or inform other researchers. This model also fit my applied research goal to provide a mechanism to help faculty members within a given department and librarians develop shared understanding and sponsorship of IL that could help their students to apply IL thoughtfully across their discipline studies and within their career.

Typical issues in the way IL is currently taught in HE led me to conclude that authentic, learning-focused approaches to IL across the entire university will only occur through collaborative efforts between faculty members (within a department) and librarians. When faculty members and librarians clarify and develop shared understandings of IL and how it relates to their discipline as well as how students relate to it, they will be better able to integrate IL within their classes (Saunders, 2012). IL is increasingly viewed in relationship to critical thinking and other higher order thought processes (see the definition of this term later in this chapter) (Deitering & Jameson, 2008; Detmering & Johnson, 2011; Elmborg, 2006), which require students to not only understand formal search strategies within databases, for example, but to situate these strategies within the framework of critical and reflective thought. From this perspective, faculty members may be better positioned to help students make these connections. Faculty members do not always realize, however, that IL encompasses some of the same learning goals that are valued across HE and within their discipline (e.g. analytical and evaluative strategies related to sources) or that they might incorporate IL within course discourse related to

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these learning goals. Meanwhile, librarians, who are more familiar with the typical IL-related pitfalls encountered by undergraduates, champion IL whenever and wherever they can within the university. But because they do not often share the faculty member's disciplinary background, they may find it more difficult to build the discipline's philosophy, discourse or scholarship into the way that they present IL to students. Nor are they present most of the time to integrate IL within typical classroom discourse. Given the disparate yet complementary capabilities of faculty members and librarians, I posit that it is time for faculty members and librarians, within the confines of disciplinary departments, to share their knowledge with each other and to build a more cohesive approach to IL for their students.

Epistemological Stance

This study supports a social constructivist stance where knowledge is *built* by learners who connect new knowledge to previous understanding through social inquiry and interaction with their environment (Lenters, 2013). *Social* refers to interaction with other human(s) (e.g. colleagues, experts, etc.) and with human-produced artifacts such as oral stories or written or recorded artifacts. *Social inquiry,* then, refers to a social endeavor in which learners collaborate to build self and shared knowledge (Dewey, 1938; Morgan, 2014).

Theoretical Framework

Researchers designed the CoI Framework (Garrison, 2011; Garrison & Vaughan, 2008), as a process model to inform the study of collaborative learning communities within an online or blended learning environment. The CoI Framework has been used over the years in HE to inform practice and research. Using the CoI Framework in studies with faculty members is less usual and using it within IL to build shared understanding between two faculties is unique to this study. Nevertheless, the CoI may be an ideal mechanism for building a TELE workshop that

supports collaboration and shared sponsorship of IL among faculty members and librarians, discipline by discipline.

Through collaborative inquiry such as discourse, negotiation of shared meaning, and collective cognitive and teaching responsibility, the CoI Framework supports a collaborative process wherein committed learners build meaning together and create new forms of understanding in relationship to their shared learning goals as a community (Garrison, 2011; Garrison & Vaughan, 2008; Scardamalia & Bereiter, 2006; Zhang, Scardamalia, Reeve, & Messina, 2009). The CoI Framework incorporates three presences (social, cognitive, and teaching) which support an inquiry-based community (Garrison, 2011).

Overview of Methodology

Approach. I incorporated a design-based research (DBR) approach to develop and test a faculty member-librarian workshop. DBR facilitates focus on a local need in a real-world setting and is an appropriate methodological approach for an intervention that is attempting to encourage inquiry, shared understanding, and sponsorship of IL (Anderson & Shattuck, 2012; McKenney & Reeves, 2014; Rawson & Hughes-Hassell, 2015). I also chose DBR for its focus on simultaneously developing practical interventions that inform practice along with theoretical insights (McKenney & Reeves, 2014; Rawson & Hughes-Hassell, 2015). DBR encourages flexible and iterative refinement through authentic implementation and revision and therefore fits a blended TELE (Anderson & Shattuck, 2012).

Setting. The study took place in a small (fewer than 3,000 students), private US university. With fewer than 200 faculty, academic departments are also small. The university offers degrees in liberal arts, social and professional sciences, and STEM (science, technology, engineering and mathematics).

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Sample. Because my study is design-based, it consisted of two data collection points. The first data collection point was during the university environmental scan where I conducted focus group interviews of 15 faculty members/librarians and department chairs who volunteered to participate from across the university. I also conducted focus groups with 16 students who volunteered from the social sciences department which was selected as the department in which I would conduct a blended, CoI workshop. In addition, I conducted a private interview with the Vice President for Academic Affairs. I used the results from this university environmental scan to inform the design of the FacLibCoI workshop, which occurred in phase two of the study. The second data collection point occurred in phase three with the implementation of the FacLibCoI workshop, which included 14 participants (faculty members from a social sciences department and university librarians). Participant numbers for each of these are summarized in Table 1.1.

Table 1.1. Participants of the Study

University Environmental Scan (Focus Groups)	FacLibCoI Workshop
16 students from the social sciences department that participated in the FacLibCoI Workshop	14 participants (made up of 10 faculty members from a social sciences department and 4 librarians*)
15 faculty members/librarians and department chairs	
1 academic administrator	

*I was also a librarian, but I was there as researcher and facilitator, not as participant.

The workshop consisted of four, two-hour face-to-face sessions held over two months with an asynchronous, online discussion thread that followed each face-to-face session. The full participant group would meet with the facilitator at the beginning of each face-to-face session. Typically, the group would divide into smaller groups, which had been previously defined to ensure a mix of social sciences faculty members and librarians in each group. The small groups would discuss a topic or work through a problem that had been proposed to the full group.

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Participants would come together at the end to compare their work and to build consensus. After each face-to-face session, participants were asked to collaborate in an asynchronous forum over a problem that remained unresolved from the previous face-to-face session.

By focusing on a single disciplinary department and the library, the participants could build their shared meaning making in ways that would potentially benefit the students within that academic department. Because academic departments at the university are small, the full faculty membership of the social sciences department and the full cohort of librarians participated. There were 14 participants (I was the fifth librarian but was serving as researcher/facilitator).

Data gathering and analysis. I collected and analyzed data using mixed methods appropriate to the research questions. These various views provided confirmation and contrast, clarified anomalies, and helped to establish trustworthiness. I collected data in two phases, the university environmental scan and the FacLibCoI workshop. This is illustrated in Figure 1.1.
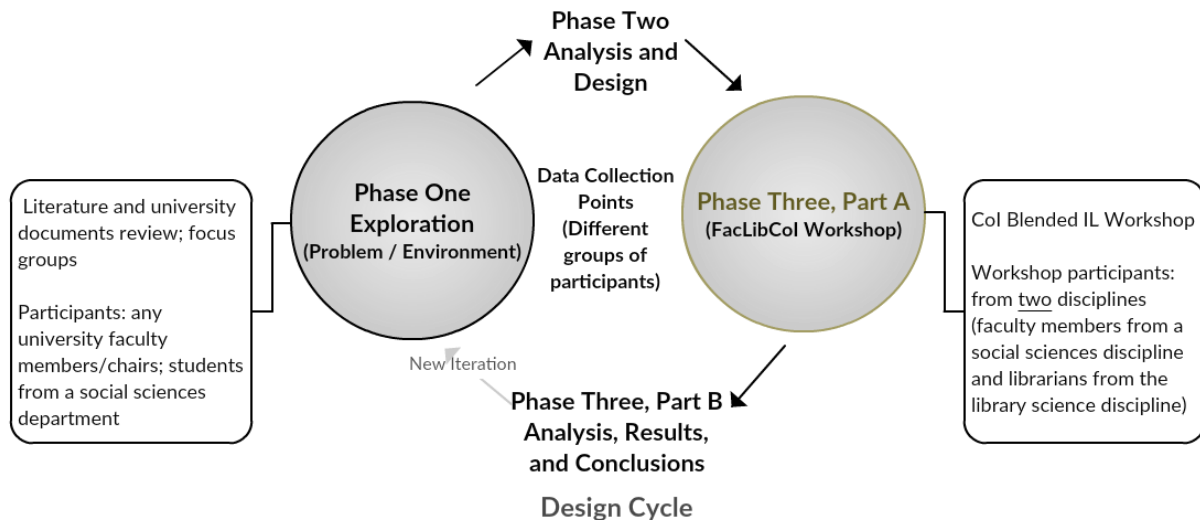
Figure 1.1. Diagram of Study Highlighting Data Collection Points

During Phase One, the university environmental scan, three forms of data were collected which included a review of literature, a review of university documents, and focus group

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interviews with faculty from across the university and students from a social sciences department. This data was used to inform the content for the design in Phase Two of the study.

Four types of data were collected during Phase Three when I implemented the FacLibCoI workshop design with faculty within a social sciences department and librarians. Data included pre- and post-interviews with participants, session transcripts, CoI questionnaires, and participant-produced artifacts. The various types of data collected in Phase One and Phase Three are described below:

Phase One: University environmental scan

- A review of literature provided theoretical and design information to inform the design and implementation of the study.

- University-produced documents, such as accreditation reports and strategic plans, were used to build a conceptual understanding of the environment in which the study would take place.

- Research assistants (RAs) and I took careful notes throughout the focus groups that I conducted with faculty members and department chairs from across the university and with students from a social sciences department. I used these notes to inform the content of the FacLibCoI workshop.

Phase Three: FacLibCoI workshop between social sciences faculty and librarians

- Transcripts were gathered from pre- and post- semi-structured interviews with participants (faculty members from a social sciences department and librarians). I used this data to explore participant understanding of and attitudes toward themes covered in the FacLibCoI workshop.

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- CoI surveys were administered after each face-to-face session of the FacLibCoI workshop. I used descriptive statistical summarization of results to explore participant perception of the three CoI presences.

- Transcripts derived from audio recordings of face-to-face discussions as well as text transcripts from asynchronous discussions of the FacLibCoI were collected. I performed deductive analysis on the transcripts to identify instances of shared understanding of IL, efficiencies/non-efficiencies in the design, and ideas for collaborative approaches to IL.

- Participant-created artifacts by the faculty members and librarians were used to identify shared understandings.

Researcher Assumptions

In choosing the CoI Framework, I assumed that through meaningful and collaborative discourse and reflection learners would construct self- and co-developed understanding around IL that would lead to recommendations for IL sponsorship within the discipline. I also assumed that contemporary educational technology, used in pedagogically-appropriate ways, would expand the collective potential for dialogue and collaboration (Lock, 2015) between faculty members and librarians. Finally, when developing workshop content, I assumed that library-based academic research, which tends to be narrowly focused and published only within library science publications, inhibits information strategies from transferring to other situations (Head, 2012; Julien, 2016; Lloyd, 2011; Waters, Kasuto, & McNaughton, 2012).

Researcher Background

My bias comes from the library science profession as I was working as a librarian who spearheaded and taught in the library's information literacy program at the university where the

study took place. At the university, we had a strong IL curriculum within the general studies program that reached most, if not all, undergraduate students. The program was not without its difficulties, but it was, at least, in place and functioning smoothly. Nevertheless, I saw firsthand the difficulties that students experienced trying to understand the relevance to their discipline courses of the IL instruction in their general studies classes. In addition to my professional role as an academic librarian teaching IL, I came to this study with a background in educational technology. The methods used to teach IL, of necessity because librarians are merely guests in someone else's classroom, fell short of engaging students and helping to foster curiosity and a desire to learn. I was therefore eager to learn more about how to encourage intellectual curiosity through the current IL program and what could be done to enhance student learning.

Definitions and Terminology

Blended learning. In this study, blended learning refers to a mix of face-to-face and online learning modalities (Graham, Henrie, & Gibbons, 2014; Vaughan, Cleveland-Innes, & Garrison, 2013) that includes verbal and written discourse (Vaughan et al., 2013). The purpose of blended learning is to provide convenience and flexibility (Moskal & Cavanagh, 2014) while enhancing student engagement and satisfaction (Garrison, 2017; Moskal & Cavanagh, 2014).

Community of Inquiry (CoI). A CoI is a group of learners whose focus is on "actively searching for personal meaning and shared understanding" (Garrison, 2017, p. 24). Members build their learning and that of the group through respectful sharing and challenging of one another's ideas and assumptions.

Higher order thinking. This term has been used in critical thinking and the CoI literature. Halpern (2007) sees higher order thinking as the larger concept under which critical thinking fits. Ennis (1989) viewed the two terms as related but different. In this study, I use the

term to refer to thought processes that "require judgment, analysis, and synthesis, and…[which are] not applied in a rote or mechanical manner; …[processes that are] reflective, sensitive to the context, and self-monitored" (Halpern, 2007). These contrast with memorization, or rote recall.

Information literacy (IL). I created a working definition, *critical thinking applied to information,* (Allen, 2008; Phillips, 2004; Weiner, 2011). This conforms to the *Framework's* (Association of College and Research Libraries, 2015) alignment of IL with critical thinking. It also supports Halpern's view (2007), that critical thinking is thoughtful engagement of cognitive strategies towards contextualized problem solving, which increases the likelihood of reaching desired goals. This definition of IL places it within a discourse familiar to faculty members.

Shared understanding. As used in this study, shared understanding is greater than and different from the mere summation of everyone's knowledge in the group. It is new knowledge negotiated and agreed upon together as a group.

Organization of the Dissertation

In this introductory chapter, I presented the historical background, context, and problem that the study sought to address. I presented the rationale and significance and the research questions that governed the study. I identified my epistemological stance, the theoretical framework, methodology, assumptions, and my background. I presented definitions of terms that are used in a specialized way in this study.

In the second chapter, I review the literature that provides the basis for the study. I explore information literacy as it has been theorized and practiced along with its various collaborative approaches. I briefly explore possible collaborative models and then review the CoI theoretical framework and associated blended learning strategies.

In chapter three, I explore the philosophical and methodological underpinnings of this study. I explain the theoretical framework and the study's design, which is based on McKenney and Reeve's (2012) Generic Model for Educational Design Research (Generic Model).

I then lay out the setting and sample for the study in chapter four. Data sources and data collection and analysis techniques are outlined and discussed. Issues of trustworthiness and ethical considerations are discussed, and limitations and delimitations are stated.

In chapters five and six, I present the findings of the study. In chapter five, I share the findings of phase one, the university environmental scan, where I interviewed one academic administrator and conducted focus groups consisting of 14 faculty members and department chairs across the university as well as 16 students from a social sciences department.

In chapter six, I enumerate the results of phase three, which corresponded to the main intervention, the FacLibCoI workshop with 14 participants made up of faculty members from a social sciences department and librarians.

I finish with chapter seven where I discuss the results presented in chapters five and six. I then draw conclusions and recommendations based on three areas: knowledge advancement, design refinement, and professional application.

The learning plan developed for the FacLibCoI workshop (consisting of unit and lesson plans) is provided in the appendices. The questionnaire used to collect data in phase three is also presented as are two of the three artifacts produced by the FacLibCoI workshop participants. The first participant-produced artifact is included in chapter six.

Chapter Two: Review of Literature

Overview

Undergraduate students today conflate IL with computer literacy much as they did a decade ago. They feel competent, having grown up with technology, and equate ease in Internet browsing with research capability, and information search and evaluation skills. (Gross & Latham, 2009, 2012; Johnson, 2007; Julien, Tan, & Merillat, 2013; Wang, 2016).

Librarians are aware of this phenomenon, and literature produced by IL practitioners shows a plethora of studies aimed at bringing more engaging IL to more students in the university. While this is certainly a worthy aim since IL has not always been approached in the most engaging of ways, the problem is broader. Not only do librarians struggle to engage students in IL, but they also struggle to engage some faculty members. Without engaging more faculty members, librarians stand little chance of guiding students who come from the various disciplines into meaningful learning around IL. Yet, HE lacks a systematic way for faculty members and librarians to build shared understanding around IL. In this study, I explore a design to address this problem.

Given the diversity of themes, I limited the review of literature to major historical and current threads that relate to the study and which represent the larger body of literature under the various related themes. The review is necessarily selective. Vast bodies of literature exist for topics such as IL, collaboration with faculty members, or faculty communities. I necessarily concentrated on aspects of these large topics that might impact this study such as the various theoretical approaches to IL or blended learning within a CoI. With these delimitations in mind, the areas I reviewed come primarily from library science literature in the form of information literacy (IL), and from the learning sciences literature for community and collaboration, the CoI

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Framework, and blended learning within a CoI. Interestingly, social sciences theory has often been used in IL and these instances are noted.

Information Literacy (IL)

The perceived need for an information literate workforce and citizenry has maintained a firm foothold in the conceptualization of IL (Elmborg, 2016), and this has only increased with the onset of the knowledge economy. For example, the Hart Research Associates study (2013) surveyed over 300 employers in the United States who not only thought that HE should place more emphasis on problem solving, collaboration and communication, but that it should teach research-related strategies. Those who believed research strategies to be important ranked it alongside creativity and innovation and above teamwork and collaboration, ethics, knowledge of science or technology, and knowledge about statistics and numbers (p. 8). A full 72 percent of employers indicated that universities should place more emphasis on teaching how to navigate "the location, organization, and evaluation of information from multiple sources" (p. 8). In 2015, the questionnaire underwent revision making equivalent results difficult to extract and compare.

Pressure upon HE to prepare people for the demands of the knowledge economy has increased over time. Employers in the US and elsewhere want university graduates who can think critically, solve problems, collaborate, and communicate well (National Association of Colleges and Employers, 2016). In the current decade, employers consistently express the belief that HE should not only provide graduates with the skill set of a given discipline but should help them to gain soft skills and capacities such as communicating well in oral and written form or applying analysis to problem solving in real world settings (Hart Research Associates, 2013; National Association of Colleges and Employers, 2016; Sokoloff, 2012). Critical thinking, self-regulated thought, and the ability to critically use information are further coveted soft skills

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(Bird, Crumpton, Ozan, & Williams, 2012; Bridgstock, 2009; Howard, 2012; Sadler, 2013; Waters et al., 2012).

Indications are that this desire for an information literate workforce is a worldwide issue. Australian employers, for example, value similar employee competencies as those preferred by their American counterparts. The Foundation for Young Australians presented an analysis of job adverts showing that employers' demand for problem-solving, creativity, critical thinking, and digital literacy competencies increased between 25 and 200 plus percent between 2012-2015 (Foundation for Young Australians, 2016). The study further indicated that by the end of the current decade, 90 percent of the Australian workforce would need to be at least at a digital-citizen level of competency, defined as being able to "use technology to communicate, find information and transact" (p. 16).

On the other hand, Elmborg (2016) asserts that when librarians argue the importance of IL to the workforce, they are falling back on early 20th century progressive administration conceptualizations and that they should, instead, be adopting the ideals of progressive pedagogy. Progressive administration focused on the needs of the economy and envisioned educational systems and organization to *train* citizenry for the workforce. Progressive education, on the other hand, as espoused by John Dewey, considered knowledge-building as paramount. Continued focus on the economy, even the knowledge economy, rather than on education, itself, is at odds with critical thought or creative knowledge building, according to Elmborg (2016) who criticizes IL for not exploring more critical approaches.

Historical background. As IL began to emerge out of BI, the *Presidential Committee on Information Literacy Final Report,* submitted to the American Librarian Association by the Association of College and Research Libraries (1989), explained the concept of information

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literacy and put forth a number of recommendations that included establishing the Coalition for Information Literacy by the American Library Association. It also recommended that research needed to promote the concept and that it should be addressed at the White House Conference on Library and Information Services. This began a new approach within the library field that came to be known as information literacy or IL. Unlike BI which focused on library tools, IL focused on literacy and listed objectives which, if accomplished, should demonstrate IL.

The Presidential Committee defined an information literate person as someone who is "able to recognize when information is needed and have the ability to locate, evaluate, and effectively use the needed information" (Association of College and Research Libraries, 1989, Introductory section, para. 3.). Along with their recommendation for increased research into IL, they recommended that IL be taught in schools and across higher education. School and academic librarians embraced these two recommendations and ten years later, the ACRL Standards Committee approved the *Standards* (Association of College and Research Libraries, 2000), which expanded the concept to include…

> "determin[ing] the extent of the information needed, access[ing] the needed information effectively and efficiently, evaluat[ing] information and its sources critically, incorporat[ing] selected information into one's knowledge base, us[ing] information effectively to accomplish a specific purpose, [and] understand[ing] the economic, legal, and social issues surrounding the use of information, and access and use information ethically and legally." (pp. 2-3)

At the conceptual level, the authors of the *Standards* (Association of College and Research Libraries, 2000) linked IL to HE and to constructivist theory when they declared that

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the purpose of HE is to promote "reasoning and critical thinking," along with lifelong learning by helping students "construct" their own "framework for learning how to learn" (p. 4).

Librarians within HE mobilized around the *Standards* (Association of College and Research Libraries, 2000). As experts in information access but not necessarily coming from a teaching background, these librarian practitioners were tasked with providing IL to an entire institutional student body. The outcomes-based, blueprint-style approach of the *Standards* (Association of College and Research Libraries, 2000) were understandable and the standards, performance indicators, and learning outcomes feasible. Elmborg (2016) noted that much of the language and substance of the eventual *Standards* (Association of College and Research Libraries, 2000) came from a much earlier ERIC Digests report by Vicki Hancock (1993).

A changing definition of IL. While scholarly discourse among practitioners within the library science field continued to examine learning outcomes based on the *Standards,* theorists examined IL's underlying philosophy and theory, sometimes applying theory from fields such as social and psychological sciences or education. Elmborg's (2006) seminal article, which reviews critical approaches to IL as a way to incorporate teaching and learning theory, is an example from these conversations. He and others believed that a skills-based pedagogy that can easily be measured by competencies or standards, such as IL at the time, fell short of contemporary educational theory that saw learning as being less about knowledge acquisition and more about meaning making that is situated in authentic context (Elmborg, 2006; Špiranec & Zorica, 2010).

In 2015, the Association of College and Research Libraries (2015) filed the *Framework for Information Literacy for Higher Education*, hereafter referred to as the *Framework,* with ALA. Voted in 2016, the *Framework* provides a less-prescriptive view of IL that focuses on

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reflection, understanding, and knowledge building. As part of this new emphasis, a new definition for IL emerged. IL is a set of:

> "integrated abilities encompassing the reflective discovery of information, the understanding of how information is produced and valued, and the use of information in creating new knowledge and participating ethically in communities of learning" (p. 3).

The Association of College and Research Library's (2015) new definition better approaches higher order thinking goals for IL, such as inquiry-based exploration, information evaluation and interpretation, understanding contextual authority, and critical self-reflection. Placing IL within higher order thinking moves it from the domain-specificity of library science to engage other academic disciplines.

The *Framework*. As mentioned earlier, a decade ago, when search engines began serving up ever greater amounts of information and privileging some results over others, research documented that this led to student anxiety as they engaged in early stages of research (Kuhlthau, 2008). In addition to these challenges, today novice researchers face new difficulties. How does one judge the credibility and objectivity of crowdsourced information, blogs, and *fake* news? Wiebe (2016), in an article in which he discussed IL in higher education, commented that young people tend to ignore these innate flaws of the Internet and conflate *Googling* with research. They feel falsely confident in their research abilities. Mechanical approaches to IL do not meet this and other similar challenges. The *Framework* (Association of College and Research Libraries, 2015) is an attempt to move IL further along the continuum between mechanistic methods to more sociocultural approaches that can withstand the information challenges of the 21st century. It is now the guiding document for IL within HE across the United States.

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The *Framework* (Association of College and Research Libraries, 2015) expands the responsibility for IL from lone librarians and their IL programs to collaborative relationships with faculty members and the entire HE institutional community. It also introduces changes to IL in terms of theory and practice. A phrase-by-phrase comparison between the *Framework* and the *Standards* (Association of College and Research Libraries, 2000, 2015) is provided in Table 2.1.

Incorporated within the *Framework* (Association of College and Research Libraries, 2015) are a number of theoretical concepts from within and outside of Library and Information Science. Perhaps the main theory upon which the document is based is that of threshold concept theory adopted from learning environments for economics. The term threshold is defined as "those ideas in any discipline that are passageways or portals to enlarged understanding or ways of thinking and practicing within that discipline" (p. 2), In a related IL study (Townsend, Hofer, Hanick, & Brunetti, 2016), threshold concepts are further defined as "an approach to teaching and learning," which uses "core ideas and processes in a discipline that students need to grasp in order to progress in their learning, but that are often unspoken or unrecognized by expert practitioners" (p. 24). The *Framework* (Association of College and Research Libraries, 2015) seems to apply thresholds to the discipline of IL, itself (p. 2), while also encouraging collaboration between faculty members and librarians to identify the disciplinary threshold concepts around which IL instruction may be built (p. 13).

The *Framework* (Association of College and Research Libraries, 2015) is made up of six interrelated frames and each contains a threshold or critical concept to the development of IL understanding and practice. Also linked to each threshold concept are knowledge practices and dispositions. Knowledge practices are not prescriptive learning outcomes. Instead they may be

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Table 2.1. Comparison of the Definitions of IL (Standards/New Framework)

Standards (2000)	←Comparison→	*Framework (2015)*
Information literacy is a set of abilities	←Set of abilities →Metaliteracy of understandings that lead to engagement on multiple levels.	Information literacy is a metaliteracy made up of understandings that are reflected in personal engagement with information on multiple levels.
requiring individuals to…	←Normative →self-regulated	engagement with…
Information literacy is the basis for lifelong learning. It is common to all disciplines, learning environments, and education levels.	←Universal/ transferable →Contextualized engagement with the ecosystem	the information ecosystem in various communities
It enables learners to master content and extend their investigations, to assume more control over their learning and be more self-directed	←Leads to self-directed, self-controlled learning→	underpinned by metacognition, including critical self-reflection.
…recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information. An information literate individual is able to: • Determine the extent of information needed • Access the needed information effectively and efficiently • Evaluate information and its sources critically • Incorporate selected information into one's knowledge base • Use information effectively to accomplish a specific purpose • Understand the economic, legal, and social issues surrounding the use of information; access and use information ethically and legally	← Breaks down into clearly defined behaviors that, if accomplished, define a *person* as being information literate →Lists a series of understandings that, when combined, form the concept of information literacy →Collaborative learning guided by critical self-reflection	Information literacy is the set of integrated abilities encompassing the reflective discovery of information, the understanding of how information is produced and valued, and the use of information in creating new knowledge and participating ethically in communities of learning. • Authority is Constructed and Contextual • Information Creation as a Process • Information has Value • Research as Inquiry • Scholarship as Conversation • Searching as Strategic Exploration

considered as examples of how to interact with the threshold idea. As such, they are to be

contextualized within the learning environment where they will be applied. According to the

Framework (2015), dispositions serve as examples of the attitudes and values held by the person

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embracing the threshold concept. Again, these would need to be crafted to the specific learning environment.

The goal of the six threshold concepts is to free learners from rote, formulaic application of IL strategies and to foster deep thinking as they engage with the information environment. When people develop larger understandings of the complex information world, they are better able to determine their discovery process. The term, "information ecosystem" as used in the *Framework* (Association of College and Research Libraries, 2015, p. 2), may represent a symbiotic (interdependent but not automatically mutually beneficial) relationship between the learner and the information environment.

The six threshold concepts attempt to encompass the breadth of IL while reflecting sociocultural learning theory and changes occurring in HE. I summarize the six themes from the *Framework* (Association of College and Research Libraries, 2015) below. Pages within the *Framework* where the specific frame may be found are noted next to each one:

1. Authority is constructed and contextual (p. 4). Authority is dependent upon things like origin and information need. Authority is granted by a community and the information seeker should become familiar with the typical authority indicators within their individual communities.

2. Information is created as a process (p. 5). Because information quality is based on processes of research, writing, editing and publication, these must be understood and considered when deciding how to use a source. While an expert may disregard format, she will consider the processes behind it in determining the usefulness of the information.

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3. Information has value (p. 6). Information may be a commodity, a way to exert control, an educational tool, or a way to explore the world. It is governed by economic, legal and sociological factors. Participation in the information ecosystem as consumer or contributor carries risks, responsibilities, and benefits.

4. Research is viewed as inquiry (p. 7). The research process is based on inquiry wherein questions lead to answers which lead to further questions. This iterative process occurs within or between disciplines but also expands to the community and contributes to directions of inquiry, methodological approaches used in inquiry, as well as to inquiry-informed practice.

5. Scholarship is seen as conversation (p. 8). Conversation takes place within learning communities and any information produced reflects this conversation.

6. Searching is viewed as strategic exploration (p. 9). Seeking information is not a one-size-fits-all, prescriptive process. Certain strategies may inform the search, but it remains a non-linear discovery process that crosses various pathways.

To summarize, the *Framework* (Association of College and Research Libraries, 2015) guides understandings, practices and dispositions used to engage with a complex information ecosystem. These make up a person's information literacy repertoire, which can grow, change, and be flexibly applied. Six threshold concepts are presented as necessary to the understanding and practice of IL. Each threshold concept includes examples of knowledge practices and dispositions to assist in designing IL learning processes.

Path forward under the *Framework*. A decade ago, Elmborg (2006) noted that librarians in HE faced increased complexity as they took on a clear educational role that challenged traditional conceptualizations of librarianship. This complexity, instead of

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dissipating, may increase with the new theoretical approaches outlined in the *Framework* (see Association of College and Research Libraries, 2015). Today, librarians and faculty members must together create an environment where students learn to find and use information in sophisticated and appropriate ways. In spite of the broad strokes of the *Framework* (Association of College and Research Libraries, 2015) that encourage librarians to establish holistic IL programs that will engage faculty members and other groups across campus to incorporate IL at various points in a student's academic career (2015), current literature continues to lament the fact that the demands upon the teaching librarian are unrealistic in terms of required expertise across multiple disciplines and groups, and in terms of time required (Church-Duran, 2017).

Practitioners and theorists have begun to further explore and define the frames to implement this less-prescriptive *Framework* (Association of College and Research Libraries, 2015) across various disciplines. This is resulting in a very recent and new body of literature. Vong (2017), who engaged in workshops for colleagues, indicates that three camps have emerged among practicing librarians: the adopters, those wanting to understand the frames within their context, and the exasperated. She indicates that debate continues around "the use and pedagogical value of the frames," and notes with concern that there is need to recognize these emotional responses (p. 392). The long-term value of the *Framework* (Association of College and Research Libraries, 2015) will depend upon how well the underlying theory is understood and embraced by IL practitioner librarians.

Although it is too early to judge the long-term efficacy of the *Framework* (Association of College and Research Libraries, 2015), there is no doubt that it is already stimulating efforts to bridge the theory-practice gap. The *Disciplinary Applications of Information Literacy Threshold Concepts* (Godbey, Wainscott, & Goodman, 2017), released in November, 2017, by the

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Association of College & Research Libraries, is one such attempt. This and other initiatives will lead to applied and theoretical research far into the foreseeable future.

IL theory. IL is a rapidly expanding, complex and diverse topic. Using only the Library and Information Science Abstracts (LISA) database (that is, excluding other related databases where cross-disciplinary IL literature would be found), I searched IL literature chronologically by historical landmarks within the IL field. The first search, 1980-1989, included the period leading up to the Presidential Committee Report on Information Literacy (Association of College and Research Libraries, 1989). The second search comprised IL literature from 1990-1999, the period of time between that document and the Standards (Association of College and Research Libraries, 2000). The third period stretched one-and-a-half times longer, or 15 years, from 2000-2014, the time that the Standards (Association of College and Research Libraries, 2000) were in use. Lastly, I searched the short period of time since the release of the *Framework* (Association of College and Research Libraries, 2015) or the three most recent years of 2015-2017. Results below show just how quickly IL literature has exploded:

Table 2.2. Information Literacy Literature (in LISA)

Period	# Years	# of Information Literacy Results	Mean # Results per Year
1980-1989	10	More than 60	6
1990-1999	10	More than 400	40
2000-2014	15	More than 6,700	447
2014-2017	3	More than 1,700	567
Total		More than 8,860	

Within IL literature, there are many localized, practitioner-reported applied studies. Over the last 15 years, however, researchers such as Detlor, Booker, Serenko, and Julien (2012) published serious theoretical pieces that call for establishing a theoretical and pedagogical base for IL to guide it beyond transmission modes of education to more active learning approaches.

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Such theoretical essays call IL away from a focus on generic skills and attributes defined in mechanistic and positivist ways (Diekema, Holliday, & Leary, 2011; Lloyd, 2010). Instead, they seek to guide IL into more theoretical approaches based on a variety of epistemologies (e.g. constructivist, critical, or sociocultural stances). Other theorists highlight the need for conceptual models and attention to learning theory in order to bridge the gap between theory and practice (Kuhlthau, 2013; Lloyd, 2017). These researchers moved beyond defining IL to exploring how it occurs (Lloyd, 2011). Perhaps the truly important takeaway is that theoretical schools or approaches to IL formed and now exist (Bruce & Hughes, 2010; Freeburg, 2017; Lloyd, 2017). Researchers are not only pursuing various topics within different epistemological stances, but based on these stances, they are questioning the core ideas of IL. It is to epistemology that we now turn our attention.

IL researchers are beginning to form various epistemological camps. Major ones are cognitive, sociocultural, process-oriented phenomenographic, and critical approaches. The remainder of my review of IL literature provides examples of IL research conducted from these perspectives. Within each camp, key researchers made important contributions and could be seen to represent a larger body of ongoing research. As I review each perspective, I relate it to the present study.

Example from a constructivist perspective. Carol Kuhlthau published groundbreaking research in which she developed the Information Search Process (ISP) Framework (1991), which is based on constructivist theory. Kuhlthau developed and tested the ISP through a series of studies stretching over two decades (Kuhlthau, 2008, 2013; Maniotes & Kuhlthau, 2014). Work on the ISP stretched across a number of studies that included school-age and high-school students, undergraduate students in college and finally different types of professionals within

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workforce environments (Kuhlthau, 2008, 2013). This Framework has been utilized by many researchers to study IL from the 1990's to today.

Kuhlthau's (1991, 2008, 2013) holistic view of the learner experience, which included thoughts (cognitive), feelings (affective) and action (physical), relates the importance of human experience to how people engage in information seeking. Identified in the ISP Framework are seven stages of the information search process (initiation, selection, exploration, formulation, collection, presentation, and assessment). Thoughts, feelings, and action are laid across these information search stages (see Table 2 in Kuhlthau, 1991).

More recently, Kuhlthau developed the Guided Inquiry Design Framework, and Maniotes and Kuhlthau (2014) provided a classroom example of guided inquiry. The ISP Framework and other conceptual work by Kuhlthau maintained a strong and extended influence on IL.

Several key findings emerge from Kuhlthau's research that are important to the concept of IL and the role it may play in the construction of knowledge. I briefly outline below those that bear influence on this study:

- *Feelings of uncertainty and anxiety* occur once a person has decided upon the subject of their research and started to gather information during the exploration phase (Kuhlthau, 2013). During this stage, the person may have trouble finding information on their topic or they may find contradictory information. If this cognitive uncertainty and affective anxiety surprise the information seeker, it can lead the person to end the experience and miss out on learning opportunities (Kuhlthau, 2008).

- Throughout the information search process there are *zones of intervention*, a concept modeled after Vygotsky's (1997) zone of proximal development, during which time the information seeker will benefit and appreciate assistance and support from experts

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in ways they would not during times outside of the zone. Such assistance allows the person to move forward (Kuhlthau, 2008). If librarians and faculty members understand this concept, they are better equipped to utilize these times to effectively and efficiently provide IL instruction.

- Different types of *goals and behavior lead to different information impact*s. Depending upon the goal that the information user has, the impact that the information can make will differ. Kuhlthau (2008) provides the example of a professional who wanted to increase knowledge. Meanwhile, a novice information user searched for the right answer. In this example, the personal goal determined the level of learning experienced through the information search.

Kuhlthau (1991) lamented the traditional focus within library science on systems and how to navigate them and presented ISP as a way to shift focus to how a user experiences those systems throughout the process. In 2013, she proposed reconsidering the *Standards* because of "positivist" and "mechanical" language. She explicitly linked the purpose of IL to "a person's capacity for deep thinking, reflecting, constructing, innovating, and learning" (p. 97). Her work has helped the IL field focus upon the experience of the person conducting the search and on how we might encourage knowledge building through the process.

Example from a phenomenographic perspective. Christine Bruce, along with various team members, utilized phenomenographic research to study the information experience. She focused on the user's relationship to the information and the system used to retrieve it. Bruce (2000) reported on her own research that took place during the last half the 1990's within the workplace where she described how users experience IL through seven faces. These faces are information technology (e.g. emphasis, competencies), information sources (e.g. bibliographic,

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human assistance), information processes (e.g. problem-solving, decision-making), information control (e.g. managing information), knowledge construction (e.g. development of one's own point of view), knowledge extension (e.g. uses knowledge to produce solutions), and wisdom (e.g. uses knowledge to benefit others) (Taken from Table 1, p. 216). Bruce asserted that these seven faces relate to workplace processes familiar to people and provide a bridge into that domain (Bruce, 2000). A roadmap for applying information literacy is found in examples of the seven faces as they apply to informed learning within academe, the workplace and within the community along with experiences from each context (Bruce, Hughes, & Somerville, 2012).

Informed learning is another concept that developed from applying the variation theory of learning to IL. This concept grew out of the premise that IL is a way of contextually-interacting with information through one's own information processes rather than possessing a set of skills that can be once learned and universally applied (Bruce & Hughes, 2010; Bruce et al., 2012). Informed learning is made up of the following six constructs: second-order perspective, simultaneity, awareness, relationality, the nature of information, and information practices (Bruce & Hughes, 2010).

Another important construct is the Nature of Information. Bruce and Hughes (2010) proposed that information is experienced in a variety of ways and can be defined differently by different user groups and even by individual users. This conceptualization, if true, represents one area of productive dialogue among faculty members and librarians seeking to better understand IL within a discipline so that they may better design learning opportunities for their students.

In summary, *informed learning* is an attempt at giving due importance to the notion that teachers and learners can be aware of their information use and the role it plays in their learning experience. By placing IL within contextualized processes (e.g. creating a project presentation,

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preparing a medical report, solving a personal problem), users become aware of their learning, which empowers them to incorporate information into further learning (Bruce et al., 2012).

The learning sciences literature, which addresses inert knowledge and a student's ability to access it, has a bearing on this research within the IL literature. Knowledge retrieval seems to be dependent upon connections that link various knowledge pieces together. When these connections are lacking, inert, or inaccessible knowledge results (Bereiter & Scardamalia, 1985). Learning sciences literature has addressed this problem in a variety of ways. Lu, Bridges, and Hmelo-Silver (2014) present problem-based learning (PBL) as an active learning approach that helps students make these necessary connections. PBL is based on sociocultural, constructivist theory and seeks to engage students in collaborative work where they must communicate their knowledge to others, have it critiqued, and through the process, learn to reflect upon and revise their knowledge. When students become aware of their knowledge they are able to connect it with other knowledge that they possess and with that of others.

Another learning method where students visualize their learning is through cognitive apprenticeship (Collins & Kapur, 2014). In cognitive apprenticeship, the novice learner observes and is mentored by the expert to engage complex concepts and arrive at successful outcomes. Students learn this conceptual knowledge in rich context, which allows them to connect it with contextual knowledge and with the disciplinary or professional field. Situating conceptual knowledge "in problem solving" (2014, p. 115) or real-world contexts enables the student to locate and apply this knowledge in ways that traditional, transmission-style teaching does not. Whatever the form that active learning takes, the point is to lead to knowledge that can be retrieved and applied (Bereiter & Scardamalia, 1985).

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This type of active learning is built or constructed within sociocultural contexts (Lu et al., 2014), such as collaborative learning communities (Garrison, 2016). While collaboratively working on a problem, research question, or design in which IL may inform the learning, students share their knowledge with each other, submitting it to critique and thus making it obvious to themselves, so that they may reflect and revise their knowledge (Lu et al., 2014). To support this process, different community learning models have arisen. Communities of practice and communities of inquiry are two examples of models that have been developed, tested, and implemented to guide a collaborative learning experience (Garrison, 2017; Wenger, 2010).

Identifying associations like this between learning sciences and IL literature may prove helpful to both fields. Examples of emerging topics within IL that relate to learning sciences literature include cross contexts or spaces for inclusive informed learning and methodological approaches such as informed learning design or informed systems (Bruce et al., 2017).

To summarize, concepts from a phenomenographic perspective of IL that seemed to relate to learning sciences and this study included:

- Second order perspective, or the importance of how users experience information.
- Information is contextual to the processes in which users engage with it.
- Awareness of one's own learning surrounding IL helps to empower the user.
- The role of technology is contextual to things like availability or capability.
- Effective use of information requires informed learners with appropriate skills.

Example from a sociocultural perspective. An influential voice in sociocultural research into IL is that of Annemaree Lloyd. Lloyd (2011) studied IL within the workplace and concluded that it is a process that is made up of many, entwined actions within a contextualized and situated dialogue. Based on her workplace research, (Lloyd, 2011) rejected the idea that IL is made up of

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transferrable skills. Instead, she viewed it as a contextualized and constructed, sociocultural practice. Several studies (Head, 2012; Lloyd, 2011; Waters et al., 2012) seem to suggest that when IL is tied to academic research processes and sources it does not easily transfer to the workplace. Head (2012), for example, found that recently-hired graduates exhibited academically-focused information skills and quick Internet search capabilities but struggled with ill-defined information problems and with formulating workable solutions that tapped industry or proprietary sources other than the Internet. Nor did graduates perceive value in team-based research or in longer, non-linear search processes.

Lloyd's emergency services studies (referenced in Lloyd, 2007; Lloyd, 2011) found that IL in the workplace is intimately related to group problem solving. Lloyd (2011) argued that because IL does not automatically transfer, research should focus on contextualized IL to better understand the sociocultural influences that impact transfer. In line with this concept, Lloyd defined IL as "a critical information practice that encompasses not only the mastery of information skills but also a mastery of the information landscape" (Lloyd, 2011, p. 285). Lloyd (2017) clearly categorizes IL as a practice and goes on to describe this practice as "situatedness, relatedness, negotiation, embodiment and collectivity" (p. 91).

Based on the sociocultural understanding of IL practice, Lloyd (2017) proposed an IL model diagrammed by a set of four concentric circles. The innermost core represents the information environment. Moving outward, the next circle is split into three pie sections (physical, social, and epistemic/instrumental modalities). The third circle represents literacies of information, and the outermost circle, information landscapes. Any number of landscapes may exist. According to the model, a researcher might enter a given information landscape through its core (the information environment), while a teacher enters through the literacies of information.

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Lloyd's sociocultural approach to IL has implications for this study in that perhaps IL, in its current form of discourse is not relatable to faculty members within their own disciplinary discourses. Lloyd observed that IL, as managed and implemented in HE, is too narrowly focused on library-based search strategies within academic sources. According to Lloyd (2011), library-based understandings of information make IL less transferrable.

Example from a critical perspective. Over the years, some researchers view critical theory and IL as a natural philosophical match due to the long-espoused belief within the library field that information holds a democratizing power (Association of College and Research Libraries, 1989). One of the key theoretical voices in critical approaches to IL is Elmborg (2006). Elmborg's theoretical essays approach IL from various library science perspectives and highlight it within various critical forms.

In one of his earlier works, Elmborg (2006) pointed to Freirean views of American education as knowledge banking that deposits information into students' heads. He contended that HE is structured to acculturate students into specific ways of knowing. In this same work, Elmborg (2006) proposed a critical approach to IL to incorporate real world problem solving.

In an essay about IL for adult learners, Elmborg (2010) considered the hegemony that HE wields and the difficulties encountered by students from less-privileged backgrounds who do not possess the "school literacies" necessary for success. He argued that much of IL process-oriented research and pedagogy reinforces this hegemony by placing discrete skills devoid of authentic environments over socioculturally relevant inquiry and knowledge creation (2010). Critical literacy, he argued, provides a way to democratize the academic community by helping newcomers engage in academic conversations, supporting them as they learn the skills and norms that govern the community's discourse (Elmborg, 2010).

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Elmborg (2010) proposed that when working with adults, critical information literacy will embrace a constructivist approach which places the power back in the hands of the learner. It will help to engage students in meaningful conversations within their zone of proximal development (Vygotsky, 1997) and cultural perspectives. Elmborg (2010) proposed that literacy is defined by the community based on how they value and thus define it. Based on this value and definition, a literate person would be able to decipher and understand the corresponding codes. Accordingly, then, "literacy is fundamentally connected to community, and community members are the judges of literacy competency" (p. 73). IL is an attempt to help members of communities (academic or professional) learn how the community values and defines information and its appropriate use. This then becomes a dynamic learning situation. On the one hand, new members learn to embrace the literacy culture of their community. On the other, they begin to engage in value-building and defining processes for themselves as novice members of the community.

In another theoretical piece, Elmborg (2012) explored a broad approach to IL in which critical information literacy is relational and multifaceted rather than something that can be objectified and classified. One concept that relates to the CoI Framework in this study is his suggestion that librarians take on the role of co-learner to model knowledge-seeking behavior. This is in contrast to the role of an expert and viewing "students as 'objects'" (p. 89).

Elmborg (2016) examined the term, lifelong learning, historically in terms of its coinage and use in 19th- and early 20th-century America, including the Dewey-Snedden debate between human growth and democratization (progressive pedagogy) and the utilitarian means to maintain a useful citizenry (progressive administration). He proposed that, within this historical context, the concept of lifelong learning can continue to be "a task-driven, programmatic initiative" that

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can be easily measured or it can become "problem-posing, one-on-one exploration" (Elmborg, 2016) leading to knowledge building within contextualized settings.

Elmborg is but one voice in the critical information literacy field. For more voices in this growing field, Tewell's (2015) review of critical information literacy is useful. The most direct link between critical theory and my study is the critical stance that is so much in evidence within the social sciences disciplinary department that participated in this study.

Summarizing IL research. Špiranec and Zorica (2010) present an excellent and still informative review of early paradigmatic discourse within IL. Research from that period until today is moving IL beyond positivist, transmission-focused learning to approaches that are integrally linked to social and constructivist learning theory and dependent upon context, experience, and collaborative processes.

Through various lines of research, IL is becoming a more robust concept that holds promise for helping people navigate the rich and complex information landscapes of today's knowledge society. These views include research into the processes of IL, variance in how people experience it, IL as a practice based on sociocultural interactions, and IL as a democratizing influence. As part of this, IL literature also considers the role that theory should play in schools of library science. Julien (2016) recently called for increased attention to the teaching of theory in these schools.

Collaborating to Teach IL

All these views, along with others, provide valuable insight into how we conceptualize IL. They hold promise for more robust and meaningful approaches within HE and for increased understanding of how best to encourage collaboration around IL between faculty members and librarians. What might a formal, systematic collaborative approach to IL involve?

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IL teaching in HE. IL instruction in higher education is typically promoted by librarians, and it may take a variety of forms from no- or one-credit classes or modules, to serving as an embedded librarian within classes across the curriculum, or to preparing online resources for disciplines or classes. Librarians worked hard over the last 15 years to incorporate IL into HE. But, for various reasons, some still continue to apply the *Standards* (Association of College and Research Libraries, 2000) well into the 21st century in erroneous ways that more closely approach knowledge transmission methods and cookie-cutter learning goals rather than socially-constructed, contextualized knowledge (Hicks & Lloyd, 2016; Kuhlthau, 2013). This approach has often reduced IL to a series of skills to be ticked off rather than thought processes to be nurtured over time. This slowed IL's trajectory from BI's emphasis on narrowly-defined library tools to an emphasis grounded in theories of literacy (Elmborg, 2006).

Unfortunately, in spite of much hard work in HE classrooms all over the nation, IL is still too often conceived of as one-shot sessions where librarians are invited into the classroom for a guest lecture to demonstrate library search tools (Cohen et al., 2016; Wang, 2016). Wang (2016) observes that single IL sessions are the most used method of IL instruction across HE. In a study about graduate student experiences in IL sessions, Monroe-Gulick & Petr (2012) note that librarians resort to this method in a desire to reach more students. A student in their study observed, "whenever they're [librarians] given an opportunity to…speak, to give the incredible training that they usually have had to do their jobs, they get very excited. And sometimes encourage professors to do it lots of times…." (p. 328).

In spite of its popularity, this type of one-shot IL session, as it is referred to in the literature, has also been criticized as being largely ineffective (Wang, 2016). In my own personal experience, such sessions often lead to redundancy for students who receive the same

information across several unrelated classes. Some believe that one-off sessions provide students with teaching "at a point of need" (Wang, 2016, p. 620) because the librarian can demonstrate resources specific to the assignment in that class. While this can be true, I often found myself generalizing more than would be helpful to upper-division or graduate students due to my lack of knowledge in their discipline. Meulemans & Carr (2013) posit that librarians are doing students a disservice by acquiescing to provide one-off IL sessions and that they should strive, instead, to work with faculty members to develop learning opportunities that are based on pedagogically-sound principles.

To reach beyond the one-shot session, librarians developed other models as mentioned above. A decontextualized, for-credit IL course, for example, is provided at some HE institutions during the student's first year. The benefit of such an approach is that it reaches all students across the institution. The danger, of course, is that students will see this as a course that is isolated from and irrelevant to the content of their other courses.

Another approach is to embed IL within courses, usually as a research module or as part of an ongoing class project. This helps to contextualize IL. For this to happen, though, librarians must develop one-on-one relationships with faculty members and take on various roles within a course (e.g. co-lecturer, curriculum designer, consultant to both students and professor, and reader). Often the librarian works with the professor to design a learning problem for which IL is part of the solution (see case examples such as Hoffman, Beatty, Feng, & Lee, 2017; or Kirkwood & Evans, 2012). The theoretical validity of this method notwithstanding, it is difficult to scale up a program like this due to the intensity of time needed to establish individual relationships and the disproportionately low numbers of librarians when compared to those of faculty members and classes.

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Librarians might also play a supportive role to faculty members to help them take on the teaching of IL within their own classes. Two studies (Bury, 2011, 2016) conducted five years apart among faculty members at a large university in Canada (the 2011 study surveyed over 1,000 faculty members and the 2016 study involved in-depth interviews with 24 faculty members) revealed that although faculty members showed openness to collaborating with librarians and admitted a role for librarians in teaching students how to access resources, faculty members took personal responsibility for student learning in things like academic writing or critical reading. One may ask whether faculty members might be the ones best suited to teach IL alongside these other concepts.

Collaborative models. Designing a successful workshop for faculty members across disciplines is a complex process due to the differences in disciplinary knowledge, teaching and scholarship. Academic disciplines carry their own philosophy, epistemology, practice and vocabulary that can inhibit meaningful exchange and lead to misunderstandings and lack of trust. The imperative, therefore, is to find ways to establish cross-disciplinary intellectual communities where trust can flourish and collaboration between librarians and faculty members can grow.

Before deciding to use the Community of Inquiry (CoI) Framework in this study, I examined the Faculty Learning Community (FLC) and Community of Practice (CoP) models. FLC's are designed as a way for faculty members from different disciplines to forge intellectual and collaborative relationships (Cox, 1999, 2004; MacPherson, 2007) and can be cohort- or issue-focused around teaching and learning (Cox, 1999; Garrison & Vaughan, 2008). An FLC typically lasts for a full year (Cox, 1999; MacPherson, 2007). Communities of Practice (CoP) are another form of learning community which may continue indefinitely. The literature on CoP's is extensive and outside the parameters of this study except as I briefly considered them before

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deciding upon the CoI. People use CoP's across organizations including education and business (Lesser & Prusak, 2000; Sherer, Shea, & Kristensen, 2003; Wenger, 2010). CoP's are 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 (Lesser & Prusak, 2000; Wenger, 2010).

Although the CoI focus of the FLC fit my study, I rejected this model because it seemed to require a significant length of time to build community, something that is unavailable to librarians. The process of the CoP seemed more appropriate to my study, but the purpose, which centered around practice rather than collaborative inquiry, caused me to look elsewhere.

The CoI Theoretical Framework (CoI Framework)

The CoI Framework is the model I selected for this study. The CoI Framework is situated within the learning sciences literature and researchers within the field of IL may find it a useful concept with which to engage. The Framework identifies a CoI as the ideal setting where teacher and students may engage in collaborative and discursive discovery and where three distinct roles or *presences* combine within an e-learning setting to enhance personal and community learning. These presences are social presence, cognitive presence and teaching presence (Garrison, 2011; Garrison, 2017) The CoI Framework posits that these three components overlap and interact in co-regulatory ways to create the educational experience.

The CoI Framework finds its theoretical base in collaborative constructivist learning theory and in Dewey's transactional conceptualization of education as an interaction between a learner's personal world of ideas and the objective or social world with which the learner transacts or interacts to construct new knowledge (Garrison, 2017). These collaborative interactions occur through thoughtful reflection and discourse (Garrison, 2017).

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The CoI Framework is a theoretical process model developed to help achieve a collaborative, constructivist learning environment. It presents a unified representation of processes that together assist in the design and implementation of a meaningful transactional education experience in an e-learning setting (Garrison, 2017). The goal of this process model is to promote "critical inquiry and the collaborative construction of personal meaningful and shared understanding" (2017, p. 24). Importantly, its emphasis on the unified whole of the collaborative inquiry experience helps learners to construct and confirm understanding (2017).

It bears mentioning here that the CoI Framework may be misinterpreted or misused by some who view the three presences (which are interconnected and co-dependent) or the four-step process of the Practical Inquiry Model (a model that describes cognitive presence) as fixed or inflexible. Others may erroneously split the *whole* apart in an effort to better understand one or more of the *pieces* (Garrison, 2017). In the third edition of his book on e-learning, Garrison (2017), insisted on the theoretically-based unity of the educational transaction within the CoI Framework. He made statements such as, "in a collaborative constructivist educational experience, teaching and learning can only be separated artificially—in reality they are one," (p. 158) or "the functional perspective of the theoretical framework…reflects a 'collaborative constructivist' view of teaching and learning," which is "a recognition of the inseparable relationship between the social environment and personal meaning making" (p. 9)

CoI development. Early work on the CoI Framework explored HE instruction and learning literature as well as textual communication within distance learning (Garrison, 2011; Garrison, Anderson, & Archer, 1999). This initial research led to the development of the CoI conceptual framework (Garrison et al., 1999) which sought to explain the three core parts that

make up an educational experience within a CoI and to transform educational use of computer-mediated communication (a term that predated the term, e-learning).

A template and indicators for each of the presences enabled the analysis of text-based transcripts (Garrison et al., 1999). A guiding study around this time analyzed the way other researchers in the field used quantitative content analysis. The research team examined 19 studies in their attempt to establish valid and reliable transcript analysis tools that could be used for research and within practice (Rourke, Anderson, Garrison, & Archer, 2001). Throughout the next decade, numerous studies utilizing transcript analysis studied one or more parts of the conceptual framework. Towards the end of that period, researchers called for a new approach that could be applied to larger studies (Arbaugh et al., 2008). A subsequent published survey instrument and its testing in large cross-institutional studies provided a validated way to measure the three presences (Arbaugh et al., 2008; Garrison, 2011).

Kineshanko (Befus) (2016) examined research that referenced a seminal article by Garrison, Anderson and Archer (1999). She found a steady incremental increase of publications from 2001 through 2014 across conference papers, books or book sections, articles, and theses and dissertations ranging from fewer than 10 in 2001 to more than 250 in 2014 (Kineshanko (Befus), 2016, see Figure 5.). She finalized on 1,515 artifacts and eliminated those that did not contribute meaningfully to the CoI Framework to arrive at 329 artifacts which met her criteria for thematic analysis (2016). She found that the "terms, concepts, processes, and tools described in the seminal publication are still germane to distance, blended, and online researchers and educators" and that they are "technologically neutral" or applicable to a variety of educational technology environments (Kineshanko (Befus), 2016, p. 98).

Garrison (2011) posited that the CoI "is the most coherent theory to date in guiding the research and practice of e-learning" (p. 29). Now referenced as a theoretical framework, according to Garrison (2017), the CoI Framework constitutes the main lens used today to study e-learning. He further asserts that steady increases in the use of the CoI Framework and the questionnaire that accompanies it shows that it is relevant, lasting, and methodologically compelling. Adding to these attributes, Kineshanko (Befus) (2016) considers that the CoI may be useful to designers and teachers as they seek to build pedagogically-sound, e-learning courses.

Elements of the CoI Framework. As mentioned earlier, the CoI Framework is made up of three elements: social, cognitive, and teaching presences. This conceptual framework, which I used in this study, is found in Figure 2.1. In the diagram, we see that the three presences overlap in a Venn diagram with the center making up the educational experience. Where two of the presences intersect, various characteristics are seen.

For example, *supporting discourse* occurs where social and cognitive presences overlap, while *setting and climate* are found at the intersection of social and teaching presence. *Monitoring and regulating learning* occurs between teaching and cognitive presences.

According to the CoI Framework, each presence has its own significant role to play in the success of the community. These are briefly described below.

Social presence. This presence helps initially to establish the online inquiry community identity and builds and maintains group unity through open and affective communication. It also helps to establish an environment of trust wherein participants construct group identity through engagement in reflective and critical discourse (Garrison, 2011). Creating social presence in an online environment is challenging but possible through a text-based medium. It is less about making personal connections for social purposes and more about developing feelings of
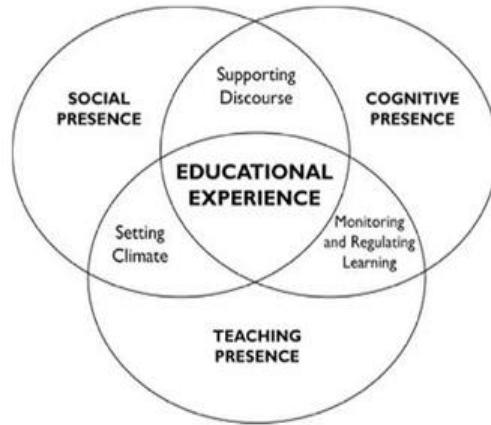
Figure 2.1. Graphical Representation of the Community of Inquiry. This model
shows three interdependent presences that create a collaborative educational
experience. By D. Randy Garrison, (2011, Fig. 3.2, Kindle location 696). Used
with permission; a revised graphical representation was published after my design
was implemented and would be used in any future iterations of this study (Figure
3.1, in Garrison, 2017, p. 25).

belonging within an educationally-motivated group. Social presence refers to "a climate that

supports and encourages probing questions, skepticism and the contribution of explanatory

ideas" and is therefore "inclusive and critical" at the same time (Garrison, 2017, p. 37).

Social presence is built over time and exerts an influence upon the other two presences in

co-dependent ways. Studies show that social presence develops when people are engaged in

learning together, that it can inhibit cognitive presence if it exceeds certain parameters, and that

it plays an intervening role between teaching and cognitive presence (Garrison, 2017).

Social presence includes the categories of affective expression, open communication, and

cohesive communicative responses. Respectful welcoming messages establish a positive

affective climate and build trust that enables open communication. Through open

communication, a member of the inquiry community responds to the questions and thoughts of

others in the group in open and respectful ways. Group cohesion occurs as social presence is established. Some practical ways to build group cohesion are by using participant names and inclusive pronouns, and encouraging collaborative, respectful dialogue (Garrison, 2017).

Cognitive presence. This presence includes the processes that support "critical thinking and discourse and higher order knowledge acquisition and application" (Garrison, 2017, p. 50). It is explained through the Practical Inquiry Model (PI), wherein four inquiry phases (i.e. trigger, exploration, integration, and resolution) make up the inquiry process. The process is modeled in cyclical fashion, but this is a guideline only. Starting in the shared world with a triggering event, the process leads to perception and on into the private world of exploration. Through inductive deliberation, the process then moves towards integration. This occurs first privately in reflection but then moves towards collaborative insight and understanding and on to shared resolution. Resolution leads to shared action which then leads into a new triggering event where the process begins again (Garrison, 2011).

It has been noted that teaching presence is critical to move the process towards resolution which is a cognitively challenging stage. Another finding showed that resolution often occurs offline especially in large projects (Garrison, 2017). Significant work has been done since 2011 in shared metacognition and it has been found that collaboration in cognitive work is important. Another area that is being explored is that of self- and co-regulation within a shared metacognitive construct.

Teaching presence. This presence provides structure to the learning experience. It facilitates a CoI through design, sharing knowledge, collaborative discourse and reflection, as well as designing and implementing appropriate assessment. Yet, the presence is called teach(ing), not teach(er) presence because the role can be shared between all members of the

inquiry community (Garrison, 2017). Naturally, the instructor will fulfill this role more heavily in the beginning and at key junctures where guidance or clarification are necessary. But the collaborative nature of a CoI means that the collaborative group bears shared responsibility for the community, which may, for example, translate into negotiating the learning goals and the assessment as a group. This is an important clarification because perceived control over one's learning is linked to success (2017).

Teaching presence involves design and organization, facilitating discourse, and direct instruction. Design and organization include preliminary planning and ongoing decision-making as the learning environment progresses. Facilitating discourse and reflection is important in an online environment because it helps the community to establish cohesiveness and meet its educational goals. It also assists them towards sustaining and correcting themselves. Finally, direct instruction is concerned with focusing discourse, identifying faulty understanding and confirming concepts and thought processes. It involves providing access to content from various sources and assisting with technology. In summary, it is within teaching presence where the learning environment is designed and guided, and it is from here that the educational experience is supported (Garrison, 2017).

Critique of the CoI Framework. The CoI Framework's three presences and the instrument items have been validated in various studies and used in hundreds more (Garrison, 2017; Kineshanko (Befus), 2016). The CoI Framework has received great acceptance, yet it has not been without its critics. I briefly examine some of the major criticism, which has tended to fall within the areas of cognitive and social presences.

Cognitive presence and learning outcomes. Rourke and Kanuka (2009) conducted a review of more than 200 studies referencing the CoI Framework and concluded that "deep and

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meaningful learning does not arise in CoI" (p. 43). They suggested that future research should study learning outcomes (2009).

In a published response to Rourke & Kanuka's (2009) assertion that deep learning did not occur within the CoI, the CoI research team clarified that as a process model the CoI Framework sought to explain the educational transaction not measure learning outcomes (Akyol et al., 2009, p. 124). They also questioned how the researchers selected the articles for review and why the methods used to measure learning excluded the Practical Inquiry Model, which is an integral part of the CoI Framework (Akyol et al., 2009).

Breivik (2016) published a theoretical piece in which he considered cognitive presence as a tool to measure critical thinking. After a philosophically-based examination and a review of some studies using the CoI Framework, he concluded that cognitive presence does not measure critical thinking and asked the research community to join him in studying its construct validity.

Social presence as a construct and its relationship to emotions. A study that utilized quantitative content analysis from discourse generated in two semester-long online college courses found social presence difficult to interpret (Shea et al., 2010). They called for further clarification. In a second study, Shea et al. (2012) questioned the CoI Framework's ability to explain learner behavior and they proposed a new *learning* presence. By 2014, this team published a third study in which they used quantitative content analysis and social networking analysis with a group of doctoral students (Shea et al., 2014). They proposed retention of the original three presences but suggested renaming them as Social-Learning Presence, Social-Teaching Presence, and Socio-Cognitive Presence, which, according to them, "reflect the unique contributions of students and teachers and also embeds the social dimension as part of each presence" (p. 15).

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Annand (2011) conducted a review of CoI Framework-based literature and posited that Social Presence received more prominence than it warranted and questioned the need for "sustained, contiguous, two-way communication" for successful online learning (p. 52). Annand (2011) further called for the subcategories of social and teaching presences to be re-evaluated and controlled studies conducted to investigate the relationship between the presences and to compare sustained communication. Garrison (2017), on the other hand, points out that "traditional distance education with its focus on prescriptive course packages to be assimilated by the student in isolation… [is] …a misconception that learning is largely an individual cognitive process," (p. 35) and concludes that "the optimal level of social presence is dynamic," but that "it has been shown that social presence is a mediating variable with regard to cognitive and teaching presence" (p. 49).

A study conducted by Cleveland-Innes and Campbell (2012) in graduate online courses across disciplines studied the emotional aspect related to the learning experience. They analyzed transcripts and open-ended questions to identify and use emotional presence indicators in further data collection. This led to a call for further study into a possible new emotional presence.

Although conducted in a K-12 online math's coaching program, I include the Swedish study by Stenborn, Jannson, and Hulkko (2016) who tested a new Emotional Presence construct within the coach-student relationship. They found evidence for all presences, but cognitive and teaching presences took prominence.

Armellini and De Stefani (2016) sought to establish the three CoI Framework presences through three iterations of a blended professional development program between 2007-2010 among English-language teachers in Uruguay. Researchers found that social presence did not perform well as its own construct, but it played a decisive role in the other presences. They

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proposed a new model in which social presence is in the center with the other two presences overlapping it and each other to create the central educational experience.

In his latest work, Garrison (2017) addressed the various attempts at adding a presence as well as assessments of the model's construct. He argued that calls for Emotional or Learning Presence are not strong enough to warrant another presence and noted that adding additional presences would break the principle of parsimony. He also argued that the CoI Framework is based on collaborative constructivism and that attempts to focus on specific learn(er) or teach(er) roles would pull the CoI Framework away from the theoretical base of collaborative cognition. Finally, Garrison (2017) observed that while further research into things like critical thinking or emotional aspects of learning can help to further define the various parts of the CoI Framework, they should be viewed as part of the environment or elements external to the model. He further pointed out that the CoI Framework cannot be judged by criteria that considers critical thinking as something that occurs to an individual in isolation.

Blended Learning Within a CoI

A technology-enhanced learning environment or TELE integrates technology and pedagogy to guide and enhance learning. It may be fully face-to-face but infused with technology. Or, it may be a blended learning environment that combines face-to-face and online sessions. It might also be a fully online environment with no face-to-face interaction. Its defining characteristic is that electronic technologies, especially those that facilitate collaboration, may be combined with appropriate learning theory and methods to design and implement a curriculum-based learning environment that enables students to connect and collaborate in the creation of knowledge (Brown, 2013; Lock, 2015).

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By way of example, Kidron and Kali (2015) used technology-enhanced cognitive apprenticeship concepts to facilitate interaction between experts and novices within a CoI. They proposed that a mixed-discipline TELE where various levels of expertise are represented could lead to understanding across disciplines.

In researching blended learning, I compiled a list of its various characteristics. This list is not exhaustive, but it highlights the main characteristics related to my study. Blended learning, therefore:

- Is comprised of a thoughtful mix of face-to-face and online learning modalities (Graham et al., 2014; Vaughan et al., 2013).

- Consists of verbal and written discourse (Vaughan et al., 2013).

- Provides convenience and flexibility (Moskal & Cavanagh, 2014).

- Can enhance student engagement and satisfaction (Garrison, 2017; Moskal & Cavanagh, 2014).

- Can support and enhance active, deep learning (Dziuban, Hartman, Moskal, Sorg, & Truman, 2004; Garrison & Cleveland-Innes, 2005; Garrison & Kanuka, 2004; Joosten, Barth, Harness, & Weber, 2014; Riley et al., 2014).

- Is interactive; students interact with content and the technology, with self, and with others (Vaughan et al., 2013; Wegmann & Thompson, 2014).

- Involves redesign from lecture to learning-centered instruction (Garrison, 2017; Riley et al., 2014; Vaughan et al., 2014).

- Requires proper technical support and scaffolding (Moskal & Cavanagh, 2014).

- Must include time management strategies for students (Moskal & Cavanagh, 2014).

- Involves self-motivation through collaboration (Garrison, 2017; McDonald, 2014).

The CoI Framework is a theoretical process model designed to work within an electronic environment, one of which is blended learning. The CoI Framework has a history with blended learning almost from inception. Merely two years after the term, *blended learning,* emerged at the Annual Sloan-C 2002 Conference (Picciano, 2014), Garrison and Kanuka (2004) wrote a position paper in which they applied the new concept to the CoI Framework.

Garrison and Vaughan (2008) explored a blended faculty member CoI in order to show how to use the four stages of the Practical Inquiry Model of critical inquiry (trigger, explore, integrate and resolution). I particularly found the course redesign planning framework questions included in this work to be helpful. These help a teacher develop learning outcomes, activities, assessment, and technologies to support learning. The book also contains many useful examples of learning activities that can be used in face-to-face and online learning environments to foster different phases of inquiry. For example, one can incorporate web-based readings or an online quiz as a trigger event in an online environment while using brainstorming activities in a face-to-face session. For integration and resolution, the authors suggested that participants could be asked to present their redesign or other integration pieces to colleagues in the CoI.

Garrison and Vaughan (2008) also focused on the teaching presence of the CoI Framework and presented seven principles of practice that were deductively generated. Five years later, Vaughan, Cleveland-Innes, and Garrison (2013) revised and updated these principles. A person who implements these seven principles will:

"plan for the creation of open communication and trust, [and] for critical reflection and discourse, establish community… cohesion, [and] inquiry dynamics (purposeful inquiry), [as well as] sustain respect and responsibility, sustain inquiry that moves to resolution, [and] ensure assessment is congruent with intended processes and outcomes." (p. 17).

Linking each of these seven principles to the three responsibilities—design, facilitation, and direct instruction—that define teaching presence, Vaughan et al. (2013) provided examples and types of assessment that included self- and peer- or instructor-based assessment, rubrics, and more. Finally, these researchers (2013) reviewed a variety of technologies that may be used for educational purposes including social media, digital storytelling, or virtual worlds. They also provided examples of how technologies facilitate inquiry.

The strength of blended learning is its ability to engage participants within a CoI. According to Garrison (2017) blended learning is about…

> "actively involving all participants in the educational experience. Its essence is moving away from using scarce face-to-face time for information transmission. To use blended learning to disseminate content is to ignore its inherent advantage to engage learners (face-to-face and online) and sustain these connections over time and space" (p. 103).

Positioning This Study Within the Literature

Information literacy literature shows a need for collaboration between faculty members and librarians and includes various attempts at collaborative initiatives, such as one-shot IL sessions, embedded librarians, IL programs tied to specific general education courses, or web-based literature guides rolled out to faculty members and students (Cohen et al., 2016; Hoffman et al., 2017; Kirkwood & Evans, 2012; Wang, 2016). IL theoretical literature shows that IL is being approached from various epistemological and learning theory lenses (Kuhlthau, 2008; Tewell, 2015; Wang, Bruce, & Hughes, 2011). This highlights an aspect that has been largely ignored in applied IL, that of cross-disciplinary discourse (for example, sharing with each other theory from each discipline that might relate to IL), which could help to build shared understanding.

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Faculty member collaboration leads back to professional-development types of experiences, wherein faculty members either work within their own disciplinary or in cross-disciplinary groups to build a sense of community and overcome issues inherent to the life of an academic professional (e.g. tenure, isolation, publishing). Or, they may work within a supportive group on improving their own teaching (Cox, 2004). Meanwhile, the CoI Framework and blended learning literature show how a CoI can be used in faculty member professional development (Garrison, 2017). Uses typically fall within the same categories as those listed above. One advantage to CoI-based faculty member professional development programs is that members can experience collaborative inquiry-based learning firsthand before attempting to create it in their own classrooms.

There seems to be a unique space in the cross point between IL, faculty member collaboration, and CoI literature for exploring how to foster dialogue between librarians and faculty members that incorporate the disciplinary discourse of both groups. The purpose is to develop *shared* understanding and sponsorship of IL.

Summary

This review informs the design and implementation of the FacLibCoI workshop with social sciences department faculty and librarians. I reviewed literature on information literacy, faculty member and librarian collaboration, communities of faculty members and specifically the CoI Framework along with blended learning within a CoI. The review helped to define the theoretical viewpoints and issues surrounding IL. It also provided a foundational view of the CoI Framework and its underlying philosophical stance. This review helped me to design and implement the FacLibCoI within a social sciences department.

Chapter Three: Methodology

Introduction

This chapter presents the philosophical and methodological perspective of the study and leads into chapter four where methods are presented. The chapter begins with the philosophical paradigm of pragmatism, specifically that of John Dewey. I explore Deweyan pragmatism within the confines of this study which I base in sociocultural constructivist epistemology and IL and place within the CoI Framework that is also based on collaborative constructivism. The philosophical foundations of the CoI Framework are briefly presented, and the study's problem statement and research questions are linked to this philosophical and theoretical base.

DBR as the methodological approach chosen for this study is then discussed. DBR is defined, its strengths and limitations presented, and the rationale for choosing DBR explained. Select DBR design models are explored and the model used in this study identified.

Next, I present and explain the research design. The philosophical rationale and the various phases of the design are explained. The design provides the framing for the remainder of the methodological steps (e.g. context, methods and analysis, trustworthiness, ethics, other considerations), which are presented in chapter four. The chapter finishes with a description of the study's commensurability between philosophy and design.

Philosophical Paradigm: Pragmatism

The philosophical paradigm that governs this study is Deweyan pragmatism, which is based on the philosophy of John Dewey. Given the controversy sometimes attached to pragmatism, I wish to briefly address it up front. Later, some of its challenges are further explored. Morgan (2014) highlights how there is often a "crude summary of pragmatism" as merely "what works" (p. 1046). Both Johnson and Onwuegbuzie (2004) and Morgan (2014),

when pointing to mixed methods as a typical approach of choice for pragmatist studies, acknowledge that some theorists on both sides of the objectivist-interpretivist debate reject mixing methods and paradigms. These authors argue against the conventional wisdom that says that methods are predetermined by paradigmatic choice. Instead, they offer the alternative view that choice of methods should be based on the research questions and goals. They point out that philosophical pragmatism, which is often unfairly reduced to a simplistic view of mixed methods research, is a much larger theory (Johnson & Onwuegbuzie, 2004; Morgan, 2014). It is my aim in this section, where I present a summary of philosophical pragmatism, to explain how pragmatism provides a paradigmatic guide for this study.

Definition. Crotty (1998) describes pragmatism as a philosophy where "the authentic meaning of ideas and values is linked to their outcomes and to the practices in which they are embedded" (p. 73). Crotty (1998) points to the practical dimension of pragmatism wherein the world is viewed as one "to be explored and made the most of" (p. 74). In that sense, pragmatism focuses on an experiential reality of living and interacting within the contextual world of the physical, social, and internal (Dewey, 1938; Johnson & Onwuegbuzie, 2004; Vanderstraeten, 2002). From a research perspective as expressed in Pierce's *pragmatic maxim* (Johnson & Onwuegbuzie, 2004), a pragmatist judges an idea's warranted truth or falsity from the experience or consequences of its use in the real world. Following this line of thought, and transposing from philosophy to methods, I chose a mixed-methods approach to study my own understanding and design of a CoI. I chose methods based on the pragmatic view that these would allow me to make warranted assertions based on actual perception, experience, and consequences.

Response to ontological dualism. Dewey departed from the traditional philosophical emphasis on the "abstract" when he asserted that knowledge is based on experience not in

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metaphysical reasoning (Dewey, 1929; Morgan, 2007). Dewey viewed philosophical dualism as artificial and problematic. In his mind, dualistic philosophical stances led to a separation between the external world and the inner being and stood in opposition to his educational ideal (Garrison & Vaughan, 2008) of a unified educational transaction where the organism exists within an external reality with which it interacts organically to build knowledge (Dewey, 1938; Garrison, 2011; Vanderstraeten, 2002). Dewey's form of pragmatism contrasts with more abstract and divisive paradigmatic focuses on the nature of reality (Morgan, 2007; van Merriënboer & de Bruin, 2014) in that it reformulates the nature of reality to be about "the experience of actions in the world" (Morgan, 2007, p. 68) rather than about an external or internal reality devoid of those experiences. From a more abstract ontological perspective, the way that a person defines reality will determine the types of knowledge available and the methods used to attain that knowledge. But Dewey's pragmatic stance *starts* with epistemology, specifically the view that knowledge is constructed. The emphasis is on the importance of lived reality in the creation of knowledge as opposed to abstract theorization about its ultimate nature (Johnson & Onwuegbuzie, 2004; Schuh & Barab, 2007).

Pragmatic epistemology. Dewey argued that the way we gain knowledge (not an abstract theoretical reality) is based within the realm of experience instead of abstract theorizing. He rejected ontological dualisms like "realism vs. idealism" (Morgan, 2007, p. 1048) and epistemological ones like "subjectivism vs. objectivism" (Johnson & Onwuegbuzie, 2004, p. 18).

Dewey's conceptualization of how knowledge takes place is based on his view of experience as a unified transaction between individual and environment. Dewey's (1896) transaction originates with the organism who actively engages with the environment. For him, the uniting of the inner world of the individual with the outer world through personal action is

important, and knowledge is based on something that the person actively *does* and the consequences that she experiences rather than upon something external to her (Johnson & Onwuegbuzie, 2004; Vanderstraeten, 2002).

As a person engages with her environment, she becomes curious, which prompts inquiry; she experiences, and begins to form belief based on that experience. The sum of various acts and experiences upon that belief results in the construction of knowledge. Through *active inquiry* and experience over time, a person comes not to know truth but to form *warranted assertions* (Morgan, 2007; Vanderstraeten, 2002). Warranted assertions are different than absolute truth and in this, pragmatism "endorses fallibilism" (Johnson & Onwuegbuzie, 2004, p. 18), which leaves room for error and correction through continued and more nuanced understanding.

It should be mentioned here that the link between individual and environment means that *inquiry within context* is an important piece of Dewey's theory. Morgan (2014) points out that pragmatism does not begin in the abstract realm of discussions about veracity or ontology, but within the context of life. This means that experience, which comes out of the organism-environment relationship, is "context-dependent" (Morgan, 2014, p. 1046).

Pragmatism and education. Dewey saw the organism-environment transaction as the basis for education. It is here, through experience, that knowledge is built and not compliantly accepted (Vanderstraeten, 2002). Dewey unequivocally rejected education that viewed the student as a passive receptacle because such an educational model does not help the student to engage in future educational experiences (Dewey, 1938). Instead, Dewey's view of education is grounded in lived reality. He viewed curiosity, inquiry, and active knowledge-building within the real world as the standard for education. Knowledge cannot be separated from the environment

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or from the person's actions within it. Knowledge is therefore intimately associated with the act of *doing* (Vanderstraeten, 2002).

Dewey also viewed knowledge as co-constructed or socially dependent (see a fuller explanation of this in the next section, Pragmatism and Constructivism). Knowledge is built when the individual engages her inner world with the environment, which includes the social world, in which she lives.

Dewey used the standard of workability (that is, what worked to help us resolve doubt, solve problems, and arrive at equilibrium in the real world) as the measure of successful inquiry (Johnson & Onwuegbuzie, 2004). Yet, he rejected education that emphasized only educational experience to the detriment of educational planning that would ensure quality experiences for students (Dewey, 1938). In Dewey's pragmatist pedagogy, the educational environment matters greatly and educators should use it to build helpful learning experiences (Dewey, 1938).

Pragmatism and constructivism. How pragmatism and constructivism relate to each other is important because constructivism presents itself in the CoI Framework which is being used in this study. The CoI Framework is based on collaborative constructivism and Dewey's theories (Garrison, 2011).

Constructivism grew out of developmental psychology at the time when Piaget's theories became popular in America (Sawyer, 2006). Piaget linked development and learning (Lenters, 2013; Sawyer, 2006). Cognitive constructivists view the mind and environment as separate and recognize the need for engagement with the environment in the form of meaning making or knowledge construction (Schuh & Barab, 2007). Constructivists assert that one builds knowledge through the process of linking new concepts with old (Lenters, 2013).

Social constructivism, on the other hand, is based on the idea that knowledge is socially-constructed (Lenters, 2013; Schuh & Barab, 2007) within one's context. An example of this concept in action may be found in the subject of history. A social constructivist would argue that history should not be studied as something that only happened in the past. Inquiry into history, according to Dewey (1938), must be based on the learner's present experience (and must therefore be context-dependent) if meaning-making is to take place. History is a representation of socially-constructed knowledge. One relies upon the sociocultural knowledge produced by others and links it to current context to understand one's own history. Interestingly, Vygotsky, who is considered one of the forefathers of social constructivism, believed that one's sociocultural development was linked with cognitive development. His theory of the zone of proximal development (the space between where a learner is able to perform with assistance or independently) presupposes a knowledgeable other and socially-linked learning (Confrey, 2006).

Although the term constructivism is not found in the writings of Dewey, his name is often associated with constructivm in the literature. For example, Kivinen and Ristelä (2003) list Dewey as one of a number of theorists who influenced constructivism. Swan and Ice (2010) refer to social constructivism and Dewey's concept of inquiry when describing the CoI Framework. Vanderstraeten (2002) argues that Dewey's transactional theory of an individual and the environment constitutes constructivist views.

In relation to the CoI Framework, Garrison and Vaughan (2008) refer to collaborative constructivism when they discuss Dewey's sociological component of education. They go on to argue for a learning community and for a teaching presence, both of which are social constructs. In line with the concept of a teaching presence, Dewey believed in the role of an educational

guide, whose job it was, in part, to organize the learning environment utilizing creativity to foster

learning experiences that are contextual and social (Dewey, 1938).

Pragmatism and research. Johnson and Onwuegbuzie (2004), in their article about

mixed methods research, consider the philosophical underpinnings of pragmatism from the

perspective of research. They point out that pragmatism's aim is to bridge philosophical dualisms

to provide a pathway that *works*. Pragmatic research emphasizes "practical empiricism" (p. 18),

or research based on experience. It is humble in its assertions of truths ("lower case *t*" as opposed

to universal Truth with a "capital *T''*) (p. 18), adopts a "value-oriented approach to research," (p.

18), and promotes understanding as something that should be continually improved.

Challenges to the pragmatism paradigm. Some challenges exist within pragmatism. It

is often blamed for non-rigorous applications of mixed methods research. Even if mixed methods

research is applied properly, researchers run the risk of focusing on their methods more than on

the theoretical rationale for the selection of these methods; the same can be said for the way

pragmatic research is often reduced to only solving problems (Morgan, 2014). Pragmatism, as a

paradigm, should be robust enough to disallow easy reductionist tendencies.

A strength of pragmatism, but also a potential weakness, is its emphasis in applied

research (Elmborg, 2012), which can de-emphasize pure research (Johnson & Onwuegbuzie,

2004) to the detriment of both. Because pragmatism rejects the traditional dualistic views of the

nature of reality through its emphasis on knowledge making within a unified organism-

environment transaction (Vanderstraeten, 2002), it can accommodate various forms of research.

Yet, there is the danger that it can be considered a paradigm for applied research only rather than

one that bridges the objectivist-subjectivist philosophical gap (Johnson & Onwuegbuzie, 2004).

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Finally, pragmatism tends to result in small changes over time rather than transformative and disruptive change (small *t*ruths rather than *T*ruth). This causes some to question the usefulness of its solutions (Johnson & Onwuegbuzie, 2004).

Summary. Pragmatists view the nature of knowledge (as opposed to the nature of reality) as the truly important question. In this respect, ontological theorizing about the nature of reality make little difference to them and some claim that pragmatism is a possible bridge between the various philosophical and ontological dualisms (Johnson & Onwuegbuzie, 2004).

Vanderstraeten (2002) explains that Dewey viewed knowledge as "a relationship between the activities of the organism and the consequences these activities bring out" (p. 238). Dependent upon inquiry and action within a social context not upon an abstraction between mind and environment (Morgan, 2014), knowledge is a social experience (Dewey, 1938; Morgan, 2014) wherein the individual engages in active inquiry in order to interact with the environment (or, in educational terms, the student actively *does* inquiry in order to learn). This socially-interpreted interaction utilizes language, culture, and experience as tools towards understanding.

From a research perspective, pragmatist researchers consider the importance of the environment and its values, view discovery of truth as tentative, and see the truth-making process as iterative and active. They believe that pragmatism can help to resolve dualistic paradigmatic arguments and guides the choice of research methodology (Johnson & Onwuegbuzie, 2004).

Statement of the Problem

We now turn to the problem that this study seeks to address. The problem starts with how students might be expected to transfer generic types of IL learning which they may have experienced previously to the contextualized settings of their disciplines and their careers through learning how disciplinary scholars and professionals think and through disciplinary

approaches to problem solving. Without collaboration between faculty members, who guide students into disciplinary ways of thinking and knowing, and librarians, whose area of expertise is IL, it seems unlikely that most students will learn to contextualize IL (Andrews & Patil, 2007; Lloyd, 2011) to their discipline and their profession. Elmborg (2006) proposes that particular types of discourse belong to specific communities and that one of the jobs of HE students is to learn academic and professional discourse and that this happens within disciplines. If this is the case, universal, general learning competencies in HE, such as critical thinking, communication skills, or IL (Sadler, 2013), must also fall within the disciplinary community if they are to become part of that discourse. The problem with IL is that it is a different discourse from that of the student's discipline. How to engender conversations that lead to a shared community, discipline by discipline, between librarians and faculty members to build IL into the student's disciplinary discourse and practice becomes the real question.

Theoretical foundation. This study sought to explore the CoI Framework as a means for facilitating the construction of shared understanding around IL between faculty of a given discipline and librarians. The core features of the CoI align with Dewey's pragmatism. His organism-environment transaction (Vanderstraeten, 2002), for example, is constructivist in essence, dependent upon sociocultural interaction, embedded in context, and is based on active inquiry. It is also receptive to teaching presence.

Complexity. Numerous studies (Ducas & Michaud-Oystryk, 2003; Julien & Given, 2004; Julien et al., 2013; Meulemans & Carr, 2013; Sterngold, 2008) reveal that there is a persistent and complex relationship in the way in which librarians and faculty members within HE understand each other and IL and collaborate together to teach IL to their students. These studies show that improvements across decades are noted but fully-shared understanding and

collaboration remains a challenge. This complex problem, from within the realm of higher education, fits the definition of a *wicked problem* as coined by Rittel and Webber (1973) in an article about social planning that is often referenced in learning sciences and DBR literature (Plomp, 2010). *Wicked* problems exist across the social sciences and are defined in part by the fact that they are difficult to define and can never be definitively solved (Rittel & Webber, 1973).

In this study, the *wicked,* ill-defined nature of a problem lies in the various complex issues that combine to create the problem. It may be argued that pervasive and persistent conditions within HE make collaboration between librarians and faculty members difficult to build and maintain. For example, a university offers various disciplinary fields, each with its unique philosophical, pedagogical and research focus. How one provides IL attuned to these disciplinary differences is a persistent issue that has led to ongoing theoretical debates. The debate between generic vs. situated approaches to teaching IL is only one example (Bury, 2011; Farrell, 2012; Lloyd, 2010). Saunders (2012) found that faculty members across various disciplines tend to believe in the importance of information literacy but may define it differently, consider the importance of types of sources differently, and value different skills of information evaluation depending upon their discipline. Although in recent years, universities made efforts towards interdisciplinary initiatives and librarians and faculty members hold shared responsibility to sponsor IL learning, the structure of separate disciplines works against collaborative efforts in general and with IL, specifically (Gillis et al., 2017; Kissel et al., 2017).

Other barriers exist within HE, including heavy curricular requirements and limited time to cover material, which may lead to a faculty member's reticence to include concepts perceived as peripheral to the core curriculum. Collaboration between librarians and faculty members is necessary if IL is to succeed within HE, but it remains difficult to achieve.

Characteristics of complex problems that bear relationship to this study. Some characteristics of complex problems as defined by Rittel and Webber (1973) apply to this study:

- *Wicked* problems may be approximated but will only be defined when the solution is found. This study sought to explore the problem of collaborative understanding around IL within HE by testing a designed solution against an approximated problem.

- One cannot easily define and independently apply a complete solution because the solution is intimately intertwined with the definition of the problem. (Rittel & Webber, 1973). Where faculty members bring different philosophical views and levels of perceived importance to IL, a possible solution may be to facilitate an interdisciplinary IL discussion. Rather than providing a complete solution, however, the discussion may reveal additional problems (such as faculty member time constraints) that require further consideration towards future solution design.

- *Wicked* problems, such as long-standing educational problems, tend to show no definite stopping point (Rittel & Webber, 1973). Given the constraints imposed, is it possible to encourage collaborative understanding around IL and to what extent? How approximate to that ideal of collaborative understanding is approximate enough? Questions such as these determine a feasible level of approximation to a solution.

- Wicked problems are "essentially unique" (Rittel & Webber, 1973). Facilitating shared understanding of IL between faculty members with different philosophical and theoretical foundations as well as educational approaches brings a high level of complexity and highly contextualized issues to the problem. For example, each university struggles with its own complex mix of disciplinary fields, institutional priorities, student and faculty member profiles, and learning goals.

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- Every solution that is implemented for a wicked problem has potentially-significant consequences (Rittel & Webber, 1973). That is, consequences matter and impact future iterations or solutions. Inefficiency, for example, is one potentially-devastating consequence that must be considered in the design and implementation of a model that involves faculty members who are busy and librarians who are sensitive to the potential scalability of a proposed solution across the university campus. If an initial model is tested and proves to be inefficient, busy faculty members and librarians will likely reject it, making further iterations difficult if not impossible to implement within the same university.

Fit between pragmatism and the problem. I believe that a wicked problem such as the one in this study, where barriers to shared understanding of IL exhibit persistent properties across time and location, benefitted from application of pragmatist methodology. A pragmatist perspective allowed me to consider faculty members and librarians as well as the environments within which they think and work as a unified whole. It supported my view that *how* faculty members and librarians might build shared understanding is important to the study's design. And it meant that I viewed possible solutions as necessarily involving librarians and faculty members engaging in active and collaborative knowledge-building through interaction within their environment.

Research Questions

Based on this complex, *wicked* issue and attempts to problematize it, the following research questions guided this study:

To what extent might collaborative learning within a design-based blended community of inquiry (CoI), hereafter referred to as the FacLibCoI, provide an efficient and sustainable way for faculty members from a single discipline and librarians to construct shared understanding of IL?

1. How might inquiry-based learning methods within a design-based FacLibCoI facilitate shared understanding of IL between faculty members and librarians?

2. How might collaborative learning within the FacLibCoI foster shared understanding and collaborative approaches to IL within the discipline?

3. To what extent might a blended, technology-enhanced learning environment (TELE) support efficiency within a FacLibCoI while maintaining the social, teaching, and cognitive presences of the CoI Framework?

Pragmatism as Research Design

Thus far, I have laid out the pragmatism of Dewey as a philosophical paradigm that underpins this study. I presented the problem and the research questions that guided the study and how pragmatism guided the design that follows.

Morgan (2014) argues for attention to the larger perspective of philosophical pragmatism on the one hand, and acknowledgement of its capability to handle qualitative, quantitative or mixed methods designs on the other. It is this dual capability of a pragmatist approach that informed the design of the study. Viewing pragmatism from philosophical paradigmatic and research perspectives helped me to thoughtfully choose the methods for the study rather than relying upon the label of pragmatism to justify an "anything goes," hodge-podge of methods.

Methodological Approach

I chose Design Based Research (DBR) as the methodological approach for this study. DBR, which is variously referred to as a "research framework," by Amiel & Reeves (2008, p.

34), a research paradigm by some (Design-Based Research Collective, 2003, p. 5; Wang & Hannafin, 2005, p. 5), a research methodology by others (Anderson & Shattuck, 2012, p. 16; Barab & Squire, 2004, p. 2), and a genre by McKenney & Reeves (2012) has been embraced and developed within the learning sciences field (Barab & Squire, 2004; Hoadley, 2004a), among others. DBR developed out of a perceived need for a research methodology that could support research about learning while simultaneously making a real difference in education by "designing learning environments for particular contexts" (Hoadley, 2004a, p. 11). Much as other design fields (e.g. engineering, medicine) utilize design research to iteratively and sustainably improve design solutions, DBR researchers seek to produce contextualized educational innovation through the iterative and collaborative process and to apply empirical and design method to provide theoretical foundations able to sustain innovation (Bereiter, 2002).

DBR history. DBR is a research approach used to address real world problems in educational contexts via collaboration between researchers and practitioners and yielding design principles that apply to and inform theory. Bereiter (2002) described DBR as research that uses the method of sustained development to produce innovative solutions. Design-based research as a methodological approach began twenty-five years ago when Brown (1992) and Collins (1990) used the term *design experiments* to describe a type of research wherein researchers "attempt to engineer innovative educational environments and simultaneously conduct experimental studies of those innovations" (Brown, 1992, p. 141). Others use the terms design research, development research, design-based research, and educational design research (Anderson & Shattuck, 2012; McKenney & Reeves, 2012; Wang & Hannafin, 2005).

DBR developed to meet the perceived need within educational research to more closely align scientific inquiry to the contextual complexity of the classroom rather than the controlled

environment of the laboratory (Hoadley, 2004b; McKenney & Reeves, 2014). Researchers design and apply real world interventions to contribute to learning theory, which can then be practically reapplied to problems (McKenney & Reeves, 2014; Rawson & Hughes-Hassell, 2015). Bereiter (2002) describes design research as "sustained innovative development" (p. 326).

DBR's purpose. DBR is meant to lead to innovative development of learning environments "in context through the systematic design and study of instructional strategies and tools" (Design-Based Research Collective, 2003, p. 5). The process, according to Wang & Hannafin (2005) is "to improve educational practices through iterative analysis, design, development, and implementation based on collaboration among researchers and practitioners in real-world settings," and lead to "contextually-sensitive design principles and theories" (pp. 6-7). Various authors use terms such as *design, develop,* or *construct* (Jacobsen, 2014; Plomp, 2010; Reimann, 2013) to describe the process whereby the researcher creates an intervention to solve a problem, extend theoretical understanding, and to further understanding "about the characteristics and the processes used to design and develop interventions" (Plomp, 2010, p. 12).

A central question about using DBR for educational research is how it might enhance the field. DBR contributes to education in four ways: "(a) exploring possibilities for creating novel learning and teaching environments, (b) developing theories of learning and instruction that are contextually based, (c) advancing and consolidating design knowledge, and (d) increasing our capacity for educational innovation" (Design-Based Research Collective, 2003, p. 8).

A decade later, DBR within the field of educational technology is described as contributing information about how an innovation is implemented along with its impact. It is also seen as a contributor to "learning theory" and "design methodologies" (Reimann, 2013, p. 46).

DBR's unique fit. DBR was an appropriate methodological approach for this study for several reasons.

- First, DBR is an approach to addressing complex (Plomp, 2010), *wicked* problems (Rittel & Webber, 1973).

- Second, it is a flexible approach used across a variety of educational research situations, phenomena, or processes (Bell, 2004; McKenney & Reeves, 2012).

- Third, it allows for the study of a phenomenon while at the same time allowing for study of the intervention design, itself (Barab, Gresalfi, & Ingram-Goble, 2010; McKenney & Reeves, 2012). For example, I was able to simultaneously observe the development of shared theoretical understanding of IL while I explored an initial design of a blended CoI prototype within a situated, real-world setting.

- Fourth, DBR supports research and theoretical refinement of goals towards educational improvement (Joseph, 2004).

By exploring the nature of collaboration and shared understanding around IL through a DBR approach, I sought to discover important theoretical principles capable of improving IL learning. DBR allowed the possibility of informing future iterations toward improving educational praxis (Bell, 2004; Jacobsen, 2014; Joseph, 2004; McKenney & Reeves, 2012).

DBR, with its roots in participatory research, educational technology and learning sciences, and with its ready alignment with social constructivist learning theory, fits with the CoI Framework (Jacobsen, 2014) in that the framework's premise is that social presence supports collaborative construction of knowledge via cognitive and teaching presences and it is the cohesive functioning of these processes that guide individual learners to construct their own and shared knowledge (Garrison, 2011). The CoI Framework also provides a theoretically-grounded

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mechanism for building social presence through trust and collaboration (Garrison, 2011; Jacobsen, 2014). By utilizing a DBR design coupled with the CoI Framework, I sought to encourage collaboration towards shared understanding around IL while generating design principles and theoretical assertions that could inform future design improvement. Based on theory and practice perspectives (McKenney & Reeves, 2012; Reimann, 2013), I designed and implemented a practical intervention (workshop) of the CoI Framework. The intervention provided a contextualized view of the problem allowing me to observe consensus-building efforts and co-construction of potential solutions.

DBR Characteristics as They Relate to this Study

Several DBR characteristics are germane to this study:

A concern for complex problems or issues. DBR attempts to address complex problems through workable solutions. It joins theory and design to practice in real-world settings. By identifying theoretical principles, the problem and solution are further defined and refined (Amiel & Reeves, 2008; Anderson, 2005; Barab & Squire, 2004). In this study, DBR was used to build understanding around IL between social sciences and the library. It may also serve to introduce learning sciences (e.g. education, education technology) and library & information science to each other (Anderson, 2005; Rawson & Hughes-Hassell, 2015; Wang & Hannafin, 2005).

A pragmatic approach grounded in theory, informed by practice. This DBR study is based on social constructivist epistemology and utilized the CoI Framework to develop an intervention and test how well the design represented the CoI Framework and *worked* in a real world setting with faculty members and librarians. It is this grounding in both theory and a contextualized setting and the potential for producing real change that contributes towards

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further theory development (Barab & Squire, 2004; McKenney & Reeves, 2014; Wang & Hannafin, 2005). Tracing back to American pragmatism, DBR flexibly and pragmatically integrates authentic, real-world complexity into design to induce change and contribute to design and theory (Anderson & Shattuck, 2012; Barab & Squire, 2004; McKenney & Reeves, 2014).

The use of multiple methods of data collection. DBR's flexible nature allows it to accommodate a variety of methods, including mixed methods design. Decisions governing the selection of methods depend upon the nature of the study, the context of the intervention, the type of change that is being proposed, and the theoretical approach. Methods should accomplish dual goals of effecting meaningful change in the messiness of the real world while contributing to theory through carefully-reported findings (Anderson & Shattuck, 2012; Barab & Squire, 2004; Oh & Reeves, 2010; Wang & Hannafin, 2005).

In this study, I purposefully selected methods based upon the social-constructivist foundations of the study, the problem as defined according to the review of literature, and the needs of the contextualized setting. A mixed methods approach allowed for discursive triangulation to build deep and rich understanding (Fielding, 2012; Mertens & Hesse-Biber, 2012). Combined, mixed methods allowed me to confirm, compare, or contrast results across methods, to clarify anomalies, and to build a nuanced picture of the problem and potential solution (Onwuegbuzie & Leech, 2005).

Although I did not use this related concept in its full definition or its process form, I found crystallization to be an attractive mind image as I studied the problem and designed towards a solution. Crystallization is a concept borrowed from social ethnographic writing and was coined by Richardson and St. Pierre (2005). It differs from triangulation in that it mixes methods *and* genres (film, written text, etc.) to provide multiple views of a phenomenon. As a

crystal reflects and bends light, it projects different angles, and *grows* in its own organic fashion (Ellingson, 2009; Richardson & St. Pierre, 2005). In this study, I use triangulation of data sources to build credibility. However, these various mixed-methods data points, when viewed together, not only serve to build trustworthiness in individual findings but they invoke full-bodied, robust imagery (not dissimilar to that produced by crystallization) of the problem and the prototyped solution. When considered as its own unique, organic whole, the combined data provides robust insights for future design iterations.

An iterative and flexible approach. DBR involves iterative cycles of research (Amiel & Reeves, 2008; Anderson & Shattuck, 2012; Barab & Squire, 2004; McKenney & Reeves, 2014; Oh & Reeves, 2010). Processes like exploration, design, testing, and analysis and evaluation combine into iterative implementation cycles leading to improvement over time (Bereiter, 2002; Pool & Laubscher, 2016; Wang & Hannafin, 2005). Iteration, broadly defined in the present study, included a foundational and ongoing review of theory along with design refinement to improve learning, identify design principles, and generate theory (Amiel & Reeves, 2008; Ejersbo et al., 2008; Hjalmarson & Lesh, 2008; Kelly, Baek, Lesh, & Bannan-Ritland, 2008). This study utilized exploratory research and multiple data gathering methods. These were compared back to the literature. This iterative approach within a single setting and study allowed for a contextualized design solution while providing documentation for the design in order that its results might be applied in new contexts (Barab & Squire, 2004; Oh & Reeves, 2010).

An approach that occurs in a naturalistic, real-world setting. DBR is contextualized in real-world educational settings to better address the complexity of educational problems (Anderson & Shattuck, 2012; Barab & Squire, 2004; Hoadley, 2004a, p. 11; Jacobsen, 2014). I considered the assertions from the literature that context and learning cannot be separated (Barab

& Squire, 2004; Oh & Reeves, 2010). I used student perceptions of research and IL gleaned from phase one data collection to inform the design (phase two) of the curriculum in phase three. This allowed participants and researcher to consider contextualized, complex explanations and solutions. Authenticity contributes to a sense of trustworthiness allowing the researcher to further refine design methodologies and theoretical principles and for other researchers to consider them within their own contexts (Barab & Squire, 2004; Oh & Reeves, 2010; Reimann, 2013).

An interventionist and collaborative approach. Penuel, Bell, Buffington, and Falk (2016) as well as others (McKenney & Reeves, 2014; Plomp, 2010) point out that design-based research is a partnership between practitioners and researchers in which collaboration helps to identify and analyze the problem and to design and test an innovative intervention. In this study, the chairs of the social sciences department and the Library advised on the timing for the FacLibCoI workshop in which their departments would participate. The chairs gave access to faculty members and librarians. Faculty members offered advice and cooperation as I solicited volunteers for the university environmental scan focus groups from among their students. Both department chairs encouraged their faculty members/librarians to participate in the FacLibCoI. The social sciences chair voluntarily provided valuable feedback as problems arose.

Collaboration is based on real-world contexts (Amiel & Reeves, 2008; Herrington, McKenney, Reeves, & Oliver, 2007; McKenney & Reeves, 2014; Wang & Hannafin, 2005), which means that it may take various forms or processes as appropriate within the context or the problem being addressed. Some examples of this type of collaboration might include seeking permissions and advice from stakeholders such as school district or teachers or exploring issues and themes with participants through interviews and surveys. During the intervention, participants, with the guidance of the researcher/facilitator, explored together the foundational

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concepts of the two disciplines, developed an IL model for the discipline, and collaboratively mapped IL standards to their national standards.

Challenges to DBR

Despite DBR's many strengths, it is not without its challenges. One of the strongest critiques of DBR came from Barab & Squire (2004) early in the use of DBR. In a more recent discussion of DBR, Barab (2014) presents a set of steps that a DBR researcher may take to mitigate these weaknesses. I summarize Barab's steps after this list of weaknesses:

Consequentiality. It can be harder to demonstrate "consequentiality" (p. 8) than to show local changes. Researchers must therefore reveal the limitations of their research. DBR is only as good as connections that can turn local results into theoretical understanding (p. 8).

Complexity. The complexity of a DBR study can make it difficult to include enough detail in the narrative to clearly express the problem and the project's design while maintaining theoretical relevance for the larger educational research community (pp. 8-9).

Researcher bias. This may be a concern if the researcher takes on multiple roles of designer, researcher, and sometimes even participant (p. 10). The researcher may mitigate this risk to some degree by building safeguards into the study. In this study, I took on the roles of researcher, designer, and facilitator. I also built interrater reliability, triangulation, and researcher reflection safeguards into the study. My intimate knowledge of IL within the university allowed me to make strategic initial and on-the-fly decisions that would have been more difficult for a neutral designer or facilitator, but which improved the study. For example, I not only developed appropriate semi-structured questions (focus groups and pre- and post-interviews) but, more importantly, I was able to follow up initial responses with more nuanced questions.

Sustainability and scalability. DBR, due to its local and contextualized nature, does not tend to address system issues such as scalability or sustainability (p. 11) This problem was carefully considered in this study because efficiency towards scalability and sustainability were part of my research question. One of the things I tested about the CoI theoretical framework was whether it could support an efficient, scalable, and sustainable design for developing shared understanding between faculty members and librarians.

Time and resources. Anderson & Shattuck (2012) raised the challenge of time and resources. DBR, which is based on multiple iterations and refinements of design, takes time that researchers, practitioners and participants may not be able to afford. DBR as a methodological approach is time and resource heavy, a factor that should not be ignored in planning (Anderson & Shattuck, 2012). Later, I discuss how Herrington, et al. (2007), McKenney and Reeves (2012), and Pool & Laubscher (2016) addressed this when using DBR in a doctoral dissertation.

Significance of findings. An additional challenge to DBR, also described by Anderson and Shattuck (2012) as part of their analysis of 47 design studies, is that most of DBR studies result in local rather than large-scale changes. They questioned whether DBR can produce large-scale, sustainable change. It should be noted that McKenney & Reeves (2013) express some degree of skepticism to the Anderson and Shattuck study based on the literature review methodology and selection criteria used.

Practical Steps to Mitigate Challenges to DBR

By utilizing certain protocols, DBR researchers may turn DBR weaknesses into strengths. Barab (2014) presented several measures that can strengthen DBR studies. He suggested that (a) the DBR researcher should document all theoretical assumptions, (b) recognize that the design and the intervention are intimately tied together, and they should (c) collect multiple forms of

relevant data. He also (d) proposes protocols to establish rigor in the analysis and reporting. First, (e) the researcher should base analysis in theory, and (f) consider both the projected and the unintended results that may help to reveal any hidden agendas. Next, the researcher should (g) encourage critique and (h) impose structures that will help to regulate the process. Finally, (i) the researcher should engage with theory and literature through dialogue with fellow researchers.

DBR and the Dissertation

The strong demand that DBR incorporate iterative revision and testing raise concerns as to how this might be accomplished within the limited time frame of a doctoral dissertation. Herrington, et al. (2007) proposed that the various stages of a dissertation could be mapped to Reeves' (2006) vision of DBR. The authors include a sample timeline. The approach seems aligned to a research doctorate where the dissertation is the main degree component.

Pool & Laubscher (2016) reported on how McKenney and Reeves' (2012) Generic Model could utilize micro-, meso-, and macro-cycles across the phases of the model to facilitate iteration. They used this approach in a PhD study that tested an online course design.

In this study, I built micro and meso iterative cycles within each of the phases of the Generic Model (McKenney & Reeves, 2012) to facilitate iteration within and across a single intervention. I also incorporated two stages of data collection within the study. The final design is described later in this chapter and shown graphically in Figure 3.2.

DBR Research Design Models in the Literature

Educational design research as a methodological approach has grown out of the fields of "psychology, learning sciences, or instructional design." (McKenney & Visscher-Voerman, 2013). As such, it has been influenced by a wide variety of design and research models which are described and proposed in the literature. For this study, in which I adopted a DBR

methodological approach and sought to explore the phenomenon of how faculty members and librarians might collaborate on information literacy, a research design model that incorporated both the goals of design and research were paramount (2013). With this goal in mind, I initially reviewed the literature to select research design models that might meet the needs of this study. I explored four for best fit. I briefly present the three which I did not choose for this study along with the rationale for why I ultimately rejected them. I then describe the selected model.

DBR research model. The first of these, the *DBR Research Model*, the principles of which Reeves (2006) describes, is iterative and its purpose is to refine problems, follow proper research methods and result in real-world solutions as well as design and theoretical principles. It is made up of four phases—analysis, development, testing, and iterative refinement and reflection. The iterative refinement and reflection phase provides opportunity for further cycles and refinement (McKenney & Reeves, 2012; Pool & Laubscher, 2016). Using this model, Herrington et al. (2007) mapped a research doctoral degree to components of Reeves' (2006) four phases. I would find this approach problematic for a shorter Doctor of Education program that splits its time between classes and dissertation limiting the time available to implement a DBR design. Furthermore, the model did not provide guiding details that could help me to develop my own research design making it problematic for this study.

Osmotic model. The *Osmotic Model* (Ejersbo et al., 2008) presented the research pathway and the design pathway as co-existent processes that work in tandem towards solving the *problem*. The authors (Ejersbo et al., 2008) found the model helpful to understand these two processes. However, the model proved to be an ideal that was difficult to apply. My main objection to this model is its dualistic splitting apart of the theoretical and design processes in contradiction to pragmatic philosophy that would promote a more wholistic approach.

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Integrative learning design framework. The Literacy Access Online (LAO) study (Bannan-Ritland, 2003; Bannan-Ritland & Baek, 2008) attempted to utilize the Integrative Learning Design Framework (ILDF) to design a technological solution that would assist teachers and other facilitators to support students with reading difficulties. The ILDF sought to integrate design, educational theory, and empirical research processes to create and study an actionable solution. The study presented these and other processes in linear terms (See Fig. 1, 2003). Stacked together, the various processes provided an integrated view that showed how the processes singularly and simultaneously moved towards solution design and intervention.

Perhaps due to the "program-level perspective" (Bannan-Ritland, 2003, p. 21) in the LAO study, the ILDF model strikes me as complex. It comprises four phases (Informed Exploration, Enactment, Evaluation: Local Impact, and Evaluation: Broad Impact) that each break into numerous sub-processes (2003). For example, the Informed exploration phase includes a variety of exploratory processes (e.g. a needs analysis, literature survey, development of theory, and audience characterization). Guiding research questions accompany each phase, and methods can be determined within each. Across the four phases, feedback loops and iterative cycles occur. After formative testing, for example, one might return to the earlier step of researching the system design should the formative testing warrant it.

The ILDF, as used in the LAO study, was an attempt to adequately prepare for and handle any complex processes of design-based research that might arise. However, in my view, this complexity in the ILDF would make it difficult for a single researcher to follow and apply.

Generic model for educational design research (Generic Model). McKenney & Reeves' (2012) Generic Model was my model of choice. It emerged out of a review of instructional, curriculum, and educational design research models and frameworks (McKenney

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& Reeves, 2012). Its strength lies in its refined elegance and versatility. At its core, it is a lean model with robust capabilities. It can accommodate multiple smaller iterations (micro-, meso-, and macro-cycles) which add layers of flexibility within a given research project as McKenney & Reeves have pointed out (2012). They also confirmed that while the model can be used with large and complex research designs, solutions, and scope, it can equally be leveraged for smaller projects. The Generic Model incorporates foundational concepts from various other models and seems the most flexible for this study and for others that might follow. It is commensurate with DBR research which is based on theory, grounded in context and collaboratively involves those within that context in iterative interventions towards making a difference in learning (p. 61).

The Generic Model (see *Figure 3.1* in the next Section) is an adaptation of Reeves' (2006) model and comprises three phases of analysis/exploration, design/construction, and evaluation/reflection. Evaluation/reflection leads to two outputs represented by *Maturing Intervention* and *Theoretical Understanding*. The model shows an iteration loop, but between each phase smaller iteration loops may exist. Outputs may iteratively feed back into any phases. Implementation occurs across all phases (referred to as implementation/spread), becoming broader and stronger as the process progresses (McKenney & Visscher-Voerman, 2013).

McKenney & Reeves (2012) included an extensive set of guidelines to implement the model. This is useful when designing a doctoral-level study. My design follows the three phases of Reeve's model: analysis/exploration, design/construction, and evaluation/reflection. The authors recommended avoiding a formulaic use of the model due to the variable nature of educational design research (McKenney & Reeves, 2012). They suggested that the ideas behind the model be used to provide guidance within an individual study. McKenney & Visscher-Voeerman's (2013) assertion that the basic model allows for various iterative approaches

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confirms this idea. Pool and Laubscher (2016) showed how McKenney & Reeves' (2012) description of micro-, meso-, and macro- stages might be leveraged for a doctoral dissertation. Its simplicity and flexibility allow for multiple iterative cycles within the design while also accommodating smaller, single-researcher studies that come with greater constraints.

Research Design for this Study

  Generic model for educational design research. I adopted the Generic Model for Educational Design Research (see Figure 3.1), as it is based on an extensive review of literature and therefore represents the major characteristics of the DBR process as currently practiced.

  A brief description of the phases (McKenney & Reeves, 2012) provide a background for how this study has been designed. The *Analysis/Exploration Phase* includes problem analysis as
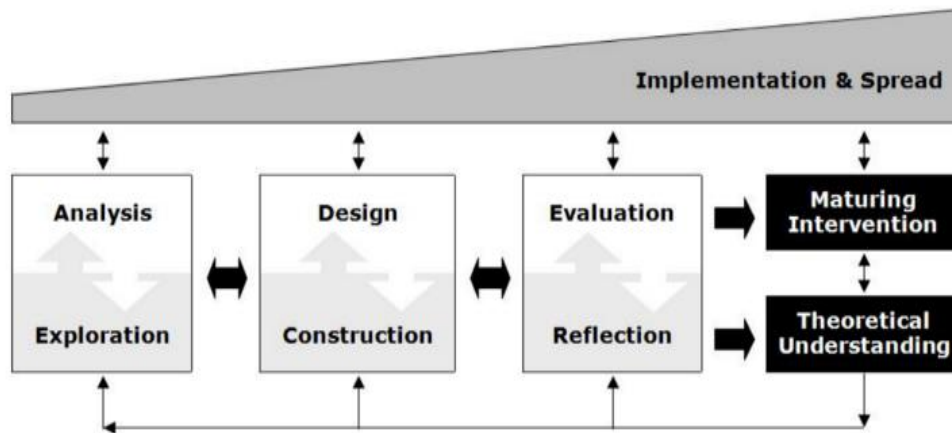
Figure 3.1. The Generic Model Process Path. (McKenney & Reeves, 2012, p. 76), shows the stages within the process model; used with permission.

well as an exploration of the literature, the design and the environment. The *Design/Construction Phase* includes the design of the conceptual framework, the study's design, and construction of a solution. Implementation of a solution occurs in the *Evaluation/ Reflection Phase* where collected data is analyzed, and design and theoretical principles are formulated.

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Additional concepts in the model are *Implementation and Spread* and *Maturing Intervention/Theoretical Understanding.* Implementation expands as the study progresses with spread occurring in later stages. Theoretical and design principles as well as recommendations are developed during *Theoretical Understanding* and inform the *Maturing Intervention* stage.

Design representation. The design for this study is based on the Generic Model depicted in *Figure 3.1* (McKenney & Reeves, 2012). Utilizing micro- and meso-cycles within each phase (Phase One: Analysis/Exploration, Phase Two: Design/Construction, and Phase Three: Evaluation/ Reflection) provided necessary structure to the study. I divided these phases into meso-cycles and smaller, iterative micro-cycles. Each phase represented is described in more depth to provide a complete picture of the way that I applied DBR in this study (see Figure 3.2 for a visual representation of the simple elegance of the Generic Model along with the complexity added by the meso- and micro-cycles that made up this study).

Phase one--analysis and exploration. The first phase of the Generic Model design corresponded to the analysis of the problem and exploration of the local environment and possible contextualized solutions. It included an Explore-Define-Reflect meso-cycle. In my design, each micro-cycle contains a row of boxes for what was explored, defined, or reflected upon. For example, in phase one, I show boxes for Literature, Documents, and Focus Groups, the three areas of exploration. The iterative nature of each micro-cycle is illustrated by arrows.

Literature review. I consulted the literature in iterative fashion to formulate the problem, seek a proposed solution within theory and to decide upon the methodological approach, formulate the conceptual framework, and determine the research design. Literature based on social constructivism and inquiry-based learning informed the teaching and learning strategies as well as the design heuristics.
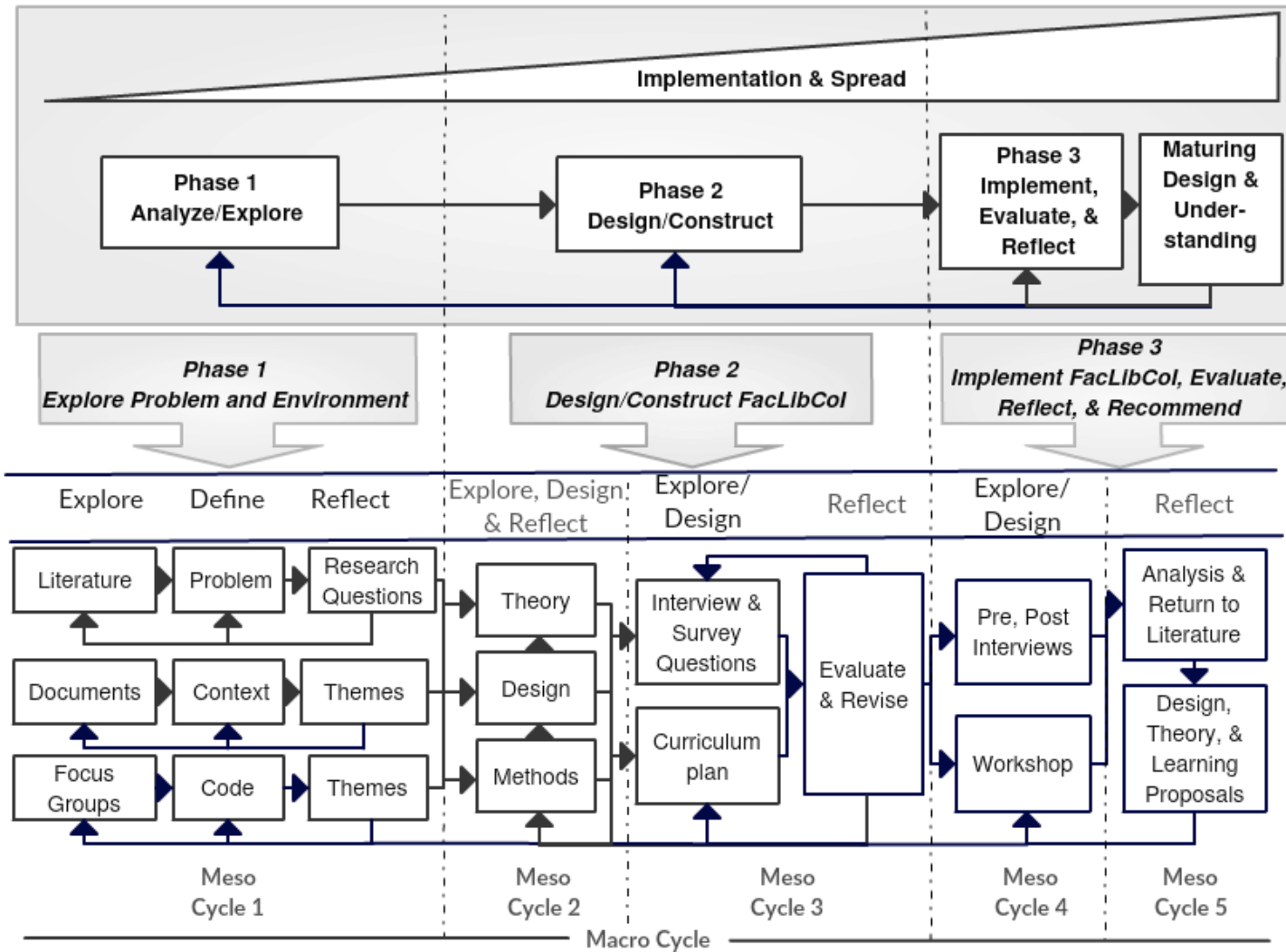
Figure 3.2. Research Design (based on the Generic Model for Design Research in Education, McKenney & Reeves, 2012).

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University environmental scan. I examined the university's mission, vision and

academic goals from various university-produced documents. I also examined the professional

association policies and standards guidelines for the social sciences and library science

disciplines which were selected to participate in the blended, CoI faculty member-librarian

workshop (FacLibCoI).

University environmental scan from a needs assessment perspective. I used the focus

group format to interview 15 faculty members/librarians and academic department chairs from

across the university, each in their respective focus groups. I conducted a private interview with

one academic administrator. I also used focus groups to interview 16 undergraduate students

from the social sciences department that was selected to participate in the FacLibCoI workshop.

Reflection. During the reflection piece of each micro-cycle within this first phase, I used

the emerging research questions and themes (See Figure 3.3) to inform next phases.
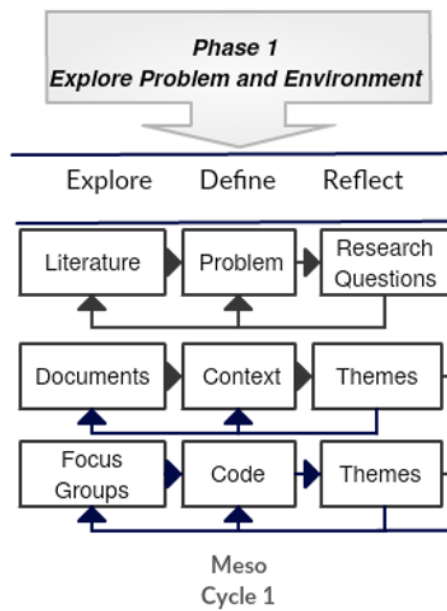
Figure 3.3. Sub-figure from Figure 3.3 Representing Meso Cycle One.

Phase two--design and construction. Figure 3.4 illustrates phase two of the study and is

made up of the second and third meso-cycles of the study. McKenney & Reeves (2012) defined

this phase as involving distinct but related design processes that lead to the construction of the intervention (which may be a prototype) and which are tested in the next phase.

Meso-cycle two, theoretical framework, study design, methods. In this meso-cycle, I developed the theoretical framework and study design and defined the methods. I placed each into its own micro-cycle, and I used these to develop the initial design and theoretical assumptions as well as requirements and propositions for the prototype intervention.

Meso-cycle three, prototype intervention. I used the first micro-cycle to develop the interview and survey questions that would be used to study the design of the FacLibCoI workshop and the learning that resulted. The curriculum and session plans for the intervention were designed during the second phase and I asked Dr. D. Randy Garrison, CoI main researcher, and two faculty from the university's School of Education to evaluate it for systemic issues and perspectives that should be considered during the FacLibCoI workshop.
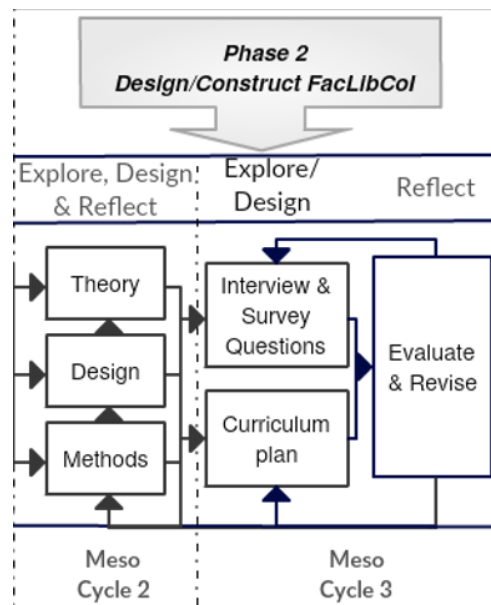
Figure 3.4. Sub-figure from Figure 3.3 Representing Meso Cycles Two and Three

Phase three—implementation, evaluation and reflection. The evaluation/reflection phase included two meso-cycles (meso-cycles four and five) as illustrated in Figure 3.5.
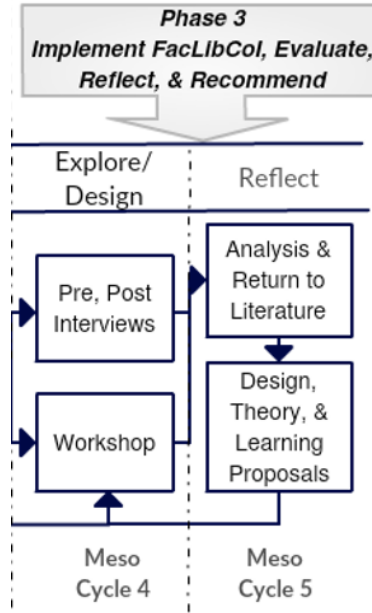
Figure 3.5. Sub-figure from Figure 3.3 Representing Phase Three

Meso-cycle four--implementation. The intervention, as well as the data gathering activities, served as a prototype as defined by McKenny & Reeves (2012). I implemented the FacLibCoI workshop with faculty members from a social sciences department and librarians over a two-month period. During the implementation, some on-the-fly redesign occurred, substituting a fourth face-to-face session for two of the online, asynchronous sessions. I collected participant responses in pre- and post-intervention interviews, research notes, transcripts, artifacts, and questionnaires filled out by each participant after each session.

Meso-cycle five—evaluation and reflection. In this cycle, I analyzed the data collected during implementation. I also reflected upon the data and literature review findings, revisiting the literature for explanation. This reflection led to the articulation of design and theoretical principles and recommendations that contribute to knowledge and inform future research.

Philosophical and Design Commensurability

Viewed from the standpoint of commensurability, I adopted a philosophical and methodological set of stances, which is shown in Figure 3.6.

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Paradigm—pragmatism. My research design is based on the pragmatist paradigm. Knowledge or warranted assertions, develop over time through socially-constructed inquiry embedded in a real-world setting. This is applied to the problem through the CoI Framework and a blended learning environment to explore how it might facilitate transactions between learner(s) and the environment to build shared understanding around IL.

Epistemology—social constructivism. I built and studied the FacLibCoI workshop for faculty members from a social sciences department and librarians to explore how the CoI environment might facilitate social construction of knowledge and lead to shared understanding around IL. The CoI Framework is based on Dewey's transactional approach to inquiry and in collaborative constructivism (Garrison, 2011).

Methodology—DBR. The methodological approach for the study is DBR. DBR is a pragmatic approach to solving sticky educational problems and simultaneously contributing to research through iterative design. McKenney & Reeves (2012) noted that DBR is agnostic towards specific methods and can accept those most suitable for researching and resolving the problem at hand.

Methods—mixed. Given that my study sought to explore how a specific blended CoI design might help university faculty members from two different disciplines (in this study, a social sciences department and the library) build a shared understanding of IL, I chose a mixed methods design so that I could explore deeply participant understandings of research and IL before the intervention as well as afterwards, while gathering participant perceptions of the intervention and their learning based on the CoI Framework's various elements (e.g. three learning presences). And I wanted to gain insight into the design of the intervention in

terms of how well it fit the CoI Framework. Finally, I wanted to gain real-time insights into the level of success of the intervention to make on-the-spot iterative changes based on observation.
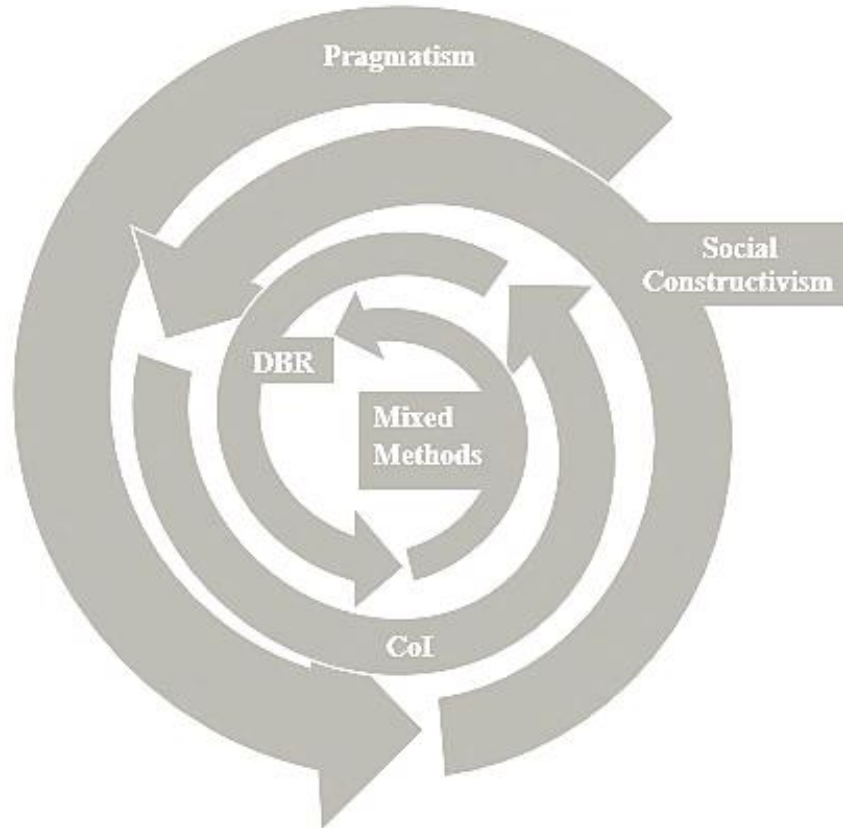
Figure 3.6. Philosophical and Methodological Commensurability . This figure shows the study's epistemological stance, theoretical framework, methodological approach and design.

Given these design choices, my mixed methods study design involved two points of data collection. The first occurred as I explored the university environment in which the FacLibCoI workshop design would be implemented. The workshop, itself, comprised the second data collection point. Participants for each of these data collection points are presented in Table 3.1.

Table 3.1. Participants of the Study

University Environmental Scan (Focus Groups)	FacLibCoI Workshop
• 16 students from the social sciences department that participated in the FacLibCoI Workshop • 15 faculty members, librarians and department chairs from across the university • 1 academic administrator	• 14 participants (made up of faculty members from a social sciences department and librarians)

I employed the following methods of data collection:

University environmental scan.

- Focus Groups—I conducted focus groups with 16 students from a social sciences discipline and 15 faculty members/librarians and chairs from across the university. I also conducted a private interview with one academic administrator. These were used to inform the content of the intervention.

- Institutional Documents—I obtained and reviewed various university governance documents such as regional accreditation reports, strategic plans, and a capital campaign proposal.

FacLibCoI workshop.

- Pre- and post-interviews—In the FacLibCoI workshop, which included 14 faculty participants from a social sciences department and the library, I gathered several types of data. The first of these were pre- and post-workshop-interviews with each participant, which I used to compare knowledge and attitudes before and after the workshop.

- CoI Questionnaires—Participants filled out a CoI Questionnaire after each session of the intervention. The questionnaire items related to the various elements of the CoI Framework and participant perceptions of the intervention.

- Session Transcripts—I collected transcripts of each session of the intervention along with research notes to reveal themes related to design, implementation, and participation.

- Artifacts—Finally, I collected group-created artifacts of knowledge construction.

My methodological stance, research design and methods are summarized in Table 3.2:

Table 3.2. Summary of Commensurability Within This Study

Context of Analysis	Units of Analysis	Units of Observation	Data Generation Methods
Research Paradigm: Pragmatism **Theoretical Perspective:** Intentional design-based intervention to sponsor change and inform learning theory and design **Epistemological Stance:** knowledge is co-constructed Theoretical Framework: Community of Inquiry **Research Design:** Generic Model for Design Research in Education Methods: Mixed	• Collaborative group • Community of Inquiry blended design	• Group • Individual Participants	University environmental scan (focus groups) • Facilitator notes • RA notes • Researcher notes • (to develop themes that would inform the main intervention) Intervention (FacLibCoI workshop) • Group Transcripts and Notes (facilitator, RA) (to observe collaboration, individual/group learning, and design successes/failures) • Group produced artifacts (to observe group learning, collaboration) • Participant Surveys (to observe perceptions of design success/failure, perceptions of learning) • Participant pre- and post-interviews (to observe individual perceptions of learning, collaboration, design successes or failures)

Summary

This chapter presented the rationale for choosing a pragmatist paradigm for this study. When pragmatism is purposefully chosen for its philosophical stance towards learning and knowledge, it can be used to guide in the selection of rigorous yet diverse data collection methods that are based not only in mechanistic processes of doing research but in a consideration of the reasons for doing it (Morgan, 2014). Next, I explained pragmatism's relationship to the study's social constructivist epistemology and to the CoI Framework. Finally, I explored the methodological approach of DBR and the Generic Model that I used. Finally, I showed how all of these are commensurate and presented my own adapted design.

In chapter four, I present the context of the study, the research team and the mixed methods design approach used. Data collection methods are described for each phase as well as data analysis techniques with examples. Issues of trustworthiness are examined along with limitations, delimitations, and ethical concerns.

Chapter Four: Methods

Introduction

In this chapter, I present the methods used in the study. I begin with a summary of the rationale for the mixed methods approach of the study as well as the mixed methods design. Next, I present the university context in which the study took place. Following on, I discuss the research sample and research team and their roles.

From there, I move into an in-depth description of the methods for each phase of the research. I provide thick description along with actual examples from the data to illustrate the methods employed.

Once the methods for each phase are described, I address trustworthiness, present the limitations and delimitations of the study and discuss pertinent ethical considerations. I end the chapter by introducing the two Findings chapters that follow this one.

Mixed Methods Approach

My study follows a mixed methods approach utilizing data and analysis types which are congruent with the study's philosophical paradigm, the research questions, the theory governing the study (Cresswell, 2009) and the type of knowledge being sought. For example, the questionnaire used with the CoI model provides a validated way to test the three presences of the CoI. A mixed methods approach to data selection and collection fits the pragmatist paradigm governing this study (Johnson & Onwuegbuzie, 2004; Morgan, 2014) and is also a typical approach within a DBR methodology (McKenney & Reeves, 2014). Additionally, it fits well with other aspects of this study. The desire to effect change through iterative development is well supported by a mixed methods approach within a pragmatist paradigm (Johnson & Onwuegbuzie, 2004). A poorly understood problem and solution also merits a flexible, mixed-

methods approach to data collection and analysis that is based on a consideration of reality as well as out-of-the box possibilities within a trusted team relationship where members adopt the attitude of "OK let's try that" (Rittel & Webber, 1973, p. 164). In line with social constructivist views that value interpretivist and action stances (Lincoln & Guba, 2000) resulting in collaboratively-constructed reality, this study mixed methods to support interpretivist discovery.

Consideration of goodness. To counteract possible concerns that pragmatically-defined mixed methods lead to a less than rigorous, *anything goes* approach, I adopted the constructivist view of a "goodness factor" or "extended considerations of validity" (Lincoln & Guba, 2000, p. 173) that considers validity in terms of triangulation of voices, methods, or interpretations. The crystalline view (in a broad adaptation of the concept from exploring a phenomenon through various genres to exploring them from various perspectives) of a new organically-developing phenomenon (p. 181) in order to build a more robust understanding was appealing. This form of validity based on authenticity (p. 180) was applied through a mixed methods approach.

Mixed methods design. I considered Cresswell's (2009) and Miles, Huberman, and Saldaña's (2014) design approaches for this study. Cresswell (2009) breaks mixed methods design into sequential, concurrent or transformative approaches:

- The sequential approach is used to expand upon the findings from one type of data collection using another data form.
- The concurrent approach uses two or more types of data collection *at the same time* to build a complex picture. Both are analyzed together and form part of the total results.
- The transformative approach uses mixed data collection methods in a design that *is based on theory and may incorporate sequential or concurrent methods*.

Miles et al. (2014, pp. 43-44), on the other hand, describe four mixed methods designs:

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- In the first, collection of quantitative and qualitative data follows a wholistic, cohesive approach wherein both are collected.

- The second design collects different forms of data from different data streams running simultaneously. One data stream may inform the other and lead to iterative changes.

- In the third type of design, different (qualitative, quantitative) types of data are collected at different stages in the research. One type is used for exploratory purposes and different types of data collection follow to further explain things brought up within the first form of data collection.

- The fourth design utilizes one form of data collection to further determine the design for the rest of the study which includes additional forms of data collection.

This study takes an approach that aligns most closely to transformative design procedures or the fourth design approach. I collected data from exploratory focus groups to help inform the design of the main intervention. Within the intervention, itself, I used a concurrent method of mixed methods (i.e. transcripts, research notes, survey, artifacts) along with pre-and-post interviews on either side of the intervention.

Under this transformative approach, then, the main data collection is qualitative and is supported by quantitative data collection and analysis to verify the main method (Cresswell, 2009). The study's transformational, mixed methods approach is displayed in Table 4.1.

Table 4.1. Sequence of Mixed Methods

Sequential ⟶	⟵	Concurrent	⟶
QUAL	[QUAL	(QUALS+QUAN)	QUAL]
(Focus Groups)	(Interview)	(Intervention)	(Interview)
Transformative Mixed Methods			

Through various types of data, I triangulated results to build holistic understanding, on the one hand, while creating multifaceted, reflective (crystallized) views (Richardson & St. Pierre, 2005) of how faculty members from a social sciences department and librarians formed (or did not form) a learning community and achieved (or did not achieve) shared understanding around IL. As already described, the study comprised two data collection stages, an exploratory one to provide information about the environment, and the main data collection that took place before, during and after the main FacLibCoI workshop intervention.

During the first phase, I conducted an initial environmental scan at the university where the study took place to explore the views of the academic community towards research and IL. This environmental scan included a review of literature, a university and standards documents review and focus group interviews with members of the university community (see Figure 3.3).

In phase two, I designed the intervention and the curriculum that I would pilot in phase three to explore how to foster efficient and sustainable collaboration between faculty members from a social sciences discipline and librarians around shared understanding and sponsorship of IL. In the third phase, I implemented the workshop and collected pre- and post-interviews, questionnaires, RA and researcher notes, session transcripts, and participant-produced artifacts.

Across all phases, the study is grounded contextually. This occurs through the combination of data collection methods across different data collection points.

Research Context

This exploratory, DBR study took place at a small private university in the United States during winter and spring quarters, 2015. The university is a small teaching institution (i.e. under 3,000 students and fewer than 200 faculty members; as opposed to a large research university where research plays a key role).

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The university is fully accredited by the appropriate regional and subject organizations and offers degrees in liberal arts, STEM (science, technology, engineering and mathematics) and social and medical professions. I chose the university for the following reasons:

Well-developed information literacy program. The university boasted a developed information literacy program run by the library through coordination with the English department. Over several years, university librarians worked side-by-side with English faculty members to incorporate information literacy into the general studies writing sequence that included a writing class taken in a student's first year and a scholarly writing class taken in the student's second year. Librarians entered all sections of these courses with a set curriculum and assignments. Information literacy also featured within the academic goals of the institution, and the university included student IL achievement metrics in its standardized reporting to its regional accreditors. Additionally, librarians presented one-off sessions of IL in some but not all senior or graduate-level research classes across the main campus. This level of IL integration across campus made the university an ideal place to conduct a study with faculty members who already understood the basic concept of IL.

Accessibility. The design of the study required a full academic term. At the time of the study, I worked as a librarian at the university, which facilitated accessibility for this length of time. I took precautions to avoid coercive tactics and to mitigate researcher bias (both are discussed in more detail later in this chapter).

Program spread. The varied nature of programs offered at the university allowed me to survey faculty members from many disciplines during the university environmental scan focus groups. This proved helpful towards gaining a broad understanding of how faculty members across the university related to IL and the teaching of research.

Fit within HE. The university operates along accepted parameters for universities of its size, academic emphasis and philosophical base. Practitioners and researchers from other similar small teaching and/or faith-based universities should therefore be able to relate to the findings.

Research Sample

In this study, I engaged with members of a social sciences faculty and librarians. As part of exploring the university overall, I first conducted focus groups with faculty members and chairs of academic departments across the university as well as upper-division, undergraduate students from the social sciences department. This exploratory environmental scan was to help create a picture of the culture and practice of the university, the library and social science department related to research and scholarship as well as IL.

Research Team and Roles

The research team comprised the Researcher/Moderator and two Research Assistants (RA). At least one RA attended the various focus groups and the FacLibCoI workshop. They also fulfilled the role of interrater once I organized codes into categories and later themes. The roles and responsibilities governing members of the research team are listed in Table 4.2.

Table 4.2. Research Team Roles and Responsibilities

Researcher/Moderator	Research Assistants	Both
- Introduced the research assistant(s) - Described the purpose of the study - Explained the rules of behavior - Explained the length of discussion - Answered questions - Facilitated discussions - Thanked participants - Dismissed participants	- Attended close but apart from the groups - Took notes - Served as reviewers for the themes derived from phase one focus groups	- Reviewed notes together after each session, filling in gaps - Transferred notes from RA to researcher after cleaning them (approximately one week after a session) - Engaged in dialogue to ensure notes, codes, and themes were accurate

In addition, the researcher worked with a few additional experts during the study. The chair of the social sciences department selected for the study assisted in building contact with the faculty members of the department beforehand and in providing key input when things seemed be going awry or exceedingly well during the intervention. Additional reviewers included an education professor at the university where the study took place who reviewed the learning plan. D. Randy Garrison reviewed the adapted CoI questionnaire and the FacLibCoI learning plan.

Phase One: Environmental Scan and Data Collection

In the first meso-cycle, phase one, Analyze and Explore the Problem, I collected preliminary data from the university where the study occurred. I hoped to better understand the university setting in which the research would take place. I wanted to learn whether various members of the university community considered a knowledge of how to access information to be an important part of scholarly research. I also wanted to understand the role that they believed these two concepts should play within the undergraduate curriculum and how they experienced current practice. I hoped that the viewpoints expressed by participants could help to guide the content of the FacLibCoI workshop that I would design and implement.

As stated in chapter one, I sought to explore whether collaborative learning within a design-based blended CoI provides an efficient and sustainable way for HE faculty members and librarians to build shared understanding through collaboration around information literacy (IL) within a given discipline. I found it important to engage with the variety of viewpoints as well as the collective culture of the university's academic community towards IL and research as I sought to build a learning environment conducive to shared understanding around IL. Two sub-questions, therefore, guided this stage of research:

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- How do members of the university academic community (faculty, librarians, academic administration) understand research and scholarship and their relationship to knowing how to access information?

- How do members of the university academic community envision research and information use fitting within the undergraduate curriculum and experience?

The data collected in phase one included:

- A review of IL literature, inquiry and collaborative learning, the CoI Framework literature as well as other related themes.

- University and standards documents (university accreditation report, university demographic data, university strategic and capital campaign plans, IL standards and the standards governing the social sciences department that participated in the CoI).

- Responses from focus groups among (a) students from the social sciences department, (b) university-wide, faculty members and librarians, and (c) academic department chairs from across the university in the form of recorded transcripts, research assistant notes, facilitator notes, and researcher reflection notes.

- Researcher notes from an interview with Vice President for Academic Affairs.

Literature review and university and standards documents. As noted above, I performed a review of theoretical literature in various related areas. These included the theory of information literacy as well as its historical and current practice. It also included cross and interdisciplinary approaches to faculty member collaboration as well as faculty member community models. This led into the literature about the CoI Framework. I also reviewed literature on technology-enhanced learning environments. I also performed a literature review to

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inform the design process. It included literature on the theory of classical pragmatism, design-based research, and on mixed and focus group methods.

I performed an environmental scan of the university. I reviewed one of its self-prepared accreditation reports, a capital funding proposal, and university and library strategic plans. I reviewed the national IL and disciplinary standards under which the FacLibCoI participant departments functioned.

Focus groups. I chose to conduct focus groups for the first phase of my research to explore the university environment where the FacLibCoI workshop would occur. I found that engaging with small social groups from within the university helped me to reduce my own bias as a member of the community by gaining a broader view (Barbour, 2007; Yilmaz, 2013).

Sampling. I used non-probability sampling based on homogenous stakeholder groups (groups within the university based on their potential relationship to IL). This type of purposive sampling is typically used not to generalize from smaller group to larger group but to allow for the gathering of rich insight and a wealth of knowledge around the study's contexts and people's interactions to them. Homogenous groups allow for group cohesiveness and focus and provide a basis for comparative analysis across groups (Palinkas et al., 2015; Yilmaz, 2013). I hoped that through thick description of displayed attitudes, behaviors, and observations of small homogeneously-chosen groups I would be able to discern meanings around IL and research concerns within the university. I also hoped to identify existing attitudes and understandings among the university's academic members towards IL and research. I identified the following homogenous university groups in relation to my study: academic administration, university-wide academic department chairs & deans and faculty members/librarians, and third- or fourth-year

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undergraduate students within the social sciences department that was selected to participate in the FacLibCoI workshop.

Homogenous within themselves (that is, faculty members from across the university formed one group, and students formed another group) (Hennink, 2014, p. 39), collectively focus groups included a cross section of the academic members of the university.

I designed groups to provide a diverse cross-section of viewpoints. Any individual who wished to join the focus group upon invitation could do so. As mentioned above, I did not use purposeful sampling to generalize findings as in quantitative methods, but to explore the environment through multiple member voices to gain a broader spectrum of insights that would inform the design and content of the intervention to follow (Palinkas et al., 2015; Yilmaz, 2013).

Based on Hennick's (2014) and Barbour's (2007) observations, I anticipated that focus groups would comprise three different homogeneous populations at the university (i.e. academic department chairs, faculty members and librarians from across the university, and undergraduate students within the social sciences department participating in this study), and would contain 4-8 participants each. This allowed me to replicate homogenous groups and to identify confirmation/ disconfirmation within a group and across different homogenous types (Miles et al., 2014).

Because I hoped to gain in-depth understanding of the phenomena of IL and research at the university, I did not restrict the exploration through research saturation, nor did I seek representation from or generalize to any disciplinary area within the university. For example, I welcomed faculty members from any university academic department into the university environmental scan faculty focus groups and I did not assume that a comment by a math professor could represent the math department or all university faculty, at large. Instead, I took each comment as part of the pool of comments by all faculty members in the focus group and

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ultimately by all participants across all focus groups. In this way, I better identified "collective narratives" (Hennink, 2014, p. 3) within an assortment of viewpoints coming from among and across university academic groups (Barbour, 2007, p. 58).

Composition of groups. Composition of the focus groups is now described:

Officers, chairs & deans, faculty members. I contacted the university officers, chairs and deans, and faculty members in an official letter of invitation. The office of the Vice President for Academic Affairs sent the letter and follow up via university email. The letter requested willing participants to contact me directly via email to volunteer to be part of a focus group. Most responses came to me and the office of the Vice President forwarded any misdirected responses.

In the end, five chairs and deans and one officer responded. The officer who responded directly supervised chairs and deans, so I chose to interview the officer separately. The chairs and deans formed a focus group. Among the non-administrative, faculty members and librarians, eleven responded. I then used Survey Monkey to schedule a time for the focus group and to assign the participants to groups according to their preferred times. We arranged time slots which would accommodate all the faculty member participants. I distributed luncheon takeout menus from one of the university cafes and each focus group member submitted their orders to me. I ordered, picked up and distributed these during the focus group meetings.

Students. In the case of the student focus groups, I consulted with the participating department on how best to select upper-level, undergraduate students for the focus groups. In consultation, we decided that because third-year students had completed the entire Library sequence of information literacy lessons given during College Writing (normally taken in the first year of university) and Research Writing (usually taken in the second year of university), they could answer questions concerning this process and how it prepared them for university-

level research and academic writing. Once we determined the student level, the department selected a class required for all third-year students. The professor invited me into the class and introduced me to the students and suggested that this exercise might help them to better understand the research process for their own upcoming senior research projects. I explained my study and my desire to interview them in a focus group setting. I requested voluntary participation, and I passed around a sign-up sheet.

Once students signed up, I used Survey Monkey to determine possible timeslots. Not all students who initially signed up availed of the online survey, and I could not interpret some answers. Once I narrowed the scheduling options, I distributed a signup sheet to their class. The signup sheet listed the buffet supper menu that would be provided along with two possible supper timeslots from which they could choose. I provided a buffet supper on both occasions.

Size of focus groups. Except for Group 5, which was one of the two student focus groups, the groups all fit within 4-8 members. The groups are shown in Table 4.3.

Table 4.3. Phase One: Exploratory Focus Groups

University Group	Focus Groups	Number of Participants
Administrators	Interview (University Officer)	1 participant
Faculty Members/	Focus Group 1 (Faculty/Librarians)	4 participants
Librarians	Focus Group 2 (Faculty/Librarians)	6 participants
Chairs and Deans	Focus Group 3 (C&D)	5 participants
Students	Focus Group 4 (Students)	6 participants
	Focus Group 5 (Students)	10 participants

Data collection protocols. The Research Team met before any focus groups took place and formulated a set of notetaking strategies. Each member of the research team then used these strategies to practice with a YouTube video clip of a focus group. Each member watched the YouTube video alone and took notes using a form made up of three columns: in the first column the RA noted down the participant being observed (participant 1, 2, 3…). In the second column,

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the RA took notes on what the person said. The RA used the third column for a second viewing of the video. Each row represented a comment by a different individual. When too much back-and-forth conversation between people on the video occurred, one line could be used to describe the back and forth. After watching the video and taking notes twice, each RA reviewed their notes, and using a highlighter, marked either in the first or second column what seemed to be the essence of the comment. Afterwards, the team reconvened and revised the strategies accordingly:

- Take down preliminary information about the focus group (diagram seating arrangement, focus group name, researcher/moderator name, research assistant(s) name(s), number of participants in focus group, start and stop time, etc.

- Notes are an objective record. The note taker's observations were solicited but not their opinions. For example,

  o "Appeared angry' vs. 'I don't know why the participant was angry. There was no reason to be…'

  o '…Forcefully objected to previous comment' vs. 'Participant 2 obviously dislikes participant 1. No matter what participant 1 says, participant 2 objects.'

- Paraphrase main points using quotations inside quotation marks when warranted or using summary description; note down other observational things that help to explain what was happening.

  o Participant might say: "In my field, it is all we can do to teach the students the content. There is so much content to cover that there isn't time for research projects. Students must learn so many scientific concepts in college that they don't have time to conduct real research. Research is what they learn how to do at master's level."

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- Notes might summarize: Content prioritized over research at college level, or Not enough time for research. Content is king.

- Note key phrases used that convey meaning: "Too much content;" "Critical thinking is key."

- Record body language or other cues (leaned in, smiled, raised voice, shakes head in disagreement).

- Record who says something (P1, P2, P3 to distinguish participants)—this can help to show exchanges in dialogue between one or more participants as well as different views between participants.

- Record observations (lively or serious discussion, thoughtful comment).

The RAs and I agreed upon the format of the notes template that they subsequently used. The template had a brief instruction section at the beginning. The rest of the template was made up of three sections to accommodate demographic or preliminary descriptive data, a participant seating chart, and a three-column section to record the dialogue (i.e. Listing of each participant as they spoke, comments, other observations). Each row held one participant's comments.

Protection of subjects. Guided by the research approval processes implemented by the University of Calgary and the university where the study took place, I implemented the following protocols to ensure that I conducted the study with due concern towards conflict of interest and protection of the participants from harm. I, therefore:

- Required Research Assistants to sign a confidentiality form.

- Required Focus group members to sign consent forms before participating.

- Informed all participants of expectations of confidentiality.

- Informed participants that this study related to my personal degree program through another university not to my position within the university.

- Assured participants of anonymity in the final report.

- Informed participants that note-taking would be the primary method of record and that individual comments form part of the group report and cannot be withdrawn.

- Informed participants that research assistants would take notes on the side. The moderator (researcher) would take public notes on a flip chart and would check these summary notes with participants as the conversation progressed.

- Provided participants with written statements. I orally reviewed these with participants. I asked participants to sign that the statement informed them of their right to leave at any time and that if they left this would be documented in the notes.

Script. I drafted a semi-structured script to guide the discussions. The script started with me introducing myself along with my relationship to the university, my research interests, and this study. I then introduced the Research Assistants and their role. Next, the script led me through the administrative responsibilities where I explained confidentiality and reviewed the rights of the participants. From there we moved into the questions, which I used to guide the discussion, but which varied slightly from group to group.

Semi-structured questions. As part of the university environmental scan, I drafted a series of semi-structured questions to use in the focus groups that would provide me with personal perspectives on how research and scholarship were understood by faculty members, librarians, academic administrators, and students. I also investigated how the members of the various focus groups used information sources to solve problems and conduct research (see Table 4.4 for the list of questions). I did not pilot test the questions beforehand mostly due to

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timing constraints. The questions for students focused on the research assignments in which they typically engaged in their coursework as well as how they experienced and understood IL. Questions for faculty members and chairs focused on the essence of scholarly research, how it related to IL, and how it should be incorporated into the undergraduate curriculum.

The information that I gathered from these focus groups informed the content of the presentations that I prepared for the FacLibCoI workshop. Participants in the FacLibCoI considered this information as they discussed and designed ways in which to incorporate IL into the social sciences department curriculum.

Meeting logistics. The university environmental scan focus groups took place during the month of February 2015 while the interview with the administrator occurred in March 2015. Focus groups met at their given time slot over lunch time in a conference room in the library (faculty members and chairs focus groups) or at supper time in the social sciences department building or library (student focus groups).

I set up the room with a table in the middle. In two opposite corners of the room, I set up a long table (one in each corner) for the RAs. From these angles, the research assistants could view the faces of the participants seated at the center table. Each research assistant used a laptop to take notes. I set up a flipchart in another corner and directed the conversation from there.

Data collection. I collected three types of data from the focus groups:

Notes on a flip chart. I took notes on a flip chart as I moderated. Before moving on to the next point, I reviewed this with the group to ensure that it represented the actual conversation.

Table 4.4. Questions for Focus Groups and Administrator Interview

Student Focus Group Questions	Faculty Members and Chairs Focus Group and Administrator Interview Questions
Describe a typical class assignment that required you to find and use one or more information sources (do research).	Define research.
	Define scholarship.
What steps did you follow to complete the assignment?	What are the components of research that undergraduate students need to learn?
What steps or processes were easy or difficult?	What are the components of scholarship that undergraduate students need to learn?
What could have better prepared or helped you to complete the assignment?	What higher order thought processes do undergraduate students need to learn to engage in research? In scholarship?
How many similar assignments did you complete throughout the previous quarter in all your classes?	Review the following statement written after reading drafts of what was later voted as the *Framework for Information Literacy for Higher Education* (Association of College and Research Libraries, 2015):
Describe a recent class assignment that required you to solve a problem that would be like what you might find in the workplace.	Students preparing for the knowledge economy require a repertoire of understandings, practices, and dispositions for engaging with the information ecosystem. This repertoire involves understanding why the way information is created and presented affects its credibility and usefulness. It involves
What steps or processes did you follow to complete the assignment?	critical thinking and self-reflection about information. Within communities of learning, scholarship and practice, students learn to find, evaluate and engage
What steps or processes were easy or difficult?	with information in ways that help them critically ask and answer questions and to self-reflect as they learn
What could have better prepared or helped you to complete the assignment?	to participate in the creation of new knowledge.
How many similar assignments did you complete throughout the previous quarter in all your classes?	How do you see this fitting within the university's academic goals? Is it part of general studies? Is it part of the curriculum in one's major subject courses? Who is responsible for teaching it?

Each session produced several flipchart pages of notes. An example of a single page is shown in Figure 4.1:
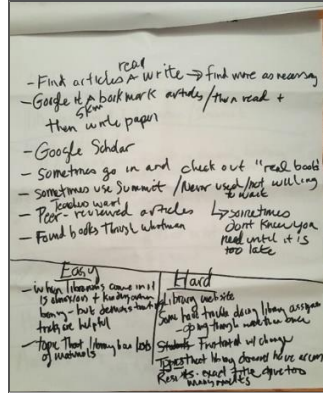
Figure 4.1. Sample Sheet of Notes. This is taken at one of the focus group sessions.

Research assistant notes. The RAs took notes during the focus group. Notes consisted of three parts: (a) summary information about the group (date, time, location, number of participants), (b) a seating chart with each participant identified as P1, P2... (see Figure 4.2), (c) notes of the session consisting of participant-by-participant summary of comments as well as non-verbal activities that occurred or anything else that they considered noteworthy.
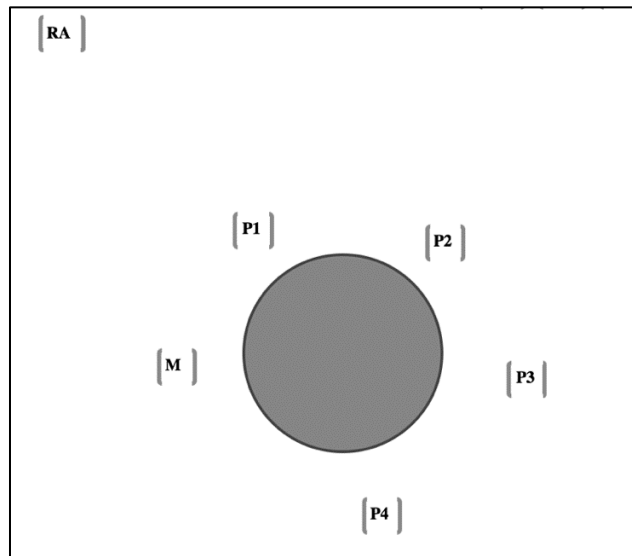
Figure 4.2. Sample Seating Chart. This chart is from a group of faculty members.

After a focus group session, the RAs and I met together to review their notes and to clarify any anomalies while we could remember the session. The RAs then took their notes and

individually cleaned them up and submitted them to me. In most cases, I received an independent record from each of the two RAs. In a few instances, only one RA could be present.

Below is an extract of research assistant notes. In this case, the Moderator asked the questions, "How do you define research? What does it mean to you and your discipline?" After some discussion, the moderator moved the discussion forward by asking, "Is scholarship the same thing or different?" The following excerpt illustrates the notetaking style:

M: Anything else?

P4: feels like entering into longstanding conversation. Not sure [??] there yet (P3 nodding). It's like making a genre. In movie, don't go and create a new genre. It's not until later. Might create prototype *[scholarship takes place w/in a field]; [it might later become a genre, but you wouldn't know until years later] [P3 seemed to be helping P4 explain this, interjecting some clarifications]*

P2: shoulders of giants.

P4: [*stomachs*] of corpses.

P3: zombie film now?

P1: where does creativity come in? Esp. in fields where objective isn't discovering new but creating new? Do we add that to scholarship?

P3: it goes with how it's presented. It's that elegance thing.

P2: speaks to P1

M: thinking of creative disciplines but what about ones following protocols.

P1. Yes, but I'm going with those doing something new.

M. clarifying 'engaging in creativity."

P2 nodding.

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P1. Can see? then standing on the shoulders of others. Person painting still painting within tradition.

P3. Film is example. Genre/trope/made up of pieces made up from other pieces [*sometimes from obscure other pieces*]

P1: nothing new

P?: "nothing new under the sun"

P3: trying to add something new to the conversation. Maybe…

Researcher reflections. After each session, I drafted a short series of reflections. These reflections included impressions of the session along with any other things that struck me during the session as being especially noteworthy or of interest. Here is an excerpt from the university-wide, faculty member focus group used as illustration above:

…there was one participant who was interested in making sure that we considered research in the context of personal discovery... wanting to find out something because I need to find it out... not as an abstract concept. I had a hard time understanding this but the more I have thought about it, I think that is a good summary. He mentioned something regarding not about vetted sources, not about the way the library does research...it is research for what I need to know, and I go to places I trust to get the information. Yes, a good summary I believe is that research is not just abstract research using approved protocols. It is really all about personal discovery and going to where trustworthy information may be found (wherever that may be?). Is this the problem with the way we teach research? This triggered discussion from another participant that it is often hard to help undergraduates understand that what they do in their personal life might be considered research. They tend to separate academic work (research) from real-

life exploration. Hmm...a really good tie-in to some comments from the first student group...

Data analysis for phase one. Due to unforeseen delays in the ethical approval process that pushed the first data collection later than anticipated, I performed an abbreviated rather than extensive data analysis on phase one research that involved manual coding and extraction of themes. I used this to inform the design and the contents of the intervention in phase three. I then, iteratively, revisited the data after phase three and completed a thorough analysis that I report in chapter five. In the extended analysis, I confirmed that the basic themes uncovered in the first analysis held true while a few additional themes emerged.

Data organization and summarization. To keep data together while summarizing it through various iterations, I organized the data by spreadsheets in Microsoft Excel.

The first spreadsheet, *Focus Group Summary*, gathered all the notes from a given focus group (i.e. the notes from research assistant(s), the flipchart notes recorded by the researcher, and any researcher reflections written shortly after the focus groups). Each set filled a column, and rows contained each snippet of dialogue or reflection. This allowed me to view each individual snippet from all three data across a single row. I incorporated an end column for summarization which became my first-level coding. Once I consolidated all notes from a given focus group into one spreadsheet, I read over the data several times to become familiar with its flow. I then conducted row-by-row, first-stage coding. I present an extract from one of the focus group spreadsheets in Table 4.5.

Once I completed initial coding for all focus groups, I reviewed the data several times and then reduced and consolidated codes for simplicity and clarity.

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Table 4.5. Excerpt from a Student Focus Group Summary

Research Assistant I	Research Assistant II	Moderator	Researcher Reflection	Summary
Q: Okay, you've sort of already talked about it; what out of these processes do you find really easy or more difficult?	Q: What do you find easy/difficult?	Q: What do you find easy or difficult about the research process?		
P1: Sometimes, I find things I want to talk about, but I can't find sources; I don't understand [named database] (many agree); if I find a book it's from the 70s; I have to fit my topic to sources available (P4 and P7 agree)	P1: Sometimes, I can find what I want to talk about, but then can't find any sources. I don't understand [named database]. Don't have anything on the topic in books or if do, it's from the 70's.	Sometimes I can find things I want to write—can't understand [named database] or books—switch topic to fit sources	Students felt that they had to change their research topics to fit the sources they could find rather than researching what they wanted to research, and they disliked this very much. I found this interesting because it seems to coincide with observations from faculty members that students want to start with answers and find sources to prove their point of view rather than letting the research lead their topic and enjoying the process	Search --Write paper first then find sources to match Extrapolate: start with answer and fit sources accordingly Library Resources/How Library Webpage works --Books are old --Don't understand [named database] (meaning databases/website??)

Next, I created a draft Focus Group Master Codes List (or code document) and reapplied these to the original data, replacing the first-level, summary coding. In some cases, I did a further code revision to ensure that they aligned with the raw data. I include an example of a focus group master codes spreadsheet in Table 4.6.

Once I had successfully applied codes back to the raw data, I re-examined each code along with the accompanying raw data and I wrote a definition for each code which was added to the Master Code Lists. As I wrote definitions, some recoding took place to better align data to

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Table 4.6. Individual Focus Group Coded Data Set Example (from Master Codes List)

RA1	Facilitator	Researcher Reflection	Code#	Code
P5 if have topic library has a lot of, then can easily find. [some]Times [I] had more in [my] personal library than [I could find in the] library had or [consortium had] but if have a lot…Pffts	Easy if library has lots of materials on a topic. Hard if you have a topic that library doesn't have access	They also criticized the holdings. In some topics, there is a lot and it is easy to do research. For other topics, there are few resources. I know this is true in some disciplines. But [social sciences department represented] doesn't seem to be one that this would be true about. So, it begs the question, what are they looking for and how are they searching? What is breaking down in the process? Why aren't they finding the resources?	SFG-24 SFG-36 SFG-45	Finding good sources is dependent on the topic. Quantity of library resources. Research process (level of difficulty).
P4 I would search ["by exact title"] but it came up with like 2,000 results (A: Frustrating) it was random and dumb. Google more specific	Hard—exact title gave too many results		SFG-14 SFG-45	Difficult to get good results from library online resources (often referred to as website, but broader) Research process (level of difficulty).

codes. Next, I added example excerpts from the raw data to each code in the Master Code List

and conducted one more revision to ensure a good match. I present an extrapolation from the

Master Code List in Table 4.7 with revisions highlighted. In the end, I produced two master code

lists, one for faculty and the other for student focus groups. Each contained near 70 codes.

Coding. At this point, it is appropriate to briefly examine the types of codes used. Coding

was organic and emerged directly from the data. I took these granularly-attached codes that

represented small segments of data and synthesized them from across sources into summary

codes. Summary codes necessarily became more objective than subjective and less emotional. In

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fact, many of the codes ended as descriptive or process-oriented codes as opposed to value,

belief, or emotion codes. In vivo coding fell aside as codes became formalized. This

Table 4.7. Master Code List with Revisions Example

Code #	Code	Definition	Quotes and Comments from Raw Data
SFG-46	Source restrictions imposed by professors.	Professors' research assignments need to be less restrictive in terms of sources students are allowed to use. // Revised: // Students express opinion that professors' research assignments need to be less restrictive in terms of sources students are allowed to use.	"Teachers want peer-review articles;" [While it is true that the students were reacting to the fact that in one assignment the full text wasn't available, the reality is that they were criticizing the fact that the teacher imposed the restriction: "hard to get to an entire article…"they advertise the abstract but there is no link to find the entire article;"] [my observation: assignment was limited to a list of titles of which many did not have full text available]; Note from RA1 "Assignment they were given did not allow them to use many journals, it was a very specific list;" Still on same assignment "A lot of information we were looking up through the library you had to basically pay; there was so much information that were paid sites;" And more on this assignment, this time note from RA1 "Had to be part of [an organization website, redacted here for anonymity]. Some organization website. Teacher may have gotten list from this website and prof had access, but the library did not have everything;" "Earlier on, when I find my sources many classes have requirements that they be after a certain year, so I have to exclude some" [within 5 years]; "...the restrictions are often stifling on my research;" Note from me: they want sources 5 years or less; this eliminates useful, historically significant articles.)

resulted in a set of high level, uniform codes that lost some of the life of the dialogue. However,

it also resulted in a toolset that turned out to be invaluable for identifying themes (higher level)

while retaining the values, beliefs, and emotions within the raw data examples that were attached

to the codes (granular level). I provide an exemplar in Table 4.8.

Theme creation. Once I coded all data streams, I organized them into themes. I went

through this inductive process several times, reading and rereading the example data and codes

as well as going back to the original raw data until themes emerged. I then identified categories

within the themes and included the supporting codes, code definitions, and raw data examples in a new spreadsheet form.

Table 4.8. High Level Formalization of Codes Example

Code #	Code	Code Definition	Examples from Raw Data
SFG-19	ENGL122/ 223 Library assignments (various opinions).	ENGL122/223 library assignments are helpful or not, along with examples.	From a student tutor "Lib assign are heavily weighted, no assistance, going through [it] more would be useful." Semi-exact quote from student with added notes from RA1: "I found in classroom "It is obnoxious" but nice to see explained up front "Kindergarten boring" but does explain "How to do it "Keywords, gives "tricks" not taught other places." Note from researcher notes "What about the learning environment the students experience is not good? How can we change it? … Student "For us who have been here forever, we go through College Writing I and II. They [librarians] come in and show us how to use it. They walk us through it." From student. "I've taken Research Writing a few times b/c didn't do well first time. Get all this nonsense at beginning of quarter…

I asked the RAs to cross check the process and results. They reviewed the Master Code List, made up of codes, definitions, and examples from the raw data. I provide an example from their review in Table 4.9. Their comments may be seen in the rightmost column of the example and my revisions based on those comments are shown by the highlighting in the example.

RAs also reviewed a list of the themes and categories that I had inductively extracted along with the codes and raw data examples that I had included under each theme. At this point in my analysis, I had also linked the themes back to one or more of the study's research

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Table 4.9. Data Review Changes Example

Code	Code Definition	Examples from raw data	Does the code name represent the data? If not, why not?	Does the definition explain the code name? If not, why not?	Are the example quotes representative of the raw data? If not, why not?
Use library resources after Google. // Revised: // Literature research process (brainstorm, Internet search).	After Google, go to library website. // Revised: // Student describes literature search process as brainstorming and then going to the Internet.	"Brainstorm topics then Wikipedia or Google to find initial feedback;"			RA 1…--No; no mention of using library resources after Wikipedia/ Google in example / RA 2…--No. leading that library resources follow Google, not clear from discussion.

questions. An example from this list of themes and categories is provided in Table 4.10. Note

that RAs added the highlighted items in the example.

Table 4.10. Reviewer Notes Example

THEME 2: Practicing Literature-based, Research-Related and Scholarly Writing Skills (Answers Research Question 2)		
2.1 Identifying Types of Information Tools and Sources Used		
Code #	Code	Code Definition
SFG-3	Student Views on Books (use/do not use).	Student comments indicate that some value books while others do not use them.
SFG-28	Use Library databases.	List tools they use— [database titles redacted here], select [subject area redacted] in [given database].
SFG-56	Use Google Scholar.	Google Scholar was listed as an information source.
SFG-57	Use Google to do research.	Use Google as primary search engine to do research.
SFG-58	Use Library online resources (website).	Library Website was listed by students. (See SFG-14 and SFG-45 for issues with the library website).
SFG-60	Use scholarly journals.	Students list scholarly journals as an information source that they use.

As a final review process, I asked the RAs three questions about the themes:

Q1. Do the themes represent the data overall? Why or why not?

Q2. Do categories represent the data and the themes overall? Why? Why not?

Q3. Are there any other themes/categories that "jumped out at you" by their absence?

A sample segment of their review is provided in Table 4.11.

Table 4.11. RA Comments Example

Q. 3. Are there any other themes or categories that "jumped out at you" by their absence?
RA-1--No. / RA-2--Yes and I am not sure if it's a new theme or a category within theme 2, 3, or 4. The students made numerous distinctions or comments about personal interaction. It is a big part of their major and came out through the discussions (e.g. SFG-8, 20, 38). Also, the students made note of a number of stumbling blocks (e.g. SFG-30, 32, 46, 50, 51). These are perceptions and reflections, but they are also a major theme or, rather, a category of their own. Perhaps to keep the language unbiased, simply separating 4.1 into "4.2. Research-related attitudes" and then determining what is reflection and what is attitude. I'm not sure that makes sense, but, there it is!

I used feedback from the RAs to finalize codes and themes. The final list of themes and sub-themes is reported in chapter five.

Phase Two: Design--Building the Intervention

In a meso-cycle within phase two, I designed the FacLibCoI workshop to explore how to foster efficient and sustainable collaboration between faculty members in a social sciences department and librarians that would enable these participants to build shared understanding and sponsorship of IL. I chose a blended technology-enhanced learning environment (TELE) for its unique capacity to enhance student engagement (Moskal & Cavanagh, 2014) and support active learning through the careful design of face-to-face and asynchronous environments (Dziuban et al., 2004; Garrison & Vaughan, 2008; Picciano, 2014). I also selected the CoI Framework for the design. Figure 4.3 illustrates how the CoI Framework's social, cognitive and teaching presences form the educational experience (Garrison, 2011).

SOCIAL PRESENCE

Supporting Discourse

COGNITIVE PRESENCE

EDUCATIONAL EXPERIENCE

Setting Climate

Monitoring and Regulating Learning

TEACHING PRESENCE
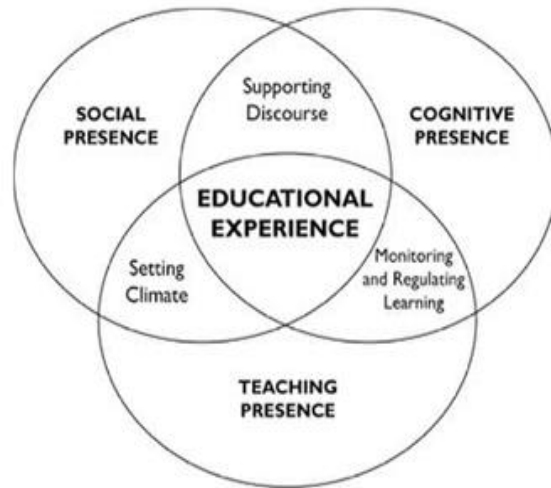
Figure 4.3. CoI Framework . Graphical representation of the three

inter-dependent presences and educational experience. By D.

Randy Garrison (2011). Used with permission.

Themes. I extracted and used tentative themes from phase one data and from Garrison

and Vaughan's (2008) CoI work to inform the FacLibCoI workshop design (see Table 4.12). The

themes from Garrison's work correspond to the CoI presences (e.g. social presence themes=SP,

etc.). The themes that I derived from the focus groups are labelled IL. These themes were then

used in the design phase of the FacLibCoI and were assigned to the learning plan that I

developed (available in Appendix A).

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Table 4.12. Themes Extracted from Environmental Scan

CoI Themes Informing the Design	Information Literacy Themes Informing Content

Social Presence
 	
SP1. Design face-to-face climate for personal connections and to create a comfortable, open environment.
SP2. Use online directed activities to create discussion and collaboration for social presence and group cohesion.
SP3. Design trusting and respectful environment where participants discuss, challenge ideas, acknowledge others' points-of view, and successfully handle conflict.
SP4. Use a survey to assess perception of social presence
 	
Cognitive Presence including Metacognition
 	
CP1. Design for the Practical Inquiry Model (trigger, exploration, integration, resolution) to allow participants to define their learning. Design for inquiry (explore, discuss, refine) using suggested or discovered sources.
CP2. Design opportunities for critical discourse, hypothesis, and debate in order to engage participants in exploration.
CP3. Design individual sense-making and reflective written communication to integrate shared understanding.
CP4. Design activities that will encourage participants to use shared understanding to work towards resolution.
CP5. Design activities to develop awareness of one's existing knowledge and to examine one's understanding.
CP6. Use an assessment questionnaire to prompt participants to consider their learning processes and strategies and to assess their perception of learning.
CP7. Design activities that help participants listen to and reflect on others' ideas, strategies and activities.
	Student research competency—faculty member/student focus groups
	
	IL1. Undergraduates tend to view research as an academically-focused activity using scholarly sources. Both students and faculty members confirmed that students do not equate solving real-world problems using non-library search tools and resources as *real* research.
	IL2. Both students and faculty members indicated that the teaching of research varies across the university.
	IL3. Student and faculty member comments indicate that students start research with a formulated opinion, seeking confirmation not discovery. While initially excited about a topic, they wonder why they are not learning much. Frustration often leads them to abandon a topic if confirmatory sources cannot be found easily.
	IL4. Student and faculty member focus groups confirmed that students find the following processes difficult:
	  a. Determine which library databases are most suited for the topic.
	  b. Create search strategies that lead to targeted results.
	  c. Create and understand citations.
	  d. Understand the dangers of sloppy scholarship and how it can result in unwitting plagiarism.
	  e. Write in a scholarly manner (e.g. introduction, thesis statement, transitions).
	  f. Read and engage with (e.g. through judgement, questioning, and critique) a scholarly article.

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Table 4.12. Themes Extracted from Environmental Scan (Continued)

CoI Themes Informing the Design	Information Literacy Themes Informing Content
Teaching Presence TP1. Use facilitation/direct instruction to help participants negotiate roles and define learning goals and outcomes. TP2. Use facilitation/direct instruction to encourage inquiry and responsibility (summarize agreement/disagreement, encourage on-task behavior, explore concepts, use content expertise to challenge thought/build community) TP3. Design for deep understanding not information overload. TP4. Use a survey to assess perception of teaching presence. TP5. Use facilitation and direct instruction to diagnose misunderstanding and provide feedback. TP6. Use solutions developed by the group to assess understanding and collaboration. TP7. Provide participants opportunity to monitor learning, help others learn, and to develop teaching presence.	Current disciplinary department and library standards IL5. Faculty members and librarians share responsibility for ensuring that students become information literate. IL6. Students will understand research to be a process that involves the need for information and the identification, evaluation and critical analysis of the information before integrating it and constructing new knowledge. IL7. Students will understand that information has value and there are many entities and many interests involved in its production, free or paid distribution, and use. Students know how to ethically use information. IL8. Students will recognize that research is a process of asking question. IL9. Students will understand that by engaging in research they are entering a scholarly conversation. They will disseminate their findings in ways that lead to research-informed practice and practice-informed research.

SWOT analysis. To inform the design phase, I did an initial overview analysis of the pre-interviews with faculty and librarian FacLibCoI participants before the initiation of the FacLibCoI workshop. This revealed some additional insights for the design. Based on these insights and the themes from the previous table, I performed a SWOT analysis (see Table 4.13) to help identify important issues to the design. Several useful propositions resulted.

Table 4.13. SWOT Analysis and Propositions for the FacLibCoI Arising from Analysis

STRENGTHS

- Participants know each other, and good collegial relationships are assumed
- Some participants excel in face-to-face while others prefer asynchronous dialogue
- IL and social sciences standards are in agreement
- Some participants are aware of active learning strategies; others are good at finding information
- Student/faculty member analysis of research and learning needs are similar

WEAKNESSES

- Extrovert participants may overwhelm introvert participants
- Extrovert participants may be less inclined to engage asynchronously
- Model requires significant time from participants
- Buy-in is more about helping the researcher, not in learning
- Undergraduate students dislike hard work associated with research.

OPPORTUNITIES

- Establish relationships where strengths of each group complement weaknesses
- Gain interest in learning how to collaborate on IL
- Find common ground to address student research skills needs
- Harness knowledge of active pedagogy to drive recommendations

THREATS

- Collegiality may lead participants to accept basic understanding and agreement and gloss over differences
- May not engage fully due to time constraints
- Faculty member reticence of student research abilities
- Student misunderstanding of research

PROPOSITIONS ARISING FROM THE ANALYSIS

SWOT1. Utilize the strengths of the group to establish relationships (Social Presence)
SWOT2. Harness knowledge of active pedagogies and student learning needs to establish interest in learning about information literacy that leads to collaboration (Content)
SWOT3. Engage participants in deep learning (Cognitive Presence)
SWOT4. Encourage participation despite time demands (Teaching Presence)
SWOT5. Consider faculty member/student conceptualizations of student research needs when proposing recommendations (Content)

Designing the intervention. Based on the exploratory review already described, I

developed a seminar that consisted of four face-to-face sessions combined with accompanying

asynchronous work among smaller groups between sessions. I designed the asynchronous forums

to allow the faculty member and librarian participants to work in smaller groups (each was a mix

of social sciences faculty and librarians) towards producing outcomes that could be brought back to the larger group in the next session, thus continuing the learning feedback loop.

In Table 4.14, I condense and list by category and code the various themes from the Environmental Scan (previously shown in Table 4.12) and the design propositions derived from the SWOT analysis (shown above in Table 4.13). I used this list to develop the Learning Plan (unit and lesson plans) for the seminar and to cross check the design.

Learning plan. I developed the seminar's learning plan and submitted it for review to two professors within the University and a researcher with the CoI Framework. One of the university's education professors and the CoI Framework researcher, D. Randy Garrison, returned their comments, which I incorporated into the Learning Plan. The plan included a unit plan summary, high level session plans, and lesson plans:

- The unit plan summary included a description of the subject, unit, timeframe, learning goals and outcomes, and necessary materials.

- The session plans incorporated the purpose and design themes (CoI presences to be incorporated in the lesson, and description of goals, specified materials needed, facilitator-provided resources, session activities and the content and participant outputs).

- Lesson plans built out the specific objectives and learning content and provided a summary and assessment for each session.

Once the Learning Plan was developed, I checked it against the list of design themes (shown in Table 4.13) and mapped these back to the Learning Plan. A full copy of the unit and lesson plan is available in Appendix A for referral during planning additional iterations of the FacLibCoI workshop.

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Table 4.14. Coded Design Themes Used in Instructional Materials

Categories	Coded Themes
Social Presence	SP1: Design F2F to support personal connections SP2: Design online to support SP and build cohesion SP3: Design learning environment to build trust and respect SP4: Use a survey to assess perception of social presence
Cognitive Presence	CP1: Design for Practical Inquiry Model (trigger, exploration, integration, resolution) CP2: Facilitate critical discourse of exploration stage CP3: Facilitate integration through individual learning/shared reflective communication CP4: Facilitate resolution through activities designed to lead to recommendations CP5: Design activities for self-awareness (existing knowledge; question understandings) CP6: Use assessment survey to prompt self-consideration of learning processes/strategies and to assess perception of learning CP7: Design activities that encourage listening to and reflecting upon others' ideas
Teaching Presence	TP1: Design for group negotiation of problem, learning goals, outcomes, roles and protocols TP2: Use facilitation/direct instruction (e.g. encouraging, summarizing, exploring, challenging) TP3: Design for deep understanding not information overload TP4: Assess perception of teaching presence using surveys TP5: Use facilitation/direct instruction to diagnose misunderstanding TP6: Use the artifacts produced along with their development to assess understanding/collaboration TP7: Design activities to help participants take on teaching presence and help others learn
Information Literacy	IL1: Undergraduates do not see real-world problem solving as research IL2: Research expectations across campus are variable IL3: Students use research as confirmatory rather than exploratory IL4a: Students find it difficult to determine the correct database to use IL4b: Students find it difficult to create quality search strategies IL4c: Students find it difficult to create and understand citations IL4d: Sloppy scholarship results in unwitting plagiarism IL4e: Students find it difficult to write in a scholarly manner IL4f: Students find it difficult to engage with a scholarly journal article IL5: Faculty members and librarians share responsibility for teaching students information literacy IL6: Students should understand the research process (identify need, find, evaluate and use) IL7: Students should use information ethically and understand the value of information IL8: Students should recognize that research is about asking questions IL9: Students should understand research as scholarly conversation informing practice and vice versa

Table 4.14. Coded Design Themes Used in Instructional Materials (Continued)

Categories	Coded Themes
Strengths, Weaknesses, Opportunities, Threats	SWOT1: Use group strengths to establish relationships (Social Presence) SWOT2: Use group knowledge about pedagogy and student learning needs as trigger (Content) SWOT3: Engage participants in deep learning (Cognitive Presence) SWOT4: Encourage participation in the face of time demands (Teaching Presence) SWOT5: Encourage group to consider student perspective of research when developing recommendations

Development of data collection tools for phase three intervention. I also developed a set of semi-structured questions for one-on-one, open-ended interviews with participants. These questions came out of my knowledge of the university and my literature review. I did not pilot test the questions. I used the interviews to gauge participants' thoughts about teaching research and their understandings of collaboration, inquiry and IL. The post interviews allowed me to consider how participant thoughts on these topics may have changed.

I chose to use a Likert-scale instrument for the second data collection method. I utilized and combined the questionnaires designed for CoI and presented in two studies (Arbaugh et al., 2008; Garrison & Akyol, 2015). I chose these because the studies showed that the items in these questionnaires had undergone various statistical analyses to test the validity of the CoI presences construct and an emerging self and co-regulation metacognitive construct. For the 34-item questionnaire, results "support[ed] the use of the CoI instrument as a valid measure of Teaching, Social, and Cognitive Presence," (Arbaugh et al., 2008) although the authors noted that Teaching Presence items might need refining. In the second study, researchers revised a metacognitive construct from three dimensions to two and tested the revised construct with graduate students. Results confirmed a shared metacognitive construct of self and co-regulation (Garrison & Akyol, 2015) as proposed by the CoI Framework. On this basis, I felt comfortable adapting these two

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questionnaires to explore whether the FacLibCoI workshop prototype design was able to support and sustain the three presences and metacognition of the CoI Framework. I gained permission to use questions from the 34-item CoI Framework survey (listed in Table 2, Arbaugh et al., 2008) and from the shared metacognition questionnaire items (listed in Table 1, Garrison & Akyol, 2015). I combined and adapted these into a 66-item Likert scale instrument, which is available in Appendix B.

I planned to administer the survey to participants immediately after a workshop session and so I made minor adaptations to the wording of survey items to better match the context of the FacLibCoI workshop (i.e. changing an item from present to past tense). For example, I changed "I am aware of my effort" (Garrison & Akyol, 2015, p. 69) to "I was aware of my effort." (see Appendix B). I also changed relative terms such as *course* to *workshop*, *work* to *teaching*, or *instructor* to *facilitator*. I generalized questions in the original 34-item questionnaire that referenced *online* to fit a hybrid CoI that included face-to-face and online components (e.g. *online discussions* became *discussions*). Finally, I created five items to assess participants' views towards specific learning strategies or artifacts used in each session. I adapted three of the five from previous items and simply repeated them in this section of the questionnaire (e.g. changed *reflection on the workshop content and discussions helped me understand fundamental concepts in the workshop* to *It helped me to understand important concepts*). I added the following two items: *it helped me to meet the learning target*, and *I found it clear and easy to use*.

Participants completed the scale after each face-to-face session. This enabled me to measure participant perceptions of each session and how they experienced the collaboration and inquiry that took place within that session.

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I audio-recorded the face-to-face sessions (including small break-out groups) for the third data collection method. I procured four portable audio recorders from the university's IT department (and participants volunteered a couple of cell phones loaded with recording apps). We switched these on during each session to create .mp4 files, which I downloaded, deleted from the original recording devices, and later transcribed. In addition, research assistants followed the same protocols established in the phase one focus groups and took notes throughout the main sessions (although they did not participate in the small breakout groups).

Phase Three: Prototyping the FacLibCoI Workshop and Analysis

TELE. In phase three, I implemented the FacLibCoI workshop prototype that I had designed in phase two. Before beginning this intervention, I conducted one-on-one pre-interviews with the social sciences faculty members and librarians. After the intervention ended, I conducted post-interviews. All participants took part in the pre-interviews and all minus one participated in the post interview. I recorded and later transcribed the interviews and took notes during each. Interviews lasted between one-half hour and one hour each. The questions used for the pre- and post-workshop interviews are shown in Table 4.15.

The FacLibCoI included four face-to-face sessions and accompanying online, asynchronous forums that took place over two months. During these sessions, the group met collectively and broke out into smaller groups, which were divided to ensure that both the social science department faculty and librarians were represented in each group. I also organized collaborative space within the university's course management system, which I selected as the medium of choice because faculty members used it with their own students. The collaborative space allowed participants to post responses to questions given to the groups by the researcher.

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Table 4.15. Questions for Semi-Structured Interviews

Before Workshop Interviews	After Workshop Interviews
1. What do you know about this workshop?	1. In what ways was the workshop what you expected?
2. Why have you agreed to be part of it?	2. In what ways was it different?
3. What do you hope to gain from your participation?	3. What do you feel you gained from your participation?
4. What do you understand IL to mean?	4. What would you have preferred had been done differently?
5. What do you understand by collaboration?	5. What do you understand the term IL to mean?
6. How do you feel about collaboration?	6. What do you understand by collaboration?
7. What do you understand by collaborative learning?	7. How do you feel about collaboration?
8. How do you feel about collaborative learning?	8. What do you understand by collaborative learning?
9. What do you understand by inquiry learning?	9. How do you feel about collaborative learning?
10. How do you feel about inquiry learning?	10. What do you understand by inquiry learning?
	11. How do you feel about inquiry learning?

I audio recorded all but one of the face-to-face sessions. I failed to switch the recorder device back on after one of the breaks and missed recording the session. In addition to the audio recordings of these face-to-face sessions, one or two research assistants took field notes throughout the group sessions. On a few occasions where the sessions ran over time and the research assistants needed to leave, notes stopped part way through. Small groups also recorded their sessions, but I did not assign any direct observation.

At the end of each face-to-face session, participants filled out individual questionnaires The questionnaire is available in Appendix B.

Data analysis for phase three. As presented earlier, I used a mixed methods approach to collect data for the main intervention (see Table 3.2). I conducted individual interviews with each participant (QUAL) beforehand. Then, during the intervention itself, I utilized the following mixed methods data collection methods:

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- Group transcripts and notes (QUAL)—thematic analysis using self-developed coding methods.

- Online transcripts (QUAL)—thematic analysis using self-developed coding methods.

- Surveys (QUANT)—descriptive statistical analysis compared with qualitative results.

- Documents/Artifacts (QUAL)—narrative review.

Transcripts, notes, and interviews. To analyze transcripts, researcher assistant notes and interviews, I chose a more deductive approach (with an added inductive option) than I had used to analyze phase one data. The intervention resulted in vast amounts of data that I needed to quickly organize to ensure that I adequately addressed the research questions. Rather than the themes being drawn directly from the data as in phase one, I preselected four main categories based on the study's research questions. I present and describe the four coding categories below:

- Blended Design—Codes included any evidence of a blended TELE design (presence, efficiency, sustainability). What parts of the design or other phenomena contributed to or did not contribute to a blended TELE?

- CoI—Codes included any evidence of a developing CoI along with evidence of its three presences (social, cognitive, teaching).

- Learning—Codes include evidence of individual and collaborative, inquiry-based learning (including identification of its forms and any collaborative learning that did not occur or that was problematic).

- Shared Understanding—Codes included evidence of shared IL understanding including evidence that inquiry-based and collaborative forms of learning that contributed to that understanding (in what ways). They also included any evidence

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that collaborative forms of learning might contribute towards collaborative approaches to IL within the discipline.

Using MaxQDA, a mixed methods data analysis software package, I conducted four levels of coding, one for each category, to chunk the data by category. I used descriptive coding to quickly chunk the data by the main categories above. Within each category, I performed preliminary ad hoc coding to develop a list of protocol codes. I then defined and compared these against the data. I recoded each chunk of data based upon a unified codes list.

Next, I coded the chunked data with emotional codes as well as with V (Value), A (Attitude) or B (Belief) based on Miles et al.'s (2014) definitions of these codes. This level of coding supports a more wholistic Deweyan view (non-dualistic view of the organism-experience-environment that involves the whole person, including emotions and beliefs) (Morgan, 2007; Vanderstraeten, 2002).

One of the weaknesses of qualitative data is the copious amounts of data that tends to be generated and that ultimately goes to waste. To mitigate in some small way this weakness, I chose to also include an inductive approach to coding. On clean data, free from any chunking, I used descriptive and in vivo codes to highlight things not captured within the four pre-defined categories. Descriptive codes identified the data's essence while in vivo codes captured its 'life.'

Questionnaires. Surveys make up the quantitative part of the study. I described these earlier. In summary, the questionnaire included 4-point forced choice Likert items as well as an open-ended question that sought perceptions from Strongly Disagree to Strongly Agree. Participants filled out a questionnaire after each face-to-face session giving their perceptions about that session.

I used descriptive statistics to summarize the data from the questionnaires, specifically mean and standard deviation. I compiled descriptive statistics for each item, for each scale, and for the entire questionnaire. I laid these summarizations out into a series of tables that are presented in chapter six.

Trustworthiness of the Study

As validity is used in quantitative studies to ensure that the study actually measures what it sets out to measure, trustworthiness or creditability is used in qualitative or mixed-methods research to ensure that the picture that emerges describes reality in all its richness (Barab & Squire, 2004). These authors point out that any positive changes that result could be considered evidence of trustworthiness since the changes occurred within real-world settings. Golafshani (2003) indicates that naturalistic studies value careful process and reporting as well as the ability to transfer findings to other settings as opposed to the traditional definitions of reliability. I conducted this study within the real-world, naturalistic setting of a university among members of its academic community. Detailed documentation and description has been incorporated in this report to provide evidence of external validity. I used triangulation to build credibility and trustworthiness that the findings are representative of the reality in which the study occurred (Golafshani, 2003; McKenney & Reeves, 2012) and to provide clear evidence of how I assigned themes and derived findings (Barab & Squire, 2004; McKenney & Reeves, 2012). I also used rich description to tie results and context to theory. In this sense, although I did not use crystallization, which requires the mixing of methods and genres, I find its imagery descriptively compelling because it serves as an illustration of how multiple data views such as those used in this study may provide credibility and trustworthiness. For triangulation, I used multiple views of the phenomenon to tease out meaning. Specifically, I used triangulation during:

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The exploratory phase of the study. I collected data across various focus groups (faculty members and chairs from across the university and students from the social sciences department) as well as an interview with the VP for Academic Affairs which could then be contrasted and compared. I also examined university-level reports and standards adopted by the university which allowed for triangulation between focus group data, written university documentation, and appropriate standards.

The FacLibCoI workshop intervention. I conducted pre- and post-interviews with all faculty members from the social sciences department and librarians, collected transcripts from the workshop face-to-face and online, asynchronous sessions, administered questionnaires to participants after each session, and collected artifacts produced by the participants; these provide material for triangulation of results from the workshop.

A third method used to establish trust in the study is rigor. Rigor is often an issue in studies that use multiple methods. Hoadley (2004b) posits that methodological alignment is a potential way of addressing rigor and suggests that this is "encouraged" when "the same people…engage the theory, the implementation of interventions, and the measurement of outcomes" (p. 205). My dual role within the study as researcher and facilitator provided me with the opportunity to align methods to the theory of social constructivist learning theory and the CoI Framework. For example, the choice of DBR as a methodological approach allowed me to design a prototype to potentially fit the CoI Framework while, at the same time, to study not only the design, but also the learning of the participants. It allowed me to play the dual role of researcher and facilitator and enabled iterative changes midstream when certain realities of the design threatened complete failure. One example that comes to mind and that I explore in more depth in chapter six is how one of the faculty chairs approached me early in the intervention to

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share that in faculty meeting, some members expressed feelings of frustration over the study. They felt that it took too much of their time. Knowing this, I engaged the group in dialogue and allowed them to renegotiate some of the planned activities.

I adopted a facilitator role in this study in addition to my researcher role and used DBR approaches to design and facilitate the workshop intervention. Based on the literature of DBR, I adopted this intimate, participatory role in order to arrive at common understanding of the participants and their developing CoI as well as to be able to understand and relate environmental and contextual issues from the intervention to theory and to further refine theory and intervention (Barab & Squire, 2004; McKenney & Reeves, 2014; Penuel et al., 2016). I sought to develop a solution to a real-world problem while identifying and refining design principles that contribute to contexts beyond this study.

Contextually-produced findings from multiple methods hold high ecological validity; that is, they approximate closely the real world setting (McKenney & Reeves, 2012). Nevertheless, my dual role as researcher-facilitator could increase the likelihood of researcher bias. I therefore made the conscious choice not to generalize results to non-researcher influenced contexts (that is, a typical faculty colloquium that is not part of a research study). I also set up and followed appropriate methodological and analytical practices that included pre- and post-interviews, triangulation across methods, and used interrater reliability for verification of thematic analysis (Anderson & Shattuck, 2012; Barab & Squire, 2004; Onwuegbuzie & Leech, 2005).

In regards to researcher bias, DeWalt & DeWalt (2011) advise that participant observation (wherein the researcher is a full member of the group but continues to record data) should only be one form of data collection and should be corroborated by other data collection

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methods. Although I took on the role of facilitator, not full participant, the advice is still helpful. I tried to mitigate bias in the following ways:

- I used a more objective form of data collection (anonymous questionnaires) to provide unbiased evaluation of the intervention from the participant perspective.
- I used research assistants to take notes throughout the focus groups in phase one of the study and in the FacLibCoI, itself, in phase three.
- Research assistants were employed to review my data reduction and coding.

Limitations and Delimitations

Several limitations apply to the study and are listed below.

- I completed one full iteration of the prototype, but the design would allow for a second iteration.
- Potential researcher bias required extra effort in areas of design, data collection, and analysis to try to mitigate negative effects.
- I collected large amounts of data that required pragmatic decisions to limit analysis due to time and energy constraints.
- Limitations suggested by the social sciences department meant that in the first phase only third-year students participated in focus groups. In hindsight, senior students and perhaps even graduate students might have contributed additional insights.
- I found that my choice to schedule the study late in the academic year played a limiting role. Faculty members seemed especially busy and less forgiving of their time.
- The available space within the academic calendar equated to a time slot of approximately half of one semester within which to conduct the study.

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The following delimitations were used:

- I chose faculty members in a social sciences department and librarians.

- I planned one complete iteration.

- I limited the design for the prototype intervention to a short-term, workshop-style design that could be accomplished within half of one semester.

Ethical Considerations

Among the most important ethical considerations that fall within the broad parameters of the overall study are the participant's right to privacy, confidentiality and anonymity, effects of experimenter bias, researcher truthfulness and honesty, participants' being informed of risks and benefits, informed consent and ability to withdraw, imbalance in power or conflict of interest, and fairness (Bloomberg & Volpe, 2012; Cresswell, 2012). As Cresswell (2012) points out, ethics should be considered in all stages of research.

Conflict of interest. I worked as a librarian at the university and knew some of the participants well. Conflicts of interest could arise unless I kept the study separate. I informed department heads and participants in the project that I chose to keep the study independent from any other responsibilities due to my position. Data from the study would not be extracted for uses in any future university-related initiatives. I only conducted focus groups with upper-level undergraduates who would no longer have the potential to have me as an IL lecturer.

Impact and operational approvals. I sought and obtained ethics board approval through the Conjoint Faculties Ethics Review Board at the University of Calgary and the ethics review board at the university where the study took place. I also sought and received approval from each of the heads of the departments that specifically participated in the study.

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Risk assessment. Risk is assessed in terms of how it compares with normal daily routines that are similar to those of the study (Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada, & Social Sciences and Humanities Research Council of Canada, 2010). Participants in this study volunteered from among students, librarians and faculty members of the university. I conducted open discussion focus groups using semi-structured questions to guide dialogue. This mimicked discussion-type courses or academic discussion groups in which participants normally participated in their line of work or study. Participants could refrain from speaking and I promised anonymity. I recruited student participants from upper-level undergraduates who had already completed library-based IL instruction and who would not be subject to future instruction in courses taught by the facilitator. Faculty members (including librarians) who participated in phase one and phase three came from academe and regularly worked in group situations. The study therefore represented no greater risk than that implied in their normal work. The study might impact future work relationships, however, and so I informed participants of the study's purpose, the expectations for collaborative involvement, and that I took seriously my responsibility as the facilitator to mitigate negative human interactions within the confines of the study.

Benefits analysis. I assert that potential benefits to the participants outweighed risks within this study. Participants could learn more about another discipline, become better acquainted with colleagues, and establish new relationships that could lead to future cooperative efforts. Participants could gain a deeper understanding of IL and develop knowledge that might lead to improvements in their future activities be those study techniques or teaching practices. They also could learn more about blended learning and CoI concepts.

Recruitment and potential participants. The university ethics review board approved formal recruitment letters for the first exploratory phase which involved students, faculty members and chairs of department. The office of the Vice President for Academics sent the letter to university-wide faculty members and chairs. I recruited students through a personal oral invitation extended to a class of junior undergraduate students in the social sciences department. The department preselected the class due to its required status for all third-year students in the discipline. All social sciences student and university-wide, faculty member participants in the first phase focus groups signed a consent form before the focus group interviews began.

In the case of the FacLibCoI workshop which involved faculty members from the social sciences department and librarians, the chairs of both departments introduced the study to their teams in department meetings and/or by email. Each faculty member and librarian received a letter of invitation. I did this to avoid coercion through personal contact. I provided faculty members and librarians with a consent form and procured their signatures.

Freedom to withdraw. I informed participants of their right to withdraw at any time but that I classified any artifacts produced as part of their participation as group products that could not be withdrawn. I further informed participants that when they completed surveys they could leave any question blank and they could terminate the activity or not submit the survey at any time throughout the process. Once submitted however, the completed survey became part of the study and could not be withdrawn.

Data identifiers. I separated identifying information from the data before I began data analysis. This information was kept behind a password and separate from the data. This information was destroyed once academic requirements related to the study were complete.

Data confidentiality and privacy. I informed participants both in writing and orally of data collection procedures and how personal identifiers would be separated from the data using anonymous identifier codes.

Data storage, retention and disposal. I did not share data with outside groups and do not plan to use it in other studies external to this study. I collected and stored identifier and study data in the United States until I completed the academic requirements associated with the study.

Summary

I attempted in this chapter to explain the mixed methods design for the study which is based on social constructivist learning theory and the CoI Framework. I then explored in detail the various methods used to collect the data. I explained the analysis and synthesis techniques used. Finally, I presented a summary of the ethical considerations, limitations and delimitations incorporated into the study.

I present the results of the preliminary research from phase one in chapter five. I used the findings of phase one (chapter five) to inform the content of the FacLibCoI workshop, which I designed in phase two. The unit and lesson plans resulting from this phase two design work are provided in Appendix A. In phase three, I implemented the design (FacLibCoI Workshop implementation) and analyzed my findings. I present the phase three results in chapter six.

Chapter Five: Phase One Findings--University Environmental Scan

Introduction

In chapter four, I presented the methods used for the phase one university environmental scan, which I conducted to inform the phase two design of the FacLibCoI workshop. Also, in chapter four, I explained the methods used to summarize and analyze focus group data.

Now in this chapter, I present the findings from the university environmental scan, which included a literature review, review of university documents and pertinent national educational standards, along with focus group interviews of university faculty and students.

Data Gathered in Phase One

In phase one, I performed a review of scholarly literature, a document review of internal and professional standards documents, and I conducted exploratory focus groups among students and faculty members as part of the university environmental scan where the study took place. Figure 5.1 shows how these data collection points fit together in phase one.
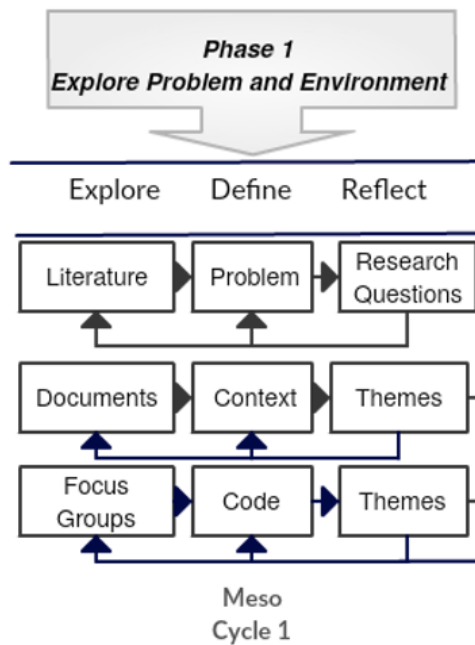
Figure 5.1. Sub-figure From Figure 3.2 Representing Meso Cycle One.

Literature review. I reviewed literature related to Deweyan pragmatism to explain the paradigmatic choice that guided this study. I also reviewed literature that related to the themes that impact the study. One literature field that impacts this study is IL. My review included official IL definitions, how IL theory and standards developed, current theoretical trends and standards, and how IL is taught in HE as well as its challenges. I reviewed several collaborative models of learning including the CoI Theoretical Framework, which I chose for the FacLibCoI workshop that I designed in phase two and implemented in phase three. I examined CoI development and theory and reviewed CoI literature that pertains to blended learning. From the design perspective, I reviewed literature in DBR theory and models including the Generic Model for Educational Design Research, which I chose for this study. The main literature review is found in chapter two with paradigmatic and design literature provided within chapter three.

University and national standards documents. I studied the university's unpublished accreditation reports and late version drafts of a capital funding request. I reviewed library and university strategic plans. Next, I reviewed the national standards used by the social sciences department and library, the two departments that would participate in the phase three FacLibCoI workshop. These standards formed part of the content for the FacLibCoI.

Focus groups. I engaged volunteer students and faculty members/librarians from across the university as well as department chairs in focus groups to explore the university's academic research teaching and attitudes. I also interviewed the Vice President for Academic Affairs. A summary of the participants who volunteered across all focus groups is presented in Table 5.1.

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Table 5.1. Phase One: Focus Groups

University Group	Focus Groups	Number of Participants
Administrators	Interview (University Officer)	1 participant
Faculty Members/	Focus Group 1 (Faculty Members)	4 participants
Librarians	Focus Group 2 (Faculty Members)	6 participants
Chairs and Deans	Focus Group 3 (C&D)	5 participants
Students	Focus Group 4 (Students)	6 participants
	Focus Group 5 (Students)	10 participants

Use of Data Collected

Information gleaned through the university environmental scan was used to prepare

themes (see Table 4.12) and a SWOT analysis (see Table 4.13) that informed the development of

the content for the phase three FacLibCoI workshop. For example, this excerpt from the lesson

plan for the first face-to-face session of the FacLibCoI workshop (found in Appendix A) shows

how the activities of the lesson were designed and mapped to some of the themes and the SWOT

analysis that came out of the findings:

Transitioning to Cognitive Presence—Facilitator Role (Facilitation and Direct

Instruction)

Identifying the Problem, We will be Working to Solve activity—Purpose. The group will
define the problem that the workshop will seek to address.

1. **(CP1, CP2, CP3, CP7, TP1, TP2, SWOT5)** Discussion Question—Think back to
   college. Remember one experience doing research. Describe the activity as you
   remember it and your feelings about it. (Take 5 minutes to write down notes that you
   will share with the group). Each member has the chance to share—and the group has
   the chance to ask questions
2. **(CP1, CP2, TP2, IL1-4, SWOT2, SWOT5)** Trigger--Presentation—What do
   students need and what do they feel?
   a. Presentation showing results from various studies and table with themes from
      our student focus groups—

(Note: Codes Used above are from the themes identified in Phase One: CP1-7=Cognitive
Presence themes; TP1-2=Teaching Presence Themes, SWOT 2, 5=University
Environmental SWOT analysis, IL1-4=themes from focus groups)

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In the rest of this chapter, I present the findings from the university documents and national standards review as well as from the focus groups and administrator interview.

University Documents and National Standards: Findings

Several themes emerged from my review of university documents and relevant educational standards that informed the design and implementation phases of the FacLibCoI. These are presented below.

Community factored high at the university. Students listed Community as a reason for enrolling and for staying. Both student and faculty member retention rates were strong. Interestingly, the university used the metaphor of *family* in its proposed capital investment campaign and coined terms such as home, living room, back yard, and living-learning spaces to describe capital projects such as a student center or a sports facility. Community was also evident in active student and alumni associations. Community identity emphasized personal and collective health, balance, and wholeness. Expressed goals included respect for human dignity, stewardship of the environment, and an intellectually-supported and faith-based spirit of service.

A teaching university. The university defined itself as a teaching university with a foundation of scholarship. As such, teaching was its main function and its students-to-faculty member ratio was low. The university supported faculty members in obtaining terminal degrees where possible. Ranked faculty members held at least a master's-level degree and four-fifths held terminal degrees. Faculty members were encouraged through modest financial and sabbatical support to engage in scholarship.

The programs offered were diverse for the size of the university. The university offered degree programs in the liberal arts, social and professional sciences as well as in Science, Technology, Engineering and Mathematics (STEM). Faculty members served as academic

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advisors. Students could avail of tutoring through a Teaching Learning Center. The Library granted access to information from anywhere at any time and librarians provided a variety of individual and classroom teaching and reference consultation options.

The university's attention to academics. Plans for academic excellence included a comprehensive review of programs towards increased excellence in teaching and assessment, advising, and scholarship. The university outlined a focus on innovative learning approaches and financial investment in technology and collaboration spaces. Listed learning goals for students included analysis, criticism and synthesis, symbolic interpretation of problems, creative problem-solving, and reflection upon solutions.

The university listed four core themes. *Excellence in Thought* represented the university's academic programs and services. Within this theme, objective two, *Provide a Positive Learning Environment,* included the Library's IL instruction program and specific assessment indicators, which the library reported on for regional accreditation. The library's IL plan was specifically addressed in two of the university's regional accreditation standards, one for faculty and the other for students. In the first, faculty were tasked to partner with the library to ensure that library resources and information were integrated into learning. In the second, the institution (i.e. library) was tasked to provide teaching and support for the university's populations (e.g. faculty, students, etc.) to be able to use library resources for their learning needs. The library had its own five-year strategic plan that addressed these standards. Library plans focused on faculty member orientation, curricular discussions with faculty members, and innovative teaching tools, such as video, online chat, and electronic library guides.

Similar standards exist for the social sciences department and the library. I reviewed the professional standards that applied to the two departments represented in the FacLibCoI

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workshop. Although the philosophies behind each set of standards were specific to each discipline, underlying similarities emerged. For example, both sets of standards considered that equal access to resources was linked to human rights and social justice. Both emphasized ethical research and decision-making behavior within practice, and both specified critical thinking and analysis as professional and scholarly goals.

Focus Groups: Findings

As part of the university environmental scan, I conducted focus groups with students from the same social sciences department that I used to recruit faculty members to participate in the phase three FacLibCoI workshop. I also held focus groups with university-wide faculty members, librarians, and chairs and deans, and I interviewed the Vice President for Academic Affairs. I used design and content themes (shown in Table 4.14) in the content of the FacLibCoI workshop in Phase Three.

I asked questions that would help me understand the university's culture toward research and scholarship, which are often the driving forces for library-based literature search and use. These are also areas in which faculty members and librarians might collaborate to teach IL. Specifically, I asked faculty and department chairs to define research and scholarship, and to explain what students should be able to do in these areas. I asked students to describe research assignments and their experiences completing these assignments. Presented within Table 4.14, nine specific themes emerged, which I have extracted in Table 5.2.

Comparing themes from preliminary and second review. These themes, along with the themes taken from the CoI Theoretical Framework and the university SWOT analysis (see Table 4.13) were used to design the FacLibCoI workshop in phase three. After the FacLibCoI workshop had been implemented, I conducted iterative reflection and theory building. As part of

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this process, I went back to phase one data and performed a more complete thematic analysis

upon the focus group data. I did this to test the accuracy of the preliminary IL themes (Table 5.2)

that had guided the design of the FacLibCoI workshop.

Table 5.2. Focus Groups—Themes

Information Literacy	IL1:	Undergraduates do not see real-world problem solving as research
	IL2:	Research expectations across campus are variable
	IL3:	Students use research as confirmatory rather than exploratory
	IL4a:	Students find it difficult to determine the correct database to use
	IL4b:	Students find it difficult to create quality search strategies
	IL4c:	Students find it difficult to create and understand citations
	IL4d:	Sloppy scholarship results in unwitting plagiarism
	IL4e:	Students find it difficult to write in a scholarly manner
	IL4f:	Students find it difficult to engage with a scholarly journal article
	IL5:	Faculty members and librarians share responsibility for teaching students information literacy
	IL6:	Students should understand the research process (identify need, find, evaluate and use)
	IL7:	Students should use information ethically and understand the value of information
	IL8:	Students should recognize that research is about asking questions
	IL9:	Students should understand research as scholarly conversation informing practice and vice versa

In Table 5.3, I present the seven, big-idea findings that resulted from this second, later

analysis of the focus group data. Then, in Table 5.4, I map these second-analysis, focus group

findings with those of the initial analysis (preliminary IL Themes) that I used to design the

FacLibCoI workshop. I do this comparison to see if the preliminary results hold up under the

second analysis.

Table 5.3. Phase One: Focus Groups—Major Findings

Major Findings in Second Analysis of Phase One Focus Group Data
Finding 1: Differences in research and scholarship were evident in cross-disciplinary dialogue among the various faculty members from across the university who participated.

Finding 2: Students from the social sciences department enjoyed social interactions in academic and community assignments and associated this with their professional identity.
   2.1. *Students sought out others whom they perceived could help them.*
   2.2. *Students expressed contentment with group work experiences.*
   2.3. *Students confirmed that they enjoyed working with clients.*

Finding 3: Value of library collections, services, and roles are dependent upon perception
   3.1. *Some students expressed satisfaction with librarian reference consultations.*
   3.2. *Students were critical of the library collections.*
   3.3. *Faculty members had positive views of the library and how it has improved in recent years.*
   3.4. *The library should play a greater facilitating role across the various disciplines.*

Finding 4: Students from the social sciences department gained knowledge, but experienced mixed feelings in writing-sequence courses
   4.1. *Students wished that the English professor would be more involved in their library-based research.*
   4.2. *Students found the live demonstration of library search tools boring but helpful.*
   4.3. *Some students vocally expressed dislike for library-based assignments. Others indicated they were helpful.*
   4.4. *Students misunderstood the purpose of the library-based assignments.*
   4.5. *Students wished for more opportunities to practice library search.*

Finding 5: Research as discovery, research as academic assignments.
   5.1. *Research as discovery—research is about a spirit of inquiry and asking questions.*
   5.2. *Research as academic assignments—research is about completing academic assignments.*

Finding 6: What should students know, what do they know?
   6.1. *What faculty members from across the university said students should know.*
   6.2. *What students from the social sciences department revealed about their knowledge.*

Finding 7: Challenges to learning.
   7.1. *Knowledge gaps among students from the social sciences department led to misconceptions and influenced student perceptions and actions.*
   7.2. *Searching for confirmation, not discovery.*
   7.3. *Rejection of processes they do not know or understand.*
   7.4. *Misconceptions about processes and the library among students in the social sciences department led to dysfunctional attitudes.*
   7.5. *Students from the social sciences department attached their frustration to the learning process.*
   7.6. *Students in the social sciences department felt that the search and writing process didn't help them to learn more about the topic.*
   7.7. *Time constraints were a serious concern.*

From this comparison between the preliminary and final analyses of focus group data, it

became clear that there were two additional findings (numbers 2 and 3 in Table 5.4) that were

not noted in the earlier findings. Interestingly, once these were noted, I was able to identify

similar reactions to social events (finding 2) among many of the faculty participants during my analysis of the FacLibCoI workshop in phase three. For finding 3 below, it is clear from the fact that I referenced it in a presentation that I gave during the phase three workshop, that I had observed it but had not chosen to assign it as an IL theme in my first analysis. With those two exceptions, the Table 5.4 comparison shows that the remainder of the preliminary themes were confirmed in the second analysis. This double analysis provides an additional element of trust in the content that was shared in the FacLibCoI workshop.

Table 5.4. Mapping Phase One Findings to FacLibCoI Preliminary IL Themes

Final Findings	**Preliminary Findings (IL Themes on p. 142)**
1. Disciplinary differences in research and scholarship evident in cross-disciplinary dialogue	IL2.
2. Students enjoyed social interactions in academic and community assignments and associated this with their professional identity	No specific IL Theme.
3. Value of library collections, services, and roles are dependent upon perception	No specific IL Theme.
4. Students gained knowledge, but experienced mixed feelings in writing-sequence courses	IL5.
5. Research as discovery, research as academic assignments	IL1, IL7, IL8, IL9.
6. What should students know, what do they know?	IL4b, IL4c, IL4d, IL5, IL6, IL7, IL8, IL9.
7. Challenges to learning	IL3, IL4a, IL4b, IL4e, IL4f.

Findings. Through the remainder of this chapter, I present the major findings from the phase one focus groups. As I review these findings, I present each using rich description. For further discussion of these findings, consult chapter seven.

While we do know that the student participants came from a social sciences department, faculty members, librarians and department chairs from across the university were promised anonymity and I did not note down their departmental affiliation in the transcripts. They are therefore, referred to here not by their departments but in more general terms. I made this

decision early in the study when I clarified that my goal for the focus groups was to better understand the university culture around concepts such as research, scholarship, and IL, as opposed to singling out individual faculty or their departments. As I describe the findings I will use the term *faculty member* to indicate the faculty member, librarian or academic administrator who participated in the focus groups.

Finding 1. Faculty members discussed research/scholarship in disciplinary ways. When I asked for a definition of research, one faculty member responded, "we all have [systematic] disciplinary responses to the question," as if to say that each would have a different answer. Faculty members from different disciplines defined the *purpose* of research differently. Not all defined it as discovering something new. A professor from a STEM theoretical field described the purpose as a search for *elegance*. "…Taking a proof from 200 pages…down to 50…will get notoriety," he said, concluding that "…elegance is …breathtaking brevity." An arts professor asked, "where does creativity come in…[when] discovery and learning new things isn't the focus but creating something new, like a painter or novelist?" Faculty members also used descriptive language that varied significantly. One recounted how she used a film to explain different types of research to students. The film apparently compared literature-based research to empirical research, where the retriever (dog) represented literature-based research and the bear represented empirical research, "[golden] retrievers do literature reviews to answer questions and analyze the data," while "bears use literature but also use surveys, interviews, etc. to find new information." A professor from the hard sciences seemed confused (or perhaps bemused) by his colleague's lively use of non-scientific descriptors.

Finding 2. Students enjoyed and identified social tasks with professional identity. Students expressed a level of enjoyment (or at least not dissatisfaction) with socially-oriented

assignments, such as mock group meetings, an "experience," observation, or practicum. They used words like, "enjoy" or "fun" to describe these. Students also indicated that they enjoyed "ask[ing] questions face-to-face," or "go[ing] to communities and…organizations." One shared that it was "nice to connect people to resources, better than [having your] nose in books." Another commented, "Fun, I'm a [specified profession] in my heart."

Students also enjoyed social consultation when needing help with their research. They confided, "For me, a lot of times I struggle to narrow my topic; I go to librarians;" while another said, "I get help from the reference librarians…down in the lobby." Other students shared that they "find an expert in the field and talk to them about it." Another said, "we…meet with the professor who talks with you about your topic; …one-on-one meetings are really helpful." Asked what they do when facing challenges with other assignments, students listed professors. "For me, if I'm confused and it doesn't make sense, I can always call my teacher…they're always there."

Finding 3. Perceptions of library collections, services, and roles determine value. Personal and group perceptions of the library are important when it comes to the library and its collections and services. I describe several concrete examples wherein perception clearly assisted or detracted from student ability to take full advantage of learning opportunities. Some of these examples also show how one person's perception influenced others.

In the first example, students who had taken advantage of one-on-one librarian consultation in writing-sequence courses perceived librarians and other staff as friendly, knowledgeable, and capable of helping them. One student recounted, "the library, my first year here, I went to the reference desk and they helped me, motivated me; and they found a lot of articles and journals on my topic." Interestingly, this positive perception, when expressed verbally, caused others to chime in, "yeah, they're the best," and "everyone's really friendly."

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A second example illustrates how, at times, student perceptions did not match reality. In these cases, perception held more sway. Students evaluated the physically-visible library collection noting that, in some subject areas, the library had plenty of books while in others, there were few or none. While there was some truth in this evaluation, students also demonstrated a fundamental lack of knowledge about the full package of subject databases or the millions of books in electronic or regional loan formats which were available to them and which might have alleviated this concern.

Interestingly, perception is likely influenced by the perceiver's level of expertise. While students were quite critical of portions of the library collection, faculty members tended to view the library positively, noting how much it had improved in recent years. One faculty member commented, "in my mind, I went to [the] library and resources [and] I've seen definite additions and amplifications at [the] library for students to collect information online and full-tech resources; [also an] amplification of websites to make available…[with]in the last 2-3 years." Another faculty member commented on the new federated search engine, "... [there have been improvements] even [in the] last few months."

Finding 4. Students gained knowledge but expressed uncertainty. Students attained a good knowledge level in the search and writing processes, but they also experienced increased uncertainty at the time of implementing these new strategies. Student uncertainty quickly led to frustration, misconceptions and attitudes that impacted learning. One example of a typical misconception was the idea that in the writing sequence courses where librarians taught the first module "that the teacher really didn't help them in the first few weeks." A student remarked, "Didn't get help from professors at the beginning—really detrimental." I observed in my notes

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that "perhaps the librarian taking sole charge of the module give[s] that impression…even though teachers are meeting [one-on-one] with students and checking their sources."

An example of how IL instruction helped students build knowledge but also led to negative emotion is that of the librarian conducting live demonstrations of library resources. One student observed, "It is obnoxious, but nice to see [it] explained up front;" "kindergarten boring," while another was more positive, "For us who have been here forever, we go through [the writing-sequence classes]. They [librarians] come in and show us how to use it [library website, databases]. They walk us through it." One student referring to the content not the demonstration style, said brightly, "…[the] most helpful thing…what rocked my world… [was] searching with keywords, and another said, it "gives tricks [meaning logic terms] not taught in other places." Considering these alternate viewpoints, "obnoxious," and "kindergarten boring," versus "the most helpful thing," and "what rocked my world," what made the difference between these opposing emotional responses?

Graded library assignments in the writing-sequence courses also garnered mixed reviews. The assignments were designed to help students find sources for their final bibliography. Each library lesson carried with it an out-of-class assignment. One student complained that "library assignments are heavily weighted, [and there's] no assistance; going through it more would be useful." Other students called it "detrimental to the process," and intimated that the assignments led to superfluous sources. On the other hand, some students valued the assignments and the learning opportunity these provided. As mentioned already, after one student expressed difficulty navigating library resources, another student remarked, "For us who have been here forever, we go through [writing-sequence courses] and we have library assignments that teach us how to navigate." But other students did not appear to understand that the assignments, carefully

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completed, would help them to create their final bibliography, and one student voiced

dissatisfaction, "I've taken [second writing-sequence course] a few times because I didn't do

well the first time. You get all this nonsense at the beginning…." Others felt that "library

assignments [were] too heavily weighted," and indicated that they "need[ed] more practice." In

my researcher notes, I asked, "how to get some sophomores to understand the value of the

learning so they do it the first time around?" and continued, "In [the writing-sequence classes]

they are taught library research methods all at once…[with] little time to practice."

      Finding 5. Defining research as discovery or as academic assignments. Faculty

members and students defined research differently. Faculty members saw research as "discovery,

adding to the corpus of knowledge." One faculty member shared, "I do a literature search to see

if there are holes…I like to dive into holes." Another described "a process of exploration and

discovery." Still another spoke of "producing understanding both contrary and expected." Some

faculty members noted a "personal component" that might not be academically-oriented, and one

described personal research outside of academic traditional search strategies, "I don't set out to

do things in 'research librarian' ways."

      Faculty members spoke of seeking answers and the need to ask questions. They noted

that undergraduate students routinely ask questions and seek answers to personal problems but

are often unable to transfer this to academic work. A faculty member observed, "They do this but

not in an academic setting. [They] might do [it] when building a bicycle or creating [a] film, but

don't attach [the behavior] to [a] scholarly setting."

      Faculty members described academic research that solved problems or expanded

understanding. They tied these to a field or discipline. One faculty participant described

academic research as "finding solutions to problems in your area." Another placed it within a

"sphere of knowledge." Faculty members also noted that *purpose* defines research and the systematic approach used. One stated that "there are different kinds of research—research that answers the question, research looking for what others have said, experimental research, setting up a control group…."

By contrast, students defined *research* more narrowly, equating it with academic sources and term papers, and specifically, with the research paper in their writing-sequence and research methods classes. This is not surprising considering that both classes carry the term *research* within their name. A student commented, "when I think of it [research], I think of a research project; Is research on Google considered research?" On the other hand, when discussing data collection during practicum, a student confided, "It's not *real* research [emphasis added]." A student colleague clarified practicum data collection as being about "who to call, finding and familiarizing yourself with the needs…," and *"…*community needs resources…has nothing to do with library research" and another student added, "closer to Google…."

Finding 6. What should students know? What do students know?

Faculty members discussed what they wanted students to know about the research process. Faculty members primarily wanted students to love learning, value the process, and "to care, to know that it matters…." They wanted students to *engage in* discovery, to "analyze, tear apart, see components and then bring [them] together again to create something new." Referencing a yearly public event at the university where undergraduate students present research, one smiled, "so cool to see students presenting their work."

Another research trait that faculty members valued for their students was humility. Students needed to "learn to be humble and honest about their research." One observed that you need to recognize and admit when "you've gone down a rabbit hole," while another suggested

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that students need to be honest enough to "recognize [that] their findings can change their thinking."

"Nuanced" and "critical thinking" ranked high on the list of things faculty members wished for students. One observed that "undergraduates [need to know that] it's okay to think." Another said, "[students] don't like the struggle…it takes time, thinking time." One said that students "prefer quick answers." Along this line, one faculty member questioned, "how can we prep them to see that research is not just a thing you do in a research class but a thing that informs all the learning they do?" Another said, "in my discipline, students are concerned with formulas…quite often [there is] no formula [but] a process. Don't be afraid to step back [and] ask follow-up questions." Another said, "students like to jump the gun to the end and they don't want to do the process. They [want] answers before [they do] the research."

Faculty members felt that students needed to know where and how to access scholarly literature as well as be able to identify a scholarly article and judge its quality and value to their own work. An academic administrator noted that "[medical schools] want to know if students can read a medical journal article and critically evaluate it." He said, "what sets you apart from your peers will be your ability to critically evaluate peer-reviewed publications." Several faculty members noted that students should understand disciplinary literature and methodology, "what does it mean to be a professional historian? What methods do you use?" Professors wanted students to understand their discipline's relationship with other disciplines. "I like to…show students…how things dovetail and interface with other disciplines; as a student, we compartmentalize learning…."

Finally, faculty members indicated that students had difficulty with basic research, scholarship and support processes. They mentioned "craft[ing] a doable problem statement," or

"record[ing] [and] keep[ing] track of what you find." Another said students needed to learn how to take careful notes because "sloppy work leads to plagiarism." Other professors noted that students struggled with pacing and time management. One faculty member shared that when he asked students for a progress update on a major paper and they indicated they hadn't yet started it, he responded to them, "you are [either] going to die or give me junk."

   Students discussed their experiences with research-related assignments. Students were able to identify various types of sources used in writing an academic paper. They also shared the challenges and difficulties they experienced. They discussed library electronic resources, referring to these collectively as the *library website* even when referring to library-provided journal databases and electronic journals. Others could name specific databases that they had used in the writing-sequence courses, as well as Google Scholar. Students were able to identify features of databases that they found helpful (an indication that they used them). "With online journals, I can use a timeline—I really like that" [many agree]. "Doesn't get your hopes up." Some students appreciated the ability to get a formatted citation. And another praised the helpfulness of abstracts. Students also identified other valid search techniques. One noted using the bibliography of one paper or one author to lead to additional sources. Another commented, "I notice I find an author I like from one project…."

  Regarding search practices, students admitted that they primarily used Google. One student confirmed heavy use when she said, "I'm a Googler…I never need the info from there [library] if I'm being honest." Others discussed using Google or Wikipedia to pick their topic or to help them gain an overview of the topic, "brainstorm topics and then go to Wikipedia or Google to find initial feedback."

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Most students were able to identify various writing processes they had learned. Together, they created an inclusive list. Things like "brainstorm topics;" and "pick a topic" were listed as early processes. One student said, "I like to find an expert in the field and talk to them about it." Others mentioned things like building an outline, when to write the introduction, the need for a thesis statement, how to create the writing structure, and writing the conclusion. They discussed formatting, "I think I figured how to cite…, but it was hard to find, and I don't know if I put in the right stuff."

Students discussed challenges they faced when implementing search strategies, "[the] biggest thing I struggle with is, when I go to a database and I have to type in keywords, they never get me where I want to go." A student tutor noted, "students don't know how to use any of those resources."

Students indicated that they procrastinated and did not use the book loan consortium due to the one-week delay in accessing books, "For me, it's just motivation; we have sources, but if you don't do it on time…you can use [books from the consortium], but if you don't prepare yourself you're screwed at the end." This was not an isolated experience. Many students agreed that they struggled with procrastination and scheduling. "I know this is my own problem. I struggle to schedule my own projects. I should be able to plan…but they all come at once and I feel blindsided. I should work in advance, but I don't."

Finding 7. Challenges to learning. Several challenges, such as knowledge gaps, misconceptions, frustration and attitudes were highlighted. These seemed capable of derailing the learning process for students. Students expressed frustration, for example, with the literature review process, failing to understand its purpose. According to their own accounts, many students did not interrogate their sources or even explore for the sake of discovery. Instead, they

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sought confirmation of their ideas. Some students admitted to writing their paper and then searching for sources to support it. "I know exactly what I'm going to say when I start writing; as far as referencing, I find something about what I'm already talking about; I have my paper mostly written [before I start using references];" Other students agreed. Various comments, threaded together, create a clear image: "I don't have time to read a full article;" "[I scroll to] pick out a sentence;" or, "I find one or two sentences I can plug [in]." Perhaps the most colorful image came from a student who reported searching for sources to "twist or maneuver."

Other students searched broadly enough to ensure that there were enough sources to support their paper, and these students tended to find good sources to cite. It was striking, however, that no matter their process, no one mentioned interrogating the literature and perhaps changing their views based on what they found. Instead, they described the frustration of trying to locate sources that confirmed their ideas. "Finding what I'm going to cite [is] the most frustrating (waves hand)." Students expressed disappointment that they didn't gain as much knowledge as they would have liked through the term-paper writing experience. The misconception lies in the fact that they also revealed that generally they did not read the articles they found when writing their papers.

For some students, a lack of knowledge about traditional academic search and writing processes seemed to produce overconfidence and subsequent rejection of methods that might help them. For example, when more knowledgeable students were discussing library resources, another chimed in, "I'm a Googler. I never need the information from there [library] if I'm being honest…." When students discussed the writing-sequence courses, another remarked wryly, "I didn't take writing here, listening to you, I'm glad I didn't. It sounds like you go through an awful process." One student said, "I do things different, I'm supposed to tell honestly," and when

another more knowledgeable student expressed difficulty citing websites because there was no author, another student replied, "for me it's the opposite…websites are easy." One student self-assuredly described her alternate process, "[I] blurb out everything I'm going to write and then I just do the paper."

My findings showed that misconceptions can be as problematic as lack of knowledge. One professor required recent sources from discipline-specific journals. She provided a list of acceptable journals and allowed any journal that carried the name of the discipline in its title. Students erroneously *believed* that they were *only* allowed to use the journals on the list, many of which carried embargoes blocking full text access to recent issues. Although the library had sufficient alternate titles, students went away convinced that the library lacked resources. In this case, one small misconception about the assignment parameters triggered frustration and a negative perception of library collections.

One final example, also with library collections, deserves mention. A student noted that "it would be helpful to have different databases for different topics/disciplines," and others agreed. The library did, in fact, provide databases across the university's disciplines, and the student could have had access to these as well as to *the most* well-regarded database in his discipline. A simple misconception like this could cause a student to miss out on using library resources that would support learning. These examples illustrate the problematic reality that student misconceptions represent *their* truth. Even when untrue, such misconceptions will likely negatively impact the student's learning.

Frustration seemed to be a significant learning barrier. Students exhibited frustration with the search processes that they were expected to use and with the writing processes they had been taught. While many students could discuss what *should* occur in the writing process, they used

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words such as "*struggle, wonder, hard thing, hardest part,*" to describe their attempts to apply this knowledge. One student shared, "For me, a lot of times I struggle to narrow my topic." Another said, "I struggle with the citing." One remarked, "I start with the introduction. And halfway through a paper, wonder how to finish."

Students were also frustrated leveraging search tools and strategies, remarking, "when writing a paper, [it's] less 'oh, what articles do I want to use?' but more, 'what ones partially pertain to my project?'" A student expressed cognitive uncertainty, "Maybe [I'm] bad at navigating [the] systems [but I] have to make [my paper] about what articles I find versus what I wanted to write about." Another student reported that the "biggest thing I struggle with is when I go to a database and I have to type in keywords [but] they never get me where I want to go; it's some other article that has that word in it but it's not the topic I'm looking for."

Students did not recognize how much they had learned about library search and scholarly writing. Furthermore, students perceived that they did not learn much about their chosen topic when they wrote papers. One student wistfully said, "when [I] write [a] paper, I think I should know something about it [when I'm done]. I don't feel any more knowledgeable about my topic [at the end]. It's more about the grade, and [I] wonder how I found those sources and hope it makes sense to the teachers." Another student expressed frustration that teachers restricted her sources to ones that were "after a certain year [published within five years], so I have to exclude some," while another remarked bitterly, "the restrictions are often stifling on my research."

One final challenge was that of time management. Students expressed feeling stressed, and desired more "time to actually read books. My research papers would be better if I read books." This conversation digressed into textbook readings. One student remarked that the "hard part…is not only reading but also absorbing; many times, you have to skim…fast." Students felt

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they needed to compromise quality due to time constraints. One said, "the quality of work I have to put out, it makes the process more difficult; I have to throw something [together] that I'm okay with…but I need to maintain quality for grad school [so I] can't be okay with it." Another remarked, "I have SEVEN [classes]," and mimicked shooting herself in the head. Still another admitted being in therapy and noted how many college students have mental breakdowns.

Summary

This exploratory phase of the research study was analyzed, and the results were used to inform the content of the FacLibCoI workshop. Findings showed that students not only enjoyed social interactions but associated this aspect of their personality with their professional identity. Student responses also indicated that they *experienced* information literacy in affective ways and that confusion and stress caused negative emotions towards IL. This was important because student perceptions and misconceptions influenced their attitudes towards library and research.

Meanwhile faculty members confirmed that there are disciplinary differences in systematic approaches to research. The language they used to describe research in their disciplines revealed diverse styles. When asked what students needed to know about research, faculty members confirmed that they desired students to see research as discovery and to learn to apply critical thinking to their research.

This chapter and the next, chapter six, present the findings for the study. This chapter presented findings from the phase one university environmental scan. Chapter six, contains the findings from phase three, the implementation and analysis of the FacLibCoI workshop. Phase two does not contain a separate chapter because it was the design phase that tied the two research phases together. Once the findings are presented (this chapter and chapter six), discussion and recommendations follow in chapter seven.

Chapter Six: Findings from Phases Three—Blended CoI Workshop

Introduction

In this chapter, I present the findings derived from the FacLibCoI workshop, or phase three of the study, in which 14 participants (made up of librarians and faculty members from one of the social sciences departments of the university) worked through the topic of IL. The overarching research questions that I sought to answer in this study were:

Research questions. To what extent might collaborative learning within a design-based blended community of inquiry (CoI), hereafter referred to as the FacLibCoI, provide an efficient and sustainable way for faculty members from a single discipline and librarians to construct shared understanding of IL?

1. How might inquiry-based learning methods within a design-based FacLibCoI facilitate shared understanding of IL between faculty members and librarians?

2. How might collaborative learning within the FacLibCoI foster shared understanding and collaborative approaches to IL within the discipline?

3. To what extent might a blended, technology-enhanced learning environment (TELE) support efficiency within a FacLibCoI while maintaining the social, teaching, and cognitive presences of the CoI Framework?

To help answer the overarching question, the following additional question guided the quantitative descriptive summarization and supporting qualitative examples:

1. Based on descriptive summary of participant perceptions and qualitative evidence, which of the CoI theoretical framework presences and shared metacognition were evident in the FacLibCoI workshop and how did they develop over time?

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Workshop design. The workshop took place over two months and included four face-to-face sessions (each session was projected to last two hours). In addition, participants were divided into small groups of four or five and were provided with questions to consider between sessions within an online, asynchronous discussion forum. Readings and other materials that supported the workshop were stored on the library's electronic library guides platform and asynchronous forum spaces for each small group were set up on the university's course management system.

Because the presentation of the findings is sometimes a bit detailed, it is easy to get lost in the process. Figure 6.1, therefore, presents an overview of the workshop as implemented.
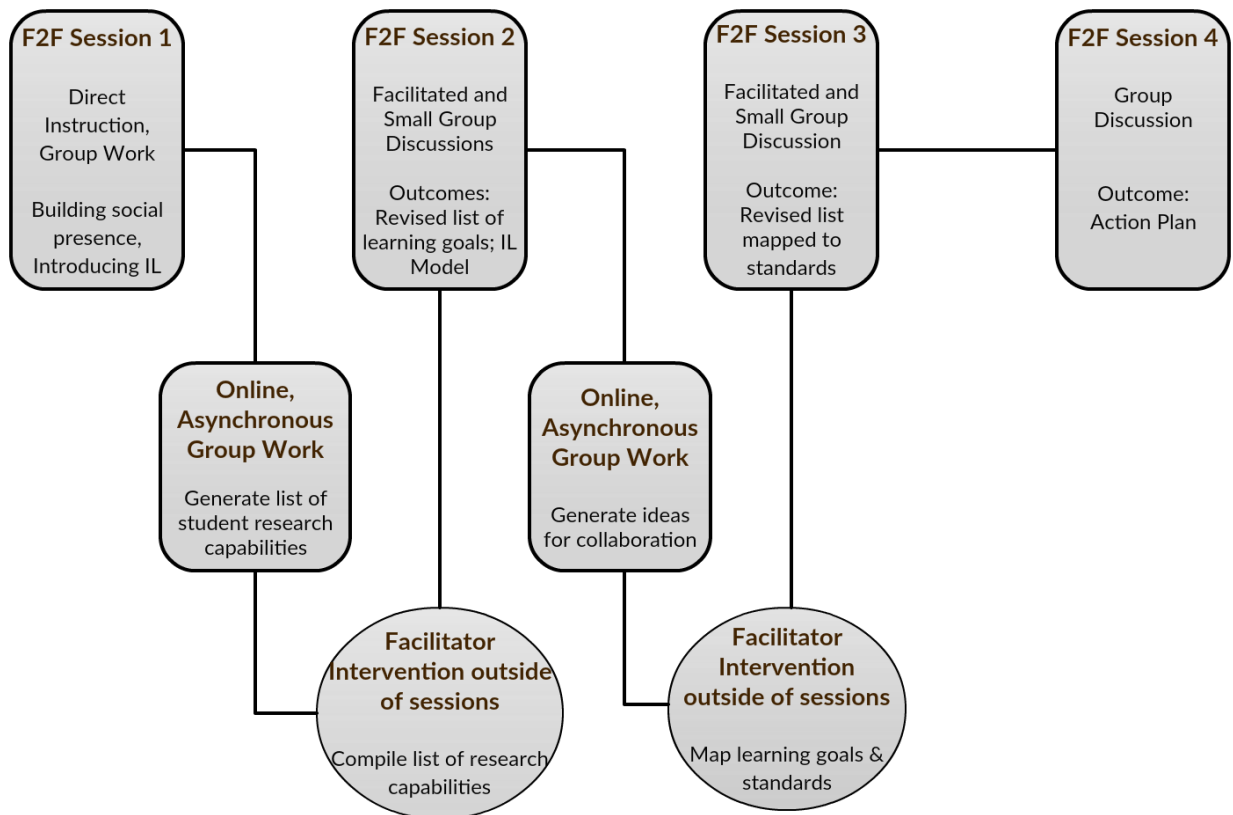
Figure 6.1. The Actual CoI Process (based on curricular design but which evolved)

Data collected. Various types of data were collected:

- Pre- and post-interviews were conducted with each participant to be able to gauge changes in understanding and perceptions around key concepts that were covered within the FacLibCoI workshop. Interviews lasted approximately one-half hour. All participants completed the pre-interview and all but one, the post interview.

- Participants completed questionnaires after each face-to-face session. These were used to identify social presence, teaching presence, cognitive presence, and metacognition (for a complete description of the questionnaire, see chapter four; the questionnaire may be found in Appendix B). There was one item in the questionnaire that specifically addressed the online portion of the design. Other items surveyed the participants' perceptions of their experience, in general.

- Research Assistants recorded observations, not dialogue. These were not used for data analysis but to confirm basic information related to the workshop sessions.

- The group agreed to and facilitated the use of audio recordings of face-to-face sessions (entire group and small groups). We missed recording the second half of the second session. Recorded sessions were transcribed.

- As part of the collaborative learning, participants produced artifacts that represented their group effort towards understanding and promoting IL.

Data analysis. Data was analyzed using deductive methods and was triangulated with results from other data types. Results of the questionnaires, for example, were summarized using descriptive statistics. This summarization was contrasted and compared with relevant segments of participant dialogue. Asynchronous work was summarized using descriptive statistics and then the qualitative data was further examined to provide additional explanation. Themes were

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extracted from the transcripts and interviews. Finally, artifacts produced by the participants

served as outcomes for the workshop and were included as evidence of shared understanding. A

summary of the various forms of data and how they were used in analysis is given in Table 6.1.

Table 6.1. Data Used to Explore the CoI Workshop Design Implementation

	CoI Surveys	Pre and Post CoI Workshop Interviews	Online Discussion Transcripts	Session Face-to-face Transcripts	Produced Artifacts
CoI Presences	✓✓	✓✓			
Online Component of CoI Design	✓		✓✓	✓	
Emotional Responses		✓✓		✓	
Shared Understanding Developed Around IL and Collaborative, Inquiry Learning		✓✓		✓	✓✓
Participant Evaluation of their Experience		✓✓		✓	
Note: Primary Data ✓✓; Secondary Data ✓					

Questionnaire used. As seen in the research questions, one of the major purposes of the

workshop design was to test whether it could support a CoI and in the process lead to shared

understanding around IL between faculty from a social sciences department and librarians. I

administered a Likert-scale questionnaire after each face-to-face workshop session, which was

adapted from the CoI and Shared Metacognition scales from Arbaugh et al. (2008) and Garrison

and Akyol (2015). I made non-substantive changes to the items to fit them to the workshop (e.g.

substituted *teacher* and *class* with *facilitator* and *workshop*). I added a few of my own non-

piloted questions (which I have not summarized here) to allow me to identify areas within

transcripts that I might have wanted to analyze deductively. I also applied a 4-point forced choice

response scale in which 1 equaled Strong Disagreement, 4 represented Strong Agreement, and

there was no neutral choice. A later work (Garrison, 2017) included both the CoI questionnaire

and the Shared Metacognition questionnaire and these used a 5-point response scale with a

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neutral choice. The questionnaire, which is found in Appendix B included scales for each of the

CoI presences and for social metacognition. Table 6.2 lists the scales. I chose to use these scales

because they were specifically designed to measure CoI presences and have been rigorously

validated over many studies. For this reason I considered quantitative methods to be the best way

to measure CoI presences and shared metacognition.

Table 6.2. Scales and Number of Items in the Questionnaire

Likert Scale	Likert Sub-Scale	# of Items
Social Presence	Affective Expression	3
	Open Communication	3
	Group Cohesion	3
Cognitive Presence	Triggering Event	3
	Exploration	3
	Integration	3
	Resolution	3
Teaching Presence	Design and Organization	4
	Facilitation	6
	Direct Instruction	3
Shared Metacognition	Self-Regulation	13
	Co-Regulation	13

Findings Related to CoI Presences

I used descriptive statistics to summarize the data from the questionnaires. At the higher

level of the CoI presences, this quickly showed that the design had worked to create and sustain a

CoI. I summarized the data for each category within each CoI presence for further analysis.

Data summarization. I summarized the responses for each session of the workshop

using Mean (M) and Standard Deviation (SD). Summaries were done for (a) each presence and

shared metacognition, (b) for each of their subcategories, and (c) for each item. The overall

descriptive summary for each session is provided in Table 6.3.

One item within the questionnaire related specifically to the online component of the

workshop. But because the questionnaire was administered after each face-to-face session, it is

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reasonable to assume that participants answered the questionnaire (except for the one item about online) from the perspective of the face-to-face session they had just completed. I have therefore analyzed the online component of the design separately in a later section of this chapter.

Table 6.3. Summarized Results: Indicators that the Design Achieved a CoI

Community of Inquiry Elements	Face-to-face Session 1 n=9 (64%)		Face-to-face Session 2 n=14 (100%)		Face-to-face Session 3 n=7 (50%)		Face-to-face Session 4 n=11 (79%)	
	M	SD	M	SD	M	SD	M	SD
Social Presence	3.4	.70	3.5	.67	3.6	.74	3.6	.77
Cognitive Presence	2.9	.81	3.3	.71	3.3	.72	3.3	.94
Teaching Presence	3.4	.75	3.7	.54	3.6	.62	3.7	.53
Shared Metacognition	2.7	.92	3.4	.75	3.3	.75	3.2	.88
Total	3.0	.88	3.5	.70	3.4	.73	3.4	.84

Notes.
- The questionnaire utilized a 4-point ordered scale
- Scale: 1=Strongly Disagree, 2=Disagree, 3=Agree, 4=Strongly Agree
- All questionnaires that were at least partially completed were included. Missing data within these was replaced with the average for the item across all questionnaires. Missing data as percentage of total data per session: Session 1=.018, Session = .065, Session 3=no missing data, Session 4=.001.

Careful review of the summarization where a score of 3.0 on a 1.0-4.0 scale indicates agreement, the mean scores show that all CoI Presences grew over time and were present as early as the second session. The variation in responses for each presence were within one SD indicating that scores were within a normal variability spread.

A few of the SD's are close to 1.0. In these cases, summarization at a more granular level revealed that these items had a core group of similar scores but also had a limited number of outlier scores which were what pushed SD close to the 1.0 mark. For example, cognitive presence, which was made up of 12 items, had an SD of 0.94 for the fourth session. Examining each item showed that there was one outlier that had an SD of 1.17. The next closest outlier had

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an SD of 1.04. And in session 1, shared metacognition had an SD of 0.92 (not as close to 1.0 but still within the 0.90-0.99 range). Only one score within that scale had a 1.0 SD.

Data by categories clarified anomalies. This more granular summarization is shown in Table 6.4 and allowed me to target areas for qualitative analysis.

Table 6.4. Forced Choice Likert Scale Questionnaire Including Presence Categories

Community of Inquiry Elements and Categories	Face-to-face Session 1 n=9 (64%)		Face-to-face Session 2 n=14 (100%)		Face-to-face Session 3 n=7 (50%)		Face-to-face Session 4 n=11 (79%)	
	M	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
SOCIAL PRESENCE	**3.4**	**.70**	**3.5**	**.67**	**3.6**	**.74**	**3.6**	**.77**
Affective Expression	2.8	.62	3.3	.77	3.2	.94	3.4	1.00
Open Communication	3.7	.54	3.6	.59	3.8	.54	3.5	.76
Group Cohesion	3.6	.58	3.6	.58	3.7	.58	3.8	.42
COGNITIVE PRESENCE	**2.9**	**.81**	**3.3**	**.71**	**3.3**	**.72**	**3.3**	**.94**
Triggering Event	3.3	.67	3.2	.8	3.7	.58	3.2	.97
Exploration	2.8	.86	3.4	.71	3.2	.87	3.1	.93
Integration	3.1	.78	3.5	.59	3.3	.56	3.3	.88
Resolution	2.5	.74	3.1	.68	3.2	.75	3.4	1.00
TEACHING PRESENCE	**3.4**	**.75**	**3.7**	**.54**	**3.6**	**.62**	**3.7**	**.53**
Design and Organization	3.8	.42	3.8	.38	3.7	.58	3.7	.54
Facilitation	3.4	.60	3.7	.47	3.6	.58	3.7	.47
Direct Instruction	2.9	1.05	3.5	.75	3.4	.74	3.6	.61
SHARED METACOGNITION	**2.7**	**.92**	**3.4**	**.75**	**3.3**	**.75**	**3.2**	**.88**
Self-Regulation	2.7	.90	3.4	.70	3.2	.78	3.2	.84
Co-Regulation	2.8	.94	3.5	.79	3.3	.72	3.1	.92
TOTAL FOR SESSION	**3.0**	**.88**	**3.5**	**.7**	**3.4**	**.73**	**3.4**	**.84**

Notes.
- The questionnaire utilized a 4-point ordered scale
- Scale: 1=Strongly Disagree, 2=Disagree, 3=Agree, 4=Strongly Agree
- All questionnaires that were at least partially completed were included. Missing data within these was replaced with the average for the item across all questionnaires. Missing data as percentage of total data per session: Session 1=.018, Session = .065, Session 3=no missing data, Session 4=.001.

In session one, several of the presence category means fell below 3.0 indicating some level of disagreement. A few of the category SD's across the various sessions were close to 1.0. Some of these are easily explained by circumstances. Within Teaching Presence, for example, the Direct Instruction category showed an overall mean of 2.9. But at the item level, two showed means of 2.2 and 2.9. These items referred to the facilitator providing adequate feedback, which was not relevant for earlier sessions where work had not yet been accomplished. These scores are therefore more likely attributable to the forced answer format of the instrument, which did not present a not applicable (NA) possibility.

Other mean scores below 3.0 in session one can be explained by the typical way in which the three presences develop over time. Resolution (Cognitive Presence), for example, showed a mean of 2.5 for the first session but increased in later sessions and ended with a mean of 3.4 in session four. The SD for this mean was 1.0, but further exploration showed extreme scores from two of the 11 participants. Based on the majority of participants, the mean is generally representative and confirms the trend within a CoI where cognitive presence (of which resolution is the final stage) increases over time as the CoI progresses (Garrison, 2017, p. 30).

Another example of normal progression towards the development of a CoI is that of the Triggering Event (Cognitive Presence) for session four, which had a mean of 3.2 (agreement) but showed the highest variance within the Presence with a SD of .97. Of the three items within this category, one had a mean of 2.8 (disagreement) and an SD of 1.17. The lower mean score of 2.8 for this item, "I felt motivated to explore content-related questions," makes sense as this was the wrap-up session where exploration of content would no longer have been relevant. Again, this points to the problematic nature of excluding an NA option on the instrument's response scale.

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For co-regulation, four items out of 13 scored below the 3.0-3.9 mean range. Two of these items used the word, "challenged," (I challenged the perspective of others; I challenged the strategies of others). I propose that this term is problematic in a setting where librarians are working with faculty members. My experience as a librarian makes me suspect that librarians would never consider that they were challenging faculty members. Instead, they view their role as facilitating the work of the professor. These two items had lower means across all four sessions and their highest mean was only 3.0 in session three.

The design supported development of CoI presences. CoI presences increased after the first session and remained stable throughout the workshop. Summarized means within Table 6.3 show that two of the three CoI presences (i.e. social, teaching) were firmly visible in the first session. This coincides with the design (See Appendix A), where session one was purposefully filled with activities designed to build social presence that would help to carry the workshop as it developed (i.e. participants sharing about their university background, about their personality type, about how they experienced the library as undergraduates). Session one was also designed with significant direct instruction, which is part of the Teaching Presence (introducing the workshop, presenting the student findings from phase one of the study) to help establish the purpose of the workshop as well as introduce the problem and stimulate cognitive presence.

One activity was specifically designed as a transition activity into the presentation on student findings. In that activity, participants were asked to reflect and share how they "felt" as undergraduates doing research or using the library at their university and then to share. This helped them to identify with each other and to begin to identify with their students.

Cognitive presence in the first session was borderline, as would be expected where social presence was the primary focus. The first session, which involved a significant amount of direct instruction would not naturally generate social metacognition and that was borne out.

The trend across the four sessions show that the various presences progressed in similar lines with the content design. Social presence and teaching presence were strong in the first session where activities were specifically designed to engender social presence. Cognitive presence became established in the second session where participants constructed their own IL Model, and it remained strong throughout. In the design, the facilitator began to drop the teaching role as participants took it up. Participants began to take on the teaching role, explaining how their curriculum worked, how students behaved, what was expected of students in their fieldwork, or how students searched a database. Teaching presence thus remained strong. Also, for this reason, shared metacognition was present from the second session on and declined as would be expected by the fourth session when the design called for the participants to reach resolution by developing an action plan going forward, which would finish up the workshop.

Collaboration of summarized results. Using the transcripts of the face-to-face sessions, I identified dialogue sequences that illustrated the three CoI presences in action and provided evidence of developing self- and co-metacognitive regulation. These are discussed in the following sub-sections, which include illustrative dialogue sequences. These were identified using definitions and examples of the presences provided in Garrison (2017). I assign numbers (e.g. librarian 1 or social sciences participant 2) to distinguish speakers within a dialogue segment. These numbers do not represent the same participants across all dialogue segments.

Summary data showed that social presence was strong and increased over time. Examples of dialogue also confirm this. Humor is an example of the personal/affective category

of social presence, and it appeared throughout but was especially strong in the earlier sessions, where facilitation questions and activities were designed to elicit emotive connection with each other and with the content. In this example, an exchange between a social sciences faculty member and a librarian, which might have been interpreted by an outsider as being critical of libraries, actually elicited laughter and good-natured ribbing back and forth between the two participants. The exchange occurred after participants had been asked to share a memory from when they used a university library as a college student. The exercise was meant to help them think back and identify with their own students and how they might feel the first time they are asked to engage in academic work requiring the library. A couple of faculty members had described feelings of fear and unease when they first encountered libraries in their student years. As a librarian was seeking to recall, another faculty member made an off-handed comment in a teasing voice about the scary librarians of his own past. While he was, in one sense, expressing real feeling, he also masked it in a form of teasing. The librarian took the veiled criticism in stride and gave back with some dry humor of his own. In this case, humor allowed both participants to acknowledge each other's feelings and move beyond them into collaborative dialogue. The group accepted the banter, laughed easily, and collegiality was established:

Facilitator: Can you attach feelings to that? What do you feel when you think back?

Librarian: Honestly, I can't. I apologize but I can't re... I wouldn't be able to remember.

Social sciences participant: …that's because when we were growing up, librarians were mean [said in a joking way, and everyone laughed].

Librarian: [Tone of good humor] So, by implication, you're saying that now they're not?

Social sciences participant: Junior high and high school, you didn't talk to the librarian because she would rake you over the coals for talking out loud. [But then] in

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college you were supposed to talk to the librarian and they were supposed to be helpful? [this time reflecting personal experience, but said in a teasing tone]

Librarian: [Dry humor] The session on the 17th will be on stereotypes.

[The exchange ended with much laughter throughout the group]

Librarian 2: Stereotypes? That would be fun [more laughter].

Another example of social presence, this time from a later session, reveals how much group cohesion (another category within social presence) had grown. Group cohesion grew because of small groups working together to reach consensus and construct shared meaning. This is an important design feature that must be handled thoughtfully. For example, although small groups were part of the design, during the first session, when I divided the group, I did not do so deliberately but simply by counting off around the group. And I did not keep those groups in the first asynchronous session. This turned out to be detrimental to the online design as the beginnings of trust and cohesion that had built during the first session were lost in the online format. After that, I chose to keep the same small groups throughout the remainder of the workshop, which proved to be a wise decision. That critical choice led to a growing sense of community. Dialogue between two social science participants and the facilitator revealed this:

Social sciences participant 1: I think, too, …one success is that it's created community between your unit and our unit.

Social sciences participant 2: Yeah.

Social science participant 3: Absolutely.

Social sciences participant 1: Before, I knew you guys by sight…more or less. We worked on a committee together. Some of you I knew more than others. But…

Social sciences participant 3: Yeah, the sense of being colleagues…is different, for sure.

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Open communication, which includes acknowledging and approving contributions of colleagues, is another category within social presence, and there was evidence of its existence. Participants frequently used typical "yeah," "um-hmmm," "exactly," or "I agree" responses to others' comments. One longer example of approval occurred during session two between a social sciences participant and a librarian:

> *Librarian participant:* …there were several of these things that were suggesting… taking the skill and applying it to practice…I grouped them under evaluation, but that could potentially be its own thing of almost application.

> *Social sciences participant:* I think that…actually…is a good one. Application to whatever your field is.

> *Librarian participant:* Yeah, to realize, basically.

> *Social sciences participant:* Yeah, I like that. I like that.

> *Librarian participant:* Yeah, so that when you're going out, you know how to take the skills you've learned and apply them in real life.

> *Social sciences participant:* Okay, so application to discipline.

> *Librarian participant:* Real world context, yeah.

By sessions three and four there was clear indication of people engaging with the content and task at hand. During these sessions, forms of agreement were evident but abbreviated…often only one word, "yeah," "exactly," or "yes:"

Cognitive Presence grew between session one and two and then remained stable throughout. Cognitive presence is made up of triggering events, exploration, integration, and resolution. Triggering events were primarily initiated by the facilitator as part of the design to stimulate curiosity and help participants engage (i.e. how did you feel? This is what your

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students said…). Exploration and integration quickly took over as participants as a group interacted with the content of the workshop. All were experienced academicians, and they naturally began brainstorming, asking others for input, and volunteering ideas and experiences. An example of exploratory dialogue occurred in a small group during session 2, where participants shared concepts and experiences:

> *Social sciences participant 1:* So, under resources there's access, there's knowledge…
>
> *Librarian participant 1:* Yeah.
>
> *Social sciences participant 2:* Yeah, and this one here, struck me, understanding libraries, public libraries. One of the things that we do in policy is teach them how to use the domains that are out there, like [redacted].gov to look at laws or bills…
>
> *Librarian participant 1:* I was glad to read that, because we just cancelled [database] for next year and that was the only other place that we would have access to …that sort of thing, so yeah, nice to know that you're teaching…other resources, yeah.
>
> *Social sciences participant 2:* And in practice, when they get out in practice, those are the ones they're more likely to use, quite frankly.

After exploration, participants worked at constructing new ideas from the information and experiences they had shared. During this stage of integration, they provided explanation for expressed views, consolidated their ideas, and offered solutions. These are all typical behaviors within cognitive presence. I believe that integration occurred because, based on the design, participants had a task set before them. In each session, participants were presented with clear goals towards which their groups were supposed to work. These took on various forms, from a probing question to be answered or an assignment to consolidate or synthesize data. An example

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of integration dialogue, which occurred within a small group as part of session three, shows participants building meaning for a learning goal:

> *Social sciences participant 1:* Because they hopefully learn to access resources that they have available through a library whether it's here on campus or whether they graduated, and they have some sort of online where they can go to a public library.

> *Librarian participant 1:* Or it might not necessarily be just a library.

> *Social sciences participant 2:* It could be just the web.

> *Librarian participant 1:* It might be just learning what journals, what resources.

> *Social sciences participant 2:* What journals, what books….

> *Librarian participant 1:* I mean, I think something that is important is that obviously we love to be involved when we can, but it isn't always just about…

> *Social sciences participant 2:* …How they're utilizing information.

> *Librarian participant 1:* …How we're coming into [class], it's how they're utilizing it.

> *Social sciences participant 2:* …Information, yeah.

> *Librarian participant 1:* …bigger picture…they have to be able to walk out and…do that.

The last category within cognitive presence is resolution. In this study, application of what was produced in the workshop would normally occur at the point where social sciences faculty members and librarians began to interact with students back in the library and the classroom. That stage fell outside the remit of the workshop. Only small examples of resolution around the production of the workshop artifacts could be anticipated. As participants completed their work, evidence of resolution emerged. For example, in one of the small groups in session three, where participants were asked to consolidate the learning goals that everyone was working

on, the group did a fair bit of wordsmithing on one learning goal and found resolution when the meaning became clear.

Teaching Presence on the part of the facilitator was strongest in session one but participants took on other teaching presence roles as the workshop progressed. I purposely took on the teaching presence role in the beginning of the workshop to help establish design and organization, introduce the workshop, the problem, and the plans moving forward. Beginning with session two, however, my direct instruction became more limited to facilitating the topics with which participants engaged within their small groups. Participants took on the task of direct instruction as they shared their knowledge (based on their discipline) with those of the other discipline. Experiential sharing turned out to be the preferred way to share knowledge about one's own discipline. Participants also occasionally resorted to explaining pieces of their curriculum or services. For example, in one of the small groups that took place during session two, a librarian explained how the library's new federated search engine worked and why databases would still be more useful to the social sciences graduate students.

Participants also began to facilitate their own discussions, interjecting faciliatory questions to their colleagues such as, "Do you think that…?" or "Does anyone else have…?", which helped to keep the discussion moving forward. Design and organization dialogue, another category within teaching presence, was scarce but did occur when the small groups organized themselves (i.e. one becoming the note-taker, another managing the discussion).

Shared Metacognition, both self- and co-regulation, could not be identified in actual dialogue because participants were fully engaged in active learning not verbally reflecting upon that learning. Co-regulation includes monitoring the ideas and learning of others and managing this. Some dialogue indicated that social metacognition, especially co-regulation, was occurring

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although the speaker was not explicitly identifying it as such. For example, in his post-interview, one participant commented about the IL Model that was one of the artifacts to come out of the group's work. His comment showed that he was observing and considering the work of others, "I was not in the group that really came up with the model, so I was kind of like in awe going, 'Wow, these folks came up with this really cool thing, you know.'"

Findings Related to the Asynchronous, Online Portion of the Workshop

The blended portion of the workshop consisted of asynchronous group discussion forums that occurred during the time between each face-to-face session. Since face-to-face sessions took place with at least two weeks in between, and sometimes longer, the asynchronous sessions were designed to maintain participant engagement. The topics for the sessions came out of the face-to-face sessions and consisted of a question or an activity in preparation for the next session.

Asynchronous participation did not inspire, but it holds promise. This was the most problematic portion of the workshop from the perspective of maintaining participation. While 11 (79%) of the 14 participants willingly began an asynchronous thread or responded to one or more threads, there was little sustained participation. After two asynchronous topics and minimal participation, the facilitator held a discussion with the group during a face-to-face session and together everyone decided to end asynchronous group discussions. We then regrouped and agreed to add an additional face-to-face session, instead. This decision also led to further conversation between the facilitator and the participants at the end of the workshop. The results presented here are from the first two topic discussions.

Figure 6.2 shows that there was a total of 11 discussion threads within two topics, which had been defined by the facilitator. These topics were drawn from the assigned readings. Participants were asked to share ideas on how IL might relate to the social sciences department

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and how librarians and social sciences faculty members might collaborate to provide IL

opportunities to social sciences students. The hope was that these topics would stimulate ideas

that could be fleshed out in face-to-face work.

In Figure 6.2, each pair of bars represents one thread. The dark bar represents the number

of participants within the thread and the light bar shows the number of posts for that thread.

Thread 10 showed more discussion than the other threads. It was the first thread that began to

resemble an ongoing discussion between four participants (including the facilitator), as opposed

to a set of one-off independent responses to an original post.
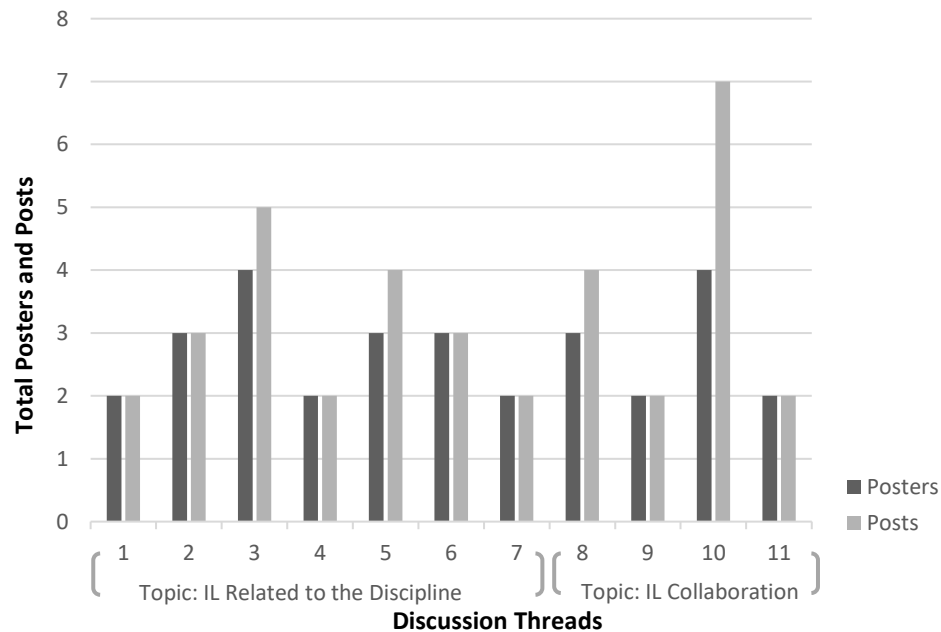
Figure 6.2. Total Asynchronous Discussions. This figure shows Number of

Participants Who Posted and Number of Posts within each Thread. (Facilitator

Participation is Included in these Figures)

Table 6.5 provides a summary of the average number of participants and posts per thread.

The facilitator was counted among the participants within a given thread, which means that many

of the threads were an attempt at compliance but received no uptake from group colleagues. Including facilitator posts, the average number (Mean) of posts per thread were 3.0 and 3.8.

Table 6.5. Averages of Number of Participants and Posts

Topic	No. of Participants for Threads by Topic M	No. of Posts Within Threads by Topic M
IL Related to the Discipline (7 threads)	2.7	3.0
IL Collaboration (4 threads)	2.8	3.8

The standard deviation for participants per thread was 0.79 and for the number of posts across all threads, 1.62. This higher level of variability is illustrated in Figure 6.2, which shows moderate engagement within a few threads while other threads received little to no engagement apart from that of the original poster and the facilitator.

Those who did participate showed similar evidence of thoughtful engagement with the topic as was evident in face-to-face discussions. For example, when discussing how they saw IL relating to the discipline, one faculty member participant focused on how to evaluate and synthesize sources and applied it to the field. She asked reflectively,

 "What factors may lead to five studies looking at the same topic—i.e. what are the outcomes of exposure to trauma, or how helpful are antidepressants—and to be able to make sense of (or at least process thoughtfully) why different studies may lead to vastly different conclusions."

One area that showed promise (albeit in nascent form) within the asynchronous portion of the workshop was that of the CoI presences, which were in evidence even in infrequent posts and low interaction. Instances where participants demonstrated various behaviors associated with one or more of the CoI Presences are shown in Table 6.6, along with examples of each.

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Table 6.6. Evidence of CoI Presences within Asynchronous, Online Postings

Associated Presence(s)	No. of Instances	Behavior	Example from Raw Data
Social Presence	5	Affirms another or agrees with another	"Article was really interesting." "Your list is really comprehensive." "Good comments going on here." "[Named the poster], I like your idea of having a librarian on site…"
Cognitive Presence	3	Offers observations or question(s) in response to a post	"Collaboration would need to be intentional and focused since students can center the model at any point…" "We could develop an online training module for the IL Model." "How do these issues fit within the 3rd world?"
Cognitive Presence	2	Challenges the assertion of another	When one person views the model in linear fashion another responds, "The model is circular, not linear." "I agree that this is an issue…however, in teaching policy for our advanced graduate students…we try to make sure…"
Teaching Presence	2	Takes on the teaching role	[Defines various terms for the other discipline from IL perspective] "Mezzo would be the library and professor collaborate over course requirements." Provided an additional article to the group and asked for comment.
Metacognition	2	Expresses opinion about their way of thinking	"I am a linear thinker…" "I tend to be a rule-governed, direction-following sort of person, at least in this (named discipline) …"

The asynchronous, online portion of the blended design was not sustainable. Nevertheless, from the perspective of exhibiting promise for future iterations, participants who did engage online exhibited similar types of interaction as they did in the face-to-face setting. Evidence, no matter how small, of open communication, thoughtful engagement with the topic, willingness to explain or to challenge another, and verbalizing self-regulated assessment was present.

Findings Related to Participant Emotional Responses

Emotional reactions seemed important to outcomes and even external to the CoI.

While it is true that social presence includes a personal/affective component that interacts with

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the other presences, it is internal to the process model and involves building group identity and trust through affective relationships (Garrison, 2017). Some of the emotional responses that I observed, however, seemed to have little to do with social presence. Rather, they seemed more tied to personality types and learning preferences or to factors external to the CoI. These emotional responses seemed to affect how the participants perceived the workshop.

Time and excessively busy schedules were external factors that caused stress to some participants and may have exerted some negativity upon social and cognitive presence within the CoI. Two participants reflected, for example, their feelings of frustration. One said, "at the time, I grumped, 'Oh, I'm a busy person today…'" Another's response indicated that her feelings impacted others in the group. She shared her "own private grumblings to…family as well as [in] some of the hallway conversations that we [fellow participants] had." Another example involved an emotional response to the schedule of the CoI workshop. The participant indicated in her post-workshop interview that she had gained value from the experience. Yet she expressed a level of frustration that the workshop scheduling was personally inconvenient, "And to be honest, it was like…you know, kind of a hassle because I was coming on Friday, which I don't normally do."

Participants defined themselves very clearly as having strong extrovert or introvert tendency. This personality trait affected their initial emotional responses to collaboration. In the case of extroverts, their enthusiasm for collaboration helped to build social and cognitive presence within the CoI. One self-declared extrovert admitted, "I get energized with collaborating." Another described the collaborative synergy within the CoI workshop as "really exciting to see that interaction between us and the willingness to work together." This strong extrovert component among the participants may also have negatively affected their perceptions of the online component as they seemed to need or prefer face-to-face interaction, at least in the

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beginning, to sustain personal buy-in. Meanwhile, when self-declared introvert participants were asked how they felt about collaboration, one responded emphatically, "Yuck!" Another used humor but the underlying emotional response was evident when he said, "collaboration is fantastic when other people do it." In his post interview, this same participant explained that the collaboration ended up being "mostly fine." Even so, he described his initial thoughts in the beginning as, "Oh no! You may have to talk to these people."

Strong emotions were also evident in the personal realm. Some participants revealed personal learning preferences in emotional ways. One described herself as pragmatic as she negatively described the third session where discussion focused on defining the learning goals. The session had become quite detailed and stretched beyond the allotted time. She described the experience in exasperated tone, "too many angels dancing on the head of a pin." This participant also described the initial readings, which outlined the standards with which each department aligned, as "really tedious, boring stuff." Another participant revealed both her emotional and epistemological stance when she enthusiastically shared, "I love collaboration. I mean, I'm a person who really believes that the best learning is embedded within the social construct."

Changeability of emotional responses. Finally, emotional reactions to the CoI did seem to be changeable, although it would be too much to claim that one experience such as this workshop would change a participant's natural inclination and bias for or against collaboration or group work. But for the workshop, itself, it was heartening to see that participants' attitudes towards collaboration did change, at least within the workshop itself. I interpreted the data by setting up a continuum with negative response to collaboration on one end and positive response on the other (see Figure 6.3). I then placed participant pre- and post-workshop responses towards collaboration on the continuum. What I found was that across the trajectory of the FacLibCoI

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workshop, participants in the group moved towards the right and a more positive response on the continuum.

Left *Right*
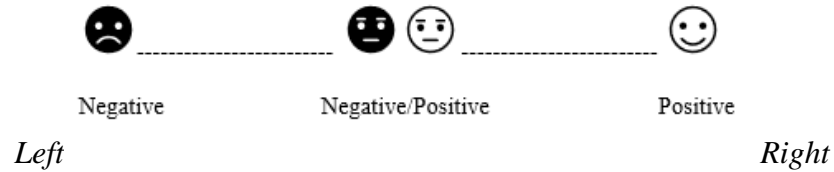
Figure 6.3. Continuum for Feelings Towards Collaboration

Two participants who had negative responses to collaboration at the beginning of the CoI workshop moved to mixed negative by the end. Two participants who started out as mixed negative moved along the continuum to mixed positive. And two participants who began at the mixed positive point moved across to positive. To summarize, after participating in the CoI workshop, all six of the participants who had declared themselves as introverts moved one step towards the right on the continuum from where they had begun. These are shown in Figure 6.3.

Left *Right*
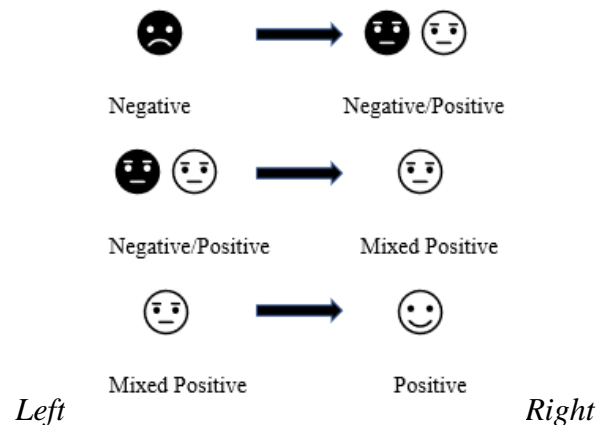
Figure 6.4. Changes in Emotional Response to Collaboration

One participant who started at the negative end admitted that she could understand the purpose of collaboration where people commit to working and can be trusted to accomplish a task. But her response to collaboration was "Yuck, I am a confirmed introvert." After the workshop, she shared that when the group was working on concrete tasks she "had no problem

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with collaboration." Thus, her personal preference did not change but her view of the collaboration she experienced fit within her definition of good collaboration and she handled it.

The two participants who started with mixed feelings about collaboration ended feeling more positive, but with mixed thoughts about the merits of collaboration. At the beginning one participant said that she viewed collaboration as positive when she could participate in smaller groups. She added that, "if I'm forced into it with people I don't know very well or there's no trust structure…then [I] just get quiet…and I'm…just allowing the world to pass around me." At the end of the workshop, she found it "very useful…within the realms of even [what] an introvert can handle…You…got to know the participants and [it] was very helpful. It was a good format."

Findings Related to Shared Understanding around IL

Shared understanding emerged through collaborative, inquiry learning. Together, participants within the FacLibCoI workshop produced a series of three outcome artifacts. The first artifact was a social sciences IL Model, which participants then used to inform everything else that they did. The second was a series of learning goals mapped to the standards to which the social sciences department and the library adhered. The third artifact was a shared action plan for future collaboration between the two departments around IL. These artifacts represent the shared understanding around IL that developed within the group. Additionally, there is corroborative evidence of shared understanding from transcripts of post-workshop interviews.

Artifacts as evidence of shared understanding. To help build shared understanding, participants read a few articles about IL along with the IL standards to which the library adhered. They also read the educational standards that applied to the social sciences department. They then submitted what they believed to be important research capabilities for social sciences students. As the facilitator, I compiled these into a list of approximately 25 capabilities. In the

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second face-to-face workshop session, in which all participants were in attendance, participants worked in their small groups to review the list, clarify concepts, consolidate where possible, and in some cases, rank the items. One of the small groups began by grouping the capabilities into four categories:

Social Sciences Participant 1: So, then what we have to have is ...she wants us to to bring these down. I mean, we've consolidated them...

Librarian Participant: Into four instead of seven.

Social Sciences Participant 1: Into four words, but what you know. I don't know if we even need seven...

Librarian participant: Those four areas are really nice, and you can put a lot of these into one of those. Like choosing access to databases, locating, retrieving appropriate and relevant professional and scholarly sources, that is, that's the resources. And access discovery tools, that's all resources. Those those, the second, third, and fourth one, are kind of the resources one.

Social Sciences Participant 1: So under resources there's access, there's knowledge of,

Social Sciences Participant 2: Yeah, and this one here, struck me, understanding libraries, public libraries. One of the things that we do in policy is teach them how to use the domains that are out there, like [redacted].gov to look at laws or bills and follow those bills and learn how to do that. And, for our graduate students, particularly, that's a really new experience, and they come away from that thinking, "Yeah, I could do this. If I was really [excited?] about a law, a problem that's now being addressed, cause we were looking at sex trafficking and things like that, and the students were really interested in that. ..

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Social Sciences Participant 3: There is one dimension we left out, actually, based on this list at least. Understanding that [IL] is human right, understand that it's an open and tolerant environment, requires open and tolerant environment, keep an open mind, be able to adapt and be flexible while researching. So it means some sort of an awareness piece, as well. Awareness, tolerance, attitude piece.

Social Sciences Participant 1: Almost precursory to...

Social Sciences Participant 3: Resources ...

Librarian Participant: Yeah, [as if asking the student] why are you doing this? Why are you doing this?

Social Sciences Participants 1 and 2: Yeah/right.

As the group continued, they reached a moment in their discussion where these concepts began to take on a cyclical process path and the social science IL Model emerged:

Social Sciences Participant 3: If you want to make this a circle, this would be an outer...

Social Sciences Participant 1: Yeah, yeah.

Librarian Participant: Hmmm.

Social Sciences Participant 1: So what would we label that? How would we...

Social Sciences Participant 3: Attitudes?

Librarian Participant: Values?

Social Sciences Participant 3: Open attitudes...Open values. Open values, yes.

Social Sciences Participant 2: Then you're valuing, you're valuing the human right. Cause they said, "understand that literacy is a human right" and that leads to responsibility. In other words, if you're literate, then having had that opportunity,

what responsibility follows? Which comes with that social justice piece that's so

important in the profession.

Social Sciences Participant 3: So, the value of the information literacy,

Social Sciences Participant 2: Yeah, something like that.

Librarian Participant: Yeah. That would be at the value...

By the end, the group realized that they had gone beyond the instructions given.

Social Sciences Participant 1 to group: This is the result of putting together four

conceptual thinkers and asking them to do something linear [all laugh].

Back together, each group presented their consolidated list. When this group's turn came, they explained their IL Model. The full group compared it with their lists and ultimately agreed to adopt the model as their own. Together, they revised the IL Model to incorporate the other small groups' ideas. The social sciences IL Model is the first of the major outcomes produced, and participants felt good about it and referred to it often throughout the rest of the workshop, using it as the benchmark for all new work. The IL Model is found in Figure 6.5.

The IL Model explained. Participants envisioned critical thinking at the center of the research process with the various aspects of IL making up a circular literacy flow that could be applied to any type of research or evidence-based practice. Enveloping the IL process were two pieces, attitudes and values and ethical responsibility, which participants felt were necessary for literacy. Participants perceived the IL processes in circular form, which allows students to enter the process at any point and engage with any aspect of IL (i.e. accessing sources, information synthesis, analysis, or evaluation). When I asked one participant (who was not part of the initial

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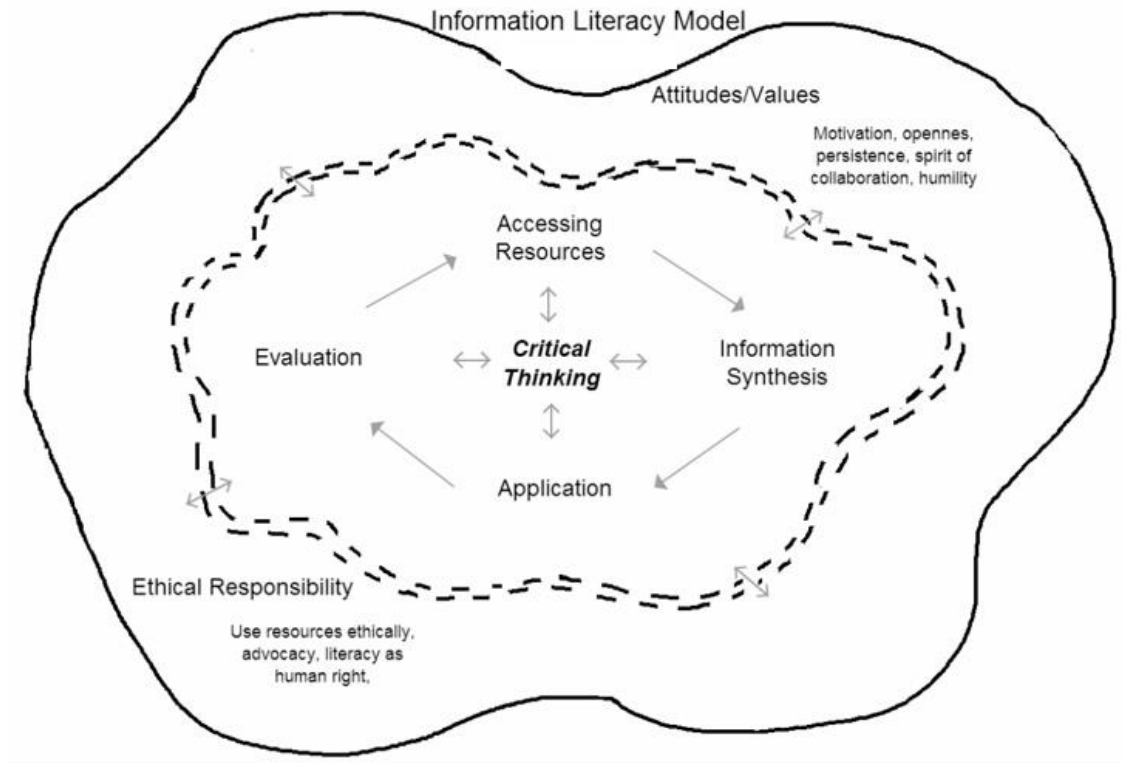
Figure 6.5. Artifact One: IL Model Developed by the Study's Participants

group that came up with the model) where he saw research and IL intersecting, he corrected my

use of the term *intersect* by describing the model to me:

"Using that term, *intersect*, that would seem to me as though there's one place

where, when you hit that part of the research process... it's like a side street coming

in. [But] what we kind of ended up with in our model, you know, maybe not a line

laid on top of each other, but one circle laid on top of the other, you know, because

it keeps coming back around and then, arguably, it starts back over again..."

The circular, enter-at-any-point process within the model necessarily required that

IL be integrated across the curriculum so that students could participate in the model any

time critical thinking or research was introduced. This led participants to the realization

that the IL Model and what it required was bigger than what either the librarian or the

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faculty member could do on their own. One of the social sciences faculty members shared, "it helped me to understand that I don't know all the stuff there is to know." A librarian's comment shows how much bigger interdisciplinary collaboration became once the IL Model was in place:

> "We had…this model and we had this idea that we came up with and then we had to actually apply that to well, what is happening either within the framework of the [social science] department's accreditation and assessment or within the framework of what's possible for faculty and staffing levels within the library, that kind of thing. So, it's kind of saying, okay well here's our model. How do we actually make...how does it match up against what we already know and have and how do we make it apply…?"

Developing the second artifact. In the third face-to-face session, I presented the participants with a compiled list of the proposed student competencies that the group had drawn up previously. I had done a draft mapping of these competencies to a list of the social sciences and IL learning standards. Participants worked in small groups with this list to review and make changes and additions to the document. They mapped the competencies to the various elements of their IL Model. As a larger group, and with me as facilitator and recording secretary, they consolidated their lists into one. Nine of the 14 members were present and participated in this revision. The process took longer than expected. Differences in philosophy emerged between members which needed to be discussed and understood. The group voluntarily decided to stay for an additional hour. A couple of participants left beforehand, but the remainder stayed.

The document that the group produced was a list of learning goals subdivided into six overarching categories: Attitudes/Values, Ethics, Values and Responsibility, Access Resources,

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Information Synthesis, Application, and Evaluation. By the end of session three, the participants had agreed upon a list of learning goals and had mapped them to the library and social sciences standards to which the departments subscribed. The Attitudes/Values section of the document is shown here in Table 6.7. The complete document may be found in Appendix C.

Table 6.7. Group-defined Learning Objectives Linked to IL Model and EP/IL Frameworks

Model Element	Learning Objective	Standards	Gen/ Adv	Where in Curriculum	How Measured
Attitudes/ Values	Demonstrate commitment to remain current on treatment modalities, social policies, practice context, and new themes within the profession	EP1; IL1			
	Demonstrate open-mindedness to new concepts and ideas presented in the literature	EP2; IL4			
	Seek new research environments, discovery tools, and help from librarian, researchers, and professionals	EP2, 6; IL1, 4, 6			
	Demonstrate persistence in their research efforts even when they bump up against challenges	EP1, 4; IL4, 6;			
	*Critically analyze one's own learning and thinking (whether hypothesis is confirmed by literature review/reflective)-- reflexivity--do they see themselves as part of the process?	EP1; IL1			

Developing the third artifact. In the second asynchronous discussion (between face-to-face sessions two and three), participants were asked to contribute ideas on how the department and library could collaborate around IL for students. Four threads with posts from seven of the participants made up this discussion and contributed ideas or interpretations of collaboration. For example, one participant suggested developing an online tutorial together to explain the newly developed IL Model to students. Another suggested that collaboration "would need to be

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intentional and focused" since students could potentially "enter the model almost anywhere on the wheel." One librarian proposed that the librarians and faculty members work together to create "a list of core attitudes/values and responsibility practices that we believe are important [and] then have both library and …faculty intentionally promote those values as they work together in other areas." A social sciences faculty member proposed having a librarian attending in the department during times when students were in between classes so that students could consult about assignments. Another suggested a 24/7 *live librarian* chat service on the library home page. One suggested asking students to find out what they thought would be helpful.

In the fourth session, we again had most of the participants present and I led them in a group discussion about the pathway forward. Together the group developed an action plan, Artifact 3 was based on the collaboration ideas that they had proposed in their second online, asynchronous discussion (described above). The group then assigned themselves to each of the action items. The action plan is also found in Appendix C, but I include a small portion by way of example in Table 6.8.

Table 6.8. Artifact Three: Action Plan

Persons Responsible (Descriptors shown rather than names)	Tasks
2 Faculty Participants	- Way to catch transfer students/graduate students - Consistent assignments in all sections of a class (Named participant is willing to pilot in the fall) - Pre/post assessment of IL/APA skills from library 1st year students—assignment linking them to library and its resources and to librarians

All three artifacts were produced collaboratively. To summarize, the IL Model, the mapped list of learning goals, and the action plan, were all done through group collaboration

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(albeit with significant facilitation on the part of the facilitator). These artifacts represent time spent reading about IL and about each other's standards along with approximately ten hours of group engagement to develop shared understanding of IL to improve the education of the students within the social sciences department. Although, the artifacts are a powerful indication of shared understanding around IL, further evidence from post-workshop interviews is now presented to validate these outcomes.

Themes of shared understanding extracted from post-workshop participant interviews. In addition to the artifacts, post-workshop interviews revealed themes around which the participants shared understanding. Themes were determined through initial coding and data chunking. Given that all participants were present for the second session where the IL Model was developed, and most were present for the last session where the action plan was drafted, I felt comfortable that everyone had enough insight into the direction of the group that their expressed views represented understanding of and affiliation with the direction laid out by the whole group. With 13 usable interview transcripts, I therefore defined some level of shared understanding to have occurred when at least 7 participants (of 13) commented on a theme that had emerged through analysis. With this threshold in place, I dropped one identified theme, which only garnered four participant comments. The remaining themes self-grouped with three themes receiving comments from 10-13 participants and two themes drawing comments from 7-8 participants. These themes are listed in Table 6.9 and further explored through dialogue.

Table 6.9. Shared Understanding: Post Interview Themes that Participants Shared

Shared Understandings	No. of Participants
1. By understanding each other's discipline (library and social sciences department) and engaging in interdisciplinary collaboration, we can work as a team to better support student learning.	11
2. IL is bigger than just finding resources. Students must learn to apply critical thinking and IL to their practice in ways that enable them to access and evaluate resources, to apply these to best practice, and to stay current in their field.	11
3. Collaborative inquiry learning is a process whereby people who are willing can create a synergy that allows them to ask questions and to engage in critical thinking towards discovering new concepts and solutions. The IL Model is the key product and participants took ownership of it.	10
4. Critical thinking undergirds and infuses every aspect of IL and the research process. Because students may enter this process at any point, it is important to build IL into a critical thinking piece that is incorporated across the curriculum.	8
5. It was helpful to get to know each other and build trust across the two departments. This will help future interdisciplinary collaboration between the two.	7

Theme 1. By understanding each other's disciplinary area and engaging in interdisciplinary collaboration, we can work as a team to better support student learning.
During the post-workshop interviews with each participant, 11 participants spoke to the value of learning about each other's discipline and expressed the belief that as an interdisciplinary team, they could better support student learning. Furthermore, these 11 participants represented a cross section of faculty from the social sciences department and librarians. This theme includes four complementary sub-themes. The first was the shared feeling of being a team. Next, they recognized areas within their own teaching that could or did benefit from working together. Third, the participants felt that they gained valuable knowledge from the other department that would help in the future. And last, they were able to generate ideas for collaboration.

In the first sub-theme of identifying with each other, participants described the relationship that had developed between their departments. One social sciences department faculty member said, "We're all on the same team with the outcome that students become more

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competent and literate." Another said, "it feels like we're allied." A librarian observed, "Oh, we actually cross over much more than we necessarily realize."

Social sciences faculty members seemingly learned and acknowledged that the librarians had something to contribute, saying things like, "we're not fully realizing the objectives within courses because of our preconceived ideas about information," and "we've proved that…we don't always…give the best kinds of resources to our students…, so working with a party who could…enlighten us on searches [and] how [to] structure…an assignment to get some better scholarship is helpful." And librarians expressed similar affinity towards working with the social sciences department faculty members. One librarian was able to move beyond thinking about teaching IL tools to considering how librarians might help students learn to apply the tools in ways that would enhance their practice in the field, "…there's a general sort of knowledge of information literacy and tools and so forth, but then how does that influence what they're [students] going to be doing in practice? So that part, which, you know, is sort of taking it a step beyond the tool."

In the third sub-theme, both social sciences department faculty members and librarians felt that they had gained valuable knowledge from the other department. A librarian expressed that he had gained, "better understanding just simply of the curriculum and the framework and structure of what …the [social sciences] program does." Another librarian expressed similar views, "I feel like I have a better understanding of various places where like [the social sciences] department might need IL types of things." She continued, "…it was helpful for both departments, but… it certainly gave me a better understanding of some of the concerns within the [social sciences] department." One social sciences professor said that "having library people here as well, not just [us] made a lot of it more meaningful."

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Finally, in the fourth sub-theme, participants shared ideas for how to continue to build a collaborative relationship that would support the social sciences students. One said, "it helped me to start thinking about [interdisciplinary] collaboration in the sense of library being an integral part of the program and curriculum and how it all fits." Another said, "what we were talking about is more as a librarian…being more of a resource for every class, any class, not just research." Another was more specific, "we talked about embedding [librarians] like in this office for students…and having maybe open chat hours or something…." A librarian, on the other hand, considered the potential difficulties for the library, which was tasked with supporting all departments across the university with limited personnel. Nevertheless, she and her other library participants showed willingness to explore further collaboration. She remarked, "we had…this model and we had this idea that we came up with and then we had to actually apply that to well, …what's possible for faculty and staffing levels within the library, that kind of thing."

Theme 2. IL is bigger than just finding resources. Students must learn to apply critical thinking and IL to their practice in ways that enable them to access and evaluate resources, to apply these to best practice, and to stay current in the field. Several participants expressed their surprise that IL was a broader concept than they had imagined. Interestingly, this even applied to the librarians for which IL is part of their subject expertise. One librarian said that "[the experience of the workshop] broadened my look at information literacy and helped me to go from what the library needs to do, just from what our perspective is, to help me see it from the department's point of view." A social sciences department faculty member expressed, "…the model keeps coming back and informing. It's bigger than just, 'I need help with the lit review, tell me how to do a search.'" Another echoed this sentiment, "I think the definition of literacy, library literacy, is much broader than I would have thought it was." A librarian backed away

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from the term, "global perspective," but then went ahead and used it anyway, stating that "how [IL] intersects with disciplines and finding those points [is] extremely important." Participants linked IL to critical thinking in ways that they had not previously considered. One social sciences department faculty member said, "I now see critical thinking in the information literacy context, as well." They also saw IL as reaching beyond the narrow confines of research-based assignments in college to be a necessary ability once out in the profession. One social sciences department faculty member pointed out that students "need to know how to critically evaluate those sources…and how to synthesize different sources of data to be able to put together a good treatment plan…or a good program."

Theme 3. Collaborative inquiry learning is a process whereby people who are willing can create a synergy that allows them to ask questions and to engage in critical thinking towards discovering new concepts and solutions. The IL Model is the key product and participants took ownership of it. Participants integrated the concepts of collaboration, inquiry learning and critical thinking around IL in their descriptions of what they experienced in the workshop. One called the experience "the path of inquiry…where the richness of learning can happen." Another said that "critical thinking collaboratively…was much more dynamic than just me sitting down…with a piece of literature or information or whatever and analyzing it, right?" Another participant conceptualized critical thinking because of the collaborative inquiry learning process. He concluded that "people were not just trying to give flip, easy answers. They were trying to put two and two together and come up with…" [presumably, a solution]. One of the librarians linked collaboration and inquiry as "building off…each other's knowledge and expertise," and "question[ing]…how to do something or how to learn something or whatever and trying to make it happen." One declared that collaboration led to "the whole becom[ing] more than the sum of

its parts, so we came up with ideas we very super likely would not have come up with individually." She went on to say that she experienced "people…generating ideas and learning about what this information literacy thing is and how to actually use it in our curriculum."

Theme 4. Critical thinking undergirds and infuses every aspect of IL and the research process; since students may enter the process at any point, it is important to build IL into a critical thinking piece that is integrated across the curriculum. Critical thinking was an important learning concept for the social sciences department and they were happy to know that it is also an important component within IL. Participants conceptualized this link between critical thinking and IL within the model they developed. One of the librarians described it this way,

"And I think [that in] the model that we…designed as a group, critical thinking was an important piece in most of the areas, you know as you went around the model, critical thinking was a key piece…I think we put that in the middle. So that was the key piece. So, whatever you're doing, whether you're doing the literature search…, when you're evaluating the information in those sources, when you're evaluating how well you wrote the paper…it was a continuum."

Once the social sciences IL Model was in place, faculty members from the social sciences department began thinking programmatically about how to integrate the model into their curriculum. One commented, "Yeah, that model was fabulous. And I just have thought about that several times; …a student could be anywhere on that model continuum and jump in and we should have some kind of idea on how they would use [the] library at that point. Or how they would...or we as teachers could interact." Others considered how they would build curricular changes into specific courses and how these would fit with what others in the department were doing. One reflected, "sequentially…, for sophomores and transfer students in the fall…we're

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gonna catch people there. And then also at the graduate level, it's for first-year students. So, this is going to be the basic or the generalist level that we discussed." The research professor opined, "I don't really expect students to be able to do that [synthesis], but if we did implement it as part of the program that comes before the research class is taught, then it would be super...super, super, super helpful." While librarians fell back into more of an observant role during these discussions, one expressed support and understanding, "we [librarians] have a stronger feel for what things will help meet their needs. And so, it's a win all around for everybody… Critical thinking is the foundation…."

Theme 5. It was helpful to get to know each other and to build trust across the two departments. This will help future interdisciplinary collaboration between the two. A social sciences department faculty member observed gratefully, "I think I clearly know who the research librarians are now and I'm not sure that I did before…." Another confirmed, "we developed some rapport and some knowledge of one another's disciplines that I think is extremely valuable to both of us, so, ...and it feels like we're allied." He continued, "just the act of collaborating with you folks from the library was, to me that was huge, because it was an opportunity to build a sense of trust and knowledge of your capabilities and your strengths in ways that would not have happened otherwise." One librarian remarked, "I became acquainted with some people, obviously, that I didn't know at all and I just have a better idea of who is in the social sciences department. And kind of how they react to different things." Another commented on how beneficial it was to gain a better understanding of the department for planning, "I do feel like I actually got a better understanding of that department and maybe have some ideas to approach some things…"

Findings Related to How Participants Evaluated the Workshop

During their post interview, each participant was asked how they felt about the workshop experience, what went well, and what could have been improved. Responses were overwhelmingly positive towards the collaborative outcomes. One posited,

"not that I think I ever would have thought I wasted my time, but the outcome was not something I would have predicted in terms of something that really, I think, an event that moved the collaborative process between the library and our department well down the road in a way that I don't know that anything else could have."

Several commented about the IL Model, which was probably what the previous comment referred to, "I think with the model that we came up with…I thought that was really the best thing that came out of this." One commented specifically about the last session where the action plan was developed, "like the last session, I loved the last session. If it's practical, if I can see how it's useful." For that participant, the previous session where the learning goals were mapped to standards, was too detail-oriented, "too many angels dancing on the head of a pin," according to her. But others felt the mapping was a useful process. One commented, "the classroom activities, they were really good, and I thought, especially this one time when we stayed over... that one was, I felt, very informative and I felt the group spirit developing and a lot of ideas being exchanged and people really getting into the discussion." One observed, "I understood collaboration before and this was just a really nice example of it being put into practice as to how people could collaborate in the best possible way...so we came up with ideas we very…likely would not have come up with individually."

Participants commented positively about the knowledge they gained from each other, student needs, and conceptual understanding of collaborative inquiry, and IL. Referring to gains

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in knowledge, another participant said, "we discovered a new concept together… information literacy, because we had sort of discovered it ourselves, what it means, and what we think about it, and hopefully we came close to the sequence of that concept in literature." Another stated that "the workshop was a really nice example as to how to put it [IL] into practice in terms of again, people going together, generating ideas and learning about what this information literacy thing is and how to actually use it in our curriculum." Several redefined collaborative learning based on what had happened in the workshop, "Yeah, I mean kind of what we were doing was I would see as being collaborative learning, that building off of each other's knowledge and expertise."

Participants also enjoyed and were surprised by how well the collaborative learning experience had functioned. In her post-interview, a participant described an interaction:

"one of the faculty who was complaining the loudest…came to me this week and said, 'you should have been at our last meeting…I loved it, and we ended in a really good place;' so, at least for that person who was really uncomfortable from the very beginning, it came all the way…full circle."

One participant said, "I just saw more active synergy going on than I expected." Another, speaking of a relationship within her small group, said, we didn't butt heads on anything. We just sort of fed on each other's like stuff, you know, and it was like, 'Oh, this is weird. I like this.' And B--- was going, 'Yeah, that's really good.'" Another expanded,

"I liked the fact that, in collaborating, we would do it in smaller groups…we were collaborating on a particular topic that we were given, and we had the chance to discuss it in the small group and then bring it to the larger group, and everybody shared and then we all bought into [it]… And people felt very free…back and forth to each other…"

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In addition to accolades, participants also offered constructive criticism. For example, they overwhelmingly disliked the use of the course management system, preferring the time when, midstream, I allowed them to submit their ideas via email. One commented on the specific platform, the course management system, that was chosen for online, asynchronous chat, "I feel like with faculty, the [course management system] really doesn't work; [it] requires tremendous dedication; …and I tried, but obviously I wasn't dedicated enough." Only one participant expressed contentment at the use of an online platform to post information, saying that he liked "the collaboration online, um, which I did appreciate, because I can go back and kind of refer to it, instead of, 'Oh what did we say back then last week?'" In general, participant feelings about the online experience were problematic. One concluded that, "the face-to-face aspects were much more valuable than the online one."

In the final session, I asked participants to reflect on why they felt the online component had not worked. Some indicated that they could see online collaboration working (via email) much better when they moved into the next stage of collaboration where they planned to work together in smaller groups to design course assignments and other integrating mechanisms to bring IL into their curriculum. One proposed that my research design could perhaps be revised to incorporate an implementation stage where faculty members and librarians would work together to operationalize within the curriculum what they had thus far done. She went on to suggest that the online portion might work best in this second phase and should not be judged as having failed but as having been placed too early in the collaborative process.

Finally, a few participants spoke to issues of process. One confirmed that facilitator communication via email with the participants in between sessions for organizational and encouragement purposes were clear, but too long. She shared that when she needed to write long

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emails to the faculty members in her department she sometimes included a sentence midway through that they should come to her office to pick up a chocolate candy bar. When some received chocolate and others didn't and complained, she pointed them to the correspondence.

In terms of content, a few participants said they felt uncomfortable in the beginning because I did not explain to them where I was hoping we would end up. One suggested that, in future, I should explain that, for the integrity of the research, I could not tell them where I hoped they would end up but that I was confident that it would be a good place and that I was asking them to trust me as they worked through the ambiguity. One also said she appreciated what she had learned from the presentations early in the workshop. Another commented on the usefulness of the readings, while another complained about the technical nature of them.

Finally, there was strong criticism of the time commitment needed to complete the workshop. At least four participants said that they had not realized how much time it would take, although this was pointed out to them when they agreed to participate. One specifically and graphically stated, "And it felt sort of like…you get your foot in the door and all of a sudden, [the researcher] owns our entire spring quarter of Fridays, and so forth (laughs)." Others found scheduling during the last term of the year or the first or last month of the term problematic.

Participant experience is shown in Table 6.10 and is divided between positivity and constructive suggestions. These will inform recommendations in the final chapter of this study.

Two librarian and two social sciences department faculty member participants thought that the model could be used to start similar conversations with other departments on campus. A few of the participants suggested that if this were to roll out to other departments, we could ask for volunteers from their faculties to join the team to publish interdisciplinary research.

Table 6.10. Summary of Participant Evaluation of the Workshop

Things Participants Liked	Suggestions for Improvement
The collaboration was "fluid," there was "synergy," they "fed" off one another's ideas; there was no discord	Face-to-face was more important than the online component to build synergy, while the online component seemed like duplication
The experience helped to develop collaboration between departments that couldn't have happened in other ways	Technical formats were difficult to use. Participants preferred technologies that they regularly used (email, social media)
Participants were pleasantly surprised that the process sustained willing participation	The online component, if using familiar technology, might work better in the next stage, which fell outside of the research study
Participants gained better understanding of each other and of student needs	The workshop fell at a busy time during the last term of the school year
Collaborative inquiry learning through group work was a good format	Expected time commitment was not well understood up front
Processes and guidance were clear; presentations were good	Some felt uncomfortable with the ambiguity of what was happening early in the process

Summary

Data sources included interviews, questionnaires, transcripts of sessions, and artifacts produced by the participants. Findings were derived deductively from these sources. Evidence of CoI presences and metacognition were found, along with a shared understanding of IL. Outcomes of the asynchronous and face-to-face components were discussed as were emotional responses. These findings and those of the exploratory focus groups' findings in chapter five are discussed in chapter seven. I also propose design and theoretical advances in chapter seven, when I draw conclusions and present recommendations.

Chapter Seven: Discussion, Conclusions and Recommendations

Introduction

To situate the discussion, this design-based study had two points of data collection, as shown in Figure 7.1. The first point of data collection occurred during phase one with the overall exploration of the problem and of the university learning environment where the design was to be implemented. The second was during the implementation of the learning environment design (the FacLibCoI workshop) in phase three, which had been designed in phase two.
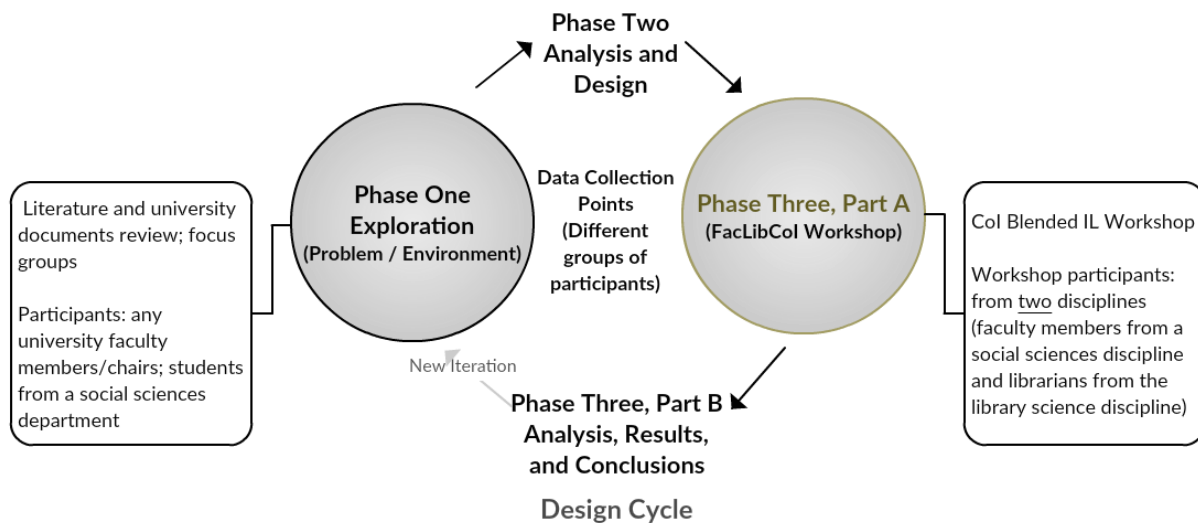
Figure 7.1. Diagram of Study Highlighting Data Collection Points

During the phase one exploratory data collection, I conducted focus groups, which were drawn from among faculty members/librarians and department chairs across the entire university and from students who were enrolled in the social sciences department that participated in the FacLibCoI. In the FacLibCoI workshop (phase three of this study), participants were university faculty members from a social sciences department and university librarians.

Findings from phase one exploration were reported in chapter five. Chapter six included findings from the phase three implementation of the FacLibCoI workshop. In this final chapter, I

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discuss these findings and present the conclusions and recommendations for each. Recommendations fall into three categories, design refinement, knowledge advancement, and professional application, and are thus indicated in each instance.

Phase One Focus Groups: Discussion, Conclusions, and Recommendations

Findings from the exploratory focus groups with students from the social sciences department and faculty members from across the university informed the content and discussions of the FacLibCoI workshop. I present a summary of these exploratory findings in Table 7.1.

Table 7.1. Summarized Findings of Exploratory Focus Groups

1. Disciplinary differences in how faculty members and chairs across the university defined research and scholarship were evident in cross-disciplinary dialogue. In some disciplines, research was defined as discovery, while in others it was defined as elegant presentation of theory or creative production of something beautiful or useful.
2. Students enjoyed social interactions in academic and community assignments and associated this with their professional identity; this trait needs to be considered when teaching IL to students from this discipline.
3. The value of library collections, services, and roles are dependent upon perception; students who perceived the library to have nothing of value chose not to use it even if it did have valuable resources that pertained to their research topics.
4. Students gained knowledge, but experienced mixed feelings about information discovery and use in their writing-sequence courses, often considering it as boring and not helping them to locate confirmatory sources for their writing assignments. They did not understand the point of a literature search being to discover new information and perhaps inform their perspective.
5. Research was perceived differently by students and faculty members and chairs. Faculty members and chairs viewed it broadly as discovery, students as completing academic assignments.
6. There was a gap between what it was assumed students should know and what they did know about IL. Those who had gone through the university's writing-sequence courses had an intellectual knowledge of how to conduct literature search and evaluation, but they possessed novice skills. Students who had not taken the writing-sequence courses had little intellectual knowledge about IL and even fewer skills.
7. Challenges to learning included misconceptions about the purpose of research, the availability and quality of sources, and about their search capabilities. These easily derailed students in their research process as did frustration when they attempted to use the search techniques that had been demonstrated to them to find confirmatory sources.

Four themes emerged from these exploratory focus group findings. First, research is defined within disciplinary spaces (Findings 1, 5). Second, there is need for a cohesive transition for IL learning between the undergraduate writing-sequence courses and the upper division disciplinary courses (Findings 5, 6, 7). Third, learning experience is as important as process (Findings 2, 3, 4, 7). And fourth, student misconceptions lead to negative attitudes and should be addressed early in the learning process (Findings 5,7). These are discussed in the following section, and conclusions and recommendations are presented for each.

Research is defined within disciplinary spaces (Findings 1, 5). Focus group data revealed a contextual component to research and the IL processes. This fits Lloyd's (2011) contention that IL is contextually-based. Specifically, when asked to define research and scholarship, faculty members and chairs defined and discussed research and scholarship as well as student knowledge needs broadly as discovery but then in terms that were unique to their disciplines. Meanwhile, student comments about the processes experienced conducting literature-based research revealed that they experienced basic discipline-related knowledge gaps because they had not yet enrolled in disciplinary classes. Unfortunately, findings also showed that even when students had gained some disciplinary knowledge once enrolled in upper-division courses, the misconceptions that had originally occurred due to the gaps in knowledge did not disappear. This may have contributed to student difficulties in transferring the IL knowledge they had gained in their writing-sequence courses to their disciplinary work.

Another problem was that some students seemed unaware of the disciplinary databases available to them. Even if they were aware that they had choices in databases, they found it hard "to identify the best search engine [meaning database]." One student confessed, "I tend to use

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[interdisciplinary databases she had used in general education courses]. It's hard to decipher which one I need to search in."

Conclusion. If research is tied to context and research and IL concepts are best learned within the contextualized setting (Julien, 2016; Lloyd, 2011), one would want to consider how to better scaffold and transition students more quickly into discipline-based IL work.

Recommendations towards professional application. The recommendations for this finding are related to active and situated learning:

1. Consider introducing active learning strategies (Bereiter & Scardamalia, 1985; Collins & Kapur, 2014; Garrison, 2016; Lu et al., 2014) such as problem-based learning, cognitive apprenticeship or collaborative inquiry from learning sciences research into the writing-sequence IL modules to encourage the formation of knowledge connections.

2. Place more emphasis on disciplinary resources in the writing sequence courses.

These recommendations would require liaising with writing-sequence faculty and redesigning the IL modules. Given that the current program has not seen major revision for a few years, it would be a reasonable proposal to the English Department and could probably be redesigned in time for implementation the following year.

General studies and discipline IL lack a transitional piece (Findings 5, 6, 7). This problem is two-fold. First, transfer students coming into the university at the point of incorporating into discipline-level courses are disadvantaged because they are not familiar with the library or the research and writing processes expected of them. One student admitted, "This is the first time tonight [that] I've been in the library since I've been here; it's the way it goes; best information is here, but I'm not very familiar with it." Additionally, transfer students who

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had not taken the writing-sequence course equivalents at their previous school seemed to have less basic knowledge of library resources, search strategies, and appropriate writing processes.

Meanwhile, students who had taken the writing-sequence courses indicated that they wished they had had more opportunity to practice the skills they were learning in these classes. Their comments showed that they brought feelings of uncertainty from the writing-sequence courses into their discipline. This, along with misconceptions such as confirmation bias or confusion when identifying appropriate resources and search strategies, may have caused them difficulty at the time of applying their novice skills in disciplinary settings.

Feelings of anxiety and cognitive uncertainty are normal parts of the exploration phase, according to Kuhlthau (2013). Thus, student-expressed feelings of uncertainty might be traceable to the natural disparity between a good foundational knowledge of how literature review and scholarly writing should occur and the novice skills that students were trying to bring to the process. Kuhlthau (2008) noted that it is important to help students move beyond this unresolved stage before they get frustrated and choose to exit the learning situation. This is the "zone of intervention," (2008) wherein the teacher (and/or librarian) would scaffold students through the uncertainty and on to resolution.

Conclusion. Students seemed to have difficulty incorporating IL knowledge into their discipline courses due in part to lack of IL knowledge (in the case of transfer students) or feelings of uncertainty (in the case of students who had completed IL instruction in the writing-sequence courses). A joint librarian-disciplinary department approach could be the link between what students learn in their lower-level courses and how they transition into their discipline areas. During this stage of exploratory research, I wrote in my research notes, "What would

cooperative efforts between faculty and librarians need to look like to solve these problems? The first iteration of the FacLibCoI workshop is a good start towards answering that question.

Recommendations towards professional application. Two recommendations are provided to help scaffold students in IL as they transition to their disciplinary courses:

1. Librarians and disciplinary faculty should find ways to build a strong IL transition piece at the disciplinary level.
2. Consider an online *crash course* in IL for transfer students that could be provided to them during their department acceptance or orientation process.

It might be possible for the library to expand its subject electronic LibGuides, in consultation with various departments and then make these available to the departments for inclusion within an identified disciplinary course that students take early in their programs. An equivalent electronic guide for transfer students could also be devised. This would require liaison work with disciplines and subsequent design. With the drafting of an action plan that incorporated a timeline and assignments for reaching out in a systematic manner to the various disciplines across the university campus the plan is doable and scalable as it takes advantage of existing library software tools and existing liaison assignments.

Learning Experience is as important as process (Findings 2, 3, 4, 7). Quite apart from the knowledge that students gained in their writing-sequence courses, which corresponded quite well to Kuhlthau's (2013) ISP Framework, certain knowledge gaps led to misconceptions that impacted student attitudes and learning. Students *felt* that they didn't experience success in their search strategies during their writing-sequence courses and beyond. "[The] biggest thing I *struggle with* [emphasis added] is when I go to a database and I have to type in keywords, they never get me where I want to ...it's *hard* [emphasis added] to find good keywords to find the

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articles that I know are there," and "it came up with like 2,000 results. It was *random and dumb* [emphasis added]." These *feelings* of uncertainty also extended to their writing even a year beyond their writing-sequence courses. Students passionately discussed current difficulties in determining how to build paragraphs, write an introduction or thesis statement or cite sources.

Conclusion. Students seemed to be stuck, as it were, in an unresolved state of anxiousness that likely began in their writing-sequence courses and carried over into their current research and writing experiences. Although the librarian and professor provided opportunity for one-on-one assistance in the writing-sequence courses, this did not, in all cases, successfully provide a zone of intervention (Kuhlthau, 2008) and did not help students move through cognitive uncertainty to resolution.

Recommendation towards professional application. Consider ways in which to incorporate a zone of intervention when teaching IL. Various ways come to mind, such as the librarian shedding the *sage on the stage* role for that of a *learning partner*. Covering only the most necessary IL content (and saving the rest for later points of contact within disciplinary classes) would allow for more guided hands-on practice time. Perhaps a buddy system could be implemented within the class among students from similar disciplines so that they could learn the appropriate databases and practice disciplinary search strategies together. A few brainstorming sessions among the librarians and the writing professors could flesh out the most viable options.

Student misconceptions lead to negative attitudes (Findings 5, 7). Often, students never grasped that the purpose of a research paper was exploration and discovery. They did not understand, even when already enrolled within their discipline area, that a literature search is an opportunity to engage with experts on a topic through those experts' writings. They didn't seem to understand the importance of interrogating the literature, comparing it with their point of view,

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and constructing greater understanding. Instead, students seemed to believe that they could write down their thoughts (in other words, write their paper first) and then go to the literature to find quotes "to twist and maneuver." Some students did, at least, engage in a literature search while actively writing their paper, but did so to find confirmatory articles that supported their ideas. Either way, a fundamental misunderstanding of the reason for a literature review led to frustrating learning experiences for them.

A fundamental problem with general education courses as practiced in many American universities (and where information literacy is typically introduced) is this artificial separation wherein students are expected to learn the standards and processes of inquiry in higher education in isolation from their discipline and its fundamental philosophical underpinnings. One faculty member in the university environmental scan focus groups observed that students do not learn to love learning, to value the process, or "to care [and] to know that it matters…."

Because many students have come to view these types of introductory classes as "fluff," or as something disconnected from anything important, they may also view IL in similar light. Teaching students the mechanics of literature search and academic writing before their disciplinary professors help them to construct their own philosophical understanding of research as systematic discovery within their discipline can set them up for frustration at various levels. Students misunderstand the purpose of the literature search and what they should expect from their search results. This study shows that under these conditions, students may develop negative attitudes towards the process which will further handicap them as they engage in information literacy in the future. Data from the student focus groups shows that librarians and faculty members must be concerned for the way that students *FIRST experience* IL and research at the

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college level. Misconceptions arise easily, can lead to frustration and poor outcomes, and can make it hard to re-establish trust in the process.

Given that the university system separates general education and disciplinary courses, librarians must find ways to engage faculty members in combatting student disenchantment in these lower levels and within the discipline area. Elmborg (2010) asserted that critical IL within a constructivist learning approach might be a better way to engage adult students as it could provide them with reasons for caring and for personal engagement. He also proposed that librarians fill the role of a "co-learner," who poses problems and engages in inquiry together with students to solve the problems through the use of information (Elmborg, 2012). This coincides with the work of other IL theorists who view IL as being socioculturally-constructed (Lloyd, 2007; Wang et al., 2011), and is supported by constructs such as communities of practice or communities of inquiry developed within learning sciences (Garrison, 2016; Wenger, 2010). Dewey's organism-environment transactional approach to education comes to mind when considering a social constructivist solution (see references to Dewey and socioconstructivism in Swan & Ice, 2010) as is Vygotsky's social constructivist ideas including the zone of proximal development (Confrey, 2006).

Conclusion. Both Kuhlthau's (1991) ISP Framework, which helps to make visible a student's experience (thoughts, feelings, action) across information search stages and Bruce & Hughes' (2010) Informed Learning construct, which highlights a learner's experience with information processes, may shed light on how librarians could address student experience and alleviate cognitive insecurities and negative feelings. Properly applied, these constructs could also go some way towards helping to dissipate high levels of stress that students expressed. I posit that when we teach IL and general education, we need to address the affective side of

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learning, not just the academic processes. Ultimately, the goal is to troubleshoot situations related to IL and research that lead to negative attitudes and that might potentially interfere with future trust in the library and an appreciation for systematic, disciplinary discovery.

Recommendation towards professional application. Conduct an IL and learning sciences literature review on how to engage students in active exploration and discovery as opposed to teaching IL as a series of tools and strategies. Invite general studies faculty and librarians to attend a symposium where these issues are presented and discussed. Based on feedback from the symposium, consider what solutions might be implemented across general studies courses.

Phase Three FacLibCoI Workshop

In this section, I build upon the findings that were derived from the implementation of the FacLibCoI workshop between social sciences department faculty members and librarians. Data was collected through pre- and post-interviews with each participant through a Likert-scale CoI and Shared Metacognition questionnaire and through session transcripts. Evidence of shared understanding through participant-produced artifacts rounded out the data collection. Findings from this phase three data were presented in chapter six and are summarized in Table 7.2. These major themes will be discussed in the remainder of this section and conclusions drawn.

CoI presences and metacognition developed in the workshop design. A summary of mean and standard deviation scores from the analysis of the questionnaire responses showed clearly that all three CoI presences and social metacognition were established through the CoI workshop. Specifically, social, cognitive, and teaching presence grew and remained stable over time. Social metacognition grew strongly between sessions 1 and 2 and then declined slightly across the remainder of the workshop. By the end of the workshop, all presences and

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Table 7.2. Summarized Findings from the CoI Blended Workshop

1. A CoI was established. All presences (teaching, social and cognitive) as well as shared metacognition were achieved.
2. Shared understanding around IL emerged as participants engaged in collaborative inquiry learning. This shared understanding enabled them to create a pathway for collaboration around IL. Participant evaluation of the workshop revealed that participants learned more about each other and about their students, they experienced synergy through collaborative learning that sustained willing participation in the face-to-face component of the workshop, and they identified how IL and critical thinking within their discipline went *hand-in-glove*.
3. Asynchronous participation was not sustainable throughout the four sessions of the workshop. Participants disliked the electronic platforms used, and time was a negative factor for them.
4. Emotional reactions of some participants were important to the way they experienced the outcomes and some of these emotional reactions seemed unrelated to the workshop experience, itself.
5. In addition to the shared understanding that participants gained, several design issues were identified that may lead to building changes into future iterations. These included (a) face-to-face sessions supported synergy but online ones did not; (b) technical formats were difficult to use; (c) familiar technologies might work better, (d) the workshop coincided with busy times in the school year; (e) participants did not understand the time commitment needed; (f) ambiguity of learning goals early on made some uncomfortable.

metacognition remained within the 3.2 to 3.6 mean range, where 3.0 to 3.9 indicated agreement.

Standard deviations for all presences and metacognition stayed within one standard deviation

throughout the workshop.

The means for the various presences in this study showed that the presences developed

together over time, although a relationship could not be concluded. Nevertheless, results show

growth of cognitive presence from a mean of 2.9 to 3.3 while social presence was strong in the

beginning and continued to strengthen over time (means ranging from 3.4 to 3.6). This aligns

with findings that show Cognitive Presence advancing when social presence is demonstrated

(Garrison, 2017).

Literature also shows that teaching presence drives social and cognitive presence (2017).

My results show that means for teaching presence were equal to or higher than those of social

presence and higher than cognitive presence. This is worth further study to better clarify the

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relationship between teaching presence and the other two presences within this type of implementation.

In the case of social presence, Garrison (2017) noted that it typically decreases over time as other presences increase. In this study, social presence rose gradually and stabilized (session one had a social presence mean of 3.4; in sessions two and three, it rose to 3.5 and then 3.6 where it remained in session four). This gradual rise and stabilization does not coincide with predictions. However, analysis of participant dialogue showed that, in line with Garrison (2017), social presence shifted from interpersonal relationships to interaction focused around cognitive work, which is the desired outcome.

The shared metacognition construct of the CoI theoretical framework includes monitoring and managing activities for self and the collaborative learning group. In this study, dialogue and comments indicated higher levels of shared metacognition than what the mean scores showed in the instrument. While scores increased overall, they remained the lowest of all the means at 3.2. Qualitative data seems to indicate that participants were engaging in metacognitive thought processes but that these processes may not have been explicitly visible to them when they answered the questionnaire. It also appears that a few of the items in the Shared Metacognition Questionnaire (Garrison, 2017) use language that goes against the philosophy and culture of librarians and a few might not seem appropriate to faculty in the context of faculty peers (e.g. I *challenge* the perspectives of others; I *monitor* the learning of others). This perhaps caused the slightly lower mean scores.

When I chose to use the CoI and Metacognition scales, I based it in the scale published in Arbaugh et al. (2008). I applied a four-point forced response scale, where 1=Strongly Disagree and 4=Strongly Agree. The response scale did not include a Not Applicable (NA) option. When I

summarized data at an item-by-item level by presences and by presence categories, it became clear that means on some outlier items dropped below 3.0 (the point on the scale that indicated agreement), which brought down the overall mean. Likewise, as expected, standard deviations rose towards 1.0 for some categories or presences when individual items rose above 1.0. In some of these instances, lower means would be considered normal. CoI presences and metacognition, for example, develop over time and would not be as visible in the first session of the workshop. In other cases, however, it seems likely that anomalous scores were influenced by the lack of an NA option on the response scale of the survey. Some participants added written notes to their surveys indicating as much.

Conclusions. Five conclusions have been drawn from this finding:

1. The FacLibCoI workshop design and the CoI Theoretical Framework upon which it was based supported the development of social, cognitive, and teaching presence as well as shared metacognition. It also broadly maintained the presences throughout the workshop.

2. The four-point response scale of the questionnaire instrument was problematic and may have led to confusing results.

3. Some of the terminology used in the shared metacognition items might have been confusing and consideration should be given to address this.

4. The questionnaire was too long. By combining the CoI and Shared Metacognition scales and adding a few questions of my own, the survey became too long, and some participants complained, especially since they were asked to fill it out multiple times.

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5. With one possible exception, results reveal characteristics that should be studied for correlative relationships in future iterations because relationships have been shown in the literature as referenced by Garrison (2017).

Recommendations towards knowledge advancement. The recommendations for this item refer to the survey instrument and how it is administered.

1. In future design iterations, the researcher should apply the current published versions of the CoI and Shared Metacognition Questionnaires, including the published response scale instead of the 4-point, forced choice scale used.

2. Add an NA option to the response scale if the questionnaires are to be administered at points in the CoI where certain presences are unlikely to be visible.

3. To avoid participant survey fatigue, consider implementing only certain presence scales at one time, typically the ones under study at a particular time during the CoI (for example, administer only social presence scale after first session).

4. Refrain from administering the shared metacognition scale until later in the implementation, when it has had time to develop.

These changes would be incorporated in a subsequent iteration and would be part of the normal design revision. As such, they could be accomplished in due course without needing to involve anyone other than the research team.

Collaborative inquiry learning led to shared understanding around IL. The goal of this study was to see whether a blended CoI design could help faculty members and librarians forge a shared understanding around IL. Shared understanding is a key goal of a CoI. Garrison (2016) explains that personal meaning and shared understanding develop within a learning environment of inquiry and collaborative discourse. However, most of the CoI literature views

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shared understanding from the perspective of ultimately contributing toward individual learning. In this study, while the goal of reaching shared understanding was necessarily based on individual learning, its focus remained firmly in collectively built and shared knowledge. In this sense, this study highlights the potential power of a CoI to establish group-based learning as well as individual learning and adds a new focus on shared understanding as the desired outcome. The study also adds to the few CoI studies conducted among faculty members.

This study showed that the CoI with its collaborative inquiry-based approaches can support the development of shared understanding around IL among faculty members and librarians. Participants were able to tap into their disciplinary philosophies, culture, and knowledge, share these with each other, and explore IL together while building a new, more expansive understanding of IL that they mutually shared. This shared understanding allowed them to create a learning pathway for their students that was based on a disciplinary IL Model, which they created together. Further, participants were able to determine and map student learning goals to IL and disciplinary standards and develop an action plan to integrate IL within the departmental curriculum.

The social sciences IL Model was considered by participants as the crowning act of their effort because it grew out of their shared discourse around IL, research, and critical thinking. The outcomes did require strong facilitation, and it helped that I as the researcher was a subject expert in one of the discipline areas [in my case, library science]. Nevertheless, the faculty members and librarians were the ones working together.

Individually, participant understanding of information literacy expanded (even for the librarians for which information literacy is their disciplinary strength). Additionally, as a cohesive group formed across the two disciplines (librarians and social sciences department

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faculty members), participants created a pathway forward towards integrated IL within the social sciences discipline. This is congruent with the literature, where Garrison (2016) acknowledges that collaboration can lead to "collective" knowledge (p. 4).

The CoI workshop spanned two months. In that respect, it spanned a relatively short time compared to other faculty member communities of inquiry (or communities of practice) that have been reported in the literature and which typically span a full semester or even an academic year (Paskevicius & Bortolin, 2016; Vaughan & Garrison, 2006). Given that in this short time shared understanding between librarians and a group of social sciences faculty members developed is promising from the point of view of scaling the FacLibCoI across the university.

Even more promising is that this collaborative inquiry led to the collective realization that IL is an integral part of the disciplinary knowledge that students need and that it can be diffused across the discipline's curriculum. The collective knowledge (and collective will) that developed to integrate information literacy within the curriculum of the department (as opposed to the typical one-shot invitations into individual classes) is an outcome which, if rolled out across other departments, has the potential to move faculty members and librarians to a place of collectively helping students engage with information.

This finding aligns with Bereiter and Scardamalia's (2014) work on knowledge building where they point to its "product," which is "the creation of intellectual property or something analogous to it" and is different from "what people individually know" (p. 41). Dr. D. Randy Garrison (personal communication, April 17, 2018) confirmed that this is congruent with the CoI theoretical framework if one remembers that the personal and shared worlds cannot be separated since individual learning is necessarily tied into discourse and therefore part of shared understanding. Bereiter and Scardamalia (2014) further explain that co-generated products (in

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the case of this study, the IL Model, mapped learning goals, action plan) add to the group's ability to make further knowledge advances and to further develop solutions.

Enyedy and Stevens (2014) divide literature on collaboration within learning sciences into four groups. The fourth, collaboration-as-learning, has a collective unit of activity focus rather than an individual one. Functioning as a unit of activity consisting of collectively-developed knowledge and systems produces advances in knowledge and activity that are greater than what the individual members could have learned or produced on their own. This synergistic effect was noted by participants in this FacLibCoI workshop. Further, this synergistic energy seemed to help participants self-identify as a collaborative group that shared a knowledge uniquely their own (Barab & Duffy, 2000). Collaborative design-thinking allowed them to devise contextualized ways in which to integrate information literacy across their disciplinary curriculum.

In design thinking, for example, creativity is often considered a collaborative experience rather than an individual one, and the process of creation involves an iterative style of back-and-forth exchanges (Halverson & Sheridan, 2014). Changing perspective is encouraged through critique, and ultimately leads to a "collective state of knowledge" (Bereiter & Scardamalia, 2014, p. 41; Halverson & Sheridan, 2014), which in turn supports collective action.

In the FacLibCoI workshop, the CoI design seemed to produce a synergy that led to contextualized, shared knowledge about IL within the social sciences discipline. The IL Model that resulted was bigger than the understanding that either librarians or faculty members had of IL on their own. This is congruent with the CoI framework's shared world within the Practical Inquiry Model (again, confirmed with Dr. D. Randy Garrison through personal communication, April 17, 2018). In my mind, the arrival at shared understanding that is greater than the

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understanding that either side could contribute represents resolution, a category within the CoI's cognitive presence that can sometimes be difficult to achieve.

Conclusion. Co-developed artifacts such as a social sciences IL Model, mapped learning goals, and an action plan for implementation across the social sciences department are evidence of co-constructed, shared understanding of IL that developed among the participants. This shared understanding, which resulted in a potentially-public piece of intellectual property, represents a form of collective knowledge, which was new, and which was greater than the summation of the individual participants' knowledge. The CoI framework clearly supported collaborative learning.

Recommendations towards design refinement. The recommendations leverage the work done in this first iteration to reach out to other faculty groups:

1. Use the artifacts, especially the IL Model to engage other departments on the campus and perhaps consider how they might participate towards refining the model.

2. Present opportunities for cross-disciplinary research and possible publication afterwards.

These recommendations were unimaginable before the implementation of the FacLibCoI. Yet, they were suggestions that came from the participants themselves, and therefore stand a higher chance of successful implementation with the proper planning.

Asynchronous blended participation could not be sustained. During a group discussion and in their one-on-one, post-workshop interviews, several of the participants expressed their dissatisfaction with the online component. The online component was designed as the piece that would help to maintain collaboration between the face-to-face sessions. The electronic, asynchronous discussions were meant to provide a means to stimulate follow-up

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discussion from the previous face-to-face session and to help prepare the groundwork for the next session.

Participants shared that they tried to comply in the beginning but found the technological platforms unfamiliar. The platforms were selected because they were used by the two departments. The social sciences department used the university's course management system (CMS) for online classes, but it seems that most of the faculty member participants had never actually tried to use it from a student's role nor had they utilized the discussion board. The platform used to store documents was the library guide software used by librarians. Again, it seems that this was not a typical place for librarians to store or access documents although they used it for publishing answers to patron questions. Several suggested that had more typical platforms been used (email, Google Docs, blogging software, social media), they would have found it easier to engage.

This result is not unusual. Other faculty member CoI studies that used an electronic discussion element also showed lower uptake in the electronic discussion piece as compared with face-to-face discussion. Paskevicius and Bortolin (2016) conducted a nine-month faculty development CoI which had less online participation than face-to-face participation. Additionally, participation slowed as implementation progressed. According to their results, less than a third of participants could be considered as high participators in the online portion and more than one third did not meaningfully participate at all. Their participants reported that they saw the online portion as less important and did not feel that it added value. One of the participants in this study commented the same.

Back in early faculty CoI studies, Vaughan and Garrison (2005) reported that their faculty participants did not attach the same value to online as to face-to-face, and their assigning

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of codes to face-to-face and online discussions revealed far fewer codes for online discussion. Further, they reported that participants admitted that it was harder to commit to the online component than to the face-to-face discussions.

It also seemed that in this study, time limitations that were external to the FacLibCoI workshop elicited negative emotions, but these were only marginally directed towards the face-to-face sessions and primarily towards the online component. External factors included things like the time of the academic year, the time of the academic term, and busy schedules. This type of complaint seems to be a typical issue for faculty members. Latz & Rediger (2015) for example, found that community college faculty members reported that during busy times of year and job types of transitions things were less manageable, overall. Paskevicius & Bortolin (2016) reported that faculty members in an online professional development setting found it hard to participate due to time factors. Meanwhile, in a study by Sanford & Kinch (2015), faculty development professionals listed the ability to adapt to increased work obligations among four important topics for faculty professional development initiatives.

The literature on blended learning highlights various types of technology and designs that have been used successfully to engage participants in collaborative inquiry learning as opposed to asynchronous, online discussion. Bereiter and Scardamalia (2014), for example, developed a knowledge-building software called Knowledge Forum that allowed a collaborating group to build graphics, add notes and links, and facilitate collaborative knowledge building, critical thinking, and synthesis. Others used video-creation solutions that allowed groups to document problem-solving techniques and experiences of others to share examples or to engage in mentoring activities (Cohn, Stewart, Harwood Theisen, & Comins, 2016; Hoffman & Leafstedt, 2014; Stevens, 2007). Still others used blogs and group wikis with mixed success to assist in

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collaborative endeavors (Hoffman & Leafstedt, 2014; Sullivan et al., 2014) as well as technologies that allowed for mash-up content creation (content that can be easily repurposed and shared in different ways).

While participants in this study indicated that online discussion via email or some other form of social media with which they were familiar would more likely succeed if they were to engage in planning for implementation of IL in their classes, I believe that a redesign that provides faculty members and librarians the opportunity to experiment with and select various support technologies to help their collaborative learning processes and which they might then leverage for use with their students in their own classes might stand a chance of succeeding. Had the group had knowledge-building software available, they might have been able to draw their discipline IL Model directly into the software rather than on a paper flipchart that needed to be photographed to be disseminated and which cannot be edited or manipulated. The use of technology would need to be carefully designed and support would need to be built for those who are not eager adopters. But it could serve as a motivator… "come and gain a technology you could use with your students."

Conclusion. The collaborative, asynchronous online component as designed did not work well. The failure was traced, at least in part, to the use of technology that was unfamiliar to the participants. Another factor was that the online element did not seem to add value in the minds of the participants.

Recommendations towards knowledge advancement—add to theory of CoI implementation with faculty. Recommendations included:

1. Consider other forms of integrative technologies that might add more perceived value and could easily fit within a blended design.

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2. Negotiate with participants the technologies to be used (from a select group of options that were previously identified through focus group interviews with university-wide faculty members).

In a future design iteration, it would be helpful to take the necessary time to liaise with technology experts and investigate the various learning technology options that are available. Proper planning would need to include a more nuanced understanding of faculty member knowledge gaps related to technology.

Participant emotions affected how they experienced the FacLibCoI workshop. Some participants experienced strong individual emotional response to an element of the FacLibCoI workshop design (specifically online dialogue) or to unrelated factors or experiences that then affected their emotional response to the workshop. For example, prior commitments unrelated to the FacLibCoI caused negative reaction to the time commitment even when participants had been fully informed in advance of the projected time required. Cleveland-Innes and Campbell (2012) noted the strong influence that emotion had within the online environment upon participant thought processes. This was so much the case that Cleveland-Innes and Campbell (2012) proposed the addition of an emotional presence to the CoI theoretical framework. Garrison (2017) addresses this challenge to the three-presence CoI theoretical framework by arguing that an emotional presence adds additional complexity to a model that has been rigorously confirmed. Further, it risks splitting the model unnecessarily since emotion is already accommodated within the existing social presence.

Given my own findings that show emotional responses may emanate from outside of social presence, I consulted with Dr. D. Randy Garrison (personal communication, March 27, 2018) who confirmed that the emotional or "entering variable" would be more of a design issue

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and could be addressed at that level. He also pointed out that emotion is a pervasive influence that is an important part of social presence but that needs to be considered across all the presences.

Conclusion. Emotional responses to the FacLibCoI workshop, itself, as well as to external factors are important and must be considered both in design and implementation stages.

Recommendation towards design refinement. To remove potential obstacles to learning and shared understanding, several recommendations are made:

1. Build a participatory brainstorming time into a face-to-face session so that participants take more of a driving role in their own learning goals.

2. Redesign the CoI implementation to be more participatory. For example, negotiate time commitment and schedule with the participants in the beginning.

3. Redesign, so that the CoI becomes a collaborative research project, not a class.

4. Conduct a review of literature on factors that motivate faculty members and librarians; potentially redesign for participation and engagement.

This level of redesign requires careful thought as it would give participants a greater role in the design. While empowering, this could increase the time factor, which was already a problem.

Several design issues were identified to build out changes in future iterations. Most of the items under this category have been discussed within the other findings above. One important item remains, however. A few of the participants indicated after the workshop ended that they felt uncomfortable with the ambiguity of early processes. I addressed this question with the social sciences department chair and she indicated that it would be a fairly easy thing to hold a brief discussion with the group at the very beginning to explain that so as not to condition them towards predetermined outcomes, I could not reveal up front exactly what we were going to be

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attempting to do, but that I had a plan in mind and that I was asking them to trust me. She felt that would be adequate to reassure nervous participants that they weren't wasting their time and it would also stimulate curiosity that might help to move them through the stage of ambiguity.

On the other hand, a more participatory focus would not hurt and might help the design in other ways. In such a case, it would be part of the design to share with the group the expectations going into the study, so that they could more actively consider and tweak the design for themselves as the FacLibCoI progressed. Further, I do not think it would harm the results to expect the group to participate in selecting the types of technology that they wished to use throughout and to set up a system for monitoring how well it was working and to collaboratively readdress and manage their choices if these proved to be problematic.

Blessinger and Carfora (2014) point out that inquiry-based learning benefits from participatory learning environments that require authentic problem solving. Vaughan and Garrison (2006) in their own experimental study of a blended CoI for faculty development described how direct instruction, which is a part of the CoI's teaching presence, began to occur among participants around the technology. That is, as time progressed, some of the faculty participants began assisting others in the use of the technology. This type of collaboration early in the workshop could help to foster group cohesion, which is part of social presence and crucial to group identity (Garrison, 2017).

Conclusion. Some faculty members expressed feelings of ambiguity that will need to be addressed in future designs and there are various ways of addressing this.

Recommendations towards design refinement. Recommendations include:

1. One recommendation would be for the facilitator to share with the participants the goals of the workshop to build a participatory partnership with them.

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2. Along those lines, another would be to include faculty as participatory members in some of the design decisions.

3. Provide scaffolding and support for new concepts and skills that are introduced into the FacLibCoI design. Things that come to mind are technology support or learning sciences concepts (CoI presences, collaborative inquiry, research, critical thinking)

A more participatory design is possible within a CoI, and this might be a direction to explore in the next iteration.

Additional to the findings, two overarching recommendations stand on their own. Both relate to professional application. Both would require significant effort up front but might result in increased scalability.

Recommendation towards design refinement. Build a sustainable model that can be implemented and scaled up across the university. Include an implementation phase where faculty members and librarians complete the action plan that they develop in the workshop. As part of this new phase, build an assessment of the implementation stage within the design. For sustainability, consider the possibility of conducting future CoI implementations with broader disciplinary groups instead of individual departments (e.g. combined group of social work, sociology, education, psychology faculty members rather than just one of the departments).

Recommendation towards design refinement. Build a research team to encourage sustainable advancement in design and potential scaling up of the FacLibCoI. This could foster cross-disciplinary faculty member research capacity across the university. The team might include faculty members with expertise in statistical analysis and learning technology design and implementation. The team could also include select former participants of previous FacLibCoI iterations. Set an initial agenda for the research team to:

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- Study related theory, such as situated IL, IL and disciplinary critical thinking, faculty member motivation, or CoI presences.

- Build an online site for access to free or university-provided technologies that could be used by participants in FacLibCoI's to create knowledge as well as share it with others.

- Consider how the IL Model already developed in this study might be introduced to other discipline departments to stimulate their shared understanding of IL.

- Begin to standardize data collection and analysis methods for future iterations.

- Solicit support from the university's academic administration and obtain ethics permission for all future iterations on campus so that any future publishing of later iterations may proceed unimpeded (Vaughan & Garrison, 2006).

Recommendations for the CoI theoretical framework and for DBR. This study was exploratory in nature and used the CoI theoretical framework to specifically engender shared understanding around the concept of IL. This is new. Although most online or blended classroom studies that have sought to implement a CoI have used collaborative inquiry to help students learn through the sharing of ideas, ultimately, personal meaning-making or learning was the goal. In this study, the goal was to develop an entirely new body of knowledge, that of shared understanding, which transcends and is greater than the sum of individual learning within the community. As such, I propose that the CoI theoretical framework can be used for much more than is currently suggested by the many course-based studies found in the literature. Further, I encourage other researchers to test the limits of the CoI in the realm of learning. Garrison (2017) supports this view when he states that within CoI research, "there needs to be more research associated with learning" (p. 67).

Second, some CoI studies suggested the need for an emotional presence (Cleveland-Innes & Campbell, 2012) or to re-examine social presence for an affective dimension (Shea et al., 2010). In this study, I found that emotional or affective reactions of my participants, sometimes to things external to the FacLibCoI, affected their interaction with the CoI. Taken together, these studies may indicate a need in the CoI literature to consider the external, environmental forces including the learner's affective or emotional state. The most recent diagram of the CoI framework (Garrison, 2017, p. 25) draws a circle around the exterior of the model to represent various environmental influences. More research attention should be given to how a learner's emotional state coming into the CoI affects her own and the group's collaborative inquiry.

When considering how the implementation of DBR worked in this study, I have two observations. First, the Generic Model, which I used, places implementation within the evaluation and reflection phase. I found this to be problematic because it was too much to consider all at once. In my mind, viewing implementation as its own phase with a smaller, internal analysis and reflection iterative loop throughout the intervention would have better fit the actual process as it unfolded in my study. Viewing implementation on its own would leave a larger analysis and reflection phase at the end of the overall iteration, the sole purpose of which would be to inform the next iteration.

Finally, from the perspective of doing a DBR study for a professional doctorate, I would advise a tight design; that is, the student should keep the design simple and not try to accomplish more than is possible in a relatively short time frame and as a lone researcher. Later, there will be time for future iterations where a design and research team can be assembled and scaling up may occur.

In Closing

Because research is defined within disciplinary spaces, there is need for a cohesive transition between writing-sequence courses and student experiences with finding and using library resources in their discipline area. The FacLibCoI workshop revealed that the library and the discipline departments can collaborate to build shared understanding of IL.

Regardless of where and how IL occurs, it is worth remembering that learning experience is as important as process. It is also important to address misconceptions before negative attitudes develop which tend to persist over time even when misconceptions are shown to be incorrect. Collaboration between faculty members and librarians should be sought when attempting to teach IL at the general studies level and within a student's discipline.

This study adds to the body of learning sciences literature specifically by applying the CoI Theoretical Framework to interdisciplinary groups of faculty. It provides an example of how the CoI framework can support both individual learning and a collective knowledge output. It also provides an example of a design-based, mixed methods approach to test the CoI framework. In technology-enhanced learning environments, it adds to the knowledge of faculty member opinions towards online discussion and suggests considering forms of technology other than discussion forums, specifically knowledge-building technologies.

These findings also contribute to the body of IL literature. The CoI is a viable theoretical framework for addressing collaboration and shared understanding between faculty members and librarians around IL. Design-based research is also viable, if time-consuming. It can be used by a knowledgeable library researcher to mentor research capacity among practitioners in the library profession by including them in the research team. Third, this study provides an example of how

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faculty members and librarians in a collaborative group might choose to implement IL within a disciplinary curriculum and across the university.

Overall, it is my hope that this study may help IL practitioners and researchers to consider faculty-librarian collaboration around IL beyond the one-shot session. It is an example of how shared understanding between librarians and disciplinary faculty might lead to situating IL within a student's discipline in contextualized and powerful ways.

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Unit Plan

Subject: [Discipline redacted] Faculty-Librarian Teaching Collaboration
Unit Title: [Discipline redacted] Faculty-Librarian Community of Inquiry Workshop
Date Range: [Two month period]

Unit Summary

The workshop is designed as a blended learning environment between discipline faculty and librarians. By the end of the unit, [redacted] faculty and librarians should demonstrate group cohesion, individual as well as group learning, and shared conceptual understanding of information literacy.

Goals

Participants will

- Demonstrate group cohesion and collaboration
- Demonstrate individual understanding of the concept of information literacy as it pertains to [discipline redacted] students
- Demonstrate individual understanding of the concepts of collaborative learning and teaching, and be able to provide examples of each
- Demonstrate a shared group understanding of information literacy, collaborative learning and collaborative teaching
- Synthesize shared understanding to produce recommendations for shared sponsorship of information literacy for [discipline redacted] students

Outcomes

Participants will:

- Engage in collaborative discourse leading to appropriate product solutions
- Develop a set of discussion protocols to be used in the workshop
- Create a group-defined definition of information literacy as it relates to [discipline redacted] students
- Create a group-defined list of information literacy capabilities that students should possess
- Decide upon the group-defined problem to be addressed
- Decide upon group-defined processes and protocols to follow to develop future collaboration
- Design a set of recommendations for cooperative and collaborative sponsorship of information literacy that can be voted by the [discipline redacted] and the Library

Materials

- Electronic website (LibGuide) where content and scaffolding materials will be accessible and where participants can store group work
- Online discussion forum (D2L)—whole group and smaller groups
- ITV-equipped conference room that is equipped with projection, sound and recording facilities as well as a white board
- Direct instruction materials/media for face-to-face sessions
- Miscellaneous props or materials used to facilitate discussions will be listed in each lesson plan

Unit Sessions

The workshop is made up of four two-hour, face-to-face sessions and three asynchronous group work periods lasting between two and four weeks

F2F Session One

Friday, [date] – Face to face session (2 hours)

Purpose

The purpose of this session is to:

- Establish the learning environment by setting the conceptual and learning framework for the group
- Build a sense of community (Social Presence)
- Transition into learning individually and as a group (Cognitive Presence)

Design Themes

The design themes used for this session are:

- Social Presence:
	SP1-4 – support SP, build cohesion, trust, respect; assess perception of SP
- Cognitive Presence:
	CP1-3, 6-7 – facilitate interest through a trigger and exploration, critical discourse, individual learning and group reflection, consideration of others' ideas; prompt reflection on self-learning; assess perception of learning
- Teaching Presence:
	TP1, 2, 4 – facilitate group negotiated rules/protocols, use facilitation/direct instruction to help conceptual understanding, assess perception of TP
- Information Literacy:
	IL1-4 – present findings from my research as direct instruction

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- SWOT Analysis:

  SWOT1-2, 4-5 –use group strengths to establish relationships; use knowledge of student needs as a trigger to generate interest, encourage participation, encourage participants to consider student perspective

Content

In this session, participants and facilitator will

- Build the learning environment (Facilitator-led discussion briefly explaining the learning environment the study is seeking to build—CoI/inquiry-based learning)
- Build a sense of Community--Introverts/extroverts? Understanding and working together (Facilitator Presentation/Group exercise in establishing a set of discussion protocols that the group will use from here forward)
- Explore the problem of information literacy. What is the problem, anyway? (Group discussion about personal experience with research at undergraduate level/Facilitator presentation sharing research about information literacy needs of undergraduate students)
- Discuss the asynchronous portion of the workshop
- Distribute and complete survey

Outputs

Participants will

- Develop a group-determined list of discussion protocols to be used in the workshop
- Develop empathy with students through shared personal experiences of doing research when they were undergraduates
- Complete Questionnaire

Asynchronous Online Group Work One

Friday, [date] – Thursday, [date] (2 weeks)

Purpose

The purpose of this session is to:

- Assist participants to explore the concept of information literacy
- Facilitate individual conceptual understanding
- Facilitate group building of shared understanding

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Design Themes

The Design Themes used for this asynchronous period are:

Social Presence:

- SP2-4—support SP, build cohesion, trust, respect; assess perception of SP

Cognitive Presence:

- CP1-4, 6-7—facilitate interest through a trigger and exploration, critical discourse, individual learning and group reflection, consideration of others' ideas; prompt reflection on self-learning, and resolution; assess perception of learning

Teaching Presence:

- TP1-7

Information Literacy:

- IL1-9

SWOT Analysis:

- SWOT2-4

Content

During the asynchronous two-week period, participants will work alone and in small groups to

- Explore information literacy. Using suggested literature, participants will work alone, considering information literacy according to accreditation and professional standards; considering definitions of information literacy posed in the literature; based on the suggested literature, create a list of research capabilities that undergraduate students should be expected to learn
- Reach group-based resolution. In their small groups, participants will consolidate their lists of necessary information literacy capabilities for undergraduate [discipline redacted] students. They will develop their own group definition of information literacy for [discipline redacted] students
- Prepare a group presentation of their list and definition for the larger group at the next face-to-face session and prepare to answer any questions that arise from their presentation
- Complete Questionnaire

Outputs

In this period, participants will

- Create a group-based list of information literacy capabilities needed by students in [discipline redacted]
- Develop a group-defined definition for information literacy for [discipline redacted] students
- Prepare a presentation of their work

F2F Session Two

Friday, [date] (2 hours) – What is information literacy? (Rough conceptual plan)

Purpose

The purpose of this session is to consolidate ideas to develop shared understanding around information literacy

Design Themes

The design themes used for this session are (to be determined)

Content

In this session, participants will

- Present their small group reports on their definition of information literacy and fields questions from the larger group
- Discuss and come to consensus on a definition
- Follow same procedure as above with the small group lists of information literacy capabilities to compile a single list of capabilities
- Explore how might library and [discipline redacted] faculty cooperate or collaborate to teach these concepts? (Pose question for online forum in short presentation and group discussion)
- Complete Questionnaire

Outputs

- Group-generated definition of information literacy
- Group-generated list of necessary information literacy capabilities for [discipline redacted] students at [university name redacted]

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Friday, [date] – Friday, [date] (2 weeks)– Teaching Information Literacy (Rough conceptual plan)

Purpose

The purpose of this period is to explore the concepts of cooperative and collaborative teaching and learning

Design Themes

The design themes used for this session are [to be determined].

Content

In this period, participants will

- Work in small groups (each group will explore one topic) to explore the three topics below using resources of their own choosing:
    - cooperative or collaborative teaching
    - cooperative or collaborative learning
    - examples of cooperative or collaborative teaching/learning in the field of information literacy
- Create a group-based "compare and contrast" analysis report of cooperation/collaboration within the areas of (a) teaching; (b) learning; or (c) examples
- Prepare a 10-minute group presentation of their findings for the next face-to-face session
- Complete survey

In addition to the normal facilitation, the facilitator will scaffold this group activity with a list of possible search tools/terms for discovering sources that will help the groups to explore and present their concepts.

Outputs

Participants will

- Develop group compare-and-contrast reports
- Prepare a group presentation

www.manaraa.com

F2F Session Three

Friday, [date] (2 hours)

Purpose

The purpose of this session is to design recommendations for future cooperative/collaborative sponsorship of information literacy (rough conceptual plan)

Design Themes

The design themes used for this session are (to be determined).

Content

The content for this session will focus on cooperative/collaborative approaches to teaching and learning and on the steps moving forward toward a set of recommendations

Participants will:

- Present their compare/contrast reports (discussion—with note taking)
- Build consensus on preferred cooperative or collaborative approaches
- Consolidate the knowledge built so far (definition of IL for [discipline redacted] students; list of necessary IL capabilities; preferred cooperative/collaborative approaches)
- Discuss how to move forward from here and decide on next steps towards building a set of recommendations for the [discipline redacted] and the library. Assign work for each group
- Complete Questionnaire

Outputs

- Consolidated report on preferred cooperative or collaborative approaches to teaching and learning
- Steps to move towards Recommendations

Asynchronous Online Group Work Three

[VERY ROUGH CONCEPTUAL PLAN]

[Date] – [Date] (1 month)–Plan Development – Scaffold plan development

- Small groups work on their aspects of the plan
- Larger forum to integrate group parts
- Complete Questionnaire

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F2F Session Four

[VERY ROUGH CONCEPTUAL PLAN]

[Date] – 2 hours -- Looking back/moving forward

Purpose—to bring this workshop to closure while building a path towards continued collaboration between the two faculties

Outcome—Plan that will be presented to both faculties for official adoption

- Finalize plan – to go before faculties of both departments
- Time to complete survey
- Sign up for exit interviews
- An ad hoc Q&A session where librarians can answer question for disciplinary faculty— search techniques, access to specific titles, etc.

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Face-to-Face Session One (2 hours)

Objectives

- Engage in relationship-building behaviors and activities within the workshop to support group and individual learning. **(SP1, SP2, SP3)**
- Reach group consensus on the problem to be addressed by the workshop. Define capabilities and obstacles and arrive at a goal for the workshop. **(CP1, CP4, CP7, TP1, IL5)**

Learning Goals

- Participants will begin to develop collegial relationships that will lead to social presence. Assessed through outcomes of individual introductions, group work, surveys **(SP1, SP2, SP3)**
- Participants will begin to develop respectful relationships. Assessed through list of discussion guidelines that are developed by the group **(SP3)**
- Participants will begin to function cohesively as a group: Assessed through successful defining of goals **(SP3, CP1, CP2, CP7, TP1)**
- Participants will begin to establish cognitive presence. Assessed through the successful development of a group-defined problem **(CP1, TP1)**

Materials Needed

- Two baskets with number slips that will be drawn to define groups
- White board with markers
- Computer with speakers to hook up to the display in the room
- Post-it notes pads

Facilitator Prepared Resources

- Workshop Syllabus
- PowerPoint to Guide F2F session (Introduction to Study, Introductions to Learning Activities/Discussions, Introduction to Research on Information Literacy Student Needs)
- Extrovert and Introvert Controversy over Ideas (included in PPT above)—Video clip 2.14 min: https://www.youtube.com/watch?v=9SkIs6AM3MY

Activities

Developing Collegial Relationships (Facilitator Role: Facilitating) (SP1, SP3 SWOT1)

Get Acquainted Activity—Purpose. The purpose is to help the participants get acquainted. Given that participants are academics, small talk or silly games seems less helpful. Given the short time frame in which to develop a community of inquiry where intellectual respect is

paramount to developing mutual understanding and collaboration, it seems that something that can quickly help to develop social presence but that can also lead to collegial respect is imperative.

Activity (10-15 mins). As each person arrives, introduce them to three steps and get them started on completing these steps.

1. Write your place of birth and your graduate alma mater(s) on the white board.
2. Next, draw a number from the "hats" on the table—one is for librarians to draw from and the other for [discipline redacted] faculty.
3. Help yourself to the breakfast foods and find a seat at the board room table.
4. While you enjoy your food, introduce yourself to someone sitting near you and share something about your graduate school.

Developing Collegial Respect—Facilitator Role (Facilitator) (SP1, SP3, CP1, CP7, TP1, TP2)

Establishing ground rules for interaction activity (30 min)—Purpose. The purpose of this activity is to build social presence. The group is made up of two strong sub-groups of extrovert and introvert personalities. The group will be invited to consider this to establish discussion guidelines that they will follow.

"As an introvert, myself, I can guarantee that as I have been talking about collaborative inquiry, all my companion introverts in the room have been internally thinking along these lines:
Meme: Introvert changing lightbulb-why group activity? https://s-media-cache-ak0.pinimg.com/236x/97/c6/0c/97c60c604779972ee89db832a2c1be04.jpg

So, given that we have some powerful extroverts in the room and some equally strong introverts, it is important to establish some rules that will govern how we choose to work with each other.

Whole Group Activity:

1. I know there is debate about how the black-and-white designations introvert/extrovert may be simplistic. Nevertheless, how many have at some point self-identified as either an introvert or an extrovert?
2. Okay, let's see if you agree or disagree with the way this short video clip categorizes extroverts/introverts:

    Extrovert and Introvert Controversy over Ideas—Video clip 2.14 min:
    https://www.youtube.com/watch?v=9SkIs6AM3MY

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Small Group Activity:

1. First, take your number and find your partners (designate group spaces).
2. Now take 5 minutes of alone time to answer 3 questions (use post it notes):
   In a working group situation, what dynamics help you to feel like a contributing member?
   In a working group, what dynamics make you shut down or lose interest?
   If there were one non-negotiable for you in defining group dynamics, what would it be?
3. Now share your post it notes in the center of the table. Discuss and based on discussion come up with 3 guidelines for discussing conduct to help all voices be heard throughout the workshop.
4. When you are finished, post your guidelines on the board.
3. Full Group Synopsis: Discuss and arrive at a set of guidelines that all agree upon.

Break (10 minute)

Transitioning to Cognitive Presence—Facilitator Role (Facilitation and Direct Instruction)

Identifying the *Problem, We will be Working to Solve* activity—Purpose. The group will define the problem that the workshop will seek to address.

3. **(CP1, CP2, CP3, CP7, TP1, TP2, SWOT5)** Discussion Question—Think back to college. Remember one experience doing research. Describe the activity as you remember it and your feelings about it. (Take 5 minutes to write down notes that you will share with the group). Each member has the chance to share—and the group has the chance to ask questions
4. **(CP1, CP2, TP2, IL1-4, SWOT2, SWOT5)** Trigger--Presentation—What do students need and what do they feel?
   a. Presentation showing results from xxx study and table with themes from our student focus groups—
      - Asher, A. Duke, L. and Green, D. (2010). *The ERIAL project: Ethnographic research in Illinois academic libraries,* Retrieved from http://www.academiccommons.org/2014/09/09/the-erial-project-ethnographic-research-in-illinois-academic-libraries/
      - Results from study about employers' views of college graduates
      - Results from my research so far…student responses
      - Present traditional answer from the library/disciplinary faculty: (the one-shot session to introduce library sources)

        "While the one-shot has some value in terms of library instruction, "Hi, I'm Jake, this is our website, here's how to do some stuff, ask me questions, see me smiling, aren't I friendly…," full article is at: http://beerbrarian.blogspot.com/2014/07/the-second-draft-framework-for.html

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Slides for Presentation About Student Needs

Students:

- Who have gone through writing sequence courses have a better intellectual understanding of research as well as more developed but novice researching skills than transfer students
- Do not equate real world problem-solving with "real research." Real research is tied to academic assignments using academic sources
- Begin with an answer and seek sources to confirm it
- Believe they are engaging in exploration when seeking confirmatory sources
- Feel frustrated when they can't easily find confirmatory sources; quickly switch topics
- Have a hard time with search strategies, citations, and knowing which tools to use
- Find scholarly writing difficult
- Who have consulted with librarians, recommend them
- Wish for low-stakes practice using search tools and developing search strategies

Comparing Findings with Literature

Asher, Duke, & Green (2010)	Head (2012)	Melgosa (in progress)
Willingness to seek help from others (academic: librarian / work: colleague)		
Cannot identify librarians. Believe they are busy or do not possess subject expertise.		
Were satisfied with consultations with librarians, recommended librarians to friends, recommended library engagement with freshmen.	Sought trusted co-workers to help find answers and learn protocols. Showed ability to reach out through forums.	Students who consulted librarians recommended them to friends. Students wished for low-stakes (not so tied to grades) opportunities to practice search strategies.
Student research capabilities		
Showed poor search strategies other than free-word Google searching. Did not understand how Google organized results.	Good and fast at Internet searches and could quickly gather and mash a variety of information.	
Did not understand catalog or information organization, search logic, or how to expand/narrow searches, or subject headings.	Could not go beyond the basic search engine.	Had a hard time with search strategies and knowing which tools to use.
In terms of research capabilities, had trouble evaluating resources of all types. Had trouble understanding citations.	Did not know how to dig deeper using phone, annual reports, or company documents. They needed to become independent researchers.	Did not see real-world problem solving as "real" research. Believed they engaged in exploration when seeking confirmatory sources. Found scholarly-article analysis, citations, and scholarly writing difficult.

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Summary—Next steps—Facilitator Role (Direct instruction) (TP1, TP2, SWOT4)

Summary activity—Purpose. To prepare for the asynchronous collaboration over the next two weeks.

1. Next two weeks—asynchronous work in small group to explore key concepts together
2. Introduce group to the D2L site (discussion boards, questions, time frame)

I will post the work we have done today / we will explore the concept of Information Literacy in our small groups and prepare a report for our next face-to-face session

Assessment—Facilitator Role (Facilitator) (SP4, CP6, TP4)

Take five minutes to complete the questionnaire and turn it in to me. When you are done, you may leave (if librarians). If [discipline redacted] Faculty, take a 5-minute break and meet back for your faculty meeting.

<center>**Asynchronous Session One--D2L (2 weeks)**</center>

Objectives

*   To establish a collective understanding of the concept of information literacy. **(CP2, CP3)**
*   To collaboratively determine what information literacy means for [discipline redacted] students at [university redacted] **(CP3, CP4, TP2, TP3, IL5-9 content areas)**

Learning Goals

*   Each participant will demonstrate an understanding of the goals of information literacy through their own list of appropriate research learning goals for students in [discipline redacted] **(CP1, CP3, TP3, IL1-9, SWOT2)**
*   Participants will begin to establish collaborative learning relationships in small groups through a group-developed definition of information literacy for [discipline redacted] students at [university redacted] and through the development of a group list of research learning goals for [discipline redacted] students **(SP2, CP1, CP2, CP3, CP4, CP7, TP3, TP7 IL1-9)**
*   Participants will demonstrate an understanding of the concept of information literacy through the development of a group definition of information literacy for [discipline redacted] **(CP3, CP4, TP6, SWOT2)**

Materials Needed

*   Access to a computer and Internet
*   Login information to the Workshop D2L site

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Facilitator Prepared Resources:

- Netiquette Protocols
- Link in D2L to Workshop LibGuide where resources from Face-to-face Session One are posted
- D2L Discussion Boards Set up for Small Groups
- Ongoing discussion facilitation by facilitator
- List of Recommended and Additional Readings

Recommended Readings

(TP1, TP2, TP3, IL5-9, SWOT2, SWOT3)

Information Literacy Defined

Coonan, E. and Secker, J. (Eds.). (2013). Introduction. In E. Coonan and J. Secker (Eds.) *Rethinking information literacy: A practical framework for supporting learning.* (pp. xiv-xxx). London: Facet Publishing. (2.5 pages)

    This short summary is a good introduction into how others here and around the world have defined information literacy and some of the problems with how it is taught in higher education. Read "Definition, terminology, the information literacy landscape," pp. xx-xxii:

    [available to download from local location]

American Library Association. (February 2015). *Framework for Information Literacy.* Chicago: ALA. (6 screen lengths)

    This web document represents the latest thinking about information literacy among academic librarians in the United States. This document came out of growing criticism of the *Standards* above. The *Standards* have been accused of focusing too much on mechanical search tools and process and not enough on helping students learn how to think as information literate individuals. A new *living* framework for thinking about information literacy was filed by the American Library Association in February of this year. It is likely that this document will guide discussion about information literacy in the future:

    [was available at the American Library Association website in its then current version]

[Redacted] Education (March 201x). *Final [redacted] Policy.* [Redacted]. (14 pages)

    Like the academic library profession, [discipline redacted] is also undergoing changes to its education policy and accreditation standards. The new [Redacted] Policy was voted in [redacted] and the new standards are slated to be voted in [redacted]:

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[link removed]

Additional Readings

American Library Association. (2000). *Information literacy competency standards for higher education.* Chicago, IL: ALA. (14 pages)

Here in the United States until very recently, this document has been the defining standards for information literacy. While conceptual understandings of information literacy are being guided by more recent research, this is still the defining standard:

[was available at the Association of College & Research Libraries website]

[Redacted] Education. (200x). [Redacted] *policy and accreditation standards.* [Redacted]. (16 pages)

This document represents the current standards for [discipline redacted] education. It is an interesting read, especially in terms of how it defines the role of research: [link removed]

<div align="center">

Asynchronous Session One Activities

Interaction with Readings—Facilitator Role (Facilitator)

</div>

Interaction with readings activity. Purpose—To become familiar with current [discipline redacted] learning standards and information literacy standards.

Assignment

You are encouraged to read and react to the current and developing standards that define those research capabilities that students in higher education should be able to demonstrate.

Online Assignment

[Dates—one week] **(CP1, CP3, TP2, IL5-9, SWOT2, SWOT3, SWOT4)**

Reading/Synthesizing: During this week, read through the recommended readings. As you read the documents begin compiling a list of what you consider to be the most important research capabilities for [discipline redacted] students. Once you have completed the readings, look over the list and revise as necessary.

> *Sharing:* Post the list to your small group discussion space.
> *Teaching Presence:* Contact students through email to encourage them to move forward on this task.

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[Dates—one week] **(SP2, SP3, CP2, CP4, TP2, TP5, TP7, IL1-9)**

Group work: During the days leading up to our next F2F session, work in small groups to consolidate your lists of research capabilities into one list. Based on this list, draft your own group definition of information literacy for [discipline redacted].

You will have 10 minutes to present your list and definition to the larger group at our next face-to-face session on [date].

Assessment—Facilitator Role (Facilitator) (SP4, CP6, TP4)

Take five minutes to complete the survey about your experiences with this first asynchronous activity. Turn it in to me using the drop box in D2L.

<center>**Sessions Two and Three**</center>

Learning Objectives

- Participants will build a shared set of information literacy learning outcomes for [discipline redacted] students
- Participants will explore ideas of how [discipline redacted]-Library might collaborate to help [discipline redacted] students learn information literacy competencies
- Participants will determine the steps they will take towards creating an action plan

Lesson Plan Activities

1. Build list of information literacy learning outcomes:

    a. [Redacted quote. It referenced the standards that governed the disciplinary department in my study. It stated that discipline programs were to build content, pedagogy, and learning activities for students that are based on the competencies they should be able to demonstrate.]
    b. Share list of information literacy competencies that they developed through their first asynchronous session [similar ones have been synthesized and then mapped to the different elements within the [discipline redacted]-Library Information Literacy Model. They have also been mapped to the [discipline redacted] competencies and the IL Framework Frames]
    c. Break into groups and work through the list. Confirm the ones you like, move around if you feel something doesn't work. Add anything that you feel is really missing. Come back with notes prepared to share. (15 minutes)
    d. Bring groups together and ask each group to present their changes. Discuss and build a list that is agreed by all. (15 minutes)
    e. [this activity can last 45 minutes]

2. 10-minute break (healthy or otherwise)

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3. Develop a plan to collaborate to teach information literacy competencies to [discipline

   redacted] students.

   a. Start out with three photos.
   b. Hand out discussion comments and ask each person to read them and extract ideas…note them down on sticky notes.
   c. Compile sticky note comments on white board.
   d. Bring group back together and discuss these ideas, adding more as necessary.
   e. Build consensus.
   f. [this should take ½ hour]

4. Discuss future—how to develop action plan. Divide tasks between three groups.

   a. Discuss technologies (email, Google docs, D2L, other?)—keep me in loop
   b. Split groups up to discuss how they will implement their task over the next month.
   c. Designate someone as leader and someone as secretary and someone to report to me on progress
   d. [This should take ½ hour]

Materials Needed

- PPT—Quote/3 photos
- Post It Note Pads
- Recording devices
- White board markers
- Paper and Pens
- Model/Outcomes handout, Asynchronous comments handout
- Surveys

<div align="center">Session Four</div>

Learning Objectives

- Participants will explore ideas of how [discipline redacted]-Library might collaborate to help [discipline redacted] students learn information literacy competencies
- Participants will determine the steps they will take towards creating an action plan
- Participants will review what has been accomplished in terms of inquiry learning

Lesson Plan Activities

1. Develop a plan to collaborate to teach information literacy competencies to [discipline redacted] students.
   a. Start out reviewing the Information Literacy themes that arose from the [discipline redacted] student focus groups.

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b. Ask questions listed in PPT: how to implement model with students, how to implement learning objectives; what tools and ideas are available to us; what are our limitations?
c. Discuss how [discipline redacted] is divided (by programs? Lower/upper division? Undergraduate/graduate) and then divide into small groups by which areas people teach in; librarians divide as their own group.
d. Bring group back together and discuss these ideas, adding more as necessary.
e. Build consensus.
f. [this should take 1 hour]
2. Break (10 minute)
3. Discuss future—how to develop action plan to move us forward.
a. [This should take ½ hour]
4. Wrap Up
a. PPT discussion – where we started / the basis of group cohesion—inquiry-based learning – what it is; how we did; what worked/what didn't work
b. Discussion about technology and its use or lack thereof
c. [this should take 20 minutes]
5. Complete questionnaire and sign up for exit interview [this should take 10 minutes]

Materials Needed

- PPT
- Recording devices
- White board markers
- Paper and Pens
- Model/Learning Outcomes handout
- Surveys

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Appendix B: Participant Questionnaire

Workshop Face to face or Online Session Questionnaire

Based on the workshop session or online discussion forum just completed:	Strongly Disagree		Strongly Agree	
The facilitator clearly communicated important workshop topics.	1	2	3	4
The facilitator clearly communicated important workshop goals.	1	2	3	4
The facilitator provided clear instructions on how to participate in workshop learning activities.	1	2	3	4
The facilitator clearly communicated important dates/time frames for learning activities.	1	2	3	4
The facilitator was helpful in identifying areas of agreement and disagreement on workshop topics that helped me to learn.	1	2	3	4
The facilitator was helpful in guiding the group towards understanding workshop topics in a way that helped me clarify my thinking.	1	2	3	4
The facilitator helped to keep participants engaged and participating in productive dialogue.	1	2	3	4
The facilitator helped keep the participants on task in a way that helped me to learn.	1	2	3	4
The facilitator encouraged participants to explore new concepts in this workshop.	1	2	3	4
Facilitator actions reinforced the development of a sense of community among participants.	1	2	3	4
The facilitator helped to focus discussion on relevant issues in a way that helped me to learn.	1	2	3	4
The facilitator provided feedback that helped me understand my strengths and weaknesses relative to the workshop goals and objectives.	1	2	3	4
The facilitator provided feedback in a timely fashion.	1	2	3	4
Getting to know other participants gave me a sense of belonging in the workshop.	1	2	3	4
I was able to form distinct impressions of some workshop participants.	1	2	3	4
Online or web-based communication is an excellent medium for social interaction.	1	2	3	4
I felt comfortable conversing in the format used.	1	2	3	4
I felt comfortable participating in discussions.	1	2	3	4
I felt comfortable interacting with other workshop participants.	1	2	3	4
I felt comfortable disagreeing with other workshop participants while still maintaining a sense of trust.	1	2	3	4
I felt that my point of view was acknowledged by other workshop participants.	1	2	3	4
Discussions help me to develop a sense of collaboration.	1	2	3	4
Problems posed increased my interest in workshop issues.	1	2	3	4
Workshop activities piqued my curiosity.	1	2	3	4

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Based on the workshop session or online discussion forum just completed:	Strongly Disagree			Strongly Agree
I felt motivated to explore content related questions.	1	2	3	4
I utilized a variety of information sources to explore problems posed in this workshop.	1	2	3	4
Brainstorming and finding relevant information helped me resolve content related questions.	1	2	3	4
Discussions were valuable in helping me appreciate different perspectives.	1	2	3	4
Combining new information helped me answer questions raised in workshop activities.	1	2	3	4
Learning activities helped me construct explanations/solutions.	1	2	3	4
Reflection on workshop content and discussions helped me understand fundamental concepts in the workshop.	1	2	3	4
I can describe points of shared understanding within the group.	1	2	3	4
I can describe ways to test and apply the knowledge created in this workshop.	1	2	3	4
I have developed solutions to workshop problems that can be applied in practice.	1	2	3	4
I can apply the knowledge created in this workshop to my teaching or other related activities.	1	2	3	4
When I engaged in the learning process as an INDIVIDUAL:				
I was aware of my effort.	1	2	3	4
I was aware of my thinking.	1	2	3	4
I knew my level of motivation.	1	2	3	4
I questioned my thought.	1	2	3	4
I made judgments about the difficulty of the problem.	1	2	3	4
I was aware of my existing knowledge.	1	2	3	4
I was aware of my level of learning.	1	2	3	4
I assessed my understanding.	1	2	3	4
I changed my strategy when I needed to.	1	2	3	4
I searched for new strategies when needed.	1	2	3	4
I applied strategies.	1	2	3	4
I assessed how I approached the problem.	1	2	3	4
I assessed my strategies.	1	2	3	4
When I engaged in the learning process as a member of the GROUP:				
I paid attention to the ideas of others.	1	2	3	4
I listened to the comments of others.	1	2	3	4
I considered the feedback of others.	1	2	3	4
I reflected upon the comments of others.	1	2	3	4
I observed the strategies of others.	1	2	3	4
I observed how others were doing.	1	2	3	4
I looked for confirmation of my understanding from others.	1	2	3	4
I requested information from others.	1	2	3	4

Based on the workshop session or online discussion forum just completed:	Strongly Disagree		Strongly Agree	
Please assess the (insert learning strategy or artifact) used:				
I responded to the contributions that others made.	1	2	3	4
I challenged the strategies of others.	1	2	3	4
I challenged the perspectives of others.	1	2	3	4
I helped the learning of others.	1	2	3	4
I monitored the learning of others.	1	2	3	4
I understood the targeted learning goal(s).	1	2	3	4
It helped me to understand important concept(s).	1	2	3	4
It helped me meet the learning target.	1	2	3	4
I found it clear and easy to use.	1	2	3	4
This will be useful to me in the future.	1	2	3	4

Any additional Observations:

Adapted from Arbaugh et al. (2008) and Garrison & Akyol (2015); open source confirmed by D. Randy Garrison.

Appendix C: FacLibCoI Workshop Artifacts

Artifact Two.

Group-defined Learning Objectives Linked to IL Model and EP/IL Frameworks

Model Element	Learning Objective	Standards	Gen/ Adv	Where in Curriculum	How Measured
Attitudes/ Values	Demonstrate commitment to remain current on treatment modalities, social policies, practice context, and new themes within the profession	EP1; IL1			
	Demonstrate open-mindedness to new concepts and ideas presented in the literature	EP2; IL4			
	Seek new research environments, discovery tools, and help from librarian, researchers, and professionals	EP2, 6; IL1, 4, 6			
	Demonstrate persistence in their research efforts even when they bump up against challenges	EP1, 4; IL4, 6;			
	*Critically analyze one's own learning and thinking (whether hypothesis is confirmed by literature review/reflective)-- reflexivity--do they see themselves as part of the process?	EP1; IL1			
Ethics, Values, & Responsibility	Ethical Values: Expectations That You are Expected to Learn				
	Demonstrate an understanding that information requires an open and tolerant environment	EP1, 3; IL3			

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Artifact Two Continued

Model Element	Learning Objective	Standards	Gen/ Adv	Where in Curriculum	How Measured
Ethics, Values, & Responsibility Cont.	Demonstrate an understanding that literacy is a human right to access a variety of information and media. Demonstrate understanding that this right carries a responsibility to serve as a change agent who facilitates that right for others and who keeps abreast of the information options available through the principle of "fair use."	EP1, 3; IL3			
	Demonstrate that you have an understanding of laws, regulations, and policies related to information.	EP1, 3; IL3			
	Ethical Responsibility: Expectation that You Will Abide by This				
	Abide by laws, regulations, policy, and code of ethics as they apply to information use (e.g. proper citing)	EP1; IL3			
	Advocate for services and information available to clients	EP1, 3; IL3			
Access Resources	In order to inform professional development, evidence-based practice, and engagement in one's research:				
	Learn how to identify foundational texts and understand their role in the field	EP4; IL1, 5			
	Know how to access discovery tools that are available in the professional world (web sources, sources from professional memberships, sources through their state or public libraries)	EP4; IL6			
	Demonstrate understanding that university, agency, or public librarians are able to assist with information needs	EP8; IL6			
Information Synthesis	Assess retrieved information for their value towards application in the classroom and practice	EP7; IL4			
	Synthesize information in order to implement their own studies or produce new knowledge	EP4; IL4			
	*Critically evaluate information/be critical consumers of information	EP4; IL1, 5			

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Artifact Two Continued

Model Element	Learning Objective	Standards	Gen/Adv	Where in Curriculum	How Measured
Information Synthesis Continued	*Read scholarly literature critically, identifying bias and considering the study's conclusions	EP4, IL1			
	*Select the strongest pieces of evidence for one's own scholarly and professional practice	EP4, 7; IL1			
Application	Use information to inform one's own professional development	EP1; IL3, 4, 5			
	Use research to inform practice as allowed by agency contexts	EP5, 7; IL3, 4, 5			
	Use information to contribute to their field in professional and scholarly ways	EP4, IL3			
	*Critically engage in research to contribute to knowledge and practice	EP4; IL4, 5			
Evaluation	Engage in ongoing critical evaluation of evidence-based practice and research, identifying additional information needed to improve the application of information as appropriate	EP9; IL1			

Note 1. Standards Used in the Mapping

2015 EP Competencies
    EP1 Competency 1 Demonstrate Ethical and Professional Behavior
    EP2 Competency 2 Engage Diversity and Difference in Practice
    EP3 Competency 3 Advance Human Rights and Social, Economic, and Environmental Justice
    EP4 Competency 4 Engage in Practice-informed Research and Research-informed Practice
    EP5 Competency 5 Engage in Policy Practice
    EP6 Competency 6 Engage with Individuals, Families, Groups, Organizations, and Communities
    EP7 Competency 7 Assess Individuals, Families, Groups, Organizations, and Communities
    EP8 Competency 8 Intervene with Individuals, Families, Groups, Organizations, and Communities
    EP9 Competency 9 Evaluate Practice with Individuals, Families, Groups, Organizations, and Communities

IL for Higher Education
    IL1 Frame 1 Authority is Constructed and Contextual
    IL2 Frame 2 Information Creation as a Process
    IL3 Frame 3 Information has value
    IL4 Frame 4 Research as Inquiry
    IL5 Frame 5 Scholarship as Conversation
    IL6 Frame 6 Searching as Strategic Exploration

Note 2. Further explanations

- Critical thinking is a central concept within the IL Model that infuses all other elements. Specific critical thinking objectives have therefore been placed within the various model categories and are indicated by an asterisk.
- There was conversation about ensuring that there is a "learn-apply-critical thinking" piece in each category above. This would need to be looked at in the future. As part of this conversation, there was also the suggestion to include one objective under each category that says, "Acquire the skills needed to evaluate the application of information," or something similar. There was also mention of writing practice behaviors to go along with this.

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Artifact Three: Action Plan

Persons Responsible (Descriptors shown rather than names)	Tasks
2 Faculty Participants	• Way to catch transfer students/graduate students • Consistent assignments in all sections of a class (Named participant is willing to pilot in the fall) • Pre/post assessment of IL/APA skills from library • 1st year students—assignment linking them to library and its resources and to librarians

2 Faculty Participants and Facilitator	• Online training module for model.
	   o Initial assessment (Named participant) as part of introduction
	   o Supplementary matter – can add components

Chair of discipline department	• One-day, face-to-face seminar (University orientation for graduate students—expand the orientation) • How to apply to the classroom—embedded into classes—integrate librarians into classes and homework. Learning objectives need to be translated into class activities (something illegible related to Research Writing) • Librarians in department (introduction to librarians, conferencing) • 10 minutes in class, timeslots in building, sign-up sheet, use of adjunct professor office? Also, when useful on branch campuses? • Schedule of research librarians' availability
Teaching Librarians	• Provide social science department with skills students are supposed to know from Research Writing
Librarians/Faculty	• Evaluation of sources [differences between sources emanating from different social science disciplines] • Training for faculty on library resources [differences between sources emanating from different social science disciplines]

Librarian	• Live chat/email
	• Miscellaneous comments
	   o Tech savvy (mobile, etc.) solutions—getting them into it
	   o Password strategy
	   o Transportation

Timeline:
1. Form for learning objectives document [add in a column for where it will happen within the curriculum]
2. Assign generalist (bachelors/1st year masters)/advanced (advanced standing UG, 2nd yr. masters) standards to the two documents
3. Early [dates] to plan to approve
4. [Dates] to implement in classes

CoI Survey Instrument (Used in Appendix B, p. 277-280)
Notice of OPEN SOURCE status

Metacognition Survey Items (Used in Appendix B, pp. 277-280)
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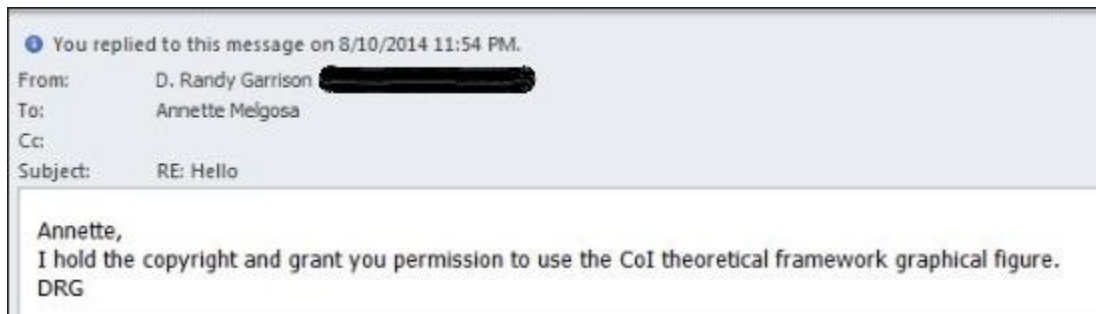
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