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The Information Use Behaviors of Graduate Students in an Online Learning Community

by

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A dissertation submitted to the

Graduate School-New Brunswick

Rutgers, The State University of New Jersey

in partial fulfillment of the requirements

For the degree of

Doctor of Philosophy

Graduate Program in Communication, Information, and Library Studies

Written under the direction of

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and approved by

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New Brunswick, New Jersey

October 2012

## ABSTRACT OF THE DISSERTATION

### The Information Use Behaviors of Graduate Students in an Online Learning Community

By Nicole Amy Cooke

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As online education expands, research should identify how students interact and learn online. Because of the technological, proximal and asynchronous uniqueness of online education, learners face challenges not native to face-to-face education. As such, online students may seek alternate relationships and methods of interacting, forming their own “Small Worlds.” Online students have their own “view of social reality, and ways in which they satisfy their intellectual, social, and physical needs” (Chatman, 1991, p. 438). Small Worlds allow people “to share a similar cultural and intellectual space” (Huotari & Chatman, 2001, p. 352), and members “share a repertoire of resources and sensibilities communally developed over time” (Wenger, 1998, p. 2). Chatman’s theory of Small Worlds is a spatial and social lens through which to examine information behavior; in this instance the online learning environment is a virtual space that fosters and shapes the information behaviors of its participants.

The purpose of this study was to investigate the information use behaviors of graduate students in an online learning community, and to elucidate the information interactions and exchanges that occur within course threaded discussions. Additionally, this study intended to determine if and how graduate students in Library and Information Science programs created

community in the online classroom, and how, if at all, the presence of community influenced information use behaviors.

With respect to the learning online, the literature clearly addresses distance education, Internet communities, communities of practice, and the development of community in traditional on campus classrooms. Some of this research begins to encompass various aspects of human information behavior as applied to the online setting. However, the literature does not marry these components and does not examine nor address the specific information needs and dynamics that occur in an online graduate classroom. The goal of this research was to provide a detailed analysis of the nature and dynamics of information behaviors in an asynchronous graduate online classroom, to identify factors that shape these behaviors, and to determine their relationship to the process of knowledge construction.

## **Dedication**

I dedicate this dissertation, and the doctoral degree, to my parents

**Amy and Douglas Cooke**

who have always made me the center of the universe, and have inspired and pushed me to heights I never dreamed possible. Their unconditional love is unmatched and will always be my guiding force in life.

At times they wanted this achievement more than I did, and now we're all done and we have earned OUR degree!

To my **Nana**, who always loved me more than I knew,  
and always basked in how smart her "baby" was.

## **Acknowledgments**

I extend my sincere gratitude to my advisor, Dr. Ross J. Todd, whose guidance, support, and snitchy humor have seen me through this program.

I thank my committee for their intellectual expertise – Dr. Marie Radford, Dr. Joe Sanchez, Dr. Carol Gordon and Dr. Theresa Anderson.

My unending gratitude to the American Library Association - The Office for Diversity and Spectrum, and the Institute for Museum and Library Services (IMLS), for creating the Spectrum Doctoral Fellowship Program. This fellowship program has made this entire doctoral journey possible.

Thanks to Dr. Betty J. Turock, the fierce fairy godmother I never anticipated having in my life! You have had an amazing impact on my professional and personal life.

Thanks to Gwendolyn Prellwitz, who introduced me to the Spectrum Initiative and has become a dear and valued friend in the process.

Thanks to Laura Stanik, my sweet and wildly funny friend, who has waved it out with me throughout the program. \O/

Thanks to Marianne Martens, Edith Beckett, and Lisa Ambrose, my PhD colleagues and friends - your support means more than you will even know.

Thanks to Gillian Bennett Bonanno, Annie Gilbert, Funda Kivran-Swaine, and the 2008 cohort – we’ve come a long way!

Thanks to my new friend and collaborator Ari Sigal - your support has been integral in completing the program and dissertation.

Thanks to Brent Ruben and the Pre Doctoral Leadership Institute for expanding my academic horizons and introducing me to new mentors / allies - Marianne Gaunt and Barbara Bender.

Thanks to Jeff Teichmann and Gretchen Allin - you are among the few people who knew me “before” that are still with me now, and you have cheered me on through this entire ordeal!

Thanks to Joan Chabrak, Graduate Student Services Coordinator extraordinaire! Thank you for helping me navigate the maze that is this program.

Thanks to Montclair State University’s Sprague Library, and Dr. Judith Lin Hunt, for providing the support and latitude to pursue the degree while maintaining my career.

Thanks to the New Jersey librarian community, where I grew up as a professional.  
Thank you for the excellent training.

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## Chapter 1: Introduction to the Research

### Introduction

As online education expands, research conducted by scholars should endeavor to further identify how library and information (LIS) students interact and learn online. Because of the technological, proximal and asynchronous uniqueness of online education, learners face challenges not native to face-to-face education. As such, online students may seek alternate relationships and methods of interacting, forming their own “Small Worlds” (Chatman, 1991). While they may not be poor or lower class, as were the participants in Chatman’s classic works, online students have their own “... view of social reality, and ways in which they satisfy their intellectual, social, and physical needs.” (p. 438) Small Worlds allow people “... to share a similar cultural and intellectual space” (Huotari & Chatman, 2001, p. 352), and members “share a repertoire of resources and sensibilities communally developed over time.” (Wenger, 1998, p. 2) As suggested in the literature (Burnett, Besant, & Chatman, 2001; Burnett, Jaeger, & Thompson, 2008; Savolainen, 2009), Chatman’s theory of Small Worlds (1991) is a spatial and social lens through which to examine information behavior. In this study, a Small World is an online learning environment, or virtual space, that fosters and shapes the information behaviors of its participants. Specifically, through threaded discussions, students seek and share information and interact with one another, creating a flow of information in an effort to construct knowledge and build community within the online learning environment.

Online learning does not discount the learning and interaction that occur in the traditional face-to-face classroom. However, online education can no longer be considered the “other” or an alternative to “real” learning. As such, significant and purposeful inquiries need to continue in the area of online pedagogy and learning (Rovai, 2004). In the spirit of social constructivism, “... a philosophy of learning based on the premise that knowledge is constructed by the individual through his or her interactions with the environment,” (Rovai, 2004, p. 80) effective online classroom environments are centered on the learners, and encourage dialogue, collaboration and high levels of interaction (p. 81).

### **Online Learning in Higher Education**

Students select distance education for the flexibility and convenience afforded by this mode of delivery, which enables them to maintain jobs and accommodate family and other obligations (Huang, 2002). Others who engage in distance learning are traditional aged college students (18-22 years of age) who enjoy the convenience and scheduling of online courses. “Learners can arrange their learning around their everyday lives without being constrained by time and place.” (p. 28) Regardless of age, distance learners may have access to courses not otherwise available in a traditional on ground program and to subject experts around the world. Students may also enjoy the anonymity and psychological space promoted by this mode of educational delivery.

With the benefits of distance education come drawbacks -- the lack of shared physical and psychological space can be problematic. Online classes require a different approach to instructional design, pedagogy, and knowledge construction, particularly if



course delivery is asynchronous (Moller, 1998). Social constructivism is a beneficial approach to online learning because it removes the instructor as the center of the educational process and makes the environment learner-centered, and suggesting that learners and instructors work together to construct knowledge and co-create the online learning environment (Anagnostopoulos et al., 2005; Brandt, 1997; Chen, 1997; Huang, 2002; Jonassen, 2000; Jonassen, 1994; Kearsley, 1998; Lock, 2002; Moller, 1998; Petraglia, 1998; Rogoff, 1994; Tu & Corry, 2002). In the spirit of educational theorists such as Piaget (1950) and Vygotsky (1978), collaboration and discovery are emphasized in the online learning environment. The teacher acts as a facilitator (Anagnostopoulos et al., 2005; Moller, 1998) and "... as a guide rather than a director," so that learning allows more "creative interaction with the teacher rather than outcome-based teaching." (Huang, 2002, p. 29) The constructivist role of the teacher is to provide feedback and guidance and to prompt dialogue and reflection (Moller, 1998, p. 118). The learning environment is socially constructed, provides a venue for information dissemination, and allows learners to apply course content to their "... real life problems" (Huang, 2002, p. 29).

### **The Evolution of Distance Education**

Teaching and learning from a distance has a long and diverse history and can be traced back to 1840 when correspondence course first began in Great Britain. Distance education is defined as:

... planned learning that normally occurs in a different place from teaching and as a result requires special techniques of course design, special instruction techniques, special methods of communication by electric and other technology,

as well as special organization and administrative arrangements. (Moore & Kearsley, 1996, p. 2)

Distance education continues to make great strides through advances in technology and high scholarship standards and continues to gain in popularity and effectiveness.

Cooke (2004, p. 49) traces the development of distance education, beginning in 1840, and notes the following milestones:

- The passage of the Morrill Act in 1862 which enabled land grant colleges to offer extension programs to rural areas;
- The establishment of the first university level correspondence teaching department at the University of Chicago in the late 1800s;
- The issuance of radio licenses in 1921 to universities in Utah, Wisconsin, and Minnesota to permit educational radio;
- The establishment of the National Home Study Council in 1926 to improve and oversee correspondence courses;
- The first televised course at the State University of Iowa in 1933;
- The establishment of the FCC's Television Fixed Service Program in 1963, which granted colleges and universities to license television frequencies to broadcast course;
- The first audio conference via telephone in 1965;
- The creation of the Corporation of Public Broadcasting in 1967, which was authorized by President Lyndon B. Johnson;
- The establishment of the British Open University in 1969; and,

- The first online undergraduate course, offered in 1984 by the New Jersey Institute of Technology.

Distance education has evolved from correspondence courses, traveling instructors, satellite television and radio broadcasts, teleconferencing, audio conferencing, and computer conferencing and has improved steadily. The trend continued in the 1990s and 2000s as the Internet and related technologies became popular and accessible to mainstream society. The United States (US) Department of Education reported the number of institutions offering distance learning programs increased 72% between 1995 and 1998 (Goodson, 2001), and by 2001 there were over three million enrollments in distance learning programs (National Center of Educational Statistics, 2003). By the 2007-2008 academic year, 20 percent of all U.S. undergraduates (out of a total of 4.3 million students), took at least one distance education course, with four percent of those taking their entire course of study online (Radford, 2011). It is expected these totals will continue to rise steeply over time.

Distance education in its current iteration, i.e., user-centered, web-based learning through course management systems (CMS) is referred to as New Millennium, Fifth Generation distance education, or e-learning (Bates, 2003; Downes, 2005; Garrison & Anderson, 2003; Taylor, 2001; Wenger, White & Smith, 2010). Distance education/e-learning is overcoming difficulties relating to time and geography, reaching populations around the world, reaching students of all ages and abilities, and is having tangible benefits, both financial and prestigious, for higher education. Higher education organizations, traditional and for-profit colleges and universities, are increasing online

offerings, increasing marketing efforts, making efforts to train faculty and staff to meet this growing need for distance learning, and accommodating students this type of learning attracts.

Online learning has become popular because of its potential for providing more flexible *access to content and instruction at any time, from any place*. Frequently, the focus entails: (a) increasing the availability of learning experiences for learners who cannot or choose not to attend traditional face-to-face offerings, (b) assembling and disseminating instructional content more cost efficiently, or (c) enabling instructors to handle more students while maintaining learning outcome quality that is equivalent to that of comparable face-to-face instruction. (Means et al., 2010, p. 22)

E-learning programs are also making steady progress in K-12 education; high school students are taking classes online (Means et al., 2010), and Internet based initiatives such as the Khan Academy are becoming a welcome presence in traditional elementary and secondary school classrooms. Similar sites are appearing on the distance learning landscape such as YouTube Edu, Public Broadcasting Service (PBS) Teachers, iTunes U, Connexions, and Google Code University.

Distance learning programs are influencing graduate study in academic institutions. The role of distance education in library and information science (LIS) education is substantial and dates to 1888, with correspondence study under the direction of Melvil Dewey (Barron, 2003). Paralleling the development of distance learning in education as a whole, LIS education has made great use of distance learning technologies and their corresponding opportunities (Barron, 2003). This trend continues, with LIS programs continually implementing online offerings into their curricula. As of 2012, of the 58 American Library Association (ALA) accredited programs in LIS, 24 programs offered some classes online, 13 programs offered significant

portions of the degree program online, and 23 programs offered the entire masters degree in an online format (ALA, 2012). These programs may or may not include residencies and feature synchronous and asynchronous modes of content delivery.

### **The Social Constructivist Approach to Teaching and Learning**

In the construction of the online learning environment, a prominent feature is technology. Online courses are typically delivered via a CMS and employ features such as bulletin or discussion boards, listservs, email, podcasting, videos, conferencing, chats, and other interactive tools. The use of technology facilitates social constructivism in the online classroom by encouraging interaction and collaboration, promoting hands-on learning, and allowing students to "... search actively and discover rich resources to solve problems or construct his or her own knowledge." (Huang, 2002, p. 30)

Jonassen (2000) suggests that online students can use technology as an educational and intellectual partner (not unlike the partnership with the instructor) in order to "... articulate what they know, reflect on what they have learned, support the internal negotiation of meaning making, construct personal representations of meaning, and support intentional, mindful thinking." (p. 24) However, the literature cautions that distance learning environments are for both information exchange and social reinforcement (Moller, 1998, p. 116) and that "... technology and social context are equally important for distance learning." (Kearsley, 1998, p. 49) Technology is a tool, and should not be used as a crutch or as a substitute for creating social, meaningful, and personal learning environments. While useful, CMS environments can isolate distance learners and remove the human element from the learning process (Huang, 2002, p.

31). Jonassen concurs, stating that technology should be used in conjunction with the other components of constructivist classroom to create "... a social negotiation environment" that "... can foster reflective response and support collaborative construction." (p. 33)

A truly constructivist online classroom can serve as an interpersonally and intellectually supportive community which facilitates learners' critical thinking and "...cognitive development through argument construction, communication of those ideas, and critical analysis of new ideas." (Moller, 1998, p. 119) In such a community students can capitalize on new information and incorporate it into their lives.

### **Statement of the Problem**

With respect to learning on the Internet and in online environments, the literature addresses distance education, Internet communities, communities of practice, and the development of community in traditional on campus classrooms. However, the literature does not marry these components and does not examine or address the specific information needs and dynamics that occur in an online graduate classroom. In addition to these concerns, the literature reflects societal concerns about the rigor and efficacy of distance education (Bower, 2001). As distance education becomes more popular and accessible because of Internet technology questions persist about whether students actually learn and/or work hard in online courses. The perception is that distance courses are easier than and subsequently inferior to seated courses and do not require any real effort from students – the perception is that online learning is not quality learning (Imel, 1999; Larreamendy-Joerns, & Leinhardt, 2006; Meyer, 2002;

Spooner, Spooner, Algozzine & Jordan, 1998; Thorpe, 1998; Valentine, 2002). The literature also questions the level of interaction and amount of instructor presence and feedback present in online classes (Thorpe, 1998). This research will identify and highlight the strengths of distance education and demonstrate the deep levels interaction, knowledge construction and socialization that occur within the online learning environment. Deep learning is conditional – dependent on students, instructor, and other environmental and pedagogical factors – and is a significant characteristic and benefit of online learning.

The goals of this research include providing a detailed examination and analysis of the nature and dynamics of information behaviors in an asynchronous online classroom, identifying factors that shape these behaviors, describing their relationship to knowledge construction, and determining the influence of community formation on these patterns and behaviors. The specific research questions to be answered in this study are:

RQ1: What information behavior patterns, if any, do students in an online asynchronous learning communities exhibit?

- What information intents are exhibited in the written interactions of the graduate students in an online learning community?
- What patterns of knowledge building are exhibited in the written interactions of the graduate students in an online learning community?
- What patterns of information interactions are exhibited in the written interactions of the graduate students in an online learning community?

- What changes in these patterns, if any, occur over the course of the teaching cycle?

RQ2: How, if at all, are these patterns of information use related to a sense of community, as measured by the Classroom Community Scale?

- What impact, if any, does the context of a small world community have on the information behaviors of online students?

Data supporting this research were collected from two online and asynchronous classes in a graduate LIS program, and were examined through learner/context analysis, textual analysis, sociometry, and via a survey instrument. The research questions and data analysis plan merge these complementary, yet separate disciplines and bodies of literature and show the online learning environment to be a small world -- a holistic social construction that encompasses LIS, distance education, psychology, communities of practice, and community psychology.

### **Definition of Terms**

The major terms and concepts used in this research are defined as follows:

Cohort Learning: "... a small group of learners who complete an entire program of study as a single unit." (Lawrence, 2002, p. 83)

Community: "... a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together." (McMillan and Chavis, 1986, p. 9)

Communities of Practice: Members of a community are informally bound by what they do together – from engaging in lunchtime discussions to solving difficult problems – and



by what they have learned through their mutual engagement in these activities. A community of practice is different from a community of interest or a geographical community, neither of which implies a shared practice. (Wenger, 1998)

Cultural Capital: The "... knowledge, skills, habits, values, and tastes that are acquired in the course of socialization that can be turned to one's advantage in particular social situations." (Bourdieu, 1977, p. 76)

Distance Learning or Online Learning: "... planned learning that normally occurs in a difference place from teaching and as a result requires special techniques of course design, special instruction techniques, special methods of communication by electric and other technology, as well as special organization and administrative arrangements." (Moore & Kearsley, 1996, p. 2)

Homophily: If group members are too similar in thought and/or experiences, cohesiveness may occur and it is less likely that learning will occur on a substantive level because group members are too like-minded and have limited chances to be exposed to new ideas and further growth (Jaffee, 2007).

Information Behavior: The study of humans' seeking, usage, avoidance, and interaction with information.

Knowledge Construction: "We understand information use as an activity that can, analytically, be divided into two phases: 1) Construction of information, and 2) using or utilizing the constructed information in action." (Tuominen & Savolainen, 1997, pp. 81-82)

Learning Community: A group of people who engage in regular communication and interaction around a common topic/area of interest.

Normative Behavior: "... predictable, routine, and manageable approach to everyday reality." (Burnett et al., 2001, p. 538)

Phenomenography: "... an interpretive approach that seeks to describe phenomena in the world as others see them, the object of the research being variations in ways of experiencing the phenomenon of interest." (Bruce, Buckingham, Hynd, McMahon, Roggenkamp, & Stoodley, 2004, p. 145)

Psychological Sense of Community: A sense of belonging among a group of people based on membership, influence, integration and fulfillment of needs, and emotional connection (McMillan & Chavis, 1986, p. 8).

Small World: Spaces in which participants "... share a similar cultural and intellectual space" (Huotari & Chatman, 2001, p. 352), and "share a repertoire of resources and sensibilities communally developed over time." (Wenger, 1998, p. 2)

Social Presence: "... the feeling of community that a learner experiences in an online environment." (Tu & Mclsaac, 2002, p. 131)

Social Constructivism: "... a philosophy of learning based on the premise that knowledge is constructed by the individual through his or her interactions with the environment." (Rovai, 2004, p. 80)

Transactional distance (Moore): The "... psychological and communications space to be crossed, a space of potential misunderstandings." These spaces occur between students and instructors, and between learners themselves (Moore, 1993, p. 22).

Virtual Ethnography: “Virtual ethnography transfers the ethnographic tradition of the research as an embodied research instrument to the social spaces of the Internet.”

(Hine, 2008, p. 257)

### **Significance of this Research**

This research undertaken in this study is significant because previous studies of online learning communities of Masters in Library and Information Science (MLIS) students have not been identified or found in literature searches related to this study. The literature has focused on online forums which are free, not related to LIS, and not academic in nature (e.g., user boards related to a hobby or interest). Additionally, the literature focused on graduate learners in the online learning environment does not examine the phenomena of interest through a LIS/information behavior perspective. This study merges these two areas by studying this specific population (online graduate students) in this specific venue (online learning communities that occur within a formal degree granting program).

In addition to enriching the literature, this research is significant to MLIS students, LIS faculty, and practicing librarians because it provides insight into improving and expanding online library education. ALA and other accrediting bodies such as Middle States Commission on Higher Education (<http://www.msche.org/>) are issuing standards and expectations for online learning, and LIS schools will need to ensure that quality content is being consistently offered to online learners. Online offerings also benefit practicing librarians who want to increase their knowledge and continue LIS

study, and it allows LIS schools to expand their reach to alumni and the professional community.

Pedagogy is important and differs based on location – pedagogy used in an on ground class is different from the pedagogical strategies used in online learning. This research situates online learning environments as Small Worlds, identifies the information behavior, knowledge construction, and community formation patterns of graduate students, and will expand knowledge in the area of online pedagogy which will benefit LIS and other areas, particularly as it relates to graduate education. The results of this research agenda will benefit the fields of information behavior, library education, distance education, and social learning.

### **Chatman's Small Worlds**

Small Worlds are social constructions whose meanings and interactions are created by its members. They are "... social environments where individuals live and work, bound together by shared interests and expectations, information needs and behaviors." (Burnett et al., 2008, p. 57) These socially constructed worlds can affect how participants seek and use information. Small worlds can provide rich focus, but can also block valuable information considered out of scope for the community in question. In a cyclical process, the ongoing seeking of specific information by the community further shapes and defines the culture of the small world. "Ultimately, the pattern of one's information behavior is based upon what is typical in the small world in which one lives." (Jaeger & Thompson, 2004, p. 100)

This study situates online learning environments as Small Worlds, and identifies the information behavior, knowledge construction, and community formation patterns of graduate students. Chapter Two presents the disciplines and literature relevant to this research and highlights the complexity of online teaching and learning.

## **Chapter 2: Literature Review**

### **Introduction**

This chapter maps the theoretical and conceptual framework of the study, and highlights the literature that informs the research questions and methods of this research. Literature was consulted in six areas, in four disciplines, in an attempt to demonstrate the interdisciplinary nature of this line of inquiry. Online learning encompasses issues in LIS, education, psychology, and organizational management – issues that instructors must consider in addition to course content and learning objectives.

### **Literature Review**

#### **Study Foundation and Framework**

Previous research addresses learning that occurs in leisure or interest-based Internet forums and learning that occurs within graduate classes. This study brings a new perspective to the literature because it examines an online learning environment of graduate students from an information behavior perspective. This perspective has not been identified in the studies reviewed in preparation for this dissertation. The information behavior perspective, specifically the theories of Chatman and Todd, gives the phenomenon of online learning another dimension and provides the foundation to situate and connect online learning within multiple disciplines. The foundation of Small Worlds (Chatman, 1991) and Information Intents (Todd, 1997) (a product of the knowledge construction literature) give depth and interdisciplinarity to the interactions and learning that occur in online graduate classrooms.

## Small Worlds

Chatman (1991) proposed the theory of Small Worlds, which encompasses several concepts including: Normative behavior; worldview; social types; information behaviors; and social network theory (Huotari & Chatman, 2001; Chatman, 2001; Chatman, 2000; Chatman, 1999; Chatman, 1991). Huotari and Chatman described Small Worlds theory in the following way:

In addressing the theory of small world, it is essential to remember that the reason the small world works is that it allows persons to share a similar cultural and intellectual space. That is, those things that hold this world together include a common assessment of information worthy of attention, social norms that allow its members to approach or ignore information and behaviors that are deemed by other inhabitants to be appropriate for this world. (Huotari & Chatman, 2001, p. 352).

Students enrolled in online LIS education programs share the culture established by the overall library community, and they share an intellectual space and corresponding academic culture by engaging in a formal learning environment. Furthermore, by studying a specific subject area, in this case LIS, students seek specific information that assumes and promotes social norms, normative behaviors, and worldviews appropriate to the field of librarianship (Burnett et al., 2001; Chatman, 2000; Chatman, 1999).

Social norms enable us to understand how behaviors fit within the proper context of things as they are defined in a particular small world. They show how social meanings are developed and protected. They also define those things that are important to pay attention to and those things that are not. (Huotari & Chatman, 2001, p. 352)

Burnett, Besant, and Chatman (2001) extended Chatman's work and suggested that the concept of normative behaviors is especially applicable to virtual communities.

In LIS allied fields of information systems and human computer interaction, normative behaviors are referred to and labeled as social exchange theory, and branded as a key component of community formation (Blanchard & Horan, 1998; Blanchard & Markus, 2004; Blanchard, 2008). Normative behavior, examines the social aspects of information (Burnett et al., 2008; Hargittai & Hinnant, 2006; Schultz-Jones, 2009) and is described as “...behavior which is viewed by inhabitants of a social world”, or small world, “... as most appropriate for that particular context.” (Burnett et al., 2001, p. 538) Normative behavior suggests that information is contextual and “... rooted within the norms and the attitudes of a particular social world.” (Burnett et al., 2008, p. 58)

Normative behavior provides “... shared perceptions of appropriate behavior with the power to induce people to behave publically in ways that may differ from their personal beliefs” (Honeycutt, 2005, para. 5 ) in an effort to conform to the community in question. The norms that are socially constructed, valued, and enforced will vary from group to group since the information sought and exchanged, and the cultural capital exchanged are dynamic entities reliant on the composition of community members. Online communities, especially those revolving around academic content, provide a common interest for their communities.

Much of the research in the area of virtual communities has concerned itself with the medium of the technology delivering the content or facilitating the gathering of the group members (Anagnostopoulos et al., 2005; Brandt, 1997; Chen, 1997; Huang, 2002; Jonassen, 2000; Jonassen, 1994; Kearsley, 1998; Lock, 2002; Moller, 1998; Petraglia, 1998; Rogoff, 1994; Tu & Corry, 2002), and fewer research studies have



focused on the interactions and information sharing that occurs. These interactions are less dependent on the medium and rely more heavily on the social exchanges that occur between individuals. Chayko notes that online communities are a new kind of “... organic solidarity” (2002, p. 8) and their development is no longer dependent on technology, proximity and circumstance. They do need a mediator (the technology), but are more dependent on like minded people and a space where the connections can grow (Chayko, 2002).

### **Knowledge Construction**

Knowledge construction, which emerged from the cognitive psychology and knowledge representation literatures, and is used in LIS literature in conjunction with information utilization (Brookes, 1980a; Brookes, 1980b; Brookes, 1974; Graesser & Clark, 1985; Pennanen & Vakkari, 2003; Rumelhart, 1977; Savolainen, 2009; Tanni & Sormunen, 2008; Todd, 2006; Todd, 1999a; Todd, 1999b; Todd & Kuhlthau, 2005; Tuominen & Savolainen, 1997; Wingens, 1990). The tangible outcome of knowledge construction can be thought of as a knowledge structure, although other names may apply as well, e.g., schemata, frames, scripts, images, or cognitive maps (Ingwersen, 1982). Hashway and Hashway (1990) described knowledge structures as external structural representations of internally held information; a knowledge structure is “... a set of symbols representative of an internal representation of the external world.” (p. 33) Todd (1997) discussed the work of Ingwersen and suggested that “... each individual’s image of the world consists of a conglomeration of different knowledge structures, the actual knowledge structures being the individual’s view of the world (p.

75). In that light, when examining information use behaviors of graduate students in an online learning community, the knowledge structures can be thought of as learners' posts in the courses' threaded discussions. Holzner and Fisher (1979) described knowledge structures as a form or mode of discourse necessary to the understanding of information utilization and "knowledge transformations" (p. 230).

When discussing knowledge construction and information utilization in LIS, Brookes' (1974) 'Fundamental Equation' must be acknowledged:

$$K[S] + \Delta I = K[S + \Delta S]$$

The equation states that knowledge acquired by an individual ( $\Delta I$ ) will be added to an existing store of knowledge or frame of reference ( $K[S]$ ), and will ultimately alter the existing body of knowledge ( $K[S + \Delta S]$ ). The equation, in which acquired information modifies the existing "knowledge structure" (pp. 147-148), describes a cyclical process in which individuals continually add new information and knowledge to the existing base.

Graesser and Clark (1985) presented a similar scenario when they consider bridging inferences and projection inferences. "Bridging inferences fill gaps between explicit statements in order to establish conceptual connectivity. Projection inferences elaborate and expands a coherent passage structure (or temporary structure on-line), but do not fill gaps." (p. 30) The conclusion was that "... the bridging inferences are part of structures that connect explicit statements whereas projection inferences are part of structures that radiate outward from the bridging structures." (p. 30)

Bridging structures are important for comprehension and interpretation, and from the LIS perspective begin to explain users' motivation for information seeking, a primary component of human information behavior. Projection addresses the construct of information utilization, i.e., what people *do* with the information acquired and subsequently accepted and absorbed.

### **Information Intents**

Information utilization, which has its foundations in the cognitive view of information science, seeks to discover what happens when people acquire information and how that information is used. One theory that investigates information utilization is Information *Intents* (Todd, 2006; Todd, 2005; Todd, 1999a; Todd, 1999b; Todd & Kuhlthau, 2004). Specifically, the Information Intents theory, originally developed during a study investigating illegal drug use knowledge (heroin) among adolescent girls is rooted in the sociology of knowledge, and benefits information science because it provides a way to identify and demonstrate information behavior patterns.

Table 1.1 depicts Todd's Information Intents which says that information is sought and acquired to get: 1) A complete picture of a situation; 2) a changed picture of a situation; 3) a clearer picture of a situation; 4) a verified picture of a situation; and, 5) a position in a picture. Within these five categories are specific examples of how information can be utilized to construct new knowledge. Acquiring information to get a complete picture, for example, is using it to bridge inferences, and the examples of how knowledge structures have changed point to projection inferences.

Information Intent	Manifestation of changes in knowledge structures
Getting a complete picture	a. Inclusive: adding specific instances, examples or types b. Elaborative: building associative structures: <ul style="list-style-type: none"> <li>• Property-oriented structures</li> <li>• Manner-oriented structures</li> <li>• Cause-oriented structures</li> <li>• Goal-oriented structures</li> </ul> c. Integrative: separate structures integrated more holistically
Getting a changed picture	a. Construction: building up a complete picture b. Deconstruction: removing incorrect ideas c. Reconstruction: replacing with more appropriate ideas
Getting a clearer picture	a. Explanation: tells how and tells why b. Precision: appending information to add precision of detail
Getting a verified picture	a. No change b. Emphatic: repetition of ideas to add weight or emphasis c. Inclusive: including more precise, specific ideas d. Defensive: defend and reaffirm viewpoints
Getting a position in a picture	a. Reactive: expressions of agreement / disagreement b. Formative: deriving personal conclusion based on facts c. Potential positioning: foreseeing future use of facts d. Predictive: predicting new events and states

Table 2.1. Information Intents Chart by Todd (2005, p. 201).

Todd and Kuhlthau's (2004) study utilized the Information Intents theory in a study of Ohio school libraries and students' perceptions of how school libraries help them in various areas of their personal and academic lives. This help is enabled through accessing of new information and the building of new knowledge. The research suggests that the interventions (and therefore the acquisition of information) provided to students enabled them to "... figure out if their own ideas are good or bad" and "... provides a critical point for students to test and work out the validity of their own ideas",

moving them from “... misinformed to being informed” (p. 10). Gaining of new knowledge can be informational and also formational, similar to Graesser and Clark’s (1985) bridging and projecting metaphor.

Once new information is acquired, people can start doing something with it, or otherwise utilizing the information. “To *use* information ‘is to listen, to look at, to read; in short, it is its reception and, if possible, the full or partial understanding by a recipient’.” (Machlup, 1979, pp. 63-64) Knowledge construction implies changes in cognitive viewpoint, and changes in behavior, and thoughts. This concept of knowledge construction is not unrelated to Dervin’s (1998) now-classic notion of sense-making, in which people use information to construct and make sense of their environments. Todd (1999b) stated that people are “... active, selective, constructive and reflective agents in utilizing information” (p. 11). Information utilization involves an “interactive change” in which an individual goes through “... a process of exposure, selection, adaption, reinvention and modifications,” incorporating new information into their existing situations and frames of references (p. 11).

Todd (2006) suggested a method of tracking knowledge construction which examines the substance and amount of knowledge over time. Information, or statements made by learners, range – as they do in Bloom’s Taxonomy -- from facts to explanation and results, on to synthesis (metacognition) of this information. As this continuum progress, it suggests that factual, objective information is added to existing knowledge bases, being adapted, and built upon. Explanation implies understanding and extension of factual information, while synthesis implies that information is being

incorporated into and is impacting existing knowledge structures (para. 14). Not only is it expected that the content of learning statements will change, but that their amount will increase as well.

### **Contributing Literature**

In order to create a Small World, or online learning environment, an intersection of course content, interaction and collaboration, and human information behavior are required. With these components in place, a goal of this proposed research includes measuring the learning, connectedness, and knowledge construction that result from the formation of a small world in an online graduate course in library and information science. Illustrated by the Figure 2.1, Small Worlds and information Intents provide the foundation of this research, and the information behavior and development of community in an online LIS course are influenced by research in several different disciplines. The major areas are: 1) Human information behavior from the library and information science literature (specifically the work of Chatman (1991) and Todd (1997; 2005), 2) community psychology; 3) the literature of distance education, particularly as affected by writings on social learning, social psychology, and social presence; 4) cohort learning which stems from the research conducted in the field of education; and 5) communities of practice, which has most notably been used in the fields of education and management.

The graphic demonstrates the bodies of literature viewed as relevant and significance to this line of research, and touches upon the disciplines of LIS, psychology, sociology, and education. With this contextualization, the study is interdisciplinary and

provides a holistic view of the user-centered learning process that can occur in the online learning environment. The literature provides the overall framework and structure of the inquiry.

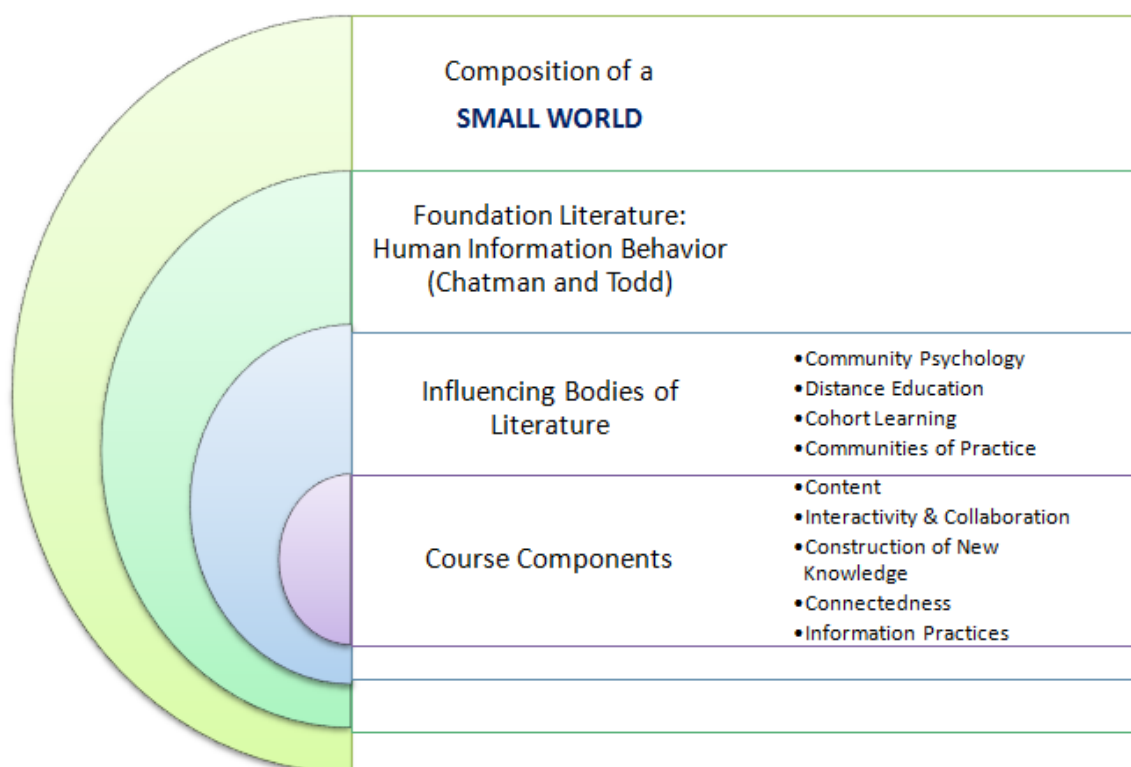


Figure 2.1. Literature and Components Contributing to the Development of a Small World.

The interior section of the graphic, course components, is viewed as more permanent, detailing characteristics of a successful online class, regardless of the specific disciplinary area: 1) Content; 2) interactivity and collaboration; 3) construction of new knowledge; 4) connectedness; and 5) information practices. All courses will have requisite content, and hopefully have elements of collaboration and interactivity, connectedness, and inspire the exchange of information and construction of new

knowledge. This study surmises that the combination of these two primary areas (the literature plus the course components) work together to form an online learning environment, an environment that could be considered a Small World. This Small World formation provides an additional framework with which to view distance education in the information behavior field (and LIS in general). Small Worlds are not a result of merely housing course content in an online course site; small worlds require context, relevant content, consistent interaction, purposeful course design and pedagogy, and social presence to emerge and survive. Studying these facets in totality will inform LIS education, as well as distance education in other areas of instruction.

**Community Psychology.** The concept of psychological sense of community, or community psychology, is significant in the literature of psychology. Related to group psychology, group cohesion and other related areas of inquiry, this subspecialty initially addressed the physical (geographical) and emotional (relational) community that developed in face-to-face neighborhoods, where homeowners and families formed and maintained relationships (McMillan & Chavis, 1986, p. 8). McMillan and Chavis' concept of community consists of four parts: 1) Membership, 2) influence, 3) integration and fulfillment of needs, and 4) emotional connections. The authors extended this definition by suggesting that community was no longer place bound and could be applied to different settings and groups of people, for example learners in a classroom. Burroughs and Eby (1998) extended McMillan and Chavis' model to the workplace, and Rovai (2001) extended this definition of community to the classroom setting.



McMillan and Chavis' description of community (1986) has permeated multiple bodies of literature, including education (Rovai & Gallien, 2005; Rovai & Wighting, 2005; Rovai & Barnum, 2003; Rovai 2002a; Rovai 2002b; Rovai, 2002c; Rovai, 2002d; Rovai, 2002e; Rovai, 2001; Rovai 2000) and is making its way into the LIS literature (Hersberger et al., 2005; Hersberger et al., 2007) and human computer interaction literature, where it has been referred to as sense of virtual community (SVOC) (Blanchard & Horan, 1998; Blanchard & Markus, 2004; Blanchard, 2008).

There are dozens of definitions of community (Hillery, 1955), and the term online community has been used broadly and has become an 'in vogue' catch-all term for anyone interacting with others in an Internet-based forum (Hersberger, Rioux, & Cruitt, 2005; Hersberger, Murray, & Rioux, 2007, p. 135; Jones, 1997; Preece, 2000). Other researchers consider the term to be metaphoric only or refer to merely make-believe communities (Blanchard & Horan, 1998, p. 295). However, most studies equate online communities to relationships between participants that involve trust (Kling & Courtright, 2003).

But to define it specifically for purposes of this research, Rovai (2000; 2002c; 2002d; 2002e) was among the first to bring the concept of online communities out of the general study of the Internet and into the educational context. Rovai's definition encompasses learning at a distance and the anticipated learning that happens in these settings. Rovai's (2002a) definition borrowed heavily from McMillan and Chavis (1986) and placed the existing construct of community squarely in an educational context:

One can define classroom community as a feeling that members have of belonging, a feeling that members matter to one another and to the group, that

they have duties and obligations to each other and to the school, and that they possess shared expectations that members' educational needs will be met through their commitment to shared learning goals. One can, therefore, constitutively define classroom community as consisting of two components: feeling of connectedness among community members and commonality of learning expectations and goals. (Rovai, 2002a, p. 322)

Rovai also posited that classroom community revolves around spirit, trust, interactions and learning (Rovai, 2001, p. 287). Many of Rovai's studies focused on the building and maintaining of a sense of community in the classroom (Rovai, 2001; Rovai, 2002a; Rovai, 2002b; Rovai, 2003a; Rovai & Wighting, 2005), and emphasized the role of the instructor in ultimately creating community in the online classroom. The instructor's role of providing structure and dialogue for an online class from a transactional distance is referred to as social presence or immediacy in the online classroom. Instructor immediacy includes elements such as: 1) How often does the professor participate in threaded discussion? 2) Does the professor provide timely feedback for assignments? 3) Does the professor design collaborative learning opportunities? And, 4) does the professor possess adequate group facilitation skills? (Rovai, 2001) These characteristics require attention from instructors, administrators and researchers (Rovai, 2002b; Liu et al., 2007; Vesely, Bloom, & Sherlock, 2007). Students' motivation and willingness to learn are certainly important factors for building community and contribute to the ultimate success of, and learning in, the classroom. However, if these instructor qualities are not present, community will not form.

The development of community depends largely on perception, or how community members / learners see themselves in relation to the community and what they consider their role to be, which is referred to as community mindedness (Liu,

Magjuka, Bonk, & Lee, 2007, p. 17), or connectedness (Chayko, 2008; Chayko, 2003; Rettie, 2003). “Social connectedness is rooted in the mind,” (Chayko, 2002, pp. 19-20) and is the “... mental glue” that holds communities together (p. 40). Students’ previous experiences with online communities (i.e., ‘community awareness’) influence the formation of new communities (Liu et al., 2007). Quan-Haase, Wellman, Witte and Hampton (2003) concurred by stating that sense of community is a type of social capital related to attitude. It is a “... strong attitude toward community – a motivated and responsible sense of belonging.” (p. 293) Both instructors and students have to believe in the existence and importance of community in order for it to be effective (Vesely, Bloom & Sherlock 2007). There will be instances when some students may just not believe in community or be uninterested in giving the participation required to make it successful (Brown, 2001). When this occurs, there is very little an instructor can do to create the requisite interconnectedness for the remainder of the group.

As with any dynamic involving people, the literature notes there are caveats concerning the development of online communities. Similar to communities of practice, online communities have developmental phases (Brown, 2001; Liu et al., 2007) and life cycles, no matter how successful. There are no firm timeframes involved, but online communities go through birth, formation, maturity, metamorphosis, and death phases (Garber, 2004). Other considerations include interaction overload, which can occur when there is an overabundance of information, threads, assignments, and “... other activities well beyond normal coping abilities,” (Rovai, 2002b, p. 45) and inappropriate application or overuse of technology.

**Distance Education.** The distance education literature addresses community development among online learners, especially as developed through computer-mediated communication (Haythornthwaite & Hagar, 2004; Haythornthwaite et al., 2000; Haythornthwaite, 2000; Kazmer, 2005; Kazmer, 2000). Since online learners do not have physical access to their instructors and fellow students, they must be purposeful in their interactions and efforts to make contact with one another. Socializing becomes a function facilitated by technology (Kazmer, 2000). Kazmer stated that forming community is an important coping skill for distance students.

They are in a new and unfamiliar learning environment, without physical classroom and with limited face-to-face contact. They face a variety of problems, social and technological, that students in more traditional programs do not. As students enter this new learning environment, they need support to help them gain entry to the community and to begin their interaction with others. (Kazmer, 2000, p. 2)

Haythornthwaite (2000) suggested that not only is community building important for distance learners, but community maintenance is vital as well. Technology facilitates community building, but concerted effort by students to maintain and nurture the initial bonds formed is needed. Disengaging and not maintaining the social bonds and connections is referred to as 'fading back' (p. 12). "Those who fail to make such connections feel isolated and more stressed than those who are more active in the community." (p. 2) Palloff and Pratt (2001) concurred by stating, "Successful learners in the online environment need to be active, creative and engaged in the learning process." (p. 14).

Palloff and Pratt (2001) state: "It is always important to remember that in the online environment, we present ourselves in text. Because it is a flat medium, we need

to make an extra effort to humanize the environment.” (p. 18) In the online classroom students may interact exclusively via text, emails, journals, assignments, and threaded discussions. In this less interactive environment, it is important to promote social presence (Biocca et al., 2003; Gunawardena & Zittle, 1997; Kehrwald, 2008; Rettie, 2003; Richardson & Swan, 2003; Stein & Wanstreet, 2003; Tu, 2000; Tu & McIsaac, 2002). Social presence is defined as “... the degree of salience of the other person in the (mediated) interaction and the consequent salience of the interpersonal relationship. This is interpreted as the degree to which a person is perceived as ‘real’ in mediated communication.” (Richardson & Swan, 2003, p. 70) This realness can be thought of as “... the degree to which a user feels access to the intelligence, intentions, and sensory impressions” of the other members of the online environment (Tu, 2000, p. 28). Social presence needs to be cultivated, varies from group to group, depends on the particular technologies available to the learners, and the culture of the group in question (Gunawardena & Zittle, 1997). Social presence is an important element in an online learning environment because of the lack of nonverbal and other interpersonal cues that are a fundamental to face-to-face classrooms. Online cues and interactions are how learners overcome transactional distance, get to know one another and form the basis for community that may result in the online environment.

The importance of nonverbal cues is especially evident when considering Internet-based asynchronous learner communities, or asynchronous learning networks (ALNs) (Rovai, 2000; Rovai, 2001; Rovai, 2002a; Rovai, 2002b; Rovai, 2003b; Rovai & Jordan, 2004; Rovai & Wighting, 2005; Rovai, 2007; Wegerif, 1998). One of several

models employed in distance education and virtual communities, ALNs involve learners and instructors who are not only separated by space, but also by time. Students in such courses, or communities, "... interact with each other mostly through the use of discussion boards, without the requirements to be on-line at the same time." (Rovai, 2001, p. 33) This population of learners is the most at-risk for alienation, boredom and lack of engagement with other students and course content (Rovai & Wighting, 2005), and run a higher risk of dropping out or removing themselves from the online environment. Asynchronous learners have the greatest challenge to surmount in building a sense of community due to the lack of same-time interactions and lack of physical and verbal cues, but may benefit the most from community formation.

Haythornthwaite and Hagar (2004) suggested that there can be barriers to forming communities through mediated means. Because technology is so pervasive and plentiful, care must be taken to use the right tools -- those capable of accommodating various hardware and software requirements and learners' varying levels of technological skill. Technological tools should be used in meaningful ways so learners should feel they are connecting with others and engaging in personal relationships and networks (Haythornthwaite, 2000), as opposed to simply using electronic tools to complete academic requirements.

**Cohort Learning.** Another body of literature related to development of Small Worlds is that of cohort groups, or learning communities. Cohort learning originated in the field of education and spans several educational disciplines, including adult education, educational leadership, distance education, and educational psychology.

Learners in cohorts share a communal space, co-create knowledge, collaborate in learning processes, and engage in experiential learning and knowing. The literature suggests that cohort learning is beneficial and enhances student learning. The literature characterizes cohorts as formal groupings of students who progress together over time, perhaps years, as a program is completed. Studies have not yet been identified (in this research study) that indicate whether a cohort can be called as such, and be successful, during the course of only one semester. Cohorts are typically engineered by faculty and administrators and are not self-selected by students. However, cohorts can become communal over time (Lawrence, 2002, p. 90). As Nesbit notes:

Cohorts are created, not born. They are successful when everyone works collaboratively and collectively on improving their own and others' learning experiences. It takes self-responsibility, patience, courage, humor, commitment, sensitivity, and a lot of hard work to create such an enriching learning experience for everybody. (Imel, 2002, p. 3)

The literature highlights benefits of the cohort model, which include: Sense of identity; community; persistence; cooperation; collaboration; decreased competition; and critical thinking skills (Lawrence, 2002, p. 86; Imel, 2002, p. 3). Limits of cohort learning have not been thoroughly investigated in the literature. Studies tend not to address the actual learning that takes place within the cohorts and they do not explore the group dynamics that can make a group successful or unsuccessful, thereby affecting the learning process. These are the factors that Chatman (1991) brings to the table. The bulk of the literature on cohort learning focuses on "... factors tangential to learning such as students' satisfaction with the social climate of these programs, program

completion rates, and faculty perceptions of the strengths and weaknesses of cohort models.” (Scribner & Donaldson, 2001, p. 606)

The literature also ignores issues of homophily and nonlearning that may occur in cohort groups. Nonlearning is identified as “... that which is presented to or experienced by learners fails to influence their understanding of a particular topic, issue or situation” (Scribner & Donaldson, 2001, p. 611). Homophily and nonlearning can be influenced by group dynamics and the learning environment that has, or has not been, created by students. The concept of homophily, suggested by Chatman’s Small Worlds theory (1991), is problematic in the cohort model. If ‘birds of a feather’ are placed in the same cohort, cohesiveness may occur and it is less likely that learning will occur on a substantive level because group members are too like-minded and have limited chances to be exposed to new ideas and further growth (Jaffee, 2007).

**Communities of Practice.** Chatman’s research provides insight into the culture and human information behaviors that result from the development of community. Wenger’s theory of communities of practice (COPs) (1998) advances understanding of the actual *formation* of these communities or Small Worlds. Wenger (1998) described three distinct dimensions of a community of practice: 1) They are joint enterprises, meaning they are created and maintained by their members; 2) they feature mutual engagement, meaning all members come together to form a social entity; and 3) the members have a shared repertoire of resources and sensibilities that have been communally developed over time.



Wenger situates education as a social process, understanding that human beings learn better when they can participate in the process. This is applicable to learners in online environments who communicate and interact asynchronously and in disparate physical locations (Hibbert & Rich, 2006; Johnson, 2001; Nincic, 2006).

Community members frequently help each other to solve problems and develop new approaches or tools for their field. This makes it easier for community members to show their weak spots and learn together in the 'public space' of the community. (McDermott, 1999, p. 34)

Johnson (2001) states that the COP theory has potential for online learning but questions whether Wenger's original concept -- which assumes face-to-face interaction among participants -- can be adequately extended to virtual communities.

Additionally, the management and virtual learning literature challenged Wenger's theory by suggesting that it promotes heterogeneity in groups (Nincic, 2006; Roberts, 2006), which in turn promotes the ideas of dominant groups and reinforces habits and conditions of groups, which may not be conducive to growth. The authors suggest that communities of practice are restrictive and reinforce Chatman's concept of Small Worlds, in a more negative connotation. Other critiques of COPs include the criticism that the theory has been too widely and inappropriately used across disciplines (Storberg-Walker, 2008; Wenger, McDermott & Snyder, 2002) and that its main assumptions are not quantifiable and therefore not truly useful in developing replicable research strategies and studies.

### **Where are we Now?**

A key finding of this review and analysis is that the literature related to online learning and Small World development are interdisciplinary and cross a range of fields

of study. The disciplines that inform this research facilitate individual learning and learning in groups. The foundation literature (the information behavior theories) begins the continuum (depicted in Figure 2.2) with learning that occurs within the individual. Information Intents and the process of knowledge construction are activities influenced by outside factors and dynamics, but which ultimately occur in the learner's own mind, with the formation of ideas, opinions and habits. As the continuum progresses, the community psychology and distance education literature describe learners interacting with each other in computer-mediated learning environments. Personal interaction at this level is variable, with the potential for instructor immediacy and structured activities within the online learning environments.

Group learning is suggested by the cohort learning and COPs literature. Cohort learning and COPs encompasses individual learning while encouraging group cohesion in a learner-centered environment. Cohort learning and COPs provide finite boundaries for the Small World and encourage peer learning and sustained interaction and information exchange. This continuum demonstrates the multifaceted nature of Small World development and maintenance.



Figure 2.2. Themes suggested by the contributing literature.

As demonstrated in the research agenda below, there are additional theories

and paradigms that can be used to examine the phenomena studied in this research.

The wealth of diverse thoughts benefits and advances this line of inquiry, and increases and solidifies the body of research in this area.

### **Key Claims Derived from the Literature**

The literature described online learning as best situated in a constructivist environment that enables learners to engage in critical thinking and collaborative learning. Although these assertions are not unfounded, they are not automatic. The research also suggested that the instructor's role in the online class is imperative, and probably the most important component to the success of an online class. Instructor immediacy is key (Bliss & Lawrence, 2009), and consistent, motivating, interactive, interaction based, and blended course design is critical (Liu et al., 2007; Rovai, 2007; Rovai, 2004; Rovai, 2001). Course design and instructor immediacy facilitate interaction in the online classroom, which in turn increases students' perceived sense of community and learning (Chayko, 2002; Rovai, 2002c; Shen et al., 2008).

Student and instructor perceptions of community are also paramount to the success of an online class. If course participants do not believe a course can, or needs to, facilitate a sense of community, the community will not form, no matter how well designed the course. However, a community is not always desired and trying to force one to form is likely detrimental. As a result, no one party (students or instructor) can ensure an online class' success precisely because it is truly a collaborative effort.

## Gaps and Challenges

The same interdisciplinary and disparate nature of the literature that enriches the perspective of this topic can also be viewed as a hindrance: the vast range of ideas makes it difficult to focus and is an added challenge for conducting research from a LIS perspective (specifically human information behavior). If this research were situated within the field of education, the challenge might be less, but the combination of human information behavior, sense of virtual community and online education is newer to LIS, and because of empirical research in this very specific area is lacking (although Haythornthwaite's work (2005; 2002; 2001) is a notable exception), generalizations cannot presently be made.

Specific challenges to this research included the decision of how far and wide to cast the net when considering online communities. The literature primarily addresses communities that exist in Internet forums (on a plethora of topics) that are voluntary and related to leisure activities or hobbies (consider the work of Rheingold (1993) and Wellman (1983)). Much of this research is transferrable, but the online classroom is not strictly a voluntary environment since it is not for leisure activities, it is not publicly accessible, it is not generally free, and has neither the same purpose nor desired outcomes as other Internet-based communities.

Continuing the discussion of voluntary communities, using the COP paradigm has been a particular challenge in this area of inquiry. Much like Internet-based communities, traditional COPs feature voluntary participation. However, like online classroom communities, COPs have learning as a focus and depend on interactions

between members. COPs are more applicable than not to this line of inquiry. Another perceived gap in the literature is the apparent lack of studies examining synchronous modes of online education. There are fewer distance education programs (especially in LIS) employing that model, or hybrid models, of course delivery. However, it is nevertheless an important topic, especially in terms of sense of community and cohort learning.

### **Influence of the Literature**

The foundational information behavior literature, the contributing interdisciplinary bodies of literature, along with the designated course components and proposed audience of interest, work well to create a unique and worthwhile study that will have impact on multiple areas of study. These elements become a sum of various parts, and informed the structure and implementation of the study, from the selection of the sample, to the choice of data analysis methods, to the interpretive thinking that accompanied the data analysis, to the determination of the study's limitations and future directions. The study has a foundation based solidly in the literature and in several disciplines, and fulfills a distinct area in the information behavior subfield of LIS and in the area of distance education.

The Small Worlds construct is a unique, multifaceted and rich way to interpret the development and life cycle of an online learning environment. As such, appropriate methods should be selected to examine these phenomena. This chapter described the extensive influence of the literature, and provides the framework for Chapter Three which describes the data analysis processes.

## **Chapter 3: Methodology and Data Analysis**

### **Introduction**

This chapter details the theoretical framework of the study that influenced the selection of methods and data collection and analysis procedures. Informed by the constructs of phenomenography and virtual ethnography, the dissertation employs learning/context analysis, textual analysis, sociometry, and the Classroom Community Scale to examine the data collected from two online classes. This chapter also describes a completed pilot study, the results of which further informed the design and execution of the research design and data collection process.

The goals of this research are to: 1) Examine the dynamics of information behaviors in an asynchronous online classroom, 2) identify factors that shape these behaviors, and 3) describe the relationship between these behaviors and knowledge construction. The study addressed the following research questions:

RQ1: What information behavior patterns, if any, do students in an online asynchronous learning communities exhibit?

- What information intents are exhibited in the written interactions of the graduate students in an online learning community?
- What patterns of knowledge building are exhibited in the written interactions of the graduate students in an online learning community?
- What patterns of information interactions are exhibited in the written interactions of the graduate students in an online learning community?
- What changes in these patterns, if any, occur over the course of the teaching

cycle?

RQ2: How, if at all, are these patterns of information use related to a sense of community, as measured by the Classroom Community Scale?

- What impact, if any, does the context of a small world community have on the information behaviors of online students?

### **Dissertation Sample**

This research examined two courses which will be referred to as *Technology* and *User Studies*. User Studies is a theoretical class examining people's information seeking, searching, using, and valuing behaviors, and their impact on services provided by libraries and information organizations. Technology is a practical, hands-on class that introduces students to key concepts about the Internet, programming, and selected hardware and software that future library professionals may encounter, and examines their role in library services. In this graduate LIS program classes are 15 weeks in length, and the two classes selected for this research are typically taken concurrently by students in their first semester of study.

Representing more than a convenience sample, these classes were selected because they had potential to yield rich discussions and also required the learners to participate in collective tasks. User Studies and Technology were also selected because of their importance to LIS curricula and to the preparation of library professionals. It is common for American Library Association (ALA) accredited programs to have introductory courses in technology and in user studies. Having such courses meets the

guidelines set forth by the ALA's 2008 Accreditation Standards (ALA, 2012), specifically the following standards:

<b>Standard I: Missions, Goals, &amp; Objectives</b>	<b>Standard II: Curriculum</b>
I.2.1 the essential character of the field of library and information studies; that is, recordable information and knowledge, and the services and technologies to facilitate their management and use, encompassing information and knowledge creation, communication, identification, selection, acquisition, organization and description, storage and retrieval, preservation, analysis, interpretation, evaluation, synthesis, dissemination, and management	II.3.3 integrates the theory, application, and use of technology
I.2.9 the role of library and information services in a rapidly changing technological society	II.3.4 responds to the needs of a diverse society including the needs of underserved groups
I.2.10 the needs of the constituencies that a program seeks to serve	II.3.5 responds to the needs of a rapidly changing technological and global society

Table 3.1. ALA Accreditation Standards – Excerpt.

Underscoring the importance of the standards set forth by ALA, of the top 10 LIS programs in North America, according to the 2009 rankings issued by *US News & World Report* (Library and Information Studies, 2009), 12 programs offer technology course and eight offer a users studies course. Of those 12 programs, five required students to complete a technology course and five required completion of a user studies.

### **Overview of Data Collection and Analysis**

Two course sections were selected and the respective instructors were asked for assistance with this study. Both instructors agreed to participate, distributed a survey to



their students, and allowed the researcher access to their online course shells after the semester had ended. Each class contained 19 students. No incentives for participation were offered to the instructors or students, and the study was approved by the Institutional Review Board at the university.

Data were collected from two online and asynchronous courses, *Technology* and *User Studies*, at an ALA accredited program in Library and Information Science at a university in the northeast United States. Data for this study consisted of the work product from these two classes (threaded discussions, course documentation, journal entries, and course content) and were collected over the course of one full academic semester (15 weeks). Students were asked to participate in a survey designed to measure classroom community (Appendix A), which provided a supplemental source of data. In addition to survey data, course shells (learner/context analysis) and threaded discussions (textual analysis) were analyzed, and graphs were generated based on student interactions within the discussion threads (sociometry). Procedures for each data analysis technique will be discussed below.

### **Pilot Study**

#### **Subject Population**

In preparation for the dissertation research an institutional review board-approved pilot study was conducted a year earlier (2010) in an online class (*User Studies*) in the same graduate program. During one semester information was gleaned about the roles 22 students played in the classroom environment, specifically within the

threaded discussions. Information about learner success and connectedness was also ascertained.

The data collected for the pilot study was collected from the online class site and consisted of the threaded discussions students engaged in on a weekly basis.

Discussions were prompted by questions posed by the professor and required students to base their responses on course readings. These discussions also required students to contribute their thoughts on the readings and respond to the posts submitted by their classmates. Discussions lasted seven days (the length of one course unit) and generated dozens of pages of conversation.

The pilot study was limited by small sample size, duration of study (one semester), model of online study (asynchronous learning), and access to one LIS program.

### **Pilot Study Results**

During the semester, students engaged in 15 weeks of course work and participated in two discussion threads per week (for a total of 30 threaded discussions). Discussions ranged in length from 24-30 pages (for a potential of 1200 pages of data), and each threaded discussion contained 70-80 posts (original postings and responses to others). Posts ranged from 97 words (three sentences) to 919 words (22 sentences), and varied in style, from bullet points to full academic essays. Given the enormity of potential data, two weeks' worth of discussion (four discussion threads) was examined as part of the pilot process to examine the potential for gathering substantive data that could lead to address the research questions.

With the initial goal of measuring information intents (Todd, 2005), textual analysis of selected threaded discussions provided indicative data on the emergence of an additional information intent: *Get Connected*. As seen in Table 3.1, *Get Connected* is described as an attempt by a discussion participant to identify and label professional and personal practices. These participants also make explicit personal connections with other individuals in the learning environment.

Information Intent	Contextualization of Information Intent
<i>Get a complete picture</i>	Intents specific to: <ul style="list-style-type: none"> <li>• Professional practice</li> <li>• Personal practice</li> </ul>
<i>Get a change picture</i>	
<i>Get a clearer picture</i>	
<i>Get a verified picture</i>	
<i>Get a position in the picture</i>	
<i>Get connected</i>	Attempts to connect with classmates and build community <ul style="list-style-type: none"> <li>• Use of names</li> <li>• Affirmations / Agreements</li> <li>• Direct responses</li> <li>• Disclosures</li> </ul>

Table 3.2. Textual analysis results from the pilot study.

For example, students announced what they would like to see in themselves as future information professionals – “When I graduate and work in a library, I will ...”. The learner is *Getting a Changed Picture* of what it means to be a librarian and reconstructing that perception based on new information received in the course discussions. This new perception applies directly to their professional practice. Similarly, learners announced their personal practices, as students, researchers, and individuals. Statements such as “I know that I can personally identify with ...” indicated

that students acquired *Verified* pictures of themselves, applying new information to their personal and professional lives.

In addition to the new Information Intent, *Getting Connected*, textual analysis of the pilot study data revealed explicit attempts by students to connect with classmates and build community in the online learning environment. The use of first names when responding to posts, the proffering of affirmations and agreements (e.g., I find it interesting ...; I really like what you said...; I understand what you're saying ...; I think ...; I hear you saying ...; I agree with you ...; I'm with you ...], and disclosures of personal information (e.g., medical conditions) indicated learners' efforts to connect with one another and make the online learning environment about more than course content.

### **Revisions for Dissertation Study**

Results of the pilot study were informative, provided direction for the dissertation research, and revealed several considerations for future research. Concerns to be addressed included: 1) The sample population, 2) the institution offering the classes, and 3) the selection of courses to examine.

It was determined that the population for the dissertation research would be only online graduate students, and not face-to-face students for comparative purposes. The differences between online and face-to-face students can be addressed in future research. It was also decided that two classes should be examined, instead of one. Another User Studies course was selected, and because it is a theory based class that relies heavily on discussion, it was felt that a second class should be practical and task oriented class, i.e., the Technology course. The selection of a practical course was a

strategic decision designed to see if community would form in a class that was not heavily dependent on threaded discussions.

The volume of data collected and analyzed in the study is summarized below:

	<b>Occurrence of data during the semester</b>	<b>Type of data collected</b>	<b>Volume of data</b>
<b>Learner/Context Analysis</b>	Course design occurred at the beginning of the semester	Qualitative	Course design components including: information about the instructor, syllabi, assignments, grading schemes, discussion questions, links to resources, and general instructions and information.
<b>Textual Analysis</b>	Threaded discussions occurred during weeks 1-15 of the course  Journal entries (User Studies course)	Qualitative	Threaded discussions  User Studies <ul style="list-style-type: none"> <li>• 30 discussions</li> <li>• 466 original posts</li> <li>• Average of 3 responses per post</li> </ul> Technology <ul style="list-style-type: none"> <li>• 3 discussions</li> <li>• 45 original posts</li> <li>• Average of 3 responses per post</li> </ul> Journal entries – 309
<b>Sociometry</b>	Threaded discussions occurred during weeks 1-15 of the course	Quantitative	Based on the threaded discussion data above, 33 graphs were generated
<b>Survey</b>	Survey was distributed during weeks 13-14 of the course	Mixed	20 students responded to the CCS (See Appendix A) which had 20 scale questions, 3 demographic questions, and 9 open-ended questions

Table 3.3. Data sources and volume.

The researcher did not participate in either class, but instead became immersed in the online course shells after the courses were completed, following the requisite IRB approval process. Finally, it was determined that examining courses at the researcher's institution was feasible and would yield rich results. Attempting to access students and online course environments at other institutions was problematic for several reasons, including: The need to find an asynchronous LIS program and faculty that would allow a researcher from another institution to study and critique their program; the need to secure institutional review board approval from multiple organizations; and, the need to safeguard student information from unaffiliated individuals. If these concerns could have been surmounted without a collaborating researcher at the desired institution, the time required to complete these steps and the conduct the research would have been prohibitive for this study.

The dissertation study analyzed the threaded discussions and survey results of two classes. These revisions comprise the structure of the dissertation study and the results are displayed and detailed in Chapter Four: Findings and Commentary about Findings.

### **Approaches to the Research**

This study is fundamentally qualitative in nature. Qualitative research seeks to answer questions by collecting evidence with a predefined set of procedures, with the goal of producing findings that are applicable beyond the initial phenomena of study. Qualitative research seeks to understand the perspectives of the population being

studied and strives to understand culturally specific contexts, values and experiences of that population (Mack, Woodsong, MacQueen, Guest, & Namey, 2005).

About the 'human' dimensions of qualitative research Denzin and Lincoln (1998) wrote the following:

Qualitative research is a situated activity that locates the observer in the world. It consists of a set of interpretive, material practices that make the world visible. These practices transform the world. They turn the world into a series of representations... . At this level, qualitative research involves an interpretive, naturalistic approach to the world. This means that qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them. (p. 4)

With the above description in mind, this research was informed by phenomenography, virtual ethnography, and naturalistic inquiry. In order to answer the research questions, it was necessary to become immersed in the Small Worlds of the LIS graduate students and investigate their experiences within the online learning environment. These approaches to qualitative research facilitated the discovery of students' information behaviors and the meanings associated with those behaviors.

Crystal and Wildemuth (2009), Miles and Huberman (1994), Erlandson et al. (1993), and Lincoln and Guba (1986) detail techniques for drawing and verifying conclusions in qualitative research, specifically when taking a naturalistic approach. Researchers speak of checking for representativeness and for researcher effects, triangulating data, weighting the evidence, and replicating findings (Miles & Huberman, 1994). This study was designed with these considerations in mind. The sample being examined (online graduate students) was representative of the study's target audience, and as the researcher was not native in these online course environments, but

examined the classes after they occurred, this lessened the potential for researcher effect on the sample population. Triangulation of data occurred by collecting and analyzing results from several different sources, including analysis of the course environment, journal entries, threaded discussions, and survey results. Concerning the weighting of evidence, the textual analysis of threaded discussions formed the bulk of the data for this study and, as such, was given more weight than the other data. However, the threaded discussions are enriched and contextualized by the data gathered from the survey, journals, and course environments. A goal of this research was to expand and build upon Todd's Information Intents framework in such a way that the theory can be used in future research designed to investigate information behaviors in online learning environments.

The study is credible because the researcher considered the data for 10 months, becoming immersed in the Small Worlds that had previously been created by the students. Engagement with the data was prolonged, in-depth, intense (Lincoln & Guba, 1986), and all data were interpreted in terms of the context of the overall study, the online learning environment, and materials were "... collected to give holistic views of the context." (Erlandson et al., 1993, p. 31) The results of the analysis are fully described and discussed (Chapter Four), the results of the analysis 'ring true' (Miles & Huberman, 1994, p. 279), and represent a comprehensive account of an online learning experience. Triangulation among data collection methods yielded converging results. Data from this study were consistent with those collected and analyzed in a pilot study, and the findings are coherent and related. Also, areas of uncertainty and limitations



were identified (Chapter Five), and predictions and conclusions drawn that confirm and expand existing literature in the field.

Regarding transferability, the sample studied was purposively selected (Erlandson et al., 1993), descriptions of the online classes have been described in sufficient detail so that the research can be duplicated, and the data are representative enough to have general applicability to the areas of online and graduate education through the lens of information behavior (Miles & Huberman, 1994). The findings of this research are described in a thorough and thick manner with an abundance of examples, are congruent with previous literature and the original Information Intents theory, and potential for future studies has been identified (Chapter Five).

The study is dependable (Miles & Huberman, 1994) because the research questions were aligned with methods of data collection and analysis, the data revealed similar patterns across collection sources, and coding checks were conducted. The study can be replicated under similar contextual circumstances and achieve comparable results. It is also consistent (Erlandson et al., 1993).

Finally, regarding the confirmability of the study, the methods of analysis are detailed in this chapter, as are the actual sequences of how the data were collected and analyzed, and the data have been retained for future examination and/or re-analysis (Miles & Huberman, 1994). The data analysis strategy of this research is replicable, and assumes that the data speak for itself, and results are not a product of researcher biases. "Data can be tracked to their sources and ... the logic used to assemble the

interpretations into structurally coherent and corroborating wholes is both explicit and implicit.” (Erlandson et al., 1993, p. 34)

### **Phenomenography**

This study has specific research questions to address, and a specific plan to collect and analyze the data. However, the overall study has been influenced by the constructs of phenomenography and virtual ethnography. These approaches have been considered in conjunction with Chatman’s concept of Small Worlds (1991), and informed the overall design and execution of the study.

Sense of community is largely based on the perceptions of learners and instructors. A phenomenographic approach is beneficial for uncovering and unpacking community members’ experiences and analyzing the information exchanges and community development that occurred within the Small World environment. Derived from the philosophical approach of phenomenology, phenomenography is a lesser known qualitative method. Marton (1981) describes the tenets of phenomenography as first order and second order perspectives. First order perspectives are the phenomena as experienced in ‘reality’, and second order perspectives reveal people's perceptions and meanings associated with the phenomena. Phenomenography is concerned with empirically uncovering second order perspectives. Found primarily in education and instructional design literature -- and much less so in LIS, communication or media studies literature -- phenomenographic study is an immersive practice that focuses on interactions.

Phenomenography was employed in this research as an interpretive method of identifying and unpacking the experiences of graduate students in the User Studies and Technology classes. The text based discussions, journal entries, and CCS survey results revealed learners' feelings of achievement, frustration, and community as they progressed through the semester.

### **Virtual Ethnography**

Similar to traditional ethnography, virtual ethnography (also referred to as webnography, cyberethnography, netnography, online ethnography, and other similar terms), requires the researcher to be a member of and participant in the cyber culture (Rybas & Gajjala, 2007; Teli et al., 2007) or online community being investigating (Hine, 2000; Hine, 2008; Paccagnella, 1997; Puri, 2007; Ward, 1999). Hine has researched virtual ethnographic methods since the late 1990s and suggests that virtual ethnographies have evolved to "... explore the complex connections between online and offline social spaces" (2008, p. 258). Virtual ethnography lends itself to the immersive and extended study of online learning communities (Rutter & Smith, 2005) and Small Worlds (Chatman, 1991).

While not a virtual ethnography as described above, this research does use ethnographic/virtual ethnographic techniques. The main techniques are naturalistic inquiry and thick description of the participants' online learning environment, following the development of the participants' social interactions over time (Joinson, 2005) and identifying participants' patterns of information behavior through post-course immersion in the data. The researcher accordingly became immersed in the online

course shells as an observer, not as a community participant, and observed the natural occurrences that transpired during a semester-long online course (Rutter & Smith, 2005). The researcher also investigated “... the complex interaction between trust, intimacy, disclosure and time as complex relationships develop” (Carter, 2005, p. 149), and the influence of these relationships on the development of community and information exchange in the online classroom.

Being fully involved in an online community requires engagement, immersion participant observation, and “... is an attempt to look at the web as an object of study and to search for insights into the ‘natural conversations’ that occur in various Web forums.” (Puri, 2007, p. 388) Online Small Worlds are socially constructed entities, consisting not only of course content, but learners’ existing knowledge, perceptions, feelings, and interactions. Phenomenography complements virtual ethnography and the combination of the two approaches provided a rich lens through which to examine the Small Worlds that were developing in the CMS.

### **Multi-Strategy Research**

Phenomenography and virtual ethnography have qualities in common such as being immersive, highlighting members’ meanings and community, and being context specific. As illustrated in Figure 3.1 the combination of these two approaches enabled a specific lens through which to study the information behavior of learners in a Small World. Phenomenography, an approach used in face-to-face study, unites with virtual ethnography to examine the specific needs and characteristics of an online learning environment. The two merge to create an atmosphere conducive to naturalistic inquiry

and elucidated a set of principles that guided the researcher. The researcher specifically engaged in immersion and close observation of participants and their lived experiences by examining the totality of the students' online activities as represented by threaded discussions and journal entries.

In order to approach this research from a naturalistic perspective (Crystal & Wildemuth, 2009; Erlandson, Harris, Skipper & Allen, 1993; Lincoln & Guba, 1986; Miles & Huberman, 1994), and collect and analyze data that "... more closely reflect the real, lived experiences of the population of interest" (Crystal & Wildemuth, 2009, p. 62), Learner/Context Analysis and Textual Analysis were used in conjunction with a survey and graphing technique called sociometry.

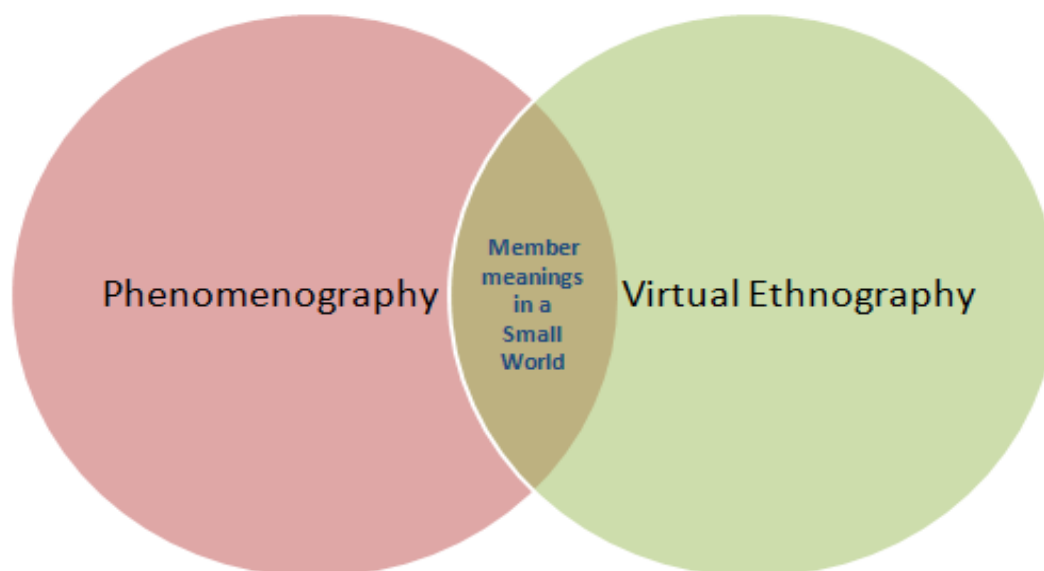


Figure 3.1. Multi-strategy approach to the research.

This naturalistic approach is more context specific than content analysis, and these methods enabled the researcher to elucidate new areas of human information behavior.

It was determined that using mixed methods, or a multi-strategy research plan would enrich the data collection and analysis plan. The sample population and selected courses lend themselves to interpretive analysis because of the text based nature of online classes. There are also questions best answered with quantitative methods. A multi-strategy approach contributed to the depth and richness of the data collected and analyzed. This approach revealed unanticipated data and added a level of completeness and confirmation to data collection. The methods described below were employed simultaneously, served to triangulate the data, and provided a diversity of viewpoints.

Data were collected from a variety of sources and in a variety of ways (Erlandson et al., 1993), with the intent of trying to “construct reality in ways that are consistent and compatible with the constructions of a setting’s inhabitants.” (p. 81) To achieve this a purposive sample was selected. Two asynchronous classes that are part of an online graduate program in LIS were purposely selected to explore the phenomena and research questions that form the basis for this study. These classes were selected because they had the potential to be “... information-rich cases for study in depth” (p. 82) and would “...maximize the range of specific information that can be obtained from and about that context” (Erlandson et al., 1993, p. 33). Naturalistic inquiry depends on context and assumes a complexity of relationships that come together to form a holistic picture of phenomena in question.

### **Methodology**

The mixed methods used in this research were informed by the literature and the constructs of phenomenography and virtual ethnography, and are described below.

## **Learner/Context Analysis**

Since the online environment can be nebulous, "... the definition of the research setting becomes not a starting point but a primary research question requiring careful and continuous examination." by the researcher (Rutter & Smith, 2005, p. 85) In order to firmly establish and describe the online environment, and identify its influence on interactions, incidents, and behaviors occurring within it, a detailed analysis of the learners and their online learning environment was conducted. Meyrowitz (1990) states environmental details should not be left implicit, and that the 'social context', 'social situation', and 'behavioral setting' should be given careful consideration, as they frame and define the phenomena of study (p. 68). Meyrowitz calls this explication 'contextual analysis' (p.68). Contextual analysis allows the researcher to explore the larger information system (p. 73) and identify social structures and roles that may emerge.

Dick, Carey, and Carey (1996, chapter 5), as part of their classic instructional design model, provided a useful framework for analyzing learners and their contexts. The authors suggested describing learners' entry behaviors, prior knowledge of the topic, attitudes toward content and the content delivery system, academic motivation, educational and ability levels, general learning preferences, attitudes towards the organization, and the group's characteristics. In conjunction with this analysis, the authors advised gathering information about the learning context, in this case the online course environment. Among the details examined were the number and nature of the parts of the CMS, the compatibility of the site with the course content and learner needs, and the relevance of the site to students' professional goals.

This portion of the Dick, Carey, and Carey model (1996) is very detailed and provided a comprehensive lens through which to view the online course environment. The researcher examined the course syllabus, course breakdown (e.g., the structure of content units), areas of study, specific assignments and requirements, and other fine details that contributed to the totality of the learning experience. Details about the learners were gathered from threaded discussions, journal entries, self-introductions and surveys. These details worked synergistically and provided a holistic context for the Small World that developed in an online learning community during a semester of graduate study.

The learning environment contains literal and figurative elements. The literal element was a course website designed by the instructor and housed within a password protected CMS. The two courses for this study were conducted in a CMS commonly used in higher education. Discovering how the courses, and course site, were organized gave insight into the instructional goals and desired learning outcomes of the instructors, and provided context for student conversations and interactions in that environment. The design of an online course, not unlike the design of a seated class, is important to the overall functioning, structure, and flow of the class. Course content is essential, but course design enables course content to be productive, and hopefully interesting and relevant. Course design, then is the frame to which course content is attached, and on which it depends for learning to occur.



## Textual Analysis

Threaded discussions are the most important and plentiful components of an online class as "... discussions can create a mutual sense of interaction and belonging that is essential to feeling the social presence of others." (Rovai, 2007, p. 103) Large volumes of content are produced in a short time, and because content is generated by multiple students, evaluating threaded discussions is challenging. "Evaluating online discussions is neither as simple nor as straightforward as one might suppose; it involves answering important questions about the instructor's purpose, the student learning to be measured, and the application of coding procedure." (Meyer, 2006, p. 83)

Discussion threads are the "media" through which the information behavior of online learner was ascertained (Fairclough, 2003, p. 30), and documents and forms of material culture examined (Lindlof & Taylor, 2010). Lindlof and Taylor characterize material documents as 'mute evidence' that cannot respond to researcher questioning, yet are rich sources of information that can be used to understand participants and phenomena of interest. Within material documents are critical incidents (Flanagan, 1954) that explicate the information behaviors and intents of participants. Lindlof and Taylor state:

Text, objects, and spaces do have a lot to 'say' when we read them alongside the living voices of informants and other social actors. Moreover, people do disclose their understandings of, and feelings about, the material world in other ways besides introspection – for example, by gesture, posture, facial expression, stories and accounts, jokes, ironic asides, confessions, even silence. (Lindlof & Taylor, 2010, p. 271)

Many forms of material culture are found in the threaded discussions, and to analyze this significant source of information, textual analysis (Krippendorff, 2004;

McKee, 2003; Neuendorf, 2002; Spurgin & Wildemuth, 2009) was employed. Similar to what was described by Lindlof and Taylor, McKee defined textual analysis as:

... a way for researchers to gather information about how other human beings make sense of the world. It is a method ... for those researchers who want to understand the ways in which members of various cultures and subcultures make sense of how they are, and of how they fit into the world in which they live. (2003, p. 1)

Textual analysis is an interpretive approach that facilitated the discovery of information interactions, intents, flow, learning, connectedness, and the development of community, as they emerged in students' discussions. Texts, in the form of threaded discussions, provided insight into the learners' experiences and the meanings assigned to them. McKee emphasized the benefits of textual analysis by suggesting that "... the reason we analyze texts is to find out what were and what are the reasonable sense-making practices of cultures, rather than just repeating our own interpretation and calling it reality." (p. 19)

**Theories for textual analysis.** Textual analysis was conducted through the lenses of two information behavior frameworks, Information Intents (Todd, 2005) and Knowledge Construction (Todd, 2006). Information Intents suggests that people seek and acquire knowledge to *Get a Complete Picture*, to *Get a Changed Picture*, to *Get a Clearer Picture*, to *Get a Verified Picture*, and to *Get a Position in the Picture* (Todd, 2005, pp. 198-203). Newly acquired information adds to an individual's existing knowledge base and facilitates the expansion of viewpoint. Information Intents allows information behavior patterns to be discovered.

Knowledge Construction (Todd, 2006) maps the increase in a learners' content knowledge over time. Concerned with information as fact, information used to explain, and synthesized information, Knowledge Construction examines how information is acquired and utilized within a specific learning environment. "We understand information use as an activity that can, analytically, be divided into two phases: 1) Construction of information, and 2) using or utilizing the constructed information in action." (Tuominen & Savolainen, 1997, pp. 81-82)

### **Sociometry**

The abundance and complexity of the social roles that exist in Small Worlds suggest that analyzing classroom networks is an appropriate method with which to identify roles in the online classroom environment (Aviv et al., 2003; Gleave et al., 2009) and represent them graphically (Welser et al., 2007). Analysis of networks has been used in sociology and organizational studies research, and has emerged in the education and LIS literature as a way to visualize information sharing patterns and relationship development in communities (Shen et al., 2008). Analysis of networks reveals information related to the roles learners play in the community, which is especially relevant to Chatman's (1991) Small Worlds.

Haythornthwaite stated that "... social network analysis is an approach and set of techniques used to study the exchange of resources among actors" (1996, p. 323) that "... examines both the content and the pattern of the relationships in order to determine how and what resources flow from one actor to another." (p. 324) In this study the resource examined is information, and analysis of networks was used to

examine the content and strength of the relationships that develop in discussion threads and to determine the types of networks formed between class participants (p. 330). Haythornthwaite also suggested analyzing networks for multiplexity (Haythornthwaite, 2001; Haythornthwaite, 2005) which identifies concurrent relationships among actors and examines how they are maintained through electronic means. Analysis of networks is used to determine network density (Shen, Nuankhieo, Huang, Amelung & Laffey, 2008), and reachability (Lu, 2007), and used to perform cohesion, role analysis, and power analyses (Aviv et al., 2003).

The specific analysis of network method used in this research is sociometry. The Small Worlds in this research are not networks in the sense described above, but contain a series of relationships and information exchanges. The goal of this research was not to measure these exchanges or establish quantitatively-based claims but to generate graphic representations of the data contained within the threaded discussions. The relationships depicted in threaded discussions warrant study and produce valuable data. Sociometry is another interpretive lens with which to view and analyze the data. In this way sociometry provides a way to triangulate data and provides visualization of the information exchanges that occur within the Small Worlds.

Developed by psychologist Jacob Moreno in 1934, sociometry is a precursor of social network analysis and is a sociological method used to determine and understand the formation of group relationships and dynamics. Discussed in the K-12 and classroom management literature of education, sociometry has been applied to social work agencies, jails, and organizations, and is useful for studying the relationships that

develop in the online learning environment. “Sociometry considers all relationships as means by which the individual extends himself, and society a means by which he can satisfy his needs and enhance his experience.” (Northway, 1952, p. 52) Sociometry provides indicators of the sociality, or social presence, of the learners in the class and gives an account of how much, or little, individuals are communicating and exchanging information within the course website.

Specifically, a sociogram is the tool used to measure and graphically represent group relationships.

A sociogram is a graph used for presenting simply the structure of the relations at a given time among members of a given group. The major lines of communication, or the pattern of attraction and rejection in its broad scope, are made readily comprehensible at a glance. (Jennings, 1973, p. 11)

### **Classroom Community Scale (CCS)**

The last method used in this research is a survey, the Classroom Community Scale (CCS) developed by Alfred Rovai (2002a; 2002b). A derivative of the Psychological Sense of Community Index (originated by McMillan and Chavis, 1986), the CCS was designed to quantitatively measure the sense of community in a learning environment, specifically levels of connectedness and learning. Rovai suggested that students in online learning environments have difficulty with course content, isolation, distractions, feelings of neglect, and higher dropout rates due to physical separation. These challenges make class cohesion and collaboration more difficult.

Cohort learning literature begins to address how learners create community, function as a unit in the learning environment, and increase learning and satisfaction levels to increase retention rates. Recent studies suggest the most essential elements

of community are trust, shared values, beliefs, and common expectations. It is also suggested that these elements influence learning especially in an online environment. The CCS was created to measure these elements. The scale quantitatively measures the sense of community in a learning environment, specifically levels of student connectedness and learning.

Ascertaining sense of community is important, as this cohesiveness contributes to the success of online classes and the development of Small Worlds. “Students with a stronger sense of community in online courses are more likely to feel positive about their educational experience and persist in their educational programs than students who feel isolated.” (Rovai, 2007, p, 103)

### **Data Analysis Procedures**

#### **Learner/Context Analysis**

To conduct this examination, a portion of Dick, Carey, and Carey’s Instructional Design Model (1996) was employed (Figure 3.2). This nine part model contains the task of *Analyzing Learners and Contexts* -- this portion of the model is detailed and provides a comprehensive lens through which to view the online course environment.

This study used syllabi, course breakdowns (i.e., the structure of content units), areas of study, specific assignments and requirements, and other details that contribute to the totality of the learning experience. Specific attention was given to the threaded discussions and journal entries assigned in the User Studies class. This data provides rich insight into the student’s activities and learning during 15 weeks, and enhanced the overall context for the Small World that develops around an online learning community during a semester of graduate study.

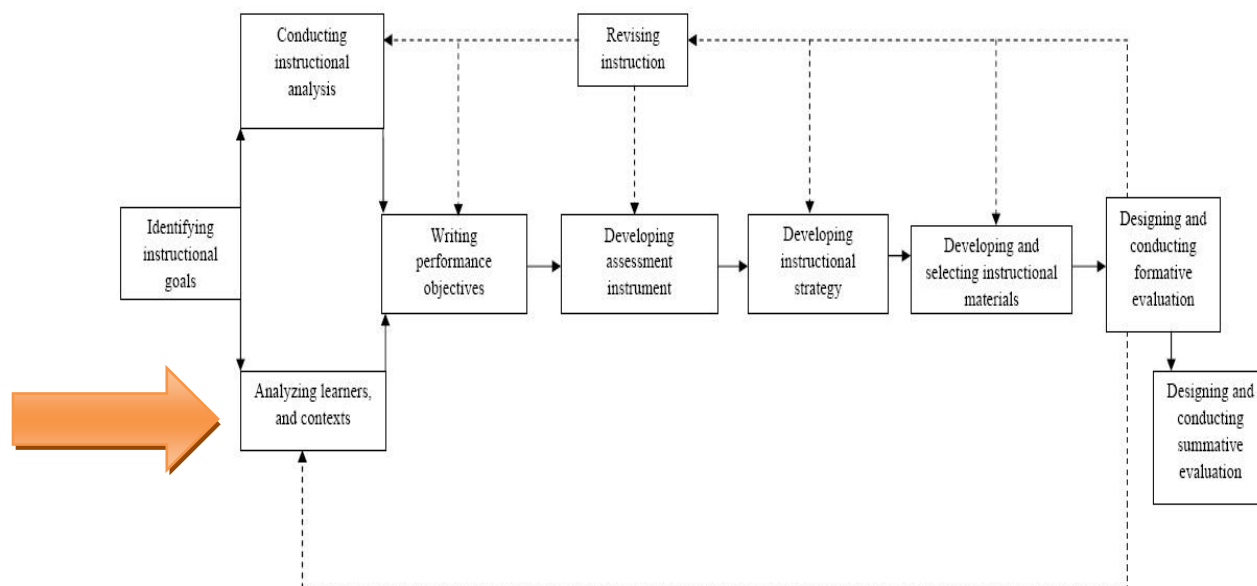


Figure 3.2. The Dick and Carey Systematic Instructional Design Model (Dick, Carey, & Carey, 2004, pp. 98-99).

### Textual Analysis

To achieve consistency in the coding scheme, coding was conducted in three rounds, or exposures, occurring over a 60 day period. A total of 33 discussion threads were analyzed – 30 from the User Studies class, and three from the Technology class. (The Technology class only required three graded discussions.) All threads were negotiated with NVivo software, a tool for qualitative data analysis (<http://www.qsrinternational.com>). Codes used were derived from the information intents and knowledge construction frameworks, and include:

#### Information Intents

- Complete picture
- Changed picture
- Clearer picture
- Verified picture
- Getting a position

#### Knowledge Construction

- Facts
- Explanation and Result
- Synthesis

These codes were not created by the researcher; rather they came directly from the two information behavior theories being used to conduct this study.

Todd's Information Intents theory (1997; 2005) investigates *why* students ask questions and exchange information and how they use the information they receive. The five intents are: 1) *Get a Complete Picture*, 2) *Get a Changed Picture*, 3) *Get a Clearer Picture*, 4) *Get a Verified Picture*, and 5) *Get a Position in the Picture*. *Getting a Complete Picture* suggests that a receiver of information develops a broader understanding of an issue by adding new information to the existing knowledge foundation. Learners make connections between pieces of knowledge already possessed, and remember and reapply previous bits of knowledge (Todd, 1997). Students were to "... add not just single faces here and there to existing knowledge to expand it, but to take in substantial amounts of information." (p. 182) *Getting a Changed Picture* (pp. 199 – 201) suggests that students use newly acquired information to modify an existing opinion or belief, more literally using acquired information to change their minds. Changing a picture can involve "... removing an incorrect idea" and "... replacing it with a new, correct idea" (p. 200), or changing a wider perspective or perception based on the acquisition of new facts (p. 201).

*Getting a Clearer Picture* (Todd, 1997) suggests students gain clarity by acquiring of new information – this new information "shed more light on" their "... existing ideas and how these ideas were related, with greater understanding and clarity" (p. 216). In some cases students may not be aware they had been confused until they reached a new level of clarity and understanding. *Getting a Verified Picture* (pp. 224 – 226)



suggests that newly-gained information removes doubt from students' existing knowledge and solidifies them. New information confirms and strengthens what they already knew. Finally, *Getting a Position in a Picture* (pp. 235 – 236) suggests that new information enables students to express opinions and draw conclusions. *Getting a Position* means:

... being able to take a stand; being able to take ideas to an end point; being able to derive and state conclusions; being able to see multiple perspectives based on the existing ideas; and being able to look over a set of ideas and offer some reflection on them. (Todd, 1997, p. 236)

The five intents were used as codes, assigned to text in the threaded discussions and counted to determine the numbers of statements made over the course of the semester.

For example, in week 11 of the User Studies course, students discussed the seeking and use of medical information. The discussion thread was examined post by post and line by line to uncover various information intents that may appear in the discussion.

The *Getting a Complete Picture* code was assigned to text / comments such as:

- *So what this did was allow the internet to become the connection for illustrating the Strength of Weak Ties between these women that would post on focus groups everything from heartburn issues to legs swelling to problems with Hubby not being attentive ( not me of course ). Similar to our super-secret MLIS facebook page is how she interacted on this site. If My wife had issue she would post it to the board and see if it resonated then she would feel "better" about what she was experiencing and more at ease ad that is what you seek at the doctor but all they would say is OH that "that NORMAL" for everything that happens.*

*Getting a Complete Picture* demonstrated the connections students made between course content and their individual information behaviors and practices.

The *getting a changed picture* code was assigned to text / comments such as:

- *I will try to open my mind to this foreign-feeling side of information, instead of just assuming it's beyond my scope of interest...it's the behavior I'm trying to learn from here and now, not the primary information itself...I need to keep this in mind, I think.*

*Getting a Changed Picture* demonstrated how students used new information to change and or expand existing views, opinions, beliefs on a given topic area.

The *Getting a Clearer Picture* code was assigned to text / comments such as:

- *In speaking to your point about the marketing done by drug companies, XXX, you might be interested in an initiative supported by The Pew Charitable Trusts, Pew Prescription Project, established "to promote consumer safety through reforms in the approval, manufacture and marketing of prescription drugs, as well as through initiatives to encourage evidence-based prescribing."*

*Getting a Clearer Picture* demonstrated the request or receipt of explicit information that was used to change or expand the current knowledge base.

The *Getting a Verified Picture* code was assigned to text / comments such as:

- *So I agree with [Professor], we must take in the role of the doctor, and the nurses, and the physicians' assistants, when we consider [user studies] in a medical context.*
- *Like XXX, I was also intrigued by, and could relate to, the "digital native" article written by Bennett, Maton, and Kervin. I noticed that many of the statements made about my generation described most of my friends and, in some ways, myself.*

*Getting a Verified Picture* demonstrated agreement among students, accompanied by the repetition of a statement, extra emphasis, and the use of a personal name (of another student or the instructor).

The *Getting a Position in a Picture* code was assigned to text / comments such as:

- *I think pregnancy in general is a great example of how much more information women have now. My mom said that when she was pregnant, she didn't know anything--and the doctor liked to keep it that way.*

*Getting a Position in a Picture* is a more general category that demonstrates students'

attempts to initiate and maintain presence in the discussion. Very often these statements express general agreement or disagreement, with no emphasis or personal names attached.

The *Getting Connected* code was assigned to text / comments such as:

- XXX, I agree that we cannot expect doctors to know all of the details about every disease off the top of their head.
- XXX and YYY, I find your theory on why weak ties are more relied upon interesting and true from experience.

*Get Connected* demonstrated students' efforts to connect with one another and the instructor emotionally by explicitly using personal names. Such statements were brief and may or may not have contained course content, but contained emphasis, excitement, and expressions of support or humor.

Todd's 2006 article discussed Knowledge Construction in relation to three kinds of statements that can be made by students: 1) *Facts*, 2) *Explanations and Results*, and 3) *Synthesis*. Facts include statements that depict known quantities, *properties* such as historical or scientific facts (e.g., water freezes at 32 degrees Fahrenheit), or *manners* of things easily observable (e.g., the sky is blue today), or *set memberships* (e.g., the children's librarian, Ms. Jones, created this month's display at the public library). As students progress and attain new information, Knowledge Construction assumes statements will proceed to *Explanation and Results*, which suggests that students can support their factual statements, and are able to discern the *reason* for, *outcome*, or *causality* of an action (e.g., the traffic accident was caused by fog and wet roads). The ultimate goal is for students to express statements of *Synthesis* which demonstrate critical thinking and encourage personal positions, opinions, reflections, and judgments

(e.g., media literacy skills are critical for children to learn so that can navigate the images they see on television and in magazines).

These codes were assigned to the threaded discussions and counted to determine the numbers of statements made over the course of the semester. The assumption is that *Synthesis* statements should outnumber *Facts* and *Explanation and Results* statement at the conclusion of the semester, which would indicate learning has occurred and students have constructed new knowledge.

To continue the example, provided by the discussions in week 11 of the User Studies course, the threads was examined post by post and line by line to uncover the knowledge construction categories in the discussion.

The *Fact* code was assigned to text / comments such as:

- *In information use environments (1991), Taylor p.235 writes: "Engineering consumes information, transforms it, and produces a product or a product itself which is information bearing."*
- *The Centers for Disease Control and Prevention studies say that 40% of students are not receiving sex education; 38% of parents have not spoken to their kids about birth control; 93% of parents support sex education in high school; and 84% support sex education in junior high school.*

*Facts* were statements not of the students' creations, but statements from their course texts and outside resources, such as websites and external articles.

The *Explanation and Results* code was assigned to text / comments such as:

- *The reputable leukemia websites like the Leukemia/Lymphoma Society offer phone lines to call and talk to their staff to ask questions about the disease. I did this on a few occasions, because I wanted to make sure that I wasn't getting inaccurate information from some of the websites I was visiting. In addition to answering many questions each time I called, the staff was 100 percent supportive and sensitive.*
- *I feel that such a place would indeed be a rich information ground. It shares many of the contextual elements with the foot clinic, including the element of touch. How comforting is it to have your head massaged during a wash! It would also benefit*

*from the diversity of information available through weak ties. Of course, it would lack the expertise of nurses, but since Pettigrew has shown that the flow of information ran frequently from the patient to nurse, and patient to patient, the absence of a nurse would not necessarily prevent it from being a profitable site of HSI, including medical care.*

*Explanation and Results* extended factual statements and demonstrated students' reflection on content and reasoning process behind statements made in the readings.

The *Synthesis* code was assigned to text / comments such as:

- I had the most remarkable HIB experience today! While scheduling my first appointment with a new pain management specialist, I was asked to visit an interactive website that would answer my questions and also provide my feedback to the doctor.

Statements in the *Synthesis* category demonstrated an additional level of reflection on the part of the students, as they began to integrate the course content into their daily lives.

Each thread was examined line-by-line, and codes were assigned to portions of the text in the discussions, ranging from a few words to a few sentences. A constant comparative approach was used -- always comparing new information with previously identified information, identifying patterns, refining coding assignments as needed, and developing new coding categories as needed (Glaser & Strauss, 1967).

In addition to the 33 discussion threads, the User Studies class contained journal entries between students and the instructor. The instructor referred to the journal area as a 'personal thinking space, shared just with your instructor'. A total of 309 journal entries were produced, and these entries were also examined according to the textual analysis methods detailed earlier. The journal entries broadly and uniformly fit within

the categories of *Getting a Complete Picture* and *Getting a Position in a Picture* and *Get Connected*.

### **Sociometry**

Sociograms depict vertices (actors engaged in discussion) and edges (various threads within the discussion). The edges are directed, meaning the sociograms describe who is talking to whom and with what frequency. Sociograms can be drawn manually, but for this research a program called NodeXL was used (<http://nodexl.codeplex.com/>). Each graph was generated by manually entering the sender and recipient of each discussion post and noting the direction of each message and the frequency of messages between individuals. Thirty discussions from the User Studies class and three from the Technology class were entered into NodeXL.

### **Classroom Community Scale (CCS)**

The original CCS was designed by Rovai (2002a; 2002b) to quantitatively measure the sense of community in a learning environment, specifically levels of connectedness and learning. The researcher created a modified version of the CCS (see Appendix A) which was distributed electronically to students at the end of the semester to determine if, and how much of, a sense of community formed during the semester. The CCS and corresponding consent form (see Appendix B) were administered with the permission of the course instructors. Data was used as an interpretive framework for understanding the learner/content analysis, the textual analysis, and the analysis of network results.

To the series of 20 Likert scale based questions (10 measuring learning and 10 measuring connectedness), the researcher added a series of demographic and open ended questions, which are listed below:

- Gender
- Age
- Number of previous online courses taken?
- How many hours a week do you spend on online discussion for the course  
(including the reading of materials and responding to other's posts)?
- How would you define an online community?
- How important do you think sense of community is to an online learning environment?
- Do you feel that community was formed in this online class?
- What prompted you to respond to particular postings from the threaded discussions?
- What were the criteria you used to choose which messages to respond to?
- What do you think helped to form a sense of community in this class?
- What do you think hindered a sense of community in this class?
- How did your sense of community impact, or not impact, your information sharing and use in this class?

The URL to the survey was sent to the course instructors who forwarded the link to their students with a request that they participate in the survey. Participation in the survey was voluntary, anonymous, and no incentives were offered to students or the

instructors. The opening page of the survey described students' rights as participants and indicated that by proceeding to the second page they gave their consent and were participating willingly. Students were promised confidentiality and assured that their responses, or lack thereof, would have no bearing on their performance in the class, nor would the information have any influence on their progress through the graduate program.

Twenty of 38 students completed the survey (a 53% response rate) during the last three weeks of the semester. Fifteen students in the User Studies class responded, and five students in the Technology class completed the survey. Survey results, including the appended open-ended questions, were used as an interpretive framework for understanding the textual analysis results (Chapter Four).

This chapter detailed the methods used to collect and analyze data from two online graduate learning environments. The rich results of the data collection are described and discussed in Chapter Four and reveal the information behavior, knowledge construction and community development that occurred in these Small Worlds.



## Chapter 4 – Findings and Commentary about Findings

### Introduction

This chapter discusses the findings of this research study, all of which relate to the questions guiding this research. The goal of this research is to provide a detailed analysis of the nature and dynamics of information behaviors in an asynchronous online classroom, to identify factors that shape these behaviors, and their relationship to knowledge construction. As established in Chapter Three, the collected data were to be analyzed qualitatively, with some potential for quantitative measures regarding the survey. In order to meet criteria of credibility, dependability, confirmability, and transferability, efforts were made to make the data analysis techniques as transparent and systematic as possible, while trying to elucidate the information behaviors of the participants. Findings were consistent with those of the pilot study and were robust enough to extend the Information Intents theory – another hoped-for outcome of the research.

### Answering the Research Questions

The key findings discussed in this chapter are outlined below:

#### **RQ1: What Information Behavior Patterns, If Any, Do Students In An Online Asynchronous Learning Communities Exhibit?**

**What information intents are exhibited in the written interactions of the graduate students in an online learning community?** The main results of the study centered on the Information Intents exhibited in the threaded discussions of the students in the online learning communities. As displayed in Figures 4.1 and 4.3

students displayed intents related to *Contextualizing*, *Creating*, *Clarifying*, *Authenticating*, and *Positioning* information (the intents as they have been renamed). Findings also displayed the intent of *Connecting* – students connected with their peers and instructor through information exchange. There was a concerted and consistent effort to connect with one another by using personal names, and there were instances of humor, joke telling, emoticons, and expressions of support and empathy throughout the semester. This variety of information behavior added a new dimension to the Information Intents theory, now seen to contain both cognitive affective dimensions.

***Changes in patterns over time.*** Technology students exhibited activity related to the intents of *Getting a Clearer Picture*, *Getting a Verified Picture*, *Getting a Position in a Picture*, and *Getting Connected*. There does not appear to be a relationship between the intents, as the number of occurrences varied from intent to intent. For example, in week 3 there were 75 instances of *Getting a Position in a Picture*, and in week 9 there were 48 instances, a decrease. However, in week 3 there were 37 instances of *Getting a Clearer Picture* and 44 instances in week 9, an increase.

The occurrences of Information Intents were much higher in the User Studies course, which had more threaded discussions, discussion guidelines, and theory based content that generated conversation and reflection. There does not appear to be a relationship between the intents, as the number of occurrences varied from intent to intent. There were few instances of *Getting a Complete Picture* in the beginning of the semester (12 instances) and these instances decreased steadily during the semester (one instance in week 13). There were more instances of the other intents, most

notably in *Getting a Clearer Picture*, *Getting a Position in a Picture* and *Getting Connected*. *Getting a Clearer picture* saw 18 occurrences in week 1 and peaked at 66 occurrences in week 5, and this number remained steady throughout the semester. *Getting a Position in a Picture* began with 28 occurrences in week 1 and peaked at 95 occurrences in week 11, an increase in activity indicative of increased conversation in the discussion threads. *Getting Connected* also demonstrated higher levels of conversation and information exchange, with 42 occurrences in week 1 and peaking at 70 occurrences in week 13, a steady increase over almost the entire semester. This also indicated that the level of community students highlighted in the CCS data was a result of the threaded discussions that took place in the online learning environment.

#### ***Summary of claims.***

- High-quality course design and frequent, structured, and open-ended threaded discussions elicited substantive discussions.
- The Information Intents theory was extended to incorporate an affective domain.

The three major changes to the Information Intents chart included:

- Renaming the Information Intents
- Modifying the manifestations/definitions of the Intents
- Adding the affective domain to the Intents schema

**What patterns of knowledge building are exhibited in the written interactions of the graduate students in an online learning community?** Findings suggested that Knowledge Construction is related to increased levels of interaction in the discussion

threads, and the course content can influence these levels (e.g., User Studies' students had higher levels of Knowledge Construction because they had more frequent and structured threaded discussions, and the theoretical content of the course lent itself to deeper levels of discussion).

***Changes in patterns over time.*** Threaded discussions in the Technology class relied heavily on *Fact* statements as students were asked to find and share resources related to Web 2.0, Library 2.0 and other similar topics. The number of *Facts* increased from 16 (week 3) to 27 (week 9), and dropped back to one (in week 13). The User Studies course experienced a steady increase in the number of *Fact* statements made over the course of the semester, beginning with 21 such statements in week 1 ending with 49 *Fact* statements in week 13.

There were few statements of *Explanation and Result*; these statements were eight and seven respectively in weeks 3 and 9, and no such statement was made in week 13. The User Studies students made contributed more statements of *Explanation and Result*. There were 27 statements in week 1, the statements peaked at 44 during week 3, and there were nine to 10 statements per unit for most of the semester. These statements contained anecdotes about students' perceptions of technologies and their influence on the LIS profession. These *Explanation* statements demonstrated a level of reflection on the part of the students and sometimes recognition of their knowledge gaps.

*Synthesis* statements, of which there was only one in the Technology class, demonstrated reflection and integration, and occurred when students applied the

course content to their lives. *Synthesis* implies that new information students receive and absorb in class will be sustained after the course ends and will change their long-term understanding and knowledge base. User Studies students made numerous *Synthesis* statements during the semester, beginning with 12 statements in week one and peaking with 34 statements in week 9. There were few *Synthesis* statements made as the semester concluded. However, the rise in *Synthesis* statements over the first nine weeks of class suggests that a great deal of *Knowledge Construction* occurred in the class. Students made strides in understanding the course content and adding it to their existing knowledge base. It is possible that these students reached a plateau after week 9, which could explain the significant drop in *Synthesis* statements that occurred between weeks 9 and 11 (from 34 statements to three statements, respectively).

#### ***Summary of claims.***

- There was no significant evidence of *Knowledge Construction* produced during the semester in the Technology class.
- There was evidence of *Knowledge Construction* produced during the semester in the User Studies class.
- Frequent threaded discussions, with open-ended questions, elicited sustained discussions that produced *Explanation* and *Synthesis* statements.

**What patterns of information interactions are exhibited in the written interactions of the graduate students in an online learning community?** Students' patterns of information interactions as exhibited in the threaded discussions were graphed with sociometry techniques. The sociograms illustrated the 'immediacy' (i.e.,

online presence) of the instructor in the User Studies course and provided visual examples of students dominated or avoided participation in discussions. Tables detailing the number of vertices (participants) and unique edges (information exchange between participants) demonstrated how these patterns changed over time.

***Changes in patterns over time.*** The Technology course only had 2 discussions that could be examined and they revealed 20 and 22 participants in discussions 1 and 2 respectively. Discussion 1 contained 69 exchanges of information and discussion 2 contained 59 exchanges. The amount of interactions between the two discussions was similar and suggested noteworthy levels of discussion between the students.

The number of User Studies students participating in each discussion ranged from 19 to 24 over the course of the semester, but the number of information exchanges varied from week to week. The number of information exchanges ranged from 22 to 69. This number fluctuated depending on the topic of the discussion and course content presented that week – some weeks generated more conversation than others. Also, as there were two discussion threads per week, the number of interactions and discussion participants tended to drop when moving from the first to the second threaded discussion of the week.

***Summary of claims.***

- Participants in threaded discussions take on social roles. Students and the instructor assumed the following roles in the discussions:
  - Leader (guiding or leading the discussion and being involved in multiple strands of conversation)

- Loner (avoiding conversation or interaction with others, being involved in one conversation strand)
- Orphan (submitting a comment that received no response)
- The roles participants play in the discussions vary throughout the semester.
- Instructor immediacy encourages and increases student interactions in threaded discussions.

**RQ2: How, If At All, Are These Patterns Of Information Use Related To A Sense Of Community, As Measured By The Classroom Community Scale?**

**What impact, if any, does the context of a Small World community have on the information behaviors of online students?** The learner/context analysis suggested that course design and customization contributes to the development of Small Worlds. Course customization is indicative of instructor immediacy – the User Studies class was carefully organized and personalized and the students formed community inside of the CMS. The Technology class site was sparsely set up, there was no customization, and there was little instructor immediacy. As a result, the class developed community outside of the CMS.

The impact of the Small World context was demonstrated through the results of the modified Classroom Community Scale. Twenty of the 38 students completed the survey, and their scores were not significantly influenced by their age, gender, previous online learning experience, or the amount of time they spent each week on course content (Table 4.6). Students in both classes indicated they felt a sense of community in the Small World that was their online course environment. The findings also revealed

that Small Worlds occur in different venues and occur for different reasons, all of which can contribute to the goals of learning.

***Summary of claims.***

- Up-front course design and implementation and instructor immediacy set the tone for the progression of the class over time.
- Instructor immediacy positively influences community development but it is not required.
- Community formed in both classes but for different reasons and in different locations.
  - The Technology class bonded offline -- on *Facebook*<sup>®</sup> – due to a negative classroom experience.
  - User Studies students formed feelings community inside the online learning environment through prolonged and content rich discussions with each other and with their instructor.

**Findings**

**Learner/Context Analysis**

Scanning the course environments of the two online classes answered the following research questions:

- RQ1: What information behavior patterns, if any, do students in an online asynchronous learning communities exhibit?
  - What changes in these patterns, if any, occur over the course of the teaching cycle?



- RQ2: How, if at all, are these patterns of information use related to a sense of community, as measured by the Classroom Community Scale?
  - What impact, if any, does the context of a small world community have on the information behaviors of online students?

**User Studies.** The User Studies class contained 19 students and the instructor, a tenured professor with previous experience teaching online, and teaching this course. The course environment, or course shell, contained basic information such as the course syllabus, the list of course readings, and a weekly schedule. The next section contained an instructor biography, including a current picture, baby pictures, and pictures from travel around the world – the instructor put great effort into customizing this page. The course shell was further customized by the instructor and contained areas called *Your Questions* and *Watercooler*, forums designed to take questions from students. Students were encouraged to answer the questions of their classmates. These forums were supplemental since students were still permitted to email the instructor and initiate personal and private contact in the journal area. (The instructor did not have official office hours, but could be reached through the course shell, email, and by telephone.) The *Your Questions* forum contained basic questions answered by the instructor related to course content and assignments. The *Watercooler* forum was a space for students to post links, articles, cartoons, and other tangentially related materials -- it was designed to facilitate social interaction between students. Students had no hesitation posting questions in these forums even if it meant revealing they had not consulted course documentation in the shell.

Other sections of the course shell included a class gallery containing pictures of the students taken at the on-campus orientation. (Online students must attend a two-day, on-campus orientation in advance of their study in the master's program. This is the only time online students are mandated to be physically present at the university.) Finally, there was a section highlighting the university's library system, designed to acquaint students with various library resources.

The weekly units come after these personalized introductory units. In week one, students were asked to introduce themselves. Unlike the introduction from the instructor, the students' introductions were brief and completely text based. Weekly course content consisted of instructor lectures, a narrated PowerPoint slide show augmented with reading assignments, and links to video and audio links. The instructor introduced the topic with several paragraphs and multiple pictures and cartoons. The required lectures, links, and any assignments for the week were then given. Weekly assignments included completing journal entries (private entries between the instructor and student) and participating in two threaded discussions (questions were drawn from the lectures and readings). Other assignments pertained to the student's preparation of their final term papers and group projects. All directives were explicit, detailed and provided to students within the course shell, not at external Internet sites. This pattern was maintained during weeks 1-6, and 13-15 of the course.

During weeks 7-12, the content was student driven -- each week was led by a group of three to four students (students were assigned to groups by the instructor) and prepared lessons in the following required topic areas: 1) Personal/social contexts in

user studies, 2) the user behavior of students / user behavior in educational settings, 3) user behavior in organizational and work environments, 4) user behavior as it pertains to browsing and consumer behaviors, 5) user behavior in medical and health related contexts, 6) user behavior in the humanities, and 7) personal information management. Each group was given the task of creating a presentation (comparable to a lecture), preparing an annotated bibliography that extended the readings provided by the instructor, writing discussion questions, and leading conversations in the threaded discussion areas. Students were permitted to work within their groups however they chose, communicating and sharing the workload as they deemed appropriate.

The major component/source of data for this online class was the threaded discussions. Discussions were compulsory and comprised 20 percent of students' overall course grades. Students were given guidelines for participating in the discussions (one original post in each thread and two responses to classmates' postings, all of which should be substantive and draw from content contained in the lectures and course readings). Table 4.1 (below) details the date and content of the weekly threaded discussion forums, as well as the topic for each discussion thread, the number of original posts, and their lengths. Since students' writing styles vary, the length of entries varied. Some primarily used bullet points, while others wrote their posts as though the assignments were academic essays.

<b>W1: 1/18-1/23</b>	
Pose your initial thoughts as to why it is important to study information interactions, or indeed, not study it (and as you are doing	16 original posts Ranging from 66

<p>this course, the latter is probably not a tenable option, but it is worth considering counter arguments!) What might be some of the benefits and drawbacks of the formal study of user studies to professional practice in the fields of librarianship and information science work?</p>	<p>words to 572 words</p>
<p>I want our online environment to be a rich and worthwhile learning community. What do you think it will take on your part, and the part of others (classmates and instructors), to create this kind of community? Also, share any concerns that you might have about learning in an online community.</p>	<p>13 original posts Ranging from 49 words to 495 words</p>
<b>W2: 1/24-1/30</b>	
<p>Having listened to the introductory lecture, work through the Julien &amp; Duggan reading. What did Julien &amp; Duggan prove? Was it convincing? Through it, what were some new learnings for you in relation to user studies?</p>	<p>14 original posts Ranging from 130 words to 732 words</p>
<p>Carefully work through the Pettigrew, Fidel, &amp; Bruce reading. There are a variety of approaches to user studies discussed in this article. We will work with these in more detail over the next few weeks, so DO NOT try to master them all! Instead, as you read it something might peak your interest or strike you in some way. Present this in the discussion, along with your perspective. Why do you find it interesting (or irrelevant, or potentially useful or not, etc)? What do you think is the main conclusion of this article?</p>	<p>16 original posts Ranging from 91 words to 438 words</p>
<b>W3: 1/31-2/6</b>	
<p>What are the strengths and weaknesses of examining user studies from a cognitive perspective, and what might be some of the practical professional implications of these?</p>	<p>17 original posts Ranging from 94 words to 628 words</p>
<p>As you may have determined in the readings, Taylor's approach is very different from Belkin's. Obviously they both are interested in how individuals approach information services. Let's think about those differences and comment on them. How would you characterize similarities and differences between Belkin's and Taylor's perspective approaches to user studies?</p>	<p>12 original posts Ranging from 193 words to 728 words</p>
<b>W4: 2/7-2/13</b>	
<p>As with last week's discussion, one of the ways of coming to terms with</p>	<p>20 original posts</p>

the diversity of ideas is to work through the strengths and weaknesses of a particular perspective. So ... what are the strengths and weaknesses of examining user studies from a sense-making perspective, and what might be some of the practical professional implications of these?	Ranging from 129 words to 570 words
Carefully work through Bates' reading. Share and discuss some of the key ideas from this paper that have captured your attention. Why do you find such ideas interesting (or irrelevant, or potentially useful or not, etc)? How do you think this article might inform the work of library and information professionals?	13 original posts Ranging from 110 words to 840 words
<b>W5: 2/14-2/20</b>	
As with the previous weeks' discussions, one of the ways of coming to terms with the diversity of ideas is to work through the strengths and weaknesses of a particular perspective. So ... what are the strengths and weaknesses of examining user studies from a constructivist perspective, and what might be some of the practical professional implications of these?	18 original posts Ranging from 75 words to 468 words
Carefully examine Kuhlthau's "Information Search Process". Think of your own learning and research experiences, and look at them through the lens of the ISP. Present your reactions and ideas in the discussion thread.	16 original posts Ranging from 37 words to 554 words
<b>W6: 2/21-2/27</b>	
Over the past four weeks you have examined a range of perspectives of user studies. We have valued how you have analyzed and critiqued these. Now, on the basis of your thinking and reflection, what is your perspective of user studies? Present your position and argument for it. And be willing to engage in the position statements of others in the class.	20 original posts Ranging from 90 words to 802 words
Based on your emerging knowledge about adolescents' information interaction in relation to drugs, make some recommendations (with justifications) as to what might be appropriate information services to meet their needs.	16 original posts Ranging from 157 words to 612 words
<b>W7: 2/28-3/6</b>	
Choose a group that you feel is most directly impacted by information poverty. What are the implications of limited access to information?	15 original posts Ranging from 100

How would their lives and society change by providing access to quality information and tools?	words to 596 words
We've run into the idea that situation and context are key indicators of information behavior again and again over the past few weeks of reading. At this point, and taking into consideration the many scholars and theories that reflect this position, how do you feel about the idea that situation more than personal characteristics influences information needs and information behavior? Does this claim make sense? If not, why not? If so, how do you see the idea playing out as a part of professional practice?	16 original posts Ranging from 61 words to 564 words
<b>W8: 3/7-3/13</b>	
Think about the three perspectives that you read about in the required readings for this week: everyday life information needs, ethnology studies, and situated cognition. Did you see any connection between them and the concepts addressed in the presentation; how do you think the three perspectives, as well as the concepts introduced in the presentation can inform our understanding of the information interactions of students in an educational context?	15 original posts Ranging from 133 words to 854 words
Situated learning assumes that there is an incongruity in the school setting: students are immersed in the school culture while being taught the tools of another culture (that of the economist, historian, scientist, etc.). Brown et al. say the teacher must find a way to create an authentic culture in the classroom and to act as an authentic practitioner so that the students will learn how to use the knowledge they are being taught. What might this look like in a classroom, what do you see as the strengths and weaknesses of this approach, and what are the implications of this learning approach to student information behavior?	12 original posts Ranging from 103 words to 412 words
<b>W9: 3/21-3/27</b>	
As we've seen in the readings highlighting the information seeking habits of a variety of professionals, describe how you in your professional life--or as a budding IS professional in the context of this class—have successfully utilized information resources around you. How could the system that provided these resources for you have more clearly laid out the variety of information seeking paths to follow?	10 original posts Ranging from 120 words to 597 words
As McNerney, Polyani et. al. point out, effective Knowledge	16 original posts

Management systems are those that are consistently reviewed and updated to include a detailed or complete story of the knowledge artifacts being gathered. Describe a KM system that you have navigated successfully and point out what elements of this system cause you to categorize it as “effective”?	Ranging from 175 words to 721 words
<b>W10: 3/28-4/3</b>	
Compare consumer information interactions to library information interactions in a browsing perspective. How are they similar or different? Can Librarians apply Underhill's retail-based methods and be successful?	15 original posts Ranging from 41 words to 571 words
Browsing has been considered to be a legitimate form of research. When has one of your browsing sessions led you to find something even richer than what you were looking for originally? Do you think it is possible to find substantial resources by browsing? Why or Why not?	18 original posts Ranging from 47 words to 819 words
<b>W11: 4/4-4/10</b>	
Think of a time when you had to conduct an information search about a health care related issue on the Internet. Can you recall what useful sites you found and relied on? How you got to those sites (i.e., search engine or directly)? How did you use the information? Did you synthesize print (or web) media or human information, or did you rely on both? There is no need to identify specific / personal issues - focus on the information behaviors.	19 original posts Ranging from 21 words to 452 words
Based on the articles about chiropraxy, heroin education, and Internet searching for health information, +14make some recommendations (with justifications) for appropriate changes to health and medical information services to meet users' needs or to make this information more accessible.	14 original posts Ranging from 58 words to 638 words
<b>W12: 4/11-4/17</b>	
What are some of the disadvantages to the increased use of information technologies in the humanities field? In a practical setting, what are some recommendations that an information professional/practitioner can implement?	16 original posts Ranging from 11 words to 832 words
As we can all agree at this point in the semester, information is plentiful. But, as stated in our reading, "What information consumes is rather obvious: it consumes the attention of its recipients. Hence, a	12 original posts Ranging from 153 words to 761 words

<p>wealth of information creates a poverty of attention and a need to allocate that attention efficiently among the overabundance of information sources that might consume it." (Herbert Simon, 1971). What e-mail program/software (Outlook, Yahoo, Gmail, etc) have you found most beneficial in managing your various personal information components? Why?</p>	
<b>W13: 4/18-4/24</b>	
How does Web 2.0 impact <b>your</b> information behavior and learning processes?	16 original posts Ranging from 91 words to 1232 words
How can we utilize Web 2.0 technologies and applications to improve library/information services? Consider a population, their HIB needs and habits, and describe an online service you would design and implement for them in your library.	17 original posts Ranging from 146 words to 526 words
<b>W14: 4/25-5/1</b>	
In this discussion thread, I'd like you to reflect on the survey you just completed and talk about the community, if any, you have experienced this semester in class.	16 original posts Ranging from 18 words to 593 words
<b>W15: 5/2-5/9</b>	
This week we are celebrating and sharing our learning. Our threaded discussion this week will bring our course to a close. We want to hear your thoughts and reflections on what are some of the key themes, principles and practices that you have come to value in this course, and where are you now with your vision for your MLIS program and learning.	14 original posts Ranging from 44 words to 543 words
In the second thread, briefly identify your group that you have researched for your term paper, and present some of the key information behaviors that characterize your group. Our expectation is that you will share your papers in Doc Sharing, so that you can learn from what others have done, and provide reflective comment.	18 original posts Ranging from 99 words to 615 words

Table 4.1. Threaded Discussions from the User Studies Class.



The bonding text, or “glue”, in the User Studies class were the threads, which were the place of interactions between students and instructor. The students came together through discussions that incorporated course contents, lectures provided by the professor, and scholarly articles about their topics of study. The weekly discussion thread questions were straightforward and asked students to compare and contrast the theories presented in their weekly readings, as well as discuss the implications of the theories for their role as library and information professionals (see Table 4.1). Discussion thread questions were posed by the instructor. During weeks 7-12, students posed some of the questions as part of their group project presentations. The questions were comparable to those that would have been asked by the instructor, and were guided by the readings the professor presented to the class for those weeks.

According to the course attendance policy, students were required to post in the discussion threads at least three times per week:

*As stated in the Student Guide for [the CMS] you are expected to access the online course material AT LEAST three times per week. For this course, you will be required to contribute your first discussion post by Wednesday, and AT LEAST twice more on two different days after your first post. It is expected that most postings will be completed by Saturday. Late postings on Sundays do not engage much discussion. ... Since the class is online and asynchronous, there are few excuses for being absent from weekly participation. If, however, you must be off-line for several days or more for work, family, or other unavoidable situations, please notify me ahead of time so that I can make arrangements.*

From the beginning of the class, students were required to participate in ‘substantive’ discussions and were given specific guidelines in the syllabus, a section in the course shell (Assignment Guidelines), and were provided with these explicit directions:

*Just a reminder about the discussion requirements (as I have mentioned in the Assignment Guidelines): I expect you to actively participate in weekly threaded discussions and group activities that require posting to the discussion board.*

*Substantive postings are required for discussions each week. This can be both an original contribution related to the focus of the weekly discussions. In addition, you should make substantive responses to a comment or question raised by a classmate. In all the postings, you should make specific reference to ideas, arguments and evidence provided in the required readings and lecture material, or to related readings. Please also bear in mind that opening your message may take time, so avoid posts that simply say "Me too!", "thank you", or "I agree!". Courtesies and pleasantries are important markers for sustaining interaction, but of themselves do not contribute to, nor count for, the required "substantive postings". Remember too there is the Watercooler for further dialog and fun! Make every effort to ensure that your posts are substantive and concise. And humor is always welcome!*

Every few weeks the professor provided the following reminder in the discussion thread forum:

*Just a gentle reminder: in your responses, we want to see explicit engagement with the lecture material and readings. This is critical to achieving a high grade for the discussion component.*

As there were guidelines in place regarding the quality and quantity of posts for the threaded discussions, students were sometimes overwhelmed by the need to post and be part of the ensuing discussions generated over the course of a week. For example, students expressed the following concerns:

- *I am a bit afraid of all the time spent at my computer; I'll be reevaluating my technology needs over time (probably acquire something more portable than my desktop pc). That, and a softer chair.*
- *The most difficult part for me will be digesting the information and sharing my thoughts early in the week so that I can give full and unique attention to the ideas you all share.*
- *I am concerned about being able to post comments as often as I would like.*
- *I was feeling really stressed earlier this week and was having a minor meltdown when I looked at the discussion threads on Tuesday evening and there were already a bunch of posts.*
- *I've been up late every night this week so I'm going to try to get some rest now!*

- *Definitely will need to create new time slots through the week devoted to being here.*

One student expressed frustration, and perhaps some resentment, about the ‘forced’ and ‘unnatural’ aspect of the discussions:

- *I feel that a community was created in this class. However, I also feel, for my part, that the community of interaction with other students here was the result of the scheduled/mandated dates by which we were supposed to respond to the discussion questions, and was unnatural (again, I only speak for me) because of its forced nature. ... So overall, the mandated discussion board environment in a class setting was not a positive experience for me. Nonetheless, I do recognize that it was something that we were expected to do for a grade, so in the end, it is what it is.*
- *I think my bigger issue is that if I was taking this class in person and not online, there is no way I would be participating to the level that we were supposed to participate here. It is just not in my nature. I don't think that forced discussions take into consideration the following: (a) some people are simply antisocial (I happen to be one of them. It's just how I am). (b) Not everyone in this program wants to work in an actual library where they will be interacting with large groups of people on a regular basis.*
- *I do agree that our discussions were forced, because it is a requirement to participate in a few discussion threads every week. At the same time, I was surprised to see how much everyone contributed on a daily basis. I was also surprised to see how many people contributed.*

While this student may have disliked the ‘forced’ nature of the threaded discussions, it is also probable that this resentment was more a result of a lack of understanding about the true nature and amount of work required for online learning. One of the students quoted above consistently and deliberately participated very infrequently, posting weeks late and only posting once per course unit. This was ironic because her posts were insightful and demonstrated understanding and engagement with the course material.

Other students may have not liked the ‘forced’ nature of the threaded discussions, but it did not deter their participation. In fact, students in the User Studies course engaged in lengthy discussions weekly. Instead of focusing on their dislike of the

threaded discussions, these students acknowledged how overwhelming and time consuming the discussions were, and recognized their value for promoting understanding of course content and facilitating peer connections. For example, the following comments were made:

- *Voluntary discussions do sound nice! I wonder if we will encounter some of those in these courses? I do agree that our discussions were forced, because it is a requirement to participate in a few discussion threads every week. At the same time, I was surprised to see how much everyone contributed on a daily basis. I was also surprised to see how many people contributed their own links and maps to our weekly discussions and "Water cooler" section. It was definitely hard for me to catch up with all of the postings. There is so much involved in this course, I wish I had the time to really look at many things more in-depth. At times I also felt like I was filling things in just to get it done and fulfill my requirement. At the same time, I also don't think this class would be as rewarding in a classroom setting. Many of the things we've learned have been because of our in-depth discussions. I know that if it wasn't for the discussions, I would've had a harder time understanding our readings every week!*
- *I know what you mean. I have been through several ... courses, and they were similar in the discussion requirements, however this course was much more involved than I imagined. And I am not a "chatty" person, so the discussions became very time consuming and taxing for me. Sometimes getting pushed outside of your comfort zone helps to broaden your perspective, at least that is how it was for me. I am still not inclined to extensive conversation, but "listening" to the others helped me think more broadly about people's perspectives.*
- *I definitely agree with your comments regarding the online format versus the classroom. I cannot even image how in-class students can achieve the depth of learning that we have experienced if they are just showing up for class three times a week. It is all of the give and take, reading each others' links, having the opportunity to pursue links of our own, that give the learning the depth. I'd love to ask an in-class student sometime what this course looks like in that format. Somehow, I imagine it being a mere shadow of what we experienced here.*

This exchange encapsulated the lone dissenter in the course, and nicely demonstrated the overall nature of the students in the class: pleasant, optimistic, and able to deal effectively and professionally with differing opinions. The second and third comments provided examples of students reaping the unplanned benefits of a

significant amount of work, and achieving a depth of learning and broadened perspective they did not anticipate, which ultimately lead to a construction of knowledge. Not only did students succeed in making factual statements and statements of *Explanation and Result*, they succeeded in making *Synthesis* statements which suggests they were integrating the course content into their daily lives.

During week nine of the semester, the instructors asked students by email to discuss their reactions to participating in threaded discussions in their weekly journal entries:

*This week in your journals, I'd specifically like you to reflect on your sense of progress in your discussions: think about the frequency of your discussions (both original posting and responsive postings), your use of learning materials and integrating these into your discussions; barriers and enablers to your participation.*

Not all students submitted reflections but those who did expressed opinions similar to what was said in the threaded discussion forums. Students felt the discussions were sometimes overwhelming and took a great deal of time, but, once an efficient work style was achieved, the discussions yielded positive interactions, increased understanding of course content, and fostered interactions with peers and the instructor. Comments included:

- *Posting to the discussion threads has been challenging for me. After making an original post and initially responding to my classmates, I find it difficult to come up with something unique to say. Everyone is so active in responding to each other that often when I go to write something, I see that someone has already said what I was thinking. However, I definitely think that I am engaging with the readings more than I would if the discussions weren't required. I am certainly working harder to understand concepts than I would in a face to face classroom since the discussions force me to synthesize what I'm thinking and say something about it on a near daily basis.*

- *There have been some weeks where I have been afraid I was going to have nothing to say or add to the discussions. These are weeks I may not have made an original posting but then I go in to the discussion boards too look around and someone says something that I just connect with. Having someone put a different spin on things are bringing focus to a certain area has shined a light and help me make connections.*
- *The group discussion have added a very rich layer to my level of learning in this class, and I believe it is much better than what I would get out of a classroom class, as more people contribute, and they contribute with references to additional materials. Also, when I read comments from others that echo my opinion, it helps me to solidify and develop my ideas.*
- *While reading through all the posts, I find myself agreeing and thinking "yes, I would have said the same thing." It can be difficult to then produce your own original post. I spend most of my time simply replying to posts.*

These comments frequently mention variations of “I don’t have anything new to add to the discussions”. There was a consistent concern about being repetitive in the discussions, perhaps because of the requirement to contribute ‘substantive’ posts. However, instead of focusing on contributing individual interpretations and opinions students were overly concerned with being original, even if it meant not adding anything substantive to the discussions or admitting they had not read the weekly articles. Students mentioned participating in discussions because they were required to do so, but also mentioned making connections with others, acquiring new perspectives, and receiving validation of their own thoughts and ideas as a result of being part of the threads.

Table 4.1 demonstrates that the discussions generated a great deal of text and required a significant investment of time and effort by the students to keep up with the workload and meet the instructor’s expectations for participation. Particularly for students new to online education, the discussion requirements and amount of text to

read was overwhelming. Even those having previous online experience may have found the sheer volume of these discussions daunting. Students discovered that attaining a level of comfort with the workload and navigating the discussion forums took time, but made the course worthwhile and productive. Good time management skills and devising strategies to accommodate the workload proved to be important elements in this process:

- *The biggest barrier to participation has been time. I had no idea how many hours it would take to read, re-read, and interpret all the required readings.*
- *I try to consistently keep up with my postings throughout each week. I always try my best to find ways to incorporate our readings and lectures into the discussion threads. Even if I feel like I haven't mastered the topic that we're talking about, I find some way to relate my own experiences to our readings, lectures, and discussions. I hope that as I continue to work in this class I develop a clearer understanding of the various concepts we've discussed so far in this course.*
- *I remember how I felt overwhelmed when we first started the semester. Each time I signed on I saw that there were 20-30 new postings! Now I've learned to check my course page frequently each day so that I can digest each new post as it is being discussed. I like to take my time before responding to each post. I usually give an original posting for my first threads that I post in each topic. Then, I like to give feedback in responsive postings by giving my thoughts on postings by my classmates. I usually have more time on the weekends to give all of my final posts. However, I always try to give some posts throughout the week as well so that others can contribute to my thoughts too.*
- *I need to discover the important points for myself, take them in, ponder them, and then add my part to the discussion. In that way, I will be contributing to my own and my fellow students' learning experience.*
- *I have noticed that there seems to be a better flow of ideas as the weeks have gone by. This may be that we are getting to "know" one another a little better, or that we are beginning to feel more comfortable with the format (probably both).*

Once the mechanics of the course had been mastered, the students discovered there was a great deal of information and learning to be had from their peers, including diverse perspectives that might not always be found in a face-to-face class:

- *I've realized that if there's something I'm not completely sure about I can either: 1) share my concerns with the class and I know someone will be able to help me understand it better or 2) someone might give another perspective by contributing to my discussions in a responsive post, which will help me to be more open-minded about the topic. I'm learning to be more open-minded to the concepts of [user studies] as I learn about them in this course. ... I participate in the discussions for each week, and learn a lot from all of my classmates. I enjoy reading and contributing to the discussions each week, because I believe that they're an important part of interacting and learning through this online course.*
- *I am very comfortable with the forum, and everyone has been very supportive. I never felt fear of flaming, which was quite nice. I think this has been a tremendous group with whom to go through this process. My classmates definitely go in the enabler column.*

A stream of comments emerged in the discussions and journal entries of students concerned that there were members of the class who were much more communicative (in terms of frequency and length of posts) than others in the threaded discussions. These classmates were noticed by, and even intimidated, their 'quieter' classmates:

- *As long as we are being honest, I also feel a mite intimidated by the brilliance of some of my classmates and this feeling holds me back – an issue I know that I must tackle if I am going to be successful in my on-line MLIS career.*
- *There are people who post far, far more often than I do—dozens of comments each week—yet in my own matrix of discussion etiquette, this is not necessarily a laudable tendency. I try to post once or twice a week, only after reading everyone else's posts carefully, and keeping my comments fairly concise and clear.*

These feelings of intimidation did not cause an openly negative comments or exchanges, but clearly were an issue for several students and had an impact on their discussion contributions (i.e., either posting more than they were comfortable with in order to keep up, or 'falling back' (Kazmer, 2006) in their participation because they could not identify places from which to launch into the conversations). This phenomenon seemed to generate an element of competition in the discussion threads -



- that is who would be the first to post a substantive comment, perhaps in an effort to get the original post out of the way and/or submit a post before another classmate wrote what she thought she wanted to contribute. This leaves some with the embarrassment of posting “I don’t have anything new to say”. Such an approach could be perceived as counter-intuitive to the goals of threaded discussions, but the students in question seemed to be comfortable with the ‘post early and post often’ method of threaded discussion participation:

- *Even though I haven’t read our other readings, I wanted to add to the discussion before others mention what I wanted to say.*
- *I’m still working through the article, but I felt inclined to comment on this excerpt!*
- *Again, this is a brief look at the readings. There will be more to come.*
- *I am not prepared to discuss that point yet, but ...*
- *I haven't yet read the recommended chapter in the text book on Dervin's Sense-Making but I'm hoping that will be helpful as well! Off to do more reading...*
- *I regret taking so long to log-on to this discussion board.*

Overall, the students proved to be active and engaged participants throughout the semester, and enjoyed periods of great conversation -- for example in units 4 and 5 in a discussion of theorists that included Marcia Bates, Brenda Dervin, and Carol Kuhlthau. The students really understood these theories and could easily apply them to their lives and information practices.

- *There is a sensical, flowing, circularity to Dervin's theory, not only as illustrated in her journey-taking example, but also from the perspective from the discontinuous to the continuous. I find it fascinating that Dervin dared to tackle the traditional study of the continuous and applied a behaviorally-based, individual-centered theory to counter or compliment this school of thought.*
- *Sense-making as a research methodology gives the researcher permission to “not take sides” in designing and describing research methods and results. Instead of “paper or plastic,” the researcher is allowed a shopping cart. In sense-making, conclusions are obtained through direct observation of not only “the answers” but the structure of the information-seeking/problem-solving behavior as it relates to the*

- user's need being not only identified, but addressed (not necessarily solved). ... Yeah, I liked Dervin.*
- *I loved the Bates article. After reading all the research and conceptual theories, reading Bates was like a breath of fresh air. She did not write in language understandable only to other experts in the field, and she gave examples of everything she proposed. It was almost like [user studies] for Dummies. Not only was she understandable, but her ideas had readily apparent practical applications.*
  - *What a fantastic article! Bates' style is very straightforward and easy to understand. It also helped that I thoroughly enjoyed her berry picking model. I agreed with all of her key points. I know that my own search queries are always evolving and I am frequently inspired by my findings to broaden my search specifications. I also tend to gather bits and pieces of information, often over multiple search sessions.*
  - *As I was reading Kuhlthau, I found myself nodding my head and saying, "Yup, that's me." It was almost a little irritating how well she nailed down exactly how I was feeling about the upcoming term and group projects. Kuhlthau writes (p.366) that "the adjectives most used to describe feeling (at initiation) were confused, frustrated, and doubtful," and I couldn't agree more. I might add panicky with a fair amount of intimidation thrown in for good measure. These concerns started to lessen when I started to work on the projects. I actually felt a bit optimistic, which she states is a common feeling in stage 2. (I am so transparent!) But it was reassuring to know that these feelings are quite normal and that I will gain confidence as the weeks go by.*
  - *Kuhlthau's ISP was another hit with me. Very much like Berry Picking, it seemed to describe exactly the research process I use. ... What I really value about this ISP model, however, is the framework it is providing to me now as I begin work on the Group Project.*

Theories relevant to the students' lives, experiences, and professional aspirations were important to generating and sustaining high-quality discussions. These comments demonstrated the patterns of written interactions and the patterns of knowledge building in an online learning community as set forth in the study's research questions. The written interactions, really exchanges of information, were part of the discussions the students have in the forums. The more engaged students were in the discussions, the more information was exchanged, and the more likely it was that students would construct new knowledge.

A set of discussions that were notable happened during week 11, when the theme was seeking and using medical information. Even though students were expressly told by the instructor that they did not need to disclose personal medical conditions or experiences, the students shared an inordinate amount of personal information about themselves and family members. Students revealed their ages and personal conditions including: stage four lung cancer, scleroderma, torn ACL ligaments, pregnancy and bed rest, pulmonary fibrosis, sinus conditions, spinal injuries, heart conditions, appendicitis, acute myelogenous leukemia, fibromyalgia, Lyme Disease, drug abuse prevention measures, multiple sclerosis, osteochondritis, caring for elderly parents, and assorted gynecological issues.

Related posts include:

- *People who lived a life in the round were often seen to be information poor because their information came from a very small group of people. When thinking about it in that way, the fact that weak ties provide more and/or different information makes sense. People with whom we have weak ties live in a different circle and have a different knowledge base, like the nurses in Pettigrew's article. When we're sick we may be very tempted to only talk to our closest friends and family, but it may actually be more beneficial to branch out to others.*
- *Recently I was diagnosed with a very common problem that luckily does not include any scary outcomes. Even though my doctor reassured me that I needn't worry I couldn't really concentrate on what he was saying after he told me what was going on. So even though it was good to speak with him, and eventually I relaxed enough to hear what he was saying, it would have been nice if he could have directed me to some written information that I could take home with me, or even a trusted website that I could read at a later time. This way I could have gotten some more in depth information at a time when I was better able to comprehend it.*
- *How can health care professionals use this knowledge to create similar atmospheres in their own practices? Perhaps waiting rooms could be turned into information grounds, not just by having pamphlets lying around that no one reads, but with nurses who are available to answer questions before and after a visit to see the doctor?*
- *Seven years ago, my back surgeon offered me a list of contacts who had previously undergone spinal fusion. The phone call provided a comfort and someone I could*

*relate to. I felt like I was in a special club because no one in my circle of family/friends could share my experience. I have never recognized the value of this support group nor how my doctor valued his patients.*

- *So sometimes it's not just medical knowledge one needs, it's help navigating the system.*
- *We truly have to be our own patient advocates and cannot simply rely on information we get from the internet.*

In addition to having relevant topics to which participants can relate, common experiences proved to be a significant discussion generator. Everyone has had some type of experience with illness, and the need for quality and accessible medical information is universal. The relative anonymity of the asynchronous environment likely provided a layer of security and comfort which made students willing to share such personal information. Though students knew each other to some degree by week 11, their ignorance of each other's appearance combined with the fact that they did not have to see each other as they 'spoke' probably made sharing personal medical details a non-threatening experience. In fact, this environment may have served to build an even stronger sense of community among this group and thereby permitted a deeper level of sharing. This sharing, which falls within the information intent categories of *Getting a Clearer Picture* and *Getting Connected*, also enabled students to contextualize their own learning and facilitated the construction of new knowledge.

Overall, the students in the User Studies course performed well in the threaded discussions, as well as in course as a whole, and viewed it as an enjoyable and positive academic experience:

- *I love that in almost every thread is a link to another article or a video or YouTube video or something silly but still relevant. I feel that this has brought a richness to the class that I did not get out of some of my undergrad classes that I took on line. I think we use the internet to make a connection to the material that you cannot do if we*

- were in a traditional classroom setting. While I miss seeing people in person I think our use of the web as a class makes up for any cons of taking all on line classes.*
- *I look forward to reading the posts and "listening" to what everyone is "talking" about. Almost every time, someone takes the discussion to a place I would have never thought of. That unpredictable aspect of the threads makes the class all the more interesting and, well, fun.*
  - *It was as if each person's contribution to a thread were the bricks of a building and with each contribution, the learning edifice was constructed.*
  - *As a learning community, I'm confident we'll find a certain rhythm or cadence to our communication. We'll invent this experience together.*

**Technology.** The Technology course had 19 enrolled students and maintained an online course website in the CMS. This class was one of multiple sections of the course, and the sections shared a common syllabus, schedule, lectures exercises, and assignments. The pages detailing the lectures and exercises contained links that led students to narrated PowerPoints, videos, and links related to every section of the course, regardless of instructor. (The instructor for this section was a doctoral student with limited experience teaching online.) A *Class Lounge* forum (in which students posted their preliminary introductions), a link to a required course survey designed to assess students' current technology skills, and a section detailing the instructor's Virtual Office preceded the course information component. The *Virtual Office* was a discussion forum in which students could post their questions or concerns about the course. Students were encouraged to answer one another in this venue. The instructor offered an email address for 'quick response' queries, and had regularly scheduled synchronous weekly office hours via chat using *Meebo*<sup>®</sup> ([www.meebo.com](http://www.meebo.com)). The instructor did not include a biography, but rather posted a link to his institutional directory page. The last section of the course page, before the weekly content units, was a detailed description

of assignments (exercises, quizzes, and a final project) and the grading plan. (For example, class participation, which required participation in threaded discussions and interactions on social media sites such as *FaceBook*<sup>®</sup>, *Twitter*<sup>®</sup>, *PBWorks*<sup>®</sup> and *Delicious*<sup>®</sup>, was worth 7.5% of the total course grade).

Weekly course content units contained a brief mention of the links to lectures and supplemental materials, and featured weekly discussion forums entitled *Term Project Discussion*. These discussions were informal, contained personal banter, and were primarily a venue for asking technical questions about class exercises. Most questions came from the same students who announced their difficulties with technology and the resources introduced in the lectures. In addition to term project discussion forums, there were three required and graded discussions in weeks 3, 9, and 13, each being worth five points. These discussions had designated topics but did not provide guidelines about the number and contents of student posts required. Table 4.2 details the dates and content of the weekly term project discussion forums and the graded discussion forums. The topic for each discussion thread, the number of original posts and their lengths are included. Students' writing styles and post lengths varied, as would be expected.

Mandatory Discussions [Weeks 3, 9, and 13]	Optional [weekly forums]
	Class Lounge
	Virtual Office 38 original posts Ranging from 2 to

	173 words
W1: 01/18-24	
	Term Project Discussion 8 original posts Ranging from 1 word to 249 words
W2: 01/25-31	
	Term Project Discussion 2 original posts Ranging from 21 to 168 words
W3: 02/01-07	
<p>Library 2.0 20 original posts Ranging from 6 to 824 words</p> <p>Discuss a specific example of how Library 2.0 technologies are altering existing or creating new library services or programming. Use the technologies you've learned about so far in the course and your existing knowledge of library services to help you identify an example to share with the class. Please also consider responding to your classmates postings if you have questions or observations that you'd like added to the discussion. The example you discuss need not only be about a successful initiative. An interesting unsuccessful example of where a Library 2.0 approach did not work or make a significant impact is a good discussion point as well.</p>	<p>Term Project Discussion 4 original posts Ranging from 3 to 76 words</p>
W4: 02/08-14	
	Term Project Discussion 4 original posts Ranging from 5 to 15 words
W5: 02/15-21	
	Term Project Discussion 1 original post (2 total) Ranging from 10 to 128 words

W6: 02/22-28	
	Term Project Discussion 4 original posts Ranging from 11 to 27 words
W7: 03/01-07	
	Term Project Discussion 0 posts
W8: 03/08-11 (break)	
	Term Project Discussion 0 posts
W9: 03/22-28	
<p>Describe an Innovative Use of Information Technology in Libraries 24 original posts Ranging from 7 to 245 words</p> <p>Identify and post an interesting use of an information technology in a library setting. This use could be an interesting deployment of a piece of open source software by a library or a library-focused web service that has been embedded within a library website in order to present some interesting content or be used in some useful way by library patrons. Your selection could also be a piece of technology that is being used in an interesting way within a library's physical space.</p> <p>In your post describe what you think is unique and interesting about your selected topic. If you discuss a particular software implementation or web service as a bonus talk about how such a resource is using some of the web technologies we've covered in class. Please provide the URL where the class can see your selected topic or at least view a description of it. If you are struggling to find a resource looking at the current content available through RSS resources we selected in exercise one might be a good place to start looking. Please also post your reactions and comments on your classmates postings.</p>	Term Project Discussion 0 posts
W10: 03/29-04/04	
	Term Project Discussion 0 posts



W11: 04/05-11	
	Term Project Discussion 2 original posts (3 total posts) Ranging from 15 to 62 words
W12: 04/12-18	
	Term Project Discussion 2 original posts Ranging from 3 to 33 words
W13: 04/19-25	
<p>Open Data and Libraries 1 post – 126 words</p> <p>In our previous graded discussion and exercise four we have talked about open source software and its application in libraries. Listen to the brief lecture for week 13 and thoroughly review both sets of supplemental materials available under the week's lecture: "<b>Open Source</b>" and "<b>Mashups and APIs</b>". In preparing for the discussion consider the two new concepts that lecture introduces, the support of open-source efforts by major corporations and the concept of open data. Both of these touch on a similar thread, the idea that large organizations are embracing the concept of releasing either software or data for free use on the web by developers to develop new applications with software they've created or on top of the data that they provide.</p> <p>For the discussion you should identify one interesting API or other open data initiative sponsored by a large organization such as Google, OCLC, Yahoo, Facebook, or Microsoft. You should provide the URL of the homepage of the resource you choose and if possible provide the URL of the terms of service that the resource has been made available under. This could be a link to an open source license or an API usage policy. You should consider how releasing this resource may further the organization's business model even though the resource is nominally free. Also consider the implications for library information services with the widespread proliferation of open data services. Should libraries embrace these information sources that are displacing the traditional models for releasing and publishing data? If so, how do you think libraries can make the best use of the resource in question.</p> <p>You should also try and provide a link to a third party service or Mash-up that may be using the resource you select. A good example of a Mash-up is a third party website that incorporates a Google map</p>	Term Project Discussion 0 posts

with other pieces of data to create a unique application. Please check the discussion board prior to starting your research so you do not select a resource that has already been posted. To earn full credit for the discussion you should also read and respond to the postings of your classmates.	
W14: 04/26-05/02	
	Term Project Discussion 0 posts
W15: 05/03-09	
	Term Project Discussion 0 posts  Course Feedback 0 posts  Peer feedback 0 posts

Table 4.2. Threaded Discussions for the Technology Class.

The bonding element in the Technology course was the *Term Project Discussion* threads. As was demonstrated in the User Studies class, this area was where peer interactions took place. The students came to the threads to seek assistance and to answer one another's questions about course exercises and assignments. These 'discussions' bore more similarity to question and answer forums. One student posted an assignment-related query, and other students would provide responses based on their understanding and experiences. It was common to see links to explanatory websites and resources, other technical information, and in some cases sections of code were cut and pasted to be used for the exercises.

Samples from the 'tech talk' include:

- *I am having trouble getting the RSS feed for the site I chose to run within my wiki. I suspect that it is a problem of permissions, but I don't know how to fix it. Any tips? Anyone also having this problem?*
- *At what point is it going wrong? Are you using Insert More Plugins -- then HTML and Gadgets -- then RSS FEED?*  
*Where are you getting the code to insert/what's the URL for the feed?*  
*I didn't have any problems -- although I did an intermediary step of subscribing to the RSS feed on Google Reader and then I grabbed the feed URL from there -- I suspect that wasn't necessary, but it worked.*  
*I ended up doing it on my personal wiki -- but I'll check to see if I could have inserted it into the class wiki. On my personal wiki, I didn't have to futz with the permissions at all.*  
*I just checked and had no problem inserting into my page on the class wiki. More details about what's going wrong for you would help in identifying the problem. -- maybe post the URL that you're trying to insert?*
- *Thanks for your help. I did exactly as you said: insert more plugins, HTML & Gadgets, RSS feed. I am working on my personal wiki, so that shouldn't be a hindrance. This is the URL <http://liblogs.albany.edu/library20/> It shows up on the page when I save it as, "Loading <http://liblogs.albany.edu/library20/>" but nothing else happens. I also subscribed to it through Google reader, but I don't suppose that makes a difference. Not sure what's going on! Let me know if you have any other thoughts - thank you!*
- *Hmmm. That's puzzling. I just tried your URL and it worked for me. Maybe you can give someone with more experience access to your page so they can see what might be going on?*

The opportunity to assist one another in these weekly forums appeared to be important to the students, and questions did not go without some response, even if an answer could not be determined. There also appeared to be a high degree of comfort among the students that allowed them to ask questions which revealed gaps in knowledge and/or difficulty with particular technologies. These weekly forums were in addition to three graded discussions (five points per discussion) that took place in weeks 3, 9, and 13. The discussion questions were prompts, and asked students to reflect on their own experience with a given topic and associated technologies. The prompts encouraged responses to classmates' posts but did not require interaction. There were

no additional guidelines for the discussion in regarding the number, length, style, etc. of posts. The prompts encouraged sharing links and resources which students engaged and seemed to enjoy. They noted how these resources related to their lives. (Links were also posted to a class social bookmarking site, which was not accessible for this study.) Sharing resources and personal experiences served to unify students.

- *As I read your post, I found myself nodding "yes" constantly as I agreed over and over with your observations. I was also a high school class room teacher, and know how hard it is to make any changes in an educational institution, much less big changes. When I started working in the public library it took me a while to adjust to how free I was to try new things, even encouraged to try new things. I think you are on the right track in trying to make small changes in areas that you can control, being a model that others will hopefully want to copy. Good Luck!*
- *I am totally fascinated by Library Thing. ... I'm kind of envisioning someone tagging a catalog record for, say, Twilight with tags such as "vampires," "young adult romance," "books that became movies," and the like. Would you think something like that would be attractive to users? Would it be unwieldy?*
- *I loved this post! Your question: Why do we use technologies which offer boundless new options to create forms which are familiar? is very thought-provoking. I think it does have somewhat to do with the emotional connection and the feeling of comfort in encountering something familiar, but I also wonder if it has anything to do with capturing different learning styles.*

Students participated in discussions one and two, but did not participate in discussion three (one student contributed a single post). There was no explanation provided, nor was there any indication that the discussion happened offline, or outside of the course management system. However, based on comments in the discussion forums and feedback received from the Classroom Community Scale (CCS) (see below) it appeared that students encountered 'navigation obstacles' and felt their class communication was 'all over the place'. There was an expressed desire to 'streamline our class communication and interaction', as expressed by this post.

*Dear Classmates,*

*If you have a moment, please take my quick survey that may help us streamline our class communication and interaction...and reveal some hidden aspects of our class experience :)!*

*For example, results so far show that:*

*- **60%** of us first check “What’s New” when we get to our [course] page;*

*- **20%** wish our communication would occur primarily via email;*

*[Instructor] has mentioned that the results could be helpful, so please take a sec to fill it out (it’s really short & simple, I promise!).*

The results of the survey were revealed offline and not available for this study.

However, CCS results showed that most communication for this class migrated to

Facebook® and that was where students’ socialized – perhaps a result of this survey. By

the time discussion three took place, all discussions had been moved outside of the

CMS. It is not known how the instructor responded to these developments and whether or not the three discussions were graded.

Overall, students in the Technology class seemed to engage in the threaded discussions because it was required. Participation in the optional weekly discussions focused on helping one another with class exercises and assignments and elicited a desire to assist and interact with peers. In this class, informal interactions were more worthwhile and productive than the required discussions. These findings suggest that the formation of community and Small Worlds, as suggested by the research questions, does influence the information behavior of online students. The formation of a Small World can occur for reasons other than shared engagement with the course content. In the Technology course a Small World was formed as a result of personal connections and a mutual dissatisfaction with the class. The findings also demonstrate the multiple locations in which a Small World can exist. The students in the Technology course

maintained their small world in *Facebook*<sup>®</sup> and utilized the resultant sense of community in the online classroom environment.

Learner/Context Analysis detailed the organization and personalization of the online learning environments and indicated how the volume of threaded discussions changed during the semester. Activity in the discussion forums was relatively stable during the semester, but some discussions generated more interactions (e.g., the unit on medical information behavior) and some discussions generate less interaction. This analysis provided insight about which questions were more interesting or engaging to the students.

This method also highlighted the importance of instructor immediacy as it was demonstrated in the customization of the CMS. The User Studies class contained pictures, cartoons and other personal pieces of information which suggested the engagement of the instructor. This engagement set the tone for the course for the semester and resulted in the formation of a Small World within the CMS. Alternatively, there was a lack of personal information and interaction in the Technology class, and subsequently students formed a Small World outside of the CMS.

### **Textual Analysis**

The textual analysis of the threaded discussions and journal entries answered the following research questions:

- RQ1: What information behavior patterns, if any, do students in an online asynchronous learning communities exhibit?

- What information intents are exhibited in the written interactions of the graduate students in an online learning community?
- What patterns of knowledge building are exhibited in the written interactions of the graduate students in an online learning community?

As discussed in Chapter Three, textual analysis of course discussion threads was conducted through the lenses of two information behavior frameworks, Information Intents (Todd, 2005) and Knowledge Construction (Todd, 2006). The theory of Information Intents suggests people seek out and acquire knowledge to *Get a Complete Picture*, to *Get a Changed Picture*, to *Get a Clearer Picture*, to *Get a Verified Picture*, and to *Get a Position in the Picture* (Todd, 2005, pp. 198-203). Knowledge Construction (Todd, 2006) attempts to map a learners' increase in content knowledge over time.

Figures 4.1 – 4.4 detail the results of the textual analysis of the 33 discussion threads, 30 threads from the User Studies course and three threads from the Technology course. Figures 4.1 and 4.2 describe the number of occurrences for each Information Intent and number of occurrences of Knowledge Construction during the semester for students in the Technology course. Figures 4.3 and 4.4 describe the number of occurrences for each Information Intent and number of occurrences of Knowledge Construction during the semester for students in the User Studies course. For the Technology class, Information Intents and Knowledge Construction were measured during weeks 3, 9, and 13 (with one threaded discussion for each of those weeks). For the User Studies class, *Information Intents* and *Knowledge Construction* were measured in weeks 1, 3, 5, 9, 11, 13, and 14. Each of these weeks contained two

discussion threads. It was determined that examining seven weeks of the User Studies class (approximately half a semester), instead of examining three weeks to match the volume of data in the Technology class, would provide a fuller and sequential analysis of how Information Intents changes over time and would provide a better view of how Knowledge Construction is built, or not, over time. (The change of patterns over time relates directly to this study's research questions.) Also, a saturation point was reached in the threaded discussion data, regarding the appearance of Information Intents and Knowledge Construction indicators, and no new insights would emerge from the examination of 15 weeks of threaded discussions.

**Information Intents.** The below table displays the number of each Information Intent as it appeared in each threaded discussion (during weeks 3, 9, and 13). The threaded discussions were coded as described in Chapter Three, and results are discussed in the following sections. Overall, the three graded threaded discussions in the Technology class highlighted students trying to *Get a Clearer Picture* and trying to *Get a Position in a Picture*. As shown below through excerpts, students attempted to *Get a Clearer Picture* of the content by asking questions and providing links, citations, and commenting on various technological tools. Examples of students *Getting a Position in a Picture* consisted of personal examples of experiences with technologies and situations, and expressions of agreement with fellow students. There was also an effort made by students to *Get Connected* with one another, usually by referencing fellow students by name and referencing statements made by them. Examples are given in the section entitled *Connecting* (see below).



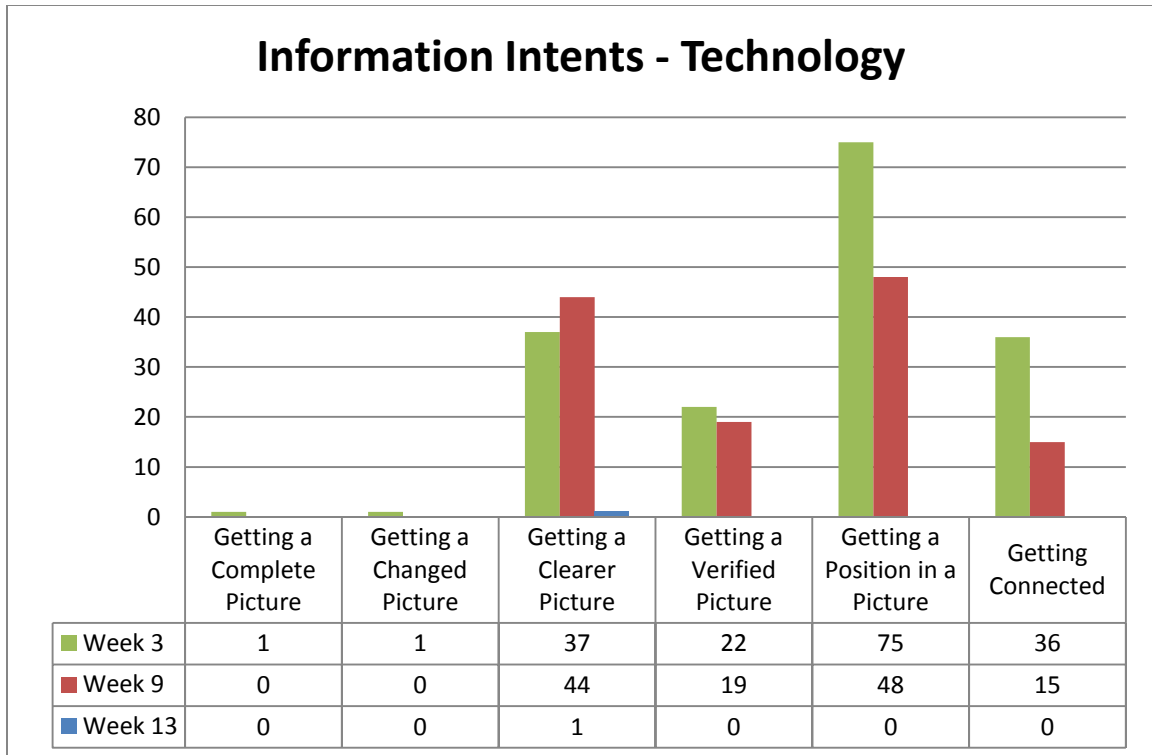


Figure 4.1. Information Intents in the Technology Class.

**Getting a complete picture.** Throughout the three threaded discussions in the Technology class, there was only one instance of a student making a statement considered to be *Getting a Complete Picture*. *Getting a Complete Picture* suggests that students have achieved a nominal level of critical thinking in their understanding of course content, and are able to apply that new information to their lives.

- I do see, however, that being a consumer of the 2.0 technologies is the best way to convince the institutions of their value. By becoming proficient in the use of Delicious and Twitter myself, I can show my administration the possibilities that exist for use within the classroom. As the information “specialist” in the building, it is my responsibility to bring new ways of information gathering to my consumers. As I have learned in the [User Studies] course, humans seek information in a variety of ways.*

In this case, the student began considering the benefits of Web 2.0 technologies to his/her professional life as an information specialist.

***Getting a changed picture.*** Similar to the single *Getting a Complete Picture* reference, there was one comment in the Technology discussions that represented a *Changed Picture*.

- *Hey it sounds like a little [User Studies] is creeping into your thoughts about technology – [Prof X] would be proud!*

This comment suggested that the student is viewing the course content as a result of having previously taken the User Studies class, an example of how perspective and understanding changes over time, and over the course of multiple classes and semesters. The post implied that this expanded view is shared by at least two students: the one making the initial comment, and the one who recognized the change in the classmate's thinking.

***Getting a clearer picture.*** There were instances in which the Technology students attempted to *Get a Clearer Picture* (for example, 44 instances in week 9). This happened by asking questions and providing examples, links, citations, and anecdotes. Questions in the threaded discussions tended to be of two types, rhetorical or theoretical, and were meant to start or extend the conversation, or to request answers. In the Technology class, questions lent themselves more to those requiring answers related to the technologies and issues being discussed. In response to another's questions, or just sharing a new resource with the group, comments contained article citations, links to websites, and other Internet content.

- *Would you think something like that would be attractive to users? Would it be unwieldy? I keep thinking social tagging would really help me navigate the many electronic resources as XXX because not all of the e-resources are listed under Indexes and Databases, some are listed under Reference, for example.*
- *Can you help me understand what you mean by "a good librarian can help him and other scholars figure out how to retain rights to their own work." ?*
- *"customer-driven offerings" ("Service for the next-generation library," Michael E. Casey and Laura C. Savastinuk, Library Journal, 9/1/2006)*

Students also provided anecdotes and expressed their opinions and experiences in order to explain a situation or add more detail to an explanation. Contributing additional information is a common way to not only provide others with a Clearer Picture, but self-reflection is an important means by which students clarified information and scenarios, and created a clearer picture for themselves. For example in the excerpt below, the student recognized the benefits of Library 2.0 and reflected on a potential downside to these technologies. The reflection solidified the concept and new information for this student, while simultaneously giving other students in the class an example that facilitated the clarification their own understanding.

- *However, the downside I see to library 2.0, is the hesitation on the part of the educational institution itself. Most of these tools such as Twitter and Facebook are blocked in our district. Most teachers in our school look down on Wikipedia as a source of information (and do not allow students to cite it in research), yet, it seems to me that it is checked for credibility constantly, and is the most highly edited source because of its 2.0 feature.*

**Getting a verified picture.** Students seeking a verified picture were looking for validation and/or confirmation of their ideas -- they readily received that from classmates. Comments that constituted *Getting a Verified Picture* are similar to those in the *Getting a Position* Category, in that they are statements that agreed with another's post. *Verified* differs from *Position* statements because they are emphatic and

demonstrate personal connection. The excerpts below give examples of students making a concerted effort to reference classmates and their comments in the course of making their own points. Students could simply state agreement or reiterate a point without acknowledging previous comments. However, for one person to recognize and emphasize points made by others indicated that it was important to students to validate their peers.

- *I read your post, I found myself nodding "yes" constantly as I agreed over and over with your observations.*
- *I think XXX's point about security issues is really important and must be weighed in discussions about integrating 2.0 technologies in our libraries and schools, and might be (partly) an underlying factor for schools/libraries often being slow to change or embrace some technologies.*
- *I am going to take XXX's advice and follow my local library and some others to see if I can put Twitter to better use!*
- *I think it's great that, as XXX and XXX mentioned, libraries are initiating features like online chats and texts to keep that interactive component and I see the value that Facebook and Twitter bring as well.*

**Getting a position in a picture.** The category of Information Intents appearing most frequently in the threaded discussions was *Getting a Position in a Picture*. These statements contained simple agreement or disagreement with a previous comment, showing no emotion or emphasis. This category also included students making general comments in an attempt to introduce and/or maintain their presence in the discussion. Students offered anecdotes and expressed opinions or predictions based on their own beliefs and experiences. *Getting a Position* statements have a more personal tone, rather than an academic or informational one.

These comments demonstrate opinions and anecdotes:

- *What made me think of that is a totally anecdotal (and perhaps not very profound) example. My boyfriend, who teaches German at a small liberal arts college, tried to*

- use some 2.0 technology by using his iPhone as a wireless remote to control his slideshows (from his own Mac laptop),*
- *I don't actually use Library Thing, but am intrigued by whether some of its social functions could be incorporated into library catalogs and resource pages. How neat (in the sense of cool, perhaps not in the sense of not messy) would it be for users to be able to tag pages on a library website of how/why books and resources were interesting or helpful to them?*
  - *Your suggestion has given me more to think about. It might be the best way to find out which tools would be most useful to the patrons we serve.*

The following statements express emotion and were made to demonstrate presence in the discussion and hopefully advance it by inviting further comment.

- *I was really struck by this point as well when I was looking at various websites.*
- *I loved this post and the article.*
- *Learning about this tool truly changed my researching.*

Below are statements that showed disagreement, whether between one another or with a proposed tool or resources. Disagreement does not have a negative connotation, but rather it can represent hesitancy, lack of understanding, or an inability to accept something said by another student.

- *Before taking this course, I was always reluctant to join Twitter.*
- *I am still not completely sold on Twitter.*
- *To be honest with you, I don't think I fully understand what exactly it is/does either :)*

Table 4.1 reported that 75 statements were made in the *Getting a Position in a Picture* category in the first discussion. In the second there were fewer statements (48). This could be the result of this discussion being shorter than the first one, or it may result from students not feeling obligated to post in order to maintain their presence in the discussion. Further, a plateau could have been reached as students became more comfortable with the threaded discussion format. A final possibility is that students did not care to post extra comments to earn five points for the discussion assignment

(Technology class discussions were graded, but did not specify a required number of posts or mandate content requirements). Without feedback from the instructor in the course shell, it was difficult to determine general progress or perceived quality of discussions over time.

These findings suggest that the patterns of Information Intents changed during the teaching cycle. Levels of interaction in the threaded discussions fluctuated depending on student interaction and interaction with the instructor. Patterns of information intents or Knowledge Construction are not guaranteed and they are not static.

**Knowledge Construction.** The Technology class produced minor results in the area knowledge construction. The assumption was that *Fact* statements would decrease during the semester as students made more *Explanation* and *Synthesis* statements that evidenced a higher level of thinking about the subject. Figure 4.2 shows an increase in *Fact* statements, a low but consistent number of *Explanation* statements, and only one *Synthesis* statement. While much information was exchanged during the course, and students formed a level of community during the semester, Knowledge Construction occurred mainly at the *Fact* level and not at the *Synthesis* level.

**Facts.** *Fact* statements presented ideas that are widely known and accepted, or information that could be easily looked up or verified. They contained no personal opinions or suppositions. They sometimes included article citations and Internet links.

- *New Literacies has been a conference focus at the National Council of Teachers of English (NCTE) annual fall conference for a couple of years now.*
- *WorldCat allows you to tag items once you sign up for a (free) account.*

- *One neat one is NewGenLib. It has modules for acquisitions, circulation, series, administration, etc. You can see more information here: <http://www.verussolutions.biz/index.php>*

Discussions in the Technology class relied heavily on *Fact* statements because students were asked to find and share resources related to Web 2.0, Library 2.0 and other similar topics. This finding demonstrates the importance of designing appropriate questions for the online learning environment. Closed-ended questions do not elicit substantive or sustained discussions that would promote and facilitate *Explanation* and *Synthesis* statements.

***Explanation and Results.*** Discussions in the Technology class yielded few statements of *Explanation and Result*. Statements made contained anecdotes about students' perceptions of technologies and how they influenced the LIS profession. These statements demonstrated a level of reflection, and sometimes showed an awareness of gaps in of their knowledge.

- *The anonymity of the Internet makes it easier for individuals who want to take advantage of the service to engage in pranks. However, it seems to me that the anonymity can also be positive, in that it provides cover for individuals who have questions but may be apprehensive about actually asking someone face to face at the risk of seeming less knowledgeable.*
- *Like learning a language, if you're not using it or reinforcing it, even one training class may not be sufficient. So there is another question - how do you not only train people to use all of the technological resources available to them, but also convince the trainee that it's a great resource and reinforce its use so that it isn't forgotten as soon as the person leaves the training class?*

***Synthesis.*** *Synthesis* statements demonstrate reflection and integration, and occurred when students applied the course content to their lives and professions.

*Synthesis* suggests that the new information students received and absorbed in the class

will remain with them after the course ends, and changes their long-term understanding and knowledge base.

- *However, the downside I see to library 2.0 is the hesitation on the part of the educational institution itself. Most of these tools such as Twitter and Facebook are blocked in our district. Most teachers in our school look down on Wikipedia as a source of information (and do not allow students to cite it in research), yet, it seems to me that it is checked for credibility constantly, and is the most highly edited source because of its 2.0 feature. A lot (not most) of teachers are afraid of the technology itself because they do not use it. Even as I write all the benefits of using what I am learning in this course, I am still very slow in learning how to use it. The fear of putting the cart before the horse, or putting something out there that we ourselves are not very skilled in using, is a legitimate fear.*

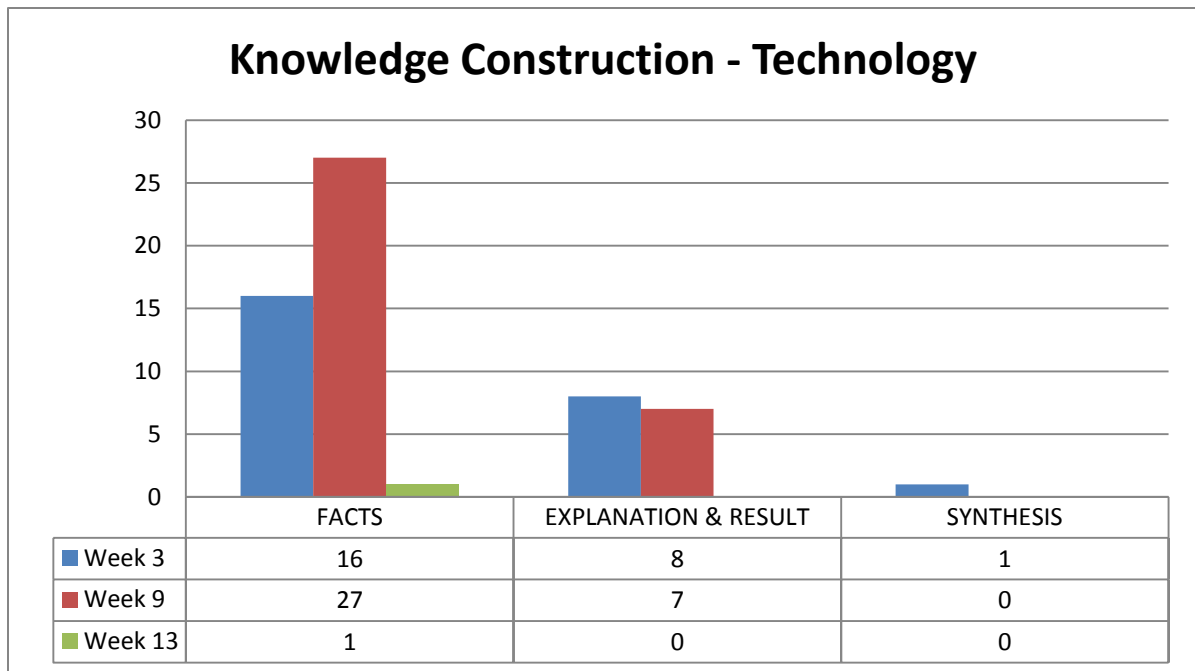


Figure 4.2. Knowledge Construction in the Technology Course.

## User Studies

**Information Intents.** Figure 4.3 displays the number of each type of information intent that occurred in the threaded discussions during weeks 1, 3, 5, 9, 11, 13, and 14.



Discussions were coded (see Chapter Three), and results are discussed in the following sections. Overall, the graded threaded discussions that took place in the User Studies class were structured (a required number of posts per week and mandating a level of substantive content) and displayed students *Getting a Clearer Picture* and *Getting a Position in a Picture*. As seen in excerpts from the threads, students attempted to *Get a Clearer Picture* of the content by asking questions and by providing links, citations, and comments about readings, lectures, and supplemental resources. Examples of students *Getting a Position in a Picture* were experiences with the course content and understanding of how it influences various situations, as well as expressions of agreement with peers. There was significant and sustained effort by students to *Get Connected* with one another (usually by referring to classmates by name and referencing specific statements they made).

***Getting a complete picture.*** Throughout the seven weeks of highlighted threaded discussions in the User Studies class, there were 26 instances of a student making a statement that could be considered demonstrating the intent of *Getting a Complete Picture*, with almost half of them happening in week 1. *Getting a Complete Picture* suggests that students have achieved a level of critical thinking about their understanding of the course content, and are able to apply that new information to their lives. Having 12 of these occurrences suggests the learning curve students had in this course -- they were unfamiliar with the subject area and the theoretical nature of the course. As they were introduced to the material and began to put the initial pieces of the semester's plan in place, students made many statements which really

demonstrated what they hoped the course will help them achieve personally (as researchers for themselves) and professionally (as researchers for others).

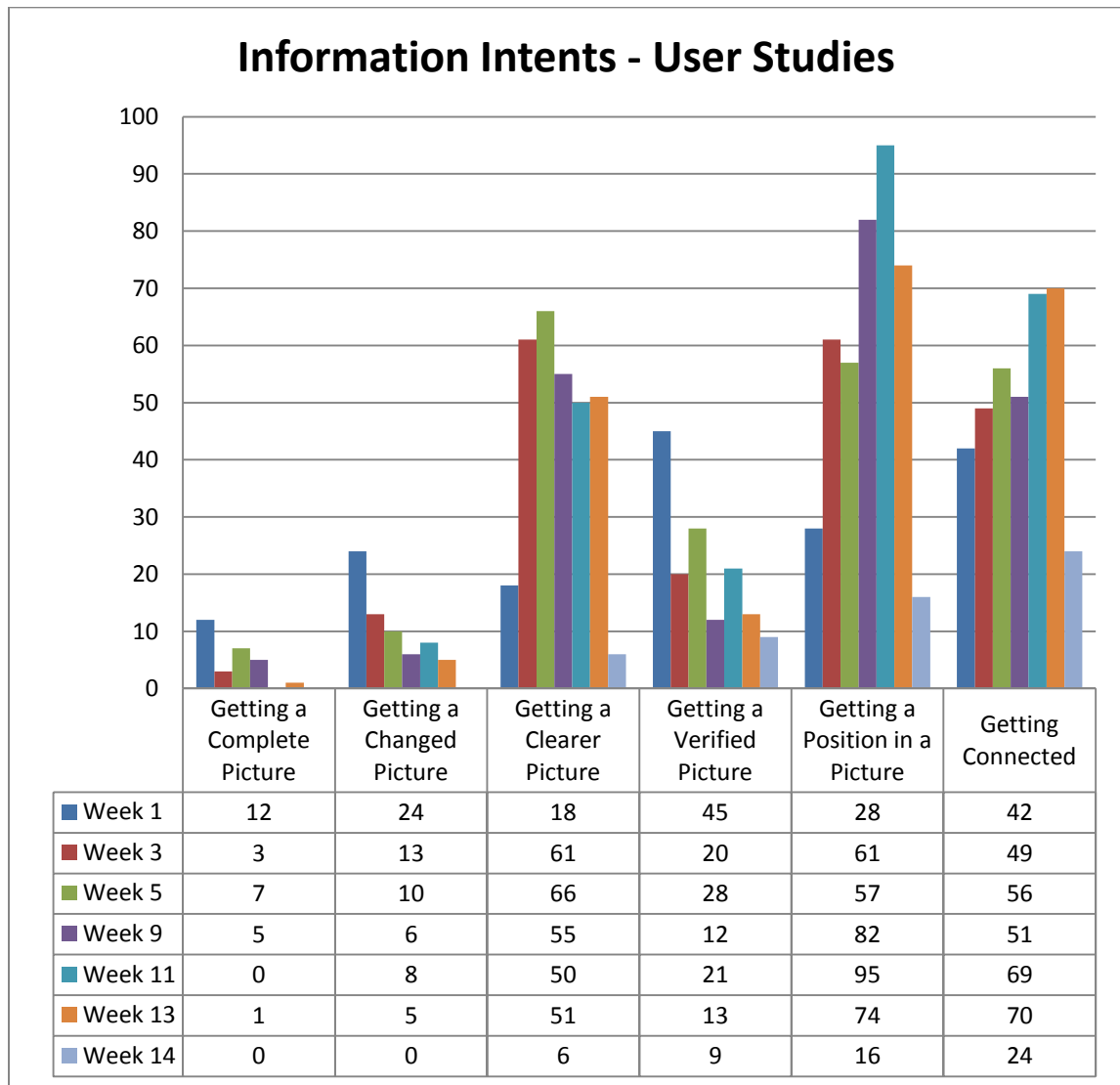


Figure 4.3. Information Intents in the User Studies Course.

User Studies students made broad, holistic statements, which demonstrated their attempts to integrate course content with their future roles as information

professionals. Initially coded as *Get Practical*, these statements were determined to be a subcategory of the *Getting a Complete Picture* category. This long-term thinking allowed them to frame the course and set learning expectations for themselves. Additional statements sub categorized as dealing with students' professional goals and practices will be discussed further in the section entitled *Professional Practice* (see below). The following posts serve to illustrate this variety of thinking:

- *Knowing how people really DO acquire that knowledge and information...how they internalize it, if you will...gives us better tools to efficiently and effectively place that information or knowledge into their hands in a useful manner.*
- *A profession without reflective practitioners willing to learn about the advances in research in the field is a blinkered profession, one that is disconnected from best practice and best thinking, and one which, by default, often resorts to advocacy and position as a bid for survival.*
- *While there's no such thing as "job security," we do have to earn-our-keep in this fast-paced information industry. And as for how to divide time/resources to optimize service, we need to develop tools to "teach" as we "serve" to help people address their information needs...find a way to share the conclusions ... with the users (it's not some secret code or special recipe like KFC's "7 herbs and spices" locked away). This way, with a "know thyself" culture, our users can over time grow to better understand their own searching patterns (and give themselves permission to search in a way they feel natural about), and more efficiently avail themselves of us folks and the systems we implement to help them.*

***Getting a changed picture.*** Similar to the *Getting A Complete Picture* category of intents, there was an emphasis on *Getting a Changed Picture* statements made in the first week of the course (24 statements), with subsequent statements decreasing (almost half in week 3) during the semester. Again, this indicates that the steepest portion of the learning curve for students in the User Studies course took place in the first month of the term.

Statements in this category included students' opinions, questions, and anecdotes designed to share experiences with their peers and advance the threaded discussions. This sharing of information enabled students to build on existing knowledge and change their views accordingly:

- *But to what degree are they expected to be active? When do they hit the brick wall and need help? It speaks to the evolving role of the librarian.*
- *In light of considering even the one article on second-hand learning, causes me to re-think some of the assumptions I've made over time. I consider myself a basically smart person, but if I've awarded cognitive authority too easily to sources that (had I investigated more thoroughly) I might have rejected (or given less weight to), some foundation information could be serving me poorly later. I don't think I have major errors in this area; however, it does cause me to consider how I could easily have ended up a very different person based on who I gave power to influence me (or who was positioned by circumstance to be that power).*
- *A week ago I would not have made that statement. This entire area of study was completely foreign to me. However, after reading much of the information provided to us since orientation, I am beginning to understand that there is a vast difference in the way different groups of people receive their information.*
- *I'm looking at things differently now!*

**Getting a clearer picture.** User Studies students attempted to *Get a Clearer*

*Picture* by asking questions and providing examples, links, citations, and anecdotes.

Instances in this Information Intents category rose sharply between weeks 1 and 3 (from 18 to 61 statements) and remained consistently high to the end of the semester. This pattern of spiking and leveling at a high number suggests that students worked through the theories and concepts presented with diligence. The statements also demonstrated efforts to get new and additional information, clarify course content, and add to their existing knowledge base.

Questions in the threaded discussions were of two types, rhetorical or theoretical, and appeared to be used to start or extend a conversation, as well as their more usual purpose of requesting answers or responses:

- *Who are we trusting to tell us this information and why?*
- *Are we entering the age of the misinformed? How can this be prevented?*
- *I was wondering what you meant when you asked at the end of your post, "Can libraries help here?" Are you referring to medical libraries? Or other libraries?*

Other statements included anecdotes, quotes, citations, and links to other resources, in an attempt to answer a question, provide further explanation, or to support for a previously made point.

- *Last semester, I took an online course with Professor XXX. During one discussion, she gave us a link to an article in The Boston Globe about a private school, Cushing Academy, that had gotten rid of all of its books from the library in order to secure more space for computers that would provide students with databases necessary for their classes and eBooks.*
- *Especially since now we are not only living in an Information Age but also an Attention Age where social media information (Blogs, Social Networks, Wikis, Video and Photo Sharing) continues to grow and grow. This can be called the Digital "ME" Era. ([http://www.webseospecialistinnyc.com/the\\_attention\\_age.html](http://www.webseospecialistinnyc.com/the_attention_age.html))*
- *In the Pettigrew article, it says that "Nurses did not uniformly agree on the extent to which they should follow up on referrals and act as advocates. They also expressed different opinions on whether or not the clinic could be described as an information place." (p. 807)*

**Getting a verified picture.** Comments that constitute *Getting a Verified Picture* are similar to those in the *Getting a Position Category*, since they are statements of agreement with another person or statement. However, *Getting a Verified Picture* statements are more emphatic and demonstrate personal connection. In the User Studies class there were 45 statements in this category in week 1, decreasing to 20 in week 3. The numbers of statements vacillated from week to week, and were never as

high as week 1. As the students began making more statements in other categories (e.g., *Getting a Clearer Picture* and *Getting a Position In a Picture*) and working through the course content (individually and collectively via discussions) they likely sought less validation and confirmation from their peers and focused on exchanging and sharing information.

The following excerpts are examples of students making a concerted effort to include classmates and their comments, while presenting their own points. Students could easily say ‘I agree’ or reiterate a point without acknowledging other students. However, the effort to do so indicated the perceived importance of including their peers.

- *Like XXX, I think ZZZ has hit the nail on the head in her post.*
- *What XXX has presented rings true from my perspective as well.*
- *I like this idea that this course can also help us in how we learn now in addition to being a foundation for what we will be learning, and I hadn't thought about it that way. Prof. XXX mentioned feeling frustrated about wanting to use this material now, and that was exactly how I was feeling as I was reading the first article.*
- *But I couldn't echo your sentiment any more if I posted on the same topic....wait...I kinda' did :)*

***Getting a position in a picture.*** *Getting a Position* consists of several motivations by students. Many statements were simply agreeing or disagreeing with a point that had already been made, without emotion or emphasis. This category encompasses general comments used to introduce and/or maintain a presence in the discussion. Students also provided anecdotes, opinions, and predictions based on their own beliefs and experiences. For example, the excerpts below are prefaced by ‘personally’, ‘I think’, ‘from my experience’, ‘my concern’, etc. – language that indicates expression of individual thoughts and not facts or clarifying statements.

- *Personally, I feel it's a waste for a school library to invest heavily in the 500 and 600's (using the Dewey numbers here). They cost so much and become obsolete so quickly that the internet is a much better option.*
- *I think a librarian or information specialist needs to consider that the person they are helping comes from a different "place" in their thinking and views on a topic, and therefore may be looking for a different angle or aspect of information than what we may assume.*
- *From my limited personal experience, it seems that most LIS professionals are aware that their clients are actively seeking information based on some motivator.*
- *My concern on the "user" side is with more information going digital, this could increase the information poverty of lower income or low-tech access people...at least in speed of access to that information as well as skills discerning the accuracy of information.*

Other statements are personal reflections and/or conclusions.

- *In my work as a school librarian over the past two years I have often lamented the fact that the older students do not make better use of our library resources. Other than stopping in to use the computers when they have assignments due, most of them are scarce. So many times I have pondered what I need to do to reach this group, but thus far I have been unsuccessful. I now see that I have not succeeded because I lack a necessary tool, and that tool is an understanding of how this group connects and interacts with information. I can experiment with different methods, but how much more effective would I be if I could access the research done by others!*

Other statements, while expressing personal opinions, appeared to be efforts to maintain presence in the discussion – jockeying for position, as it were. The discussion requirements for this section of User Studies course indicated a specific number of postings per week, and an explicit admonition to avoid ‘non-substantive’ posts such as ‘me too’ and ‘I agree’. The examples below are perhaps just a step above those, but afforded students some level of participation in the discussions.

- *Like the others I am very new to reading research studies.*
- *Like others, I found the Julien and Duggan paper difficult to wade through and likely needing a few more passes, admittedly this is my first.*

A *Position* statement sometimes contained some form of disagreement and these statements should have advanced the discussion. Even though students acknowledged a sense of trust, community, and a safe environment in the CMS, they were reluctant to disagree with one another, perhaps wary of breaching some unspoken course etiquette, offending someone, or just being wrong in their opinions or understanding. The students could have experienced even richer discussions had more contrary statements been offered. Here is a rare example:

- *I disagree with XXX's criticism that Pettigrew, Fidel and Bruce constitutes a "flagrant" example of second-hand knowledge, therefore making their chapter less than trustworthy.*

Even though the number of Information Intents was high in the User Studies course, the patterns of intents match those found in the Technology course. During the semester the number of intents occurrences rose in the categories of *Getting a Clearer Picture*, *Getting a Position in a Picture*, and *Getting Connected*. During the semester, a decrease in the categories of *Getting a Complete Picture*, *Getting a Changed Picture*, and *Getting a Verified Picture* were noted. This was an unexpected result because the assumption was that because the User Studies course required more threaded discussions and was inherently a more discussion-based class, the threads would be richer and facilitate more Information Intents in the categories of *Getting a Complete Picture* and *Getting a Changed Picture*. (The amount of personal disclosures was higher for this class compared to Technology).

Reasons for this finding may relate to two factors: the nature communication in online learning and communication and the fixed duration of the course. Online courses



in this study were asynchronous, included high levels of anonymity, and were almost completely text-based, which influenced how students communicated within the Small World environment and with what frequency. Written exchanges allowed students more time to contemplate content and compose replies, but did not guarantee that responses would demonstrate critical, broad based thinking in such a way as to blend course content with the various facets of their lives.

Survey results (see below), showed that peer communication, interaction, and bonding happened outside of the CMS, and it is possible that more holistic comments and conversations took place using social media instead. The length of the courses is also a consideration. Students talked and shared more as the course progressed. However, given a 15 week semester, it was difficult to achieve and maintain both sustained and substantive levels of engagement. Ultimately, though, this is a solid finding concerning patterns of information behavior as they occur in online learning environments.

These findings demonstrated that patterns in the information intents can change over the course of the teaching cycle. Levels of interaction in the threaded discussions fluctuated, increasing and decreasing, depending on student interaction with one another and with the instructor, which was similar to the findings from the Technology class. Having more discussion activity and interaction between students and the instructor in the first discussion thread of a User Studies weekly unit was common. An example of this is provided in the following sociograms which illustrate that the frequency of activity in a unit's first threaded discussion of a unit was higher (the graph



In Figure 4.4 the sociogram is dense which means that there was a frequency of lines (information exchanges between individuals) and the lines intersected with one another at a high rate. This indicated that significant discussion was happening in the forum and students were interacting with their peers and with the instructor. There was evidence that pairs of students had multiple interactions with one another (the colored lines that are also thicker in width) and that several students and the instructor were at the center of several sub-conversations that took place within the larger conversation. Figure 4.5 demonstrated that the second threaded discussion of this unit was less dense and featured less interaction and fewer information exchanges between the students and instructor. There were also few sub-conversations occurring in the second threaded discussion.

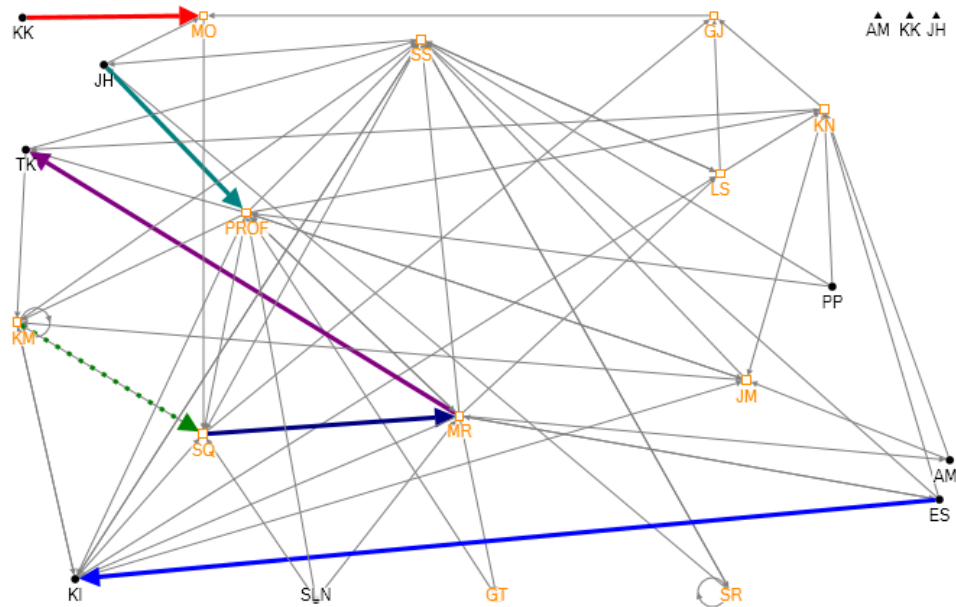


Figure 4.6. Threaded discussion #1 of Week 7.

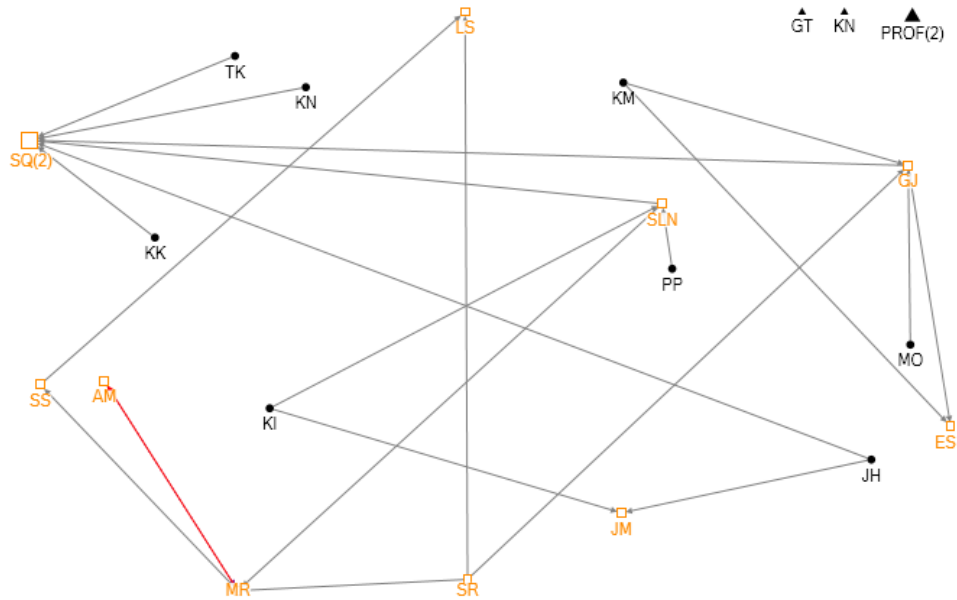


Figure 4.7. Threaded discussion #2 of Week 7.

A similar example was illustrated in the discussion from Week 7 – the first discussion demonstrated density and significant interaction while the second discussion featured fewer information exchanges. The second discussion also featured numerous loners, or students who only interacted with one other person in the discussion (i.e., students labeled TK, KN, KK, AM, PP, and MO). Discussions that feature loner indicated limited interaction between students and the instructor and suggested that sub-conversations did not occur.

Occurrences of Information Intents or Knowledge Construction indicators in the threaded discussions are not guaranteed, nor are they static. These findings also support the idea that *Connecting* and developing a sense of classroom community can happen both inside and outside the space officially designated as the classroom.

**Knowledge Construction.** The User Studies course produced considerable results in the area of Knowledge Construction. The assumption was that *Fact* statements would decrease over time and students would make more *Explanation* and *Synthesis* statements as they progressed through the class. Figure 4.4 demonstrates an increase in *Fact* statements made throughout the semester, as well as a peak of *Explanation* comments in week 3 (44 statements). These decreased substantially for the remainder of the semester. An important result of the study was the number of *Synthesis* statements made during the semester (with peak of 34 statements seen in week 9). This finding corresponds with initial assumptions for Knowledge Construction, and suggests that students did indeed build new and sustainable knowledge as they progressed through the course. The User Studies course evidenced the exchange of a great deal of useful information which may have assisted students in forming community during the semester. According to the Knowledge Construction framework, then, new knowledge was created over time.

**Facts.** *Fact* statements were those that presented widely-known and accepted ideas or things that could be easily looked up or verified. They contained no personal opinions or suppositions. These statements included article citations and Internet links.

- *In "Waiting for chiropody," Pettigrew discusses how information is shared at clinics. "As people 'visit' at the clinic, to use the seniors' and nurses' own term, their conversation about life in general and about specific situations leads to the sharing of human services information on a range of topics and in a multitude of directions" (pg. 812).*
- *Here's a link to an article there ([http://www.earthclinic.com/CURES/sinus\\_infections\\_and\\_ice\\_cream.html](http://www.earthclinic.com/CURES/sinus_infections_and_ice_cream.html)) which examines the impact of ice cream on the sinuses.*
- *The Centers for Disease Control and Prevention studies say that 40% of students are not receiving sex education; 38% of parents have not spoken to their kids about birth*

*control; 93% of parents support sex education in high school; and 84% support sex education in junior high school.*

***Explanation and Results.*** Discussions in the User Studies course showed many statements of *Explanation and Results*. The statements contained anecdotes of the students' perceptions of technologies and how they influenced the LIS profession. *Explanation* statements demonstrate reflection by the students, and sometimes an awareness of the gaps in their knowledge.

- *Is it important to understand how/why people acquire knowledge or information and use it to change their lives, opinions and relationships with each other and the world? If the answer is YES (and I believe we here can agree on that), then it follows that knowing how people really DO acquire that knowledge and information...how they internalize it, if you will...gives us better tools to efficiently and effectively place that information or knowledge into their hands in a useful manner.*
- *Once we learn how people acquire their knowledge and information it will help us immensely with providing the tools people need in our library professions.*

Statements of *Explanation and Results* often reached further intellectually by incorporating research from other disciplines and demonstrating a deeper level of understanding. This reflection allowed students to critically analyze and integrate the literature and ideas to which they were being introduced.

- *I also found the strong-weak ties concept as labeled by Granovetter in studies of elderly and their nurses. Having experienced hospitals, assisted living, and nursing home facilities as my mother aged and became ill, this was a reminder to me how limited some people can be to access information. A person of limited means can be very much at the mercy of another person when it comes to gaining information.*
- *The main fault that I see with it isn't that many people contribute to it, but that we have no idea who those people are and if what they write is verifiable. (I realize that many of facts are sourced, but many are not.) It goes back to cognitive authority and believing where the information comes from.*

***Synthesis.*** *Synthesis* implies that new information received and absorbed by students will be sustained after the class ends, and will change the students' long-term

understanding and knowledge base. Statements from the User Studies students demonstrated reflection and interest in the course content:

- *When I began teaching, I noticed a technology gap between myself and my students. Prensky's statement that "Our students have changed radically. Today's students are no longer the people our educational system was designed to teach" was too true. My elementary students had newer and nicer phones than me and were more experienced with new technology than I could ever hope to be. But, they didn't know how to do seemingly basic things, like use a search engine or type a paper into Word. Sure they were tech savvy when it came to recreation, but they hadn't been taught how to really utilize these tools efficiently. Technology wasn't a big issue when I was in school but today it is part of daily life. Schools and teachers are still trying to adapt and catch up by making technology fun but, in some areas, we have yet to convey the usefulness of technology. That was a daily struggle.*
- *The "Digital Natives: and "Digital Immigrants" discussion is going on within [User Studies] circles and other library communities. As XXX mentioned in her introduction, we have to be very careful in using these labels: "one size does not fit all". It is terminology that I think we need to address very carefully and critically. The terms fall off the lips of many librarians! It draws an analogy to a country's natives, for whom the local religion, language, and folkways are natural and indigenous, compared with immigrants to a country who often are expected to adapt and assimilate to their newly adopted home.*
- *I think this may have profound professional implications for librarians in how we work with our clients. Information seeking is a process and a journey. Just like a teacher with her student, a librarian must determine the current status and needs of his/her patrons: Where is my patron now? What is his/her end goal? Any prior knowledge? Where do I need to begin? What is the most efficient path to the goal? Then we determine what supports to provide. The hope is that over time the patron develops their own set of information seeking skills, allowing them to function more independently and with less guidance.*

A noteworthy demonstration of *Synthesis* came from a student who regularly contributed hand drawn charts and graphs which were attempts to understand and extend the theories being discussed. The most elaborate was a chart mapping the personal information management strategies of members of the class. The student devised the chart at the conclusion of the content unit and displayed not only an understanding of the content, but a rapport with and an interest in the other members

of the class. This exercise also brings to mind the various learning styles that every online learning environment encompasses. This student was a visual and tactile learner who needed to manipulate the text based information in this way to achieve understanding. The shared charts and graphs facilitated learning for this student and, as a byproduct, that of the other students as well.

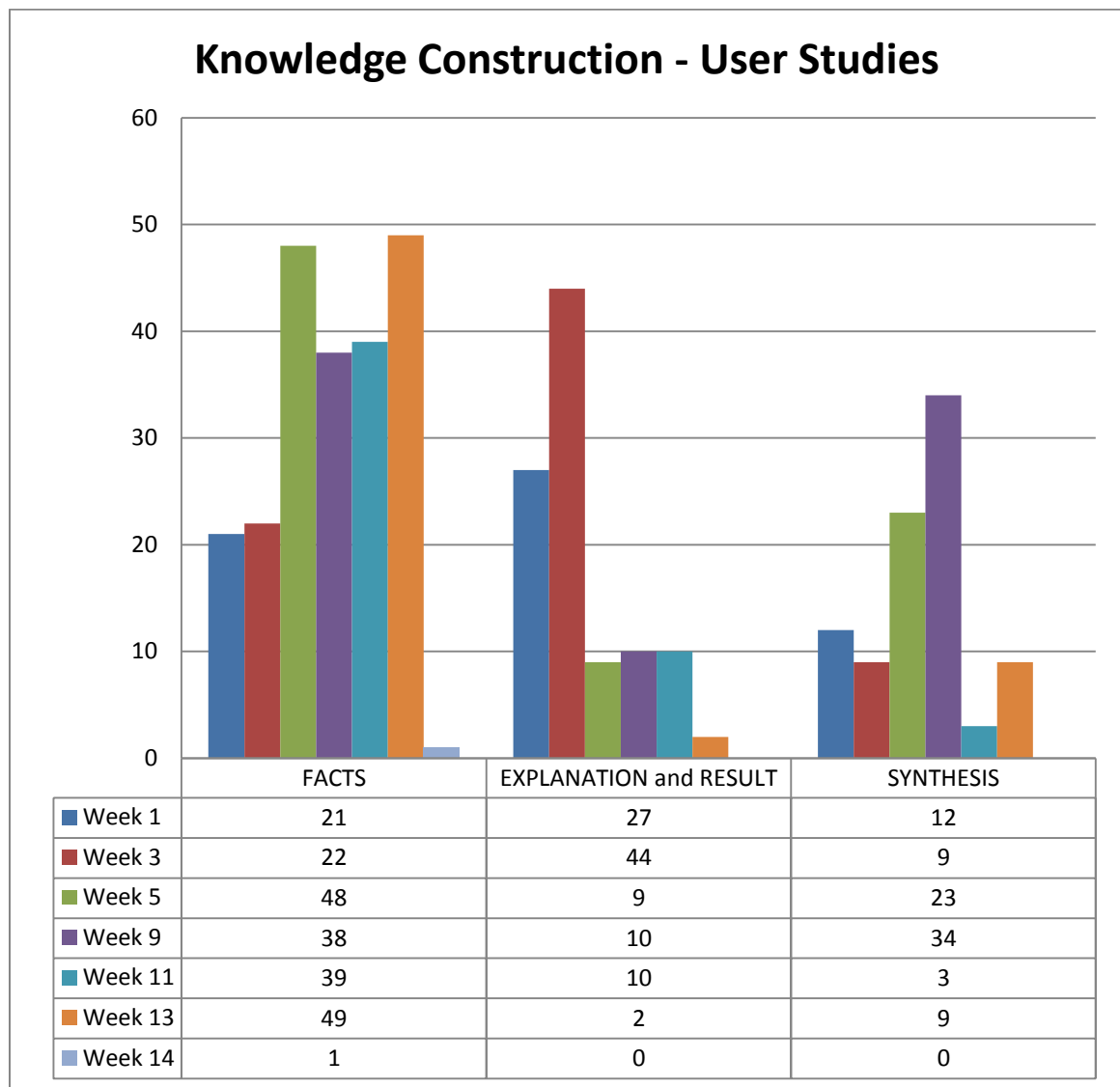


Figure 4.8. Knowledge Construction in the User Studies Course.



**Journal entries.** A rich source of data from the User Studies class came from students' journals. The number of entries ranged from four to 40 entries (each student was asked to submit an entry every week for the first 14 weeks of the term) and a total of 309 journal entries were done by the class. Coded in the same manner as the threaded discussions, journal entries were examined through the lens of Todd's Information Intents theory (2005, p. 201) and Todd's concept of Knowledge Construction (Todd, 2006). The journals demonstrated students' 'learning in action' and 'reflections on our own learning'. In general, journals represented attempts at *Synthesis* (Knowledge Construction), *Getting a Position in a Picture*, *Getting a Complete Picture*, and *Getting Connected* (*Position* and *Complete* are existing information intents, while *Connected* is a new intent emerging from this study). There were instances of *Getting a Clearer Picture* when students explicitly asked questions of the professor. Journal entries showed students struggling to make sense of the theories examined in the course, the assignments (final paper and group projects) and demonstrating anxiety about the amount of work, the density of the readings, and their grades. Each journal entry received a response from the professor, which provided a steady stream of correction (pertaining to content and assignments), encouragement (for academic and personal issues), and effort to connect with the students.

Journal entries were similar to posts in the threaded discussions and varied in length and style. While some were deeply personal, other simply extended and repeated what they posted in discussions. Some students took advantage of the one-on-one time with the instructor (e.g., one student faithfully wrote full short stories and

essays) and engaged in one-sided conversations with the instructor, using him as a sounding board to work through the materials. The journal was a space to sort out concepts and ideas that were not understood and solidify those that were grasped. Many journal entries were personal, with students using the space for therapeutic purposes, such as seeking reassurance on various issues, and engaging in a 'talking out loud' process. Others kept their entries factual and expressed their likes or dislikes about the readings, reiterated what they had read, and asked procedural questions to the instructor. Overall, the most prolific participants in threaded discussions followed suit in the journals, and students began making connections between their lives and the course content throughout the journaling exercise.

In these entries, students often took the opportunity to praise their classmates by name and say positive things about presentations or specific points of interest raised in the threaded discussions. The journals also had some complaints about the work/family/school balance. Certain students mentioned this and moved on, others dwelled on the same complaints throughout the semester. In addition to supporting classmates and expressing personal frustrations, there were mentions by some of being hesitant to participate in discussions because when more 'talkative' classmates began a conversation, they seemed to dominate it, making it hard for others to gain entry into the threads. Examples of this phenomenon are illustrated in the following sociograms (Figures 4.9 – 4.12).

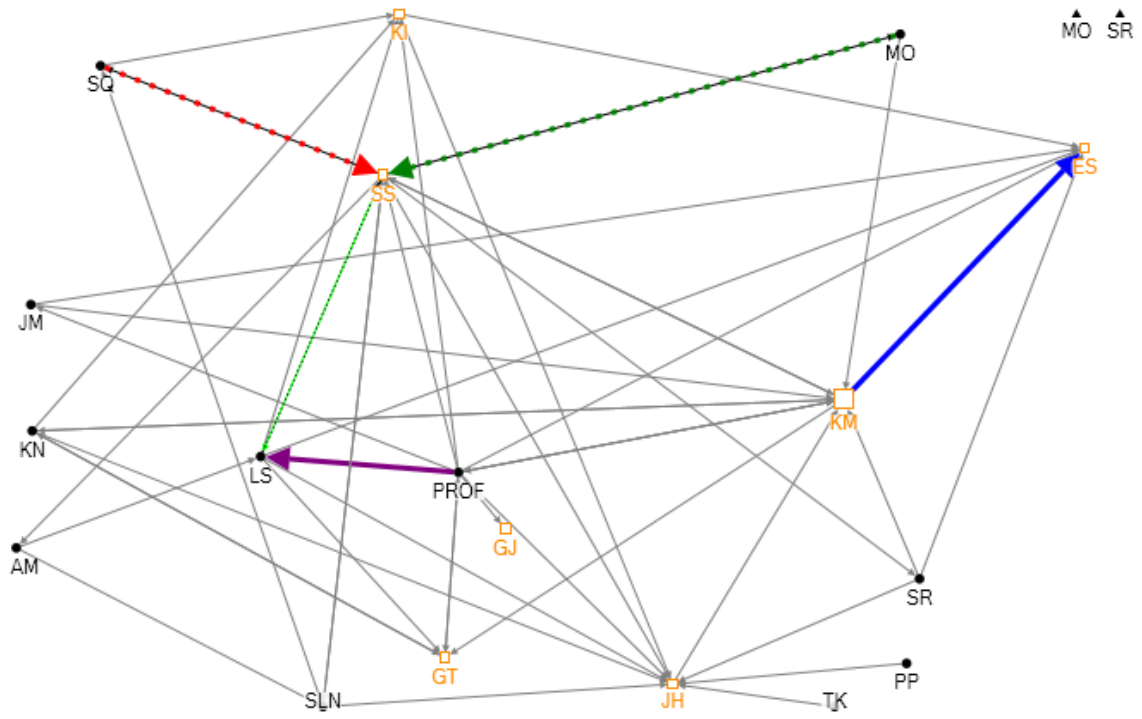


Figure 4.9. “Talkative” students – SS, KM, and JH.

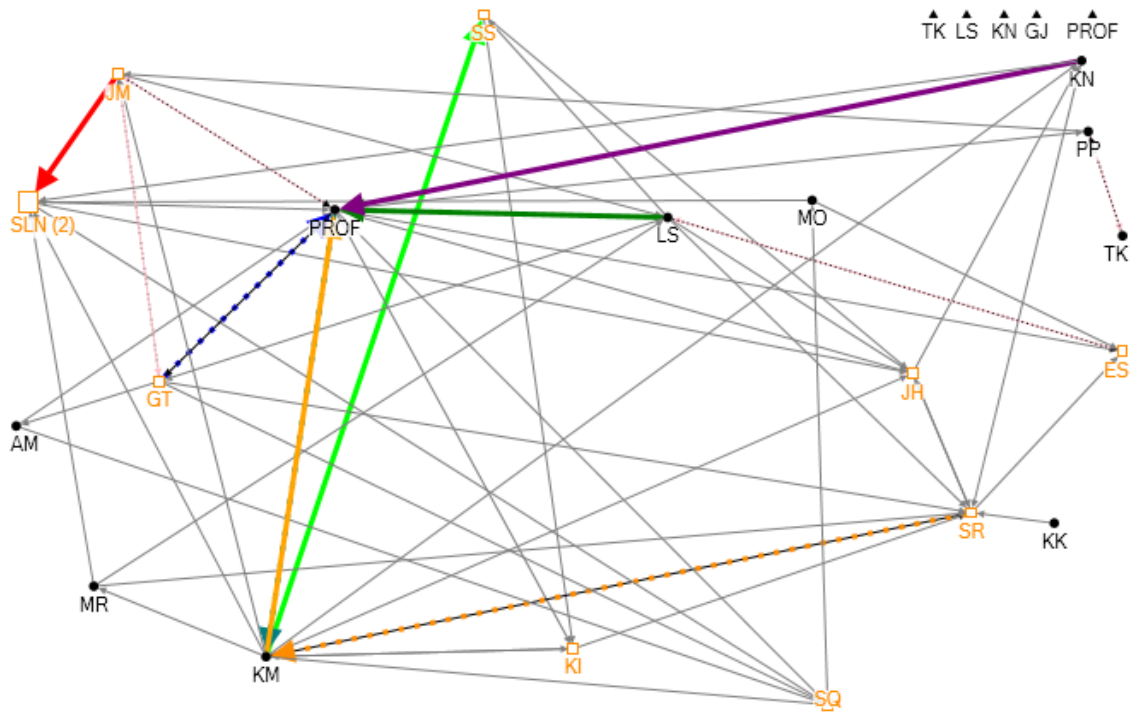


Figure 4.10. “Talkative” student – SQ, SS, SLN, DR, and KM.

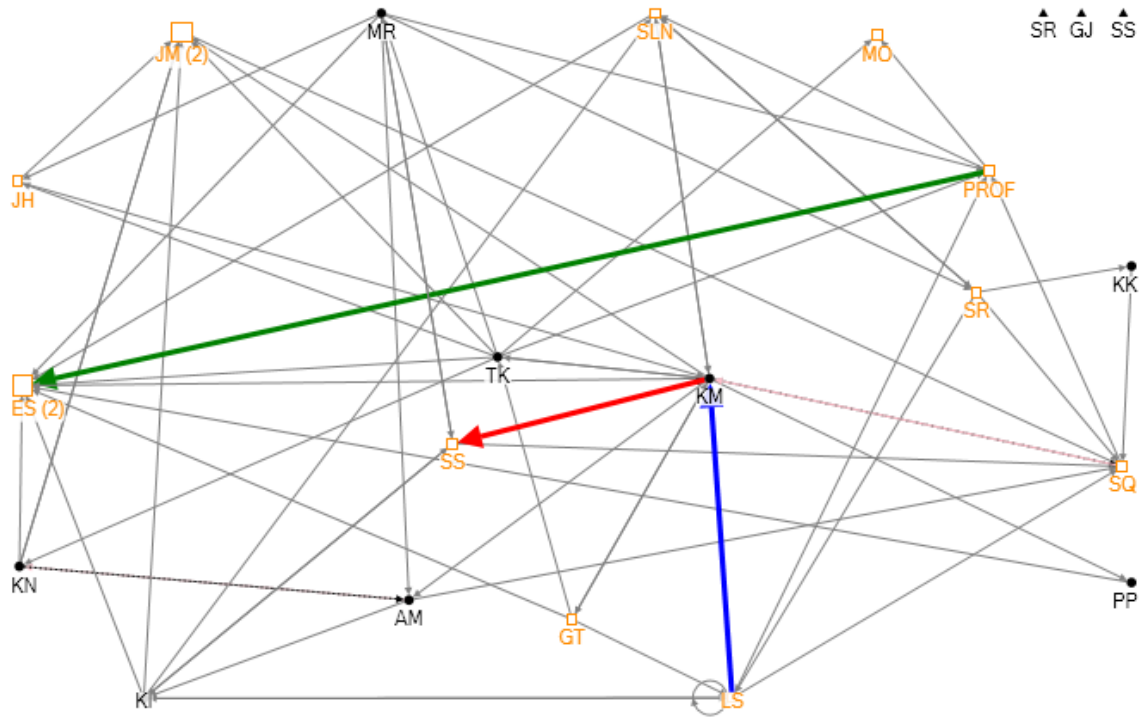


Figure 4.11. “Talkative” students – ES, TK, JM, and SQ.

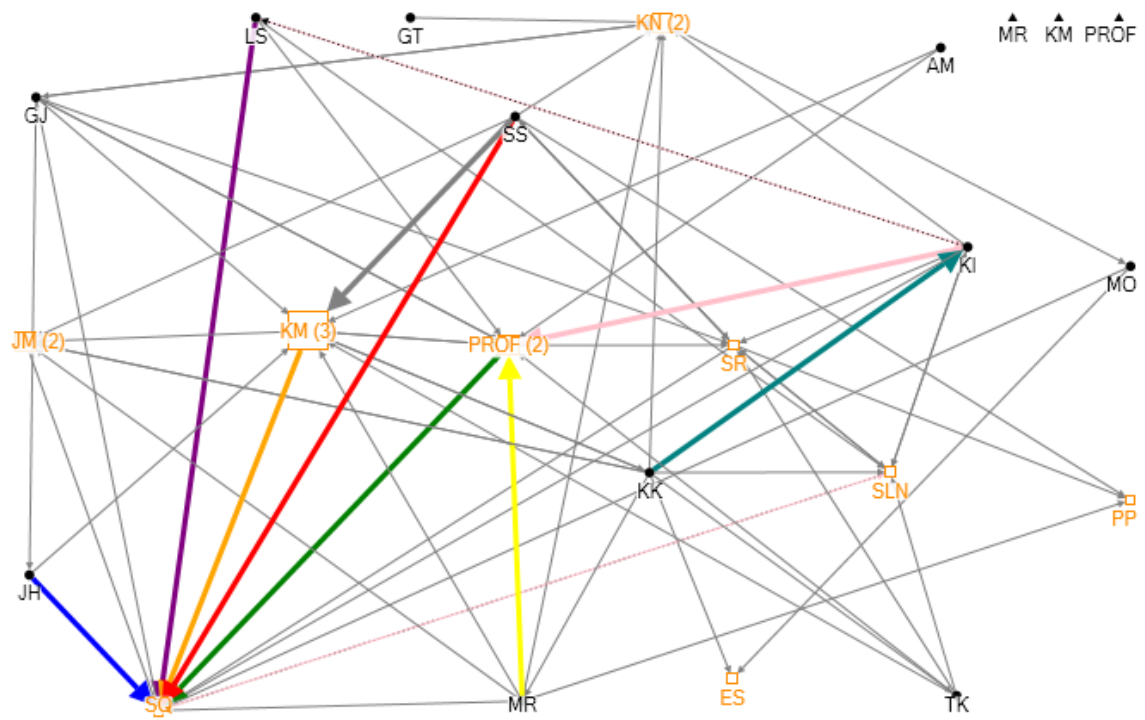


Figure 4.12. “Talkative” students – SQ, KK, JM, SR, and MR.

These sociograms indicated the students who tended to contribute the most in the threaded discussions. Discussion leaders and/or dominators varied from week to week; however, there were certain students who were consistent in their high levels of contribution throughout the semester (i.e., SS, SLN, and KM). These discussion leaders may have intimidated some less talkative students, but they also engendered responses from other students. For example, SLN regularly interacted with SR, LS, and KI; these students interacted with others but not at the level with which they interacted with SLN. This is indicative of the relationships and community that formed in the threaded discussion forums.

After textual analysis was completed the data supported modifying and expanding Todd's (2005) original list Information Intents. Notably, the names and parameters of the intents were revised, and an affective dimension was added to the framework which was originally conceived of as a series of cognitive functions. Cognitive intents were modified to accommodate the context of this study and its emphasis on student learning and interaction (changes are indicated below in Table 4.3).

**Revised Information Intents.** The most important result of this research was the extension of the Information Intents theory first proposed by Todd (1997; 2005), which was used to analyze the text of the threaded discussions. The theory was developed when studying a group of Australian adolescent girls and their understanding about heroin, as well as the pictures the girls developed when gathering new information about the drug. The girls used the word 'picture' when discussing how their knowledge

was increasing and changing. Using these intents to examine the threaded discussions of online graduate students was sufficient but they required customization to best suit this new population and setting. The original conception of Information Intents is narrow and extremely context specific. In order to better match the demographic of adult distance learners, the intents were broadened, redefined and recontextualized to fully represent the learning and construction of knowledge that occur in online learning environments, and expanded to encompass the affective dimension of information behavior.

The modifications to the Information Intents are detailed in Table 4.3.

<b>Information Intent</b>	<b>Manifestation of changes in knowledge structures</b>	<b>Domain</b>
<b>Contextualizing</b>	<ul style="list-style-type: none"> <li>a. Information integrated more holistically – incorporating new information / content to life</li> <li>b. Projecting new knowledge into professional practice</li> </ul>	<b>Cognitive and Affective</b>
<b>Creating</b>	<b>Elaborative: building associative structures</b> <ul style="list-style-type: none"> <li>a. Construction: building up understanding with new ideas</li> <li>b. Deconstruction: removing incorrect ideas</li> <li>c. Reconstruction: replacing with more appropriate ideas</li> </ul>	<b>Cognitive</b>
<b>Clarifying</b>	<ul style="list-style-type: none"> <li>a. Explanation, using information to tell how and why</li> <li>b. Appending information to add precision of detail</li> <li>c. Asking explicit questions / requesting clarification</li> <li>d. Adding specific anecdotes, instances, or examples to further elucidate a scenario</li> </ul>	<b>Cognitive</b>
<b>Authenticating</b>	<ul style="list-style-type: none"> <li>a. No change</li> </ul>	<b>Cognitive</b>

	<ul style="list-style-type: none"> <li>b. Repetition of ideas to add weight or emphasis</li> <li>c. Defend and reaffirm viewpoints</li> <li>d. Expressions of agreement / disagreement , based on facts</li> <li>e. Expressions of agreement by name / direct reference</li> </ul>	
Positioning	<ul style="list-style-type: none"> <li>e. Expressions of agreement / disagreement, based on personal opinions and feelings</li> <li>f. Deriving personal conclusion based on facts</li> <li>g. Foreseeing future use of facts</li> <li>h. Predicting new events and states</li> <li>i. Jockeying for position / maintaining position</li> </ul>	Cognitive and Affective
Connecting	<ul style="list-style-type: none"> <li>a. Direct responses (use of names)</li> <li>b. Support</li> <li>c. Empathy and listening</li> <li>d. Jokes / levity / emoticons</li> <li>e. Instructor Immediacy               <ul style="list-style-type: none"> <li>a. Support</li> <li>b. Confirmation and Verification</li> <li>c. Instruction and Correction</li> <li>d. Humor</li> </ul> </li> </ul>	Affective

Table 4.3. Revised Information Intents Chart.

The three major changes to the Information Intents chart were:

- 1) Renaming the Information Intents (in accordance with this research);
- 2) Modifying the manifestations / definitions of the Intents; and,
- 3) Adding the affective domain to the Intents schema

The names of the intents were renamed from “Getting a Picture” to terms that better reflected the student population and better represented the Knowledge Construction process assumed to take place during the semester. As detailed in the discussions that follow, the Intents were renamed as follows:

Getting a Complete Picture → Contextualizing

Getting a Changed Picture → Creating

Getting a Clearer Picture → Clarifying

Getting a Verified Picture → Authenticating

Getting a Position in a Picture → Positioning

With renaming of the intents came modifying their accompanying definitions/characteristics. The *Contextualizing* intent incorporates integration and synthesis of information, and suggests using newly-acquired information to build knowledge and look at situations in a broad, holistic way. This new information can then be applied to life beyond the educational environment. The new aspect of *Contextualizing* is using information to project new knowledge into professional practice. Students in the User Studies course made several references to how the content they were learning would benefit them as librarians.

- *Studying [User Studies] will help us become an efficient librarian. Knowing where different groups of people get their information and what they do with the information they receive can help us anticipate their information needs. Being able to anticipate what a student body or community needs librarians can have tools and programs in place to not only answer the initial questions raised but to be ready for any questions that may arise as a result of the original information gathering. We can all benefit from a continuous study of [User Studies]. With new information and technology evolving every day it is important to stay one step ahead of the people you will be helping.*
- *Not only must librarians understand the sources, they must have a sense of the seekers. Librarians try to map the needs of users onto the patterns of available information. They look at the behavior of different user groups. Although librarians may serve children or engineers or senators separately, what the profession grasps as a whole is the multiplicity of ways people get and use information.*
- *I think this may have profound professional implications for librarians in how we work with our clients. Information seeking is a process and a journey. Just like a teacher with her student, a librarian must determine the current status and needs of his/her patrons: Where is my patron now? What is his/her end goal? Any prior knowledge? Where do I need to begin? What is the most efficient path to the goal? Then we determine what supports to provide. The hope is that over time the patron*



*develops their own set of information seeking skills, allowing them to function more independently and with less guidance.*

This development was positive; since these online graduate students were enrolled in a LIS program, this indicated that they are considering their profession, and their role in it, long-term.

The *Creating* intent has a streamlined definition, compared to the original *Getting a Complete Picture* intent. Now the focus is on building new knowledge and understanding through constructing new ideas, removing incorrect ones, and replacing existing ideas with more appropriate ones. For example, this student's analogy recognized that in order to move forward and build new and comprehensive knowledge, a change in the existing knowledge foundation must be made.

- *In order to build a better mousetrap one must first study the behavior of the mouse. I think the same principle is still important when dealing with information dissemination. One must study the human subject in depth to better cater to its nutritional information requirement. The law of the jungle is prey and predator to be a successful predator you must know your prey. The benefit is you gain the ability to strike at the heart of the prey and find their weaknesses as well as strengths. To study anything in life means you gain historical perspective so as not to repeat failures of the past.*
- *A week ago I would not have made that statement. This entire area of study was completely foreign to me. However, after reading much of the information provided to us since orientation, I am beginning to understand that there is a vast difference in the way different groups of people receive their information.*

This statement exemplified the student's recognition of her own gaps in understanding and how the new information facilitated the creation of new knowledge.

The *Clarifying* intent focuses on explaining information and scenarios, adds new information and details to these scenarios, asks direct questions to solicit further explanation, and shares anecdotes or examples that serve to further explicate a

scenario. For example, the below statements demonstrated students' attempts to concretize their thinking on an issue, while providing additional instructive information to their classmates.

- *In our reading on First and Second Hand Knowledge, there is a sentence on page 10 that stuck with me. It was "Concepts and theories constitute a sort of lens through which we look at the world." As a foundation, I guess one could almost look at studying [user studies] as getting a first pair of glasses.*
- *Last semester, I took an online course with Professor XXX. During one discussion, she gave us a link to an article in The Boston Globe about a private school, Cushing Academy, that had gotten rid of all of its books from the library in order to secure more space for computers that would provide students with databases necessary for their classes and ebooks. ... The removal of the bookshelves allowed the principal to install a cafe with a very expensive cappuccino machine. I understand the emphasis on technology, but there is still something magic about holding a book in one's hands and I certainly, don't think that a cup of coffee is more important than reading, say, Macbeth.*

The *Authenticating* intent retains much of the definition from the original *Getting a Verified Picture* intent, and added two dimensions related to expressing agreement or disagreement. Considered a reactive response, students agreed or disagreed based on facts (e.g., "this week's article said ..."), and reacted to other participants by addressing them by name. For example, the below is an exchange that occurred in a thread where students discussed a point, expressed agreement and added additional information to the discussion.

- *But then I thought I saw another angle to it, and it was this: as each researcher publishing his work it permits another scholar to can look at it, expand on it, add new concepts to it, make it better than it was. In that way, instead of reinventing the wheel each time, they can build on and revise and correct.*
- *I agree wholeheartedly, but am a bit less ready to drop my skepticism.*

The *Positioning* intent also remains faithful to the original intent (*Getting a Position in a Picture*) and adds new dimensions. Positioning can now also be seen to

encompass not only expressions of agreement and disagreement, but opinions and feelings as well (e.g., “I feel the Professor’s point is correct because in my experience ...”). The other addition to the *Positioning* intent is jockeying for position or maintaining a position within a discussion. This behavior is believed to be a result of the threaded discussions being graded. Students seemed compelled to post in the discussions even when the comments did not directly relate to course content, but rather showed they were not ‘lurking’. Posting was equated with participation. For example, the below excerpts demonstrated students’ attempts to be present in the discussion, even when they acknowledge not having completed the assigned reading or being ready to fully contribute to the discussion.

- *I’m not quite done yet – don’t give away the ending!*
- *Even though I haven’t read our other readings, I wanted to add to the discussion before others mention what I wanted to say.*
- *I’m still working through the article, but I felt inclined to comment on this excerpt!*
- *I am not prepared to discuss that point yet.*

The third change, and the most important outcome of this research, was the addition of an affective domain to the Information Intents theory. The theory, as devised by Todd (1997, 2005), provides five intents, all of which demonstrate cognitive activities. Bloom (1956) describes cognitive activities are those that promote knowledge and development of intellectual skills. However, the 33 discussion threads examined (30 from User Studies and three from Technology) contained more than just examples of cognitive information sharing among students. There were concerted efforts to create connections between students by using personal names, humor, joke telling, emoticons, and expressions of support and empathy throughout the semester. These

can be considered affective actions, which Bloom described as growth in feelings or emotional areas (Krathwohl, Bloom, & Masia, 1964). This indicates an affective dimension to information sharing in the online learning environment, and therefore another domain to be considered within the Information Intents theory.

**Connecting.** *Connecting*, the sixth and new intent, is a direct response to discovering affecting elements of the affective domain in the discussion threads. This new intent represents learners' attempts to interact with one another on a personal level by significant use of personal names, expressions of support, empathy, humor, and also evidence of instructor immediacy.

- *I agree, XXX.*
- *Like XXX, I think YYY has hit the nail on the head in her post.*
- *This is an excellent point, XXX.*
- *XXX, you're so funny! :)*
- *Thank you, XXX, for the link to the article that defines the different terms related to "construct".*
- *XXX, your library rocks!*
- *Wow, XXX - out of curiosity, how does this work logistically? Is somebody actually up all night answering queries? There's a budget for that?*

**Connecting with the instructor.** Another dimension of *Connecting* was the affinity students felt for the instructor in the User Studies course; affinity that aided in the formation of community and facilitated understanding of course content. The instructor was a consistent source of comfort, encouragement, and humor, while providing more traditional functions such as giving feedback about performance, answering questions and providing correction as needed. The instructor maintained a strong presence throughout the semester in the threaded discussions and in the journal area of the CMS. Representative comments from the instructor included:

- *The concepts and principles we learn will be gradually applied to all of your courses, and some of the readings that you begin within this course will reappear as you progress. Rest assured, you will build the body of knowledge and skills to work with this in your professional practice.*
- *This is a great discussion emerging on what web 2.0 tools we actually work with. The array of tools and applications in the Web 2.0 bag is quite confronting, and yes indeed, they are in their infancy. Where do you begin? Know your community.*
- *Take heart. You will get there. Indeed, the discussion threads exist to bring the multiple insights so that you build richer clarity of the research.*
- *Again, such a thoughtful sub-thread, and your inspiring commentaries! Thanks XXX for putting forth the ideas, and for jumping in, YYY and ZZZ.*
- *OK, I am close to being a senior citizen, or as I prefer to label it "chronologically enriched" I am a Twitter user, and will say that it is one of the most fascinating forms of professional development and information sharing for me.*

To underscore the value of instructor immediacy, one student reported:

*The connection I felt to Prof. XXX via his posts and journaling played a more important role to me than did the cohort community.*

These findings relate directly to this study's proposed research question that sought to determine the patterns of intents exhibited in the written interactions of graduate students in an online learning community, and links this question to the idea that community formation influences the information behavior of students. Patterns of affective information exchange indicate the formation of community among students and suggest that the affective dimension of information sharing contributes to increased levels of information exchange and conversation in the discussions. Findings also indicated the interconnection of the cognitive and affective dimensions of the Information Intents schema. Information behavior is not compartmentalized into cognitive and affective dimensions, rather these dimensions complement one another to form a holistic and comprehensive view of information seeking and information

utilization and they illustrate how emotion is represented in text and contributes to the construction of knowledge.

### **Sociometry**

The use of sociometry to visualize the threaded discussions answered the following research question:

- RQ1: What information behavior patterns, if any, do students in an online asynchronous learning communities exhibit?
  - What patterns of information interactions are exhibited in the written interactions of the graduate students in an online learning community?

Sociometry (discussed in Chapter Three) is a sociological method used to determine and understand the formation of group relationships and dynamics. These relationships are graphically represented through sociograms. Sociometry enables the visualization of information exchanges that occur within Small Worlds. Sociometry provided indicators of the sociality, or social presence, of the learners in the classes and gave an account of the degree to which individuals communicated and exchanged information within the CMS.

Thirty-three discussions were graphed (30 from the User Studies course and three from the Technology course) and tables 4.4 and 4.5 describe the number of vertices and edges of each threaded discussion. Vertices represent the number of speakers in a given discussion, and the edges represent the number of information exchanges that occur between each of the participants. While the number of vertices remained relatively constant (which is in line with the number of people in the classes

who participated in the discussions each week), the number of edges vacillated, which indicated the discussions that generated the most conversation and interaction.

	<b>Vertices</b>	<b>Unique Edges</b>
<b>Discussion 1</b>	20	69
<b>Discussion 2</b>	22	58

Table 4.4. Sociometry graph data – Technology Class.

	<b>Vertices</b>	<b>Unique Edges</b>
<b>Discussion 1.1</b>	22	48
<b>Discussion 1.2</b>	22	32
<b>Discussion 2.1</b>	23	38
<b>Discussion 2.2</b>	20	45
<b>Discussion 3.1</b>	24	69
<b>Discussion 3.2</b>	21	24
<b>Discussion 4.1</b>	24	65
<b>Discussion 4.2</b>	19	39
<b>Discussion 5.1</b>	23	53
<b>Discussion 5.2</b>	23	33
<b>Discussion 6.1</b>	22	41
<b>Discussion 7.1</b>	23	65
<b>Discussion 7.2</b>	21	22
<b>Discussion 8.1</b>	22	46
<b>Discussion 8.2</b>	21	45
<b>Discussion 9.1</b>	20	51
<b>Discussion 9.2</b>	20	42
<b>Discussion 10.1</b>	24	60
<b>Discussion 10.2</b>	22	61
<b>Discussion 11.1</b>	24	64

<b>Discussion 11.2</b>	22	40
<b>Discussion 12.1</b>	23	67
<b>Discussion 12.2</b>	22	66
<b>Discussion 13.1</b>	23	64
<b>Discussion 13.2</b>	23	33
<b>Discussion 14.1</b>	22	36
<b>Discussion 15.1</b>	21	38
<b>Discussion 15.2</b>	20	50

Table 4.5. Sociometry graph data – User Studies Class.

**Sociograms.** Sociograms are useful for identifying relationships between class participants (Figure 4.13), seeing the role the instructor plays in discussions (instructor immediacy) (Figure 4.14), identifying leaders or those who dominate discussions (Figure 4.15) identifying loners in discussions (those who have limited interaction with peers) (Figure 4.16), and identifying orphans in discussions (those posts that received no responses, notated by solid black triangles in the upper right corner of each graph) (Figure 4.17). This type of visual data is also useful for seeing patterns in discussion group behavior that occur over the course of the semester.

The sociogram below (Figure 4.13) is a general representation of a threaded discussion, notating the interactions and information exchanges between the students in the course. Each set of initials (e.g., JH) represents the students participating in the discussion (vertices) -- the professor is noted by *PROF*. Participants that originated posts in the discussion are denoted with orange initials and those only responding to posts have black initials. Between each set of initials is a series of lines (edges) that indicate an exchange of information; each edge has an arrow indicating the direction of the



information flow. Participants that exchanged information with one another multiple times are represented by a thicker line. For example, in Figure 4.13 PROF and LS exchanged information more than one time in the discussion and therefore the edge between them is thicker than other edges in the graph.

The next sociogram (Figure 4.14) is an example of the professor at the center of the threaded discussion. While the instructor did not respond to each individual posting in a discussion, the instructor immediacy is high, and his presence was clearly demonstrated. The professor (PROF) is denoted in red in the graph, and has edges extending to 10 students in the discussion. The instructor contributed original information to the discussions and responded to posts made by the students.

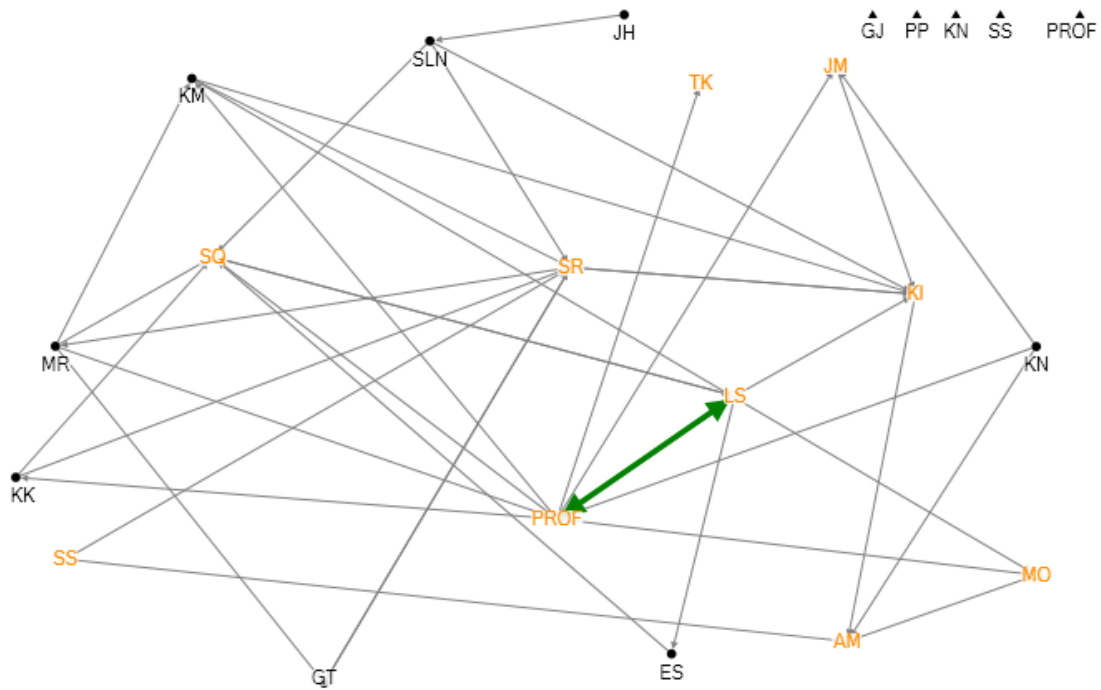


Figure 4.13. Typical Sociogram.

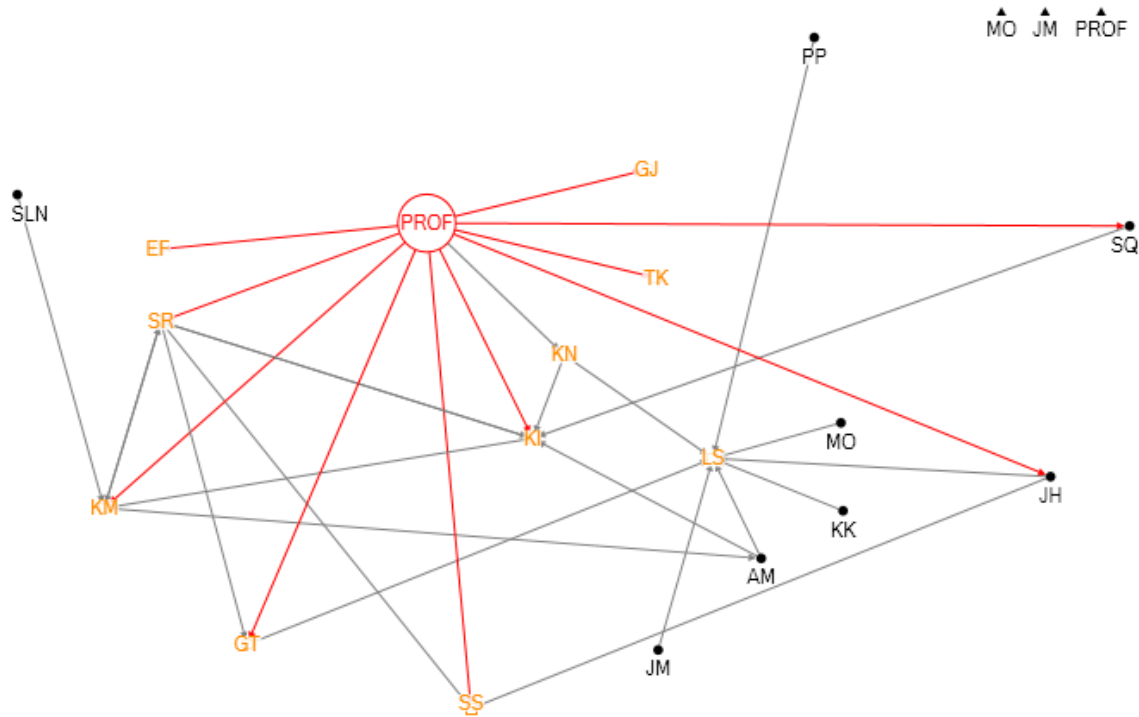


Figure 4.14. Instructor Immediacy.

The next sociogram (Figure 4.715) depicts a discussion leader other than the instructor. Discussions could have multiple leaders and leaders changed from discussion to discussion. For example, in this graph SS was a discussion leader with edges extending to 11 other, including the professor. This student contributed an original post to the discussion and responded to the posts of others. Sociograms are beneficial for identifying discussion leaders and discovering any resulting patterns (i.e., Is this student monopolizing the discussions? Are there any cliques forming around this particular student?) Following the sociograms during the semester indicated that SS was frequently a discussion leader.

Sociograms identify loners in the discussions (Figure 4.16) -- those who do not participate or respond infrequently in discussions. Studying these patterns over time

can reveal if the loners respond to certain other individuals or if there might be an issue in general that the instructor might want to pursue. For example, in this graph SS is a loner meaning there was low participation in that discussion. However, because patterns had already revealed that SS was a frequent contributor to discussions, and was frequently a discussion leader, low participation in one thread would not be a point of concern for the instructor. This graph also reveals other loners (i.e., JH and AM); if the instructor saw that JH and AM were frequently revealed to be discussion loners, it could be an opportunity for intervention or outreach to draw them into the discussions.

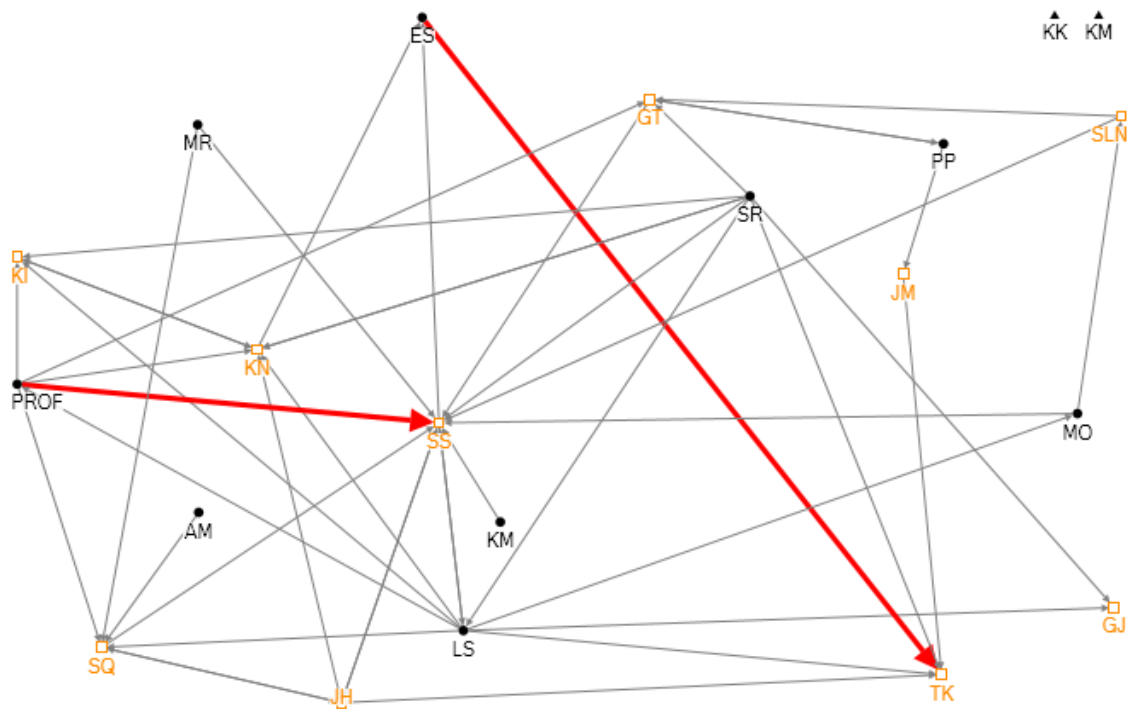


Figure 4.15. Discussion Leaders.

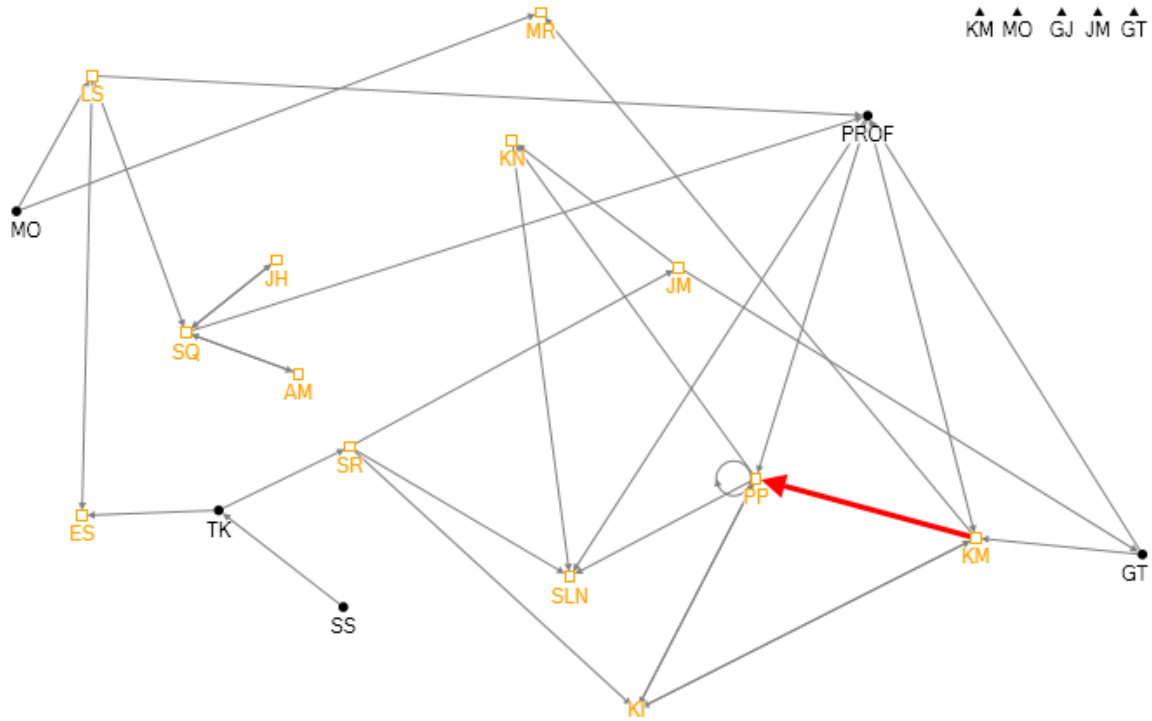


Figure 4.16. Loners.

The final sociogram (Figure 4.17) depicts discussion orphans, defined as posts that receive no response (as depicted by the solid black triangles in the upper right corner of the graphic). Orphan responses could be indicative of several things: 1) More ‘verbal’ students who posts multiple times within a discussion and one of their posts elicited no response because peers have responded to other comments; 2) students submitted a contribution to the thread after the unit and discussion were officially over; or, 3) it certain posts simply didn’t warrant or elicit a response from others. If the first scenario occurs frequently, this could be a pattern of concern to the instructor. In their journal entries and the CCS results, some students mentioned a lack of response to their posts and comments, which was discouraging and a barrier to participating in discussions and the class generally.

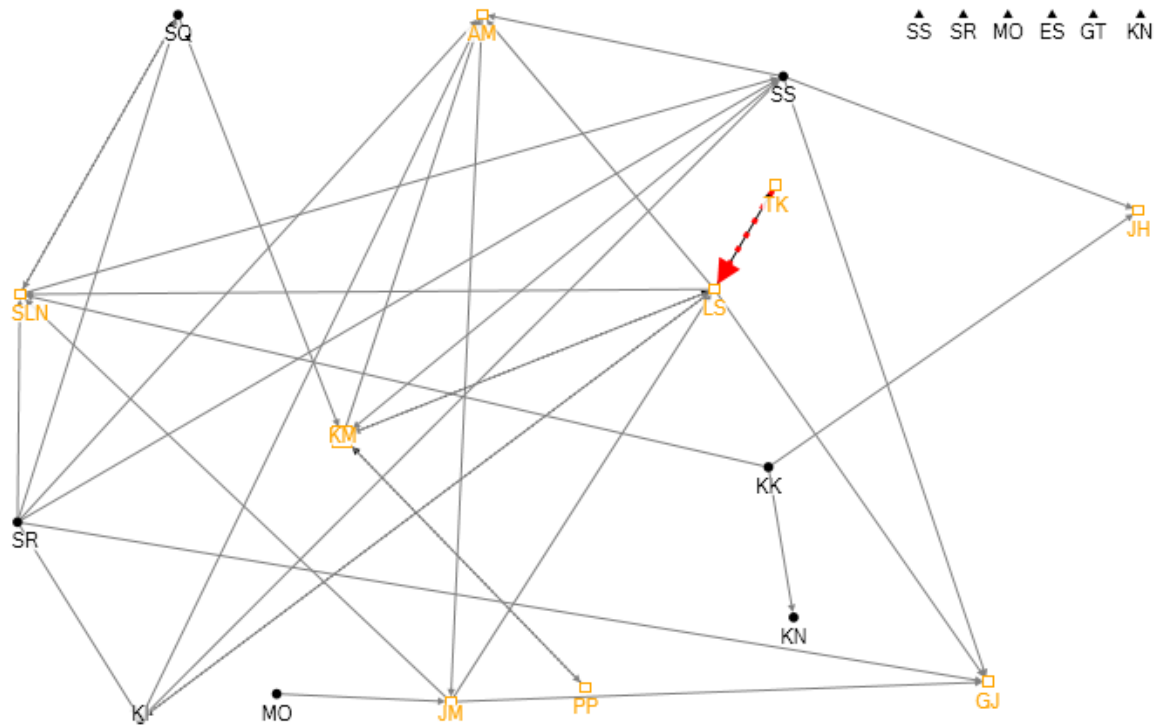


Figure 4.17. Orphans.

Sociometry provides a way to visually demonstrate the patterns of information interactions exhibited in the written interactions of graduate students in an online learning community, and indicates how these patterns change during a teaching cycle – these goals were set forth by the study’s research questions. Sociograms displayed the volume of information being exchanged in the threaded discussions, and how that volume ebbed and flowed during the semester. Sociograms highlighted the social roles exhibited in the threaded discussions, for example the role the instructor (instructor immediacy), discussion leaders, those who don’t participate in the discussions, and those students who offered information and do not receive a response. Sociograms also indicated the formation of cliques -- students who interacted primarily with one another -- which demonstrated the formation of smaller communities within the larger online

learning community. This occurrence of communities within the larger community was confirmed by statements made in the CCS results and journal entries.

### **Classroom Community Scale**

The CCS survey answered the following research question:

- RQ2: How, if at all, are these patterns of information use related to a sense of community, as measured by the Classroom Community Scale?
  - What impact, if any, does the context of a small world community have on the information behaviors of online students?

The researcher created a modified version of the Classroom Community Scale (CCS) (Appendix A), that was distributed electronically to students (with the permission of the faculty member teaching the class) at the conclusion of their semester to determine how much of a sense of community formed during the courses. The modified survey (described in Chapter Three) was completed by 20 of the 38 students in the two courses, which is a subset of an already small sample population. Five One-way analysis of variance (ANOVA) tests (Table 4.6) were conducted to determine if the following factors had any influence on the students' CCS scores:

- 1) Participation in a particular class (Technology or User Studies)
- 2) Age
- 3) Gender
- 4) Number of previous online classes completed, and
- 5) Number of hours committed to the threaded discussions per week.

It should be noted that the factors of age and number of previous online classes are categorical and not continuous variables. The analyses focused on total CCS scores, and not sub scores of learning or connectedness. Due to the limited number of respondents, the analysis resulted in an insignificant main effect for all five factors.

	<b>Sources of Variation</b>	<b>Sum of Squares</b>	<b>d.f.</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig. of F</b>
ANOVA 1	Class ID	88.82	1	88.817	0.5098	0.4844
ANOVA 2	Age	530.57	3	176.86	1.0502	0.3975
ANOVA 3	Gender	86.48	1	86.479	0.496	0.4903
ANOVA 4	Previous classes	92.47	2	46.233	0.2509	0.781
ANOVA 5	Hours/week	698.93	3	232.97	1.4757	0.2588
	None of the findings approached significance at the $p < 0.05$ level.					

Table 4.6. Analysis of Variance Results.

Participation in individual classes had no impact on the CCS scores. As determined by the textual analysis and CCS scores and data (see below discussion) community formed in both courses, but for different reasons. User Studies students formed community inside the CMS and formed community based on content and personal interactions. Technology students formed community outside the CMS and formed community based on a shared negative class experience. The factor of age was not significant – this could be a result of the small sample and because age was as categorical variable and not a continuous variable. Gender was an insignificant factor – this could be a result of the small sample size and because the respondents were primarily female (which mirrored the gender composition of the two classes). The

number of previous online classes was also insignificant. In addition to the sample size, this factor was categorical and not continuous -- this could also contribute to the lack of significance. Finally, most of the students were in their first year of study and may not have had previous experience with online classes.

Of the five factors, the number of hours committed to the discussions per week could warrant further investigation. Though not statistically significant for the current sample, it was the most potentially significant in relation to total CCS scores because it is the value closest to the  $p < 0.05$  significance level. It stands to reason that the factor of hours per week spent in the class (a continuous variable) could influence students' CCS score – the more time spent in the course shell the more opportunity learners had to interact with one another and form community.

### **Open Ended Questions**

A series of open-ended questions was added to the CCS with the goal of hearing directly from students about their experiences. With the exception of the journals, these questions provided the most revealing information of the study. Both the journal entries and surveys were private and personal means of expression, which could account for the students' candor and language. The added questions and students' responses follow.

*What do you think helped to form a sense of community in this class?*

Again, the issue of instructor immediacy was emphasized. The professor's attitude and presence made a difference in students' perceptions and performance.



*Prof. XXX's attitude about the class helped a lot. He took the class seriously but set a less formal tone. That helped me to relax and know that every answer I contributed didn't have to be perfect.*

Having *Facebook*<sup>®</sup> as an additional outlet was a prominent theme in the survey results. Thoughts and topics that were superficially mentioned or implied in the threaded discussions became evident these results. Using social media for support, interaction, and bonding was a very significant factor in strengthening personal bonds among community members, especially for the Technology group. The *Facebook*<sup>®</sup> group was open to students in all sections of the User Studies and Technology classes (referred to as a “secret” and “super secret” *Facebook*<sup>®</sup> group), where they could talk to one another without the presence of instructors.

There were also references to the orientation for online students that is required before the master's program begins. This short time was the only exposure to classmates, professors, and the campus for most students and took place before classes began. Many students did not feel they had enough time to get to know their classmates, which could impact community formation and coherence throughout the program. However, this brief interaction was beneficial and set a positive tone for their graduate school experience.

- *I think our facebook group helped us form a deeper sense of community. Being in the group was like chatting with the person you sat next to in class either before or after the class ended. Not only where we able to learn more about the people in our class on a personal level for me it was a huge support to have a place to talk to all the people who were at the orientation. They knew what I was going through they knew the troubles and the hard times they could understand what I was going through like no one else because they were also going through it as well.*
- *I think the on campus orientation was a great start to building the community, and I think the nature of the topic lended itself to sharing and supporting. Also the fact*

*that we were all a cohort, in the same place in the program, helped. I think it will be different when there are people in the class who are at different places in the MLIS program.*

- *Everyone was so friendly and supportive. Even if we all didn't agree, we were interested in each others' opinions. We respected each other.*

Students complained about group work and the “forced” participation in the threaded discussions, but it ultimately served to bring them together:

- *Group work--it forced us to step out of our secluded patterns.*
- *The forced participation created the community*

The students in the Technology class apparently had a difficult semester and lacked interaction with their instructor, hence the reliance on the *Facebook*® group and communication outside of the CMS. The language used in the comments revealed their frustration with the instructor and the course. They can be viewed as a community born of strife and discontent.

- *The uphill struggle!*
- *Stress over the projects, the fact we many (all) felt abandoned by the instructor, someone creating a facebook group for our ... cohort, and the fact we had a great online community in our other required course.*

*What do you think hindered the formation of a sense of community in this class?*

Students had varying perceptions of community and about what they felt helped or hindered community development. Overall, students felt a strong sense of community with their peers, even if that community was formed outside of the CMS.

- *I don't think anything hindered the sense of community. The community in this class was stronger than any other class I've taken.*
- *I think that if we had gotten to know each other better on a personal level before the course began a sense of community would have formed earlier. I know that the three people I spent the most time with during orientation are the three I feel closest with still. In fact, we have our own private facebook group where we have felt free to unload from the beginning. And we will chat with each other. There is a real sense of*

*friendship between us even though we only had those 2 days of orientation together. The relationship is not the same with the others whom I got to know mostly online. I'm still not sure what they all look like, how old they are, what their circumstances are, etc. That's a hindrance in a way. It's not that commonality is a necessity for a sense of community to evolve. The small group I became friendly with during orientation can be defined more by our differences than by what we have in common. But the process of learning about each other during those two days formed a bond that still exists. I have not felt that bond with anyone else.*

Other hindrances included the text-based nature of the course, geography, and not being on *Facebook*<sup>®</sup> (which would have been a conscious decision not to join as the group was open to all graduate students).

- *It's hard to communicate entirely in written word. It's hard to get to know one another with just a name attached to a discussion post.*
- *Our geographic location is the only hindrance I felt.*
- *Not being on facebook.*

Other students continued to bemoan the required participation in online classes and said it hindered the formation of community. (These comments were from only a few individuals, and these thoughts and their minimal participation can be seen in their posts, journal entries, and the survey). However, students in the Technology course identified the *lack* of required participation as a major hindrance to community formation. Those without structured interactions in the CMS made great efforts to seek them elsewhere (i.e., on *Facebook*<sup>®</sup>).

- *The forced participation. I think if a discussion forum was set up without forced participation, people would have participated anyway to try to understand the concepts.*
- *We didn't have many required discussions, so at times it felt like we were each off doing our own thing. Once we encountered some difficulties others rallied to help each other.*

*How do you feel, if at all, that community was formed in this online class?*

There was further mention here of the necessity of the in-person orientation and the *Facebook*<sup>®</sup> community. Also, the continued use of negative descriptions and language to describe the Technology course is noteworthy.

- *I think a community was formed, but it was helped along by an unofficial facebook page that many of us contributed to.*
- *In this class, I think it was very helpful that we all met, in person, at the beginning thru orientation. Also, we had an unofficial facebook group for our cohort, and a lot of community building happened there, where we chatted and talked informally about class. It was critical for us to have a space outside of the formal structure that instructors could not access.*
- *My feeling is that the real sense of community resulted in the past few weeks as angst grew with the [Technology] course. The more frustrated and upset the group members became with the course, the more of a sense of community was felt. It's this mutual suffering thing. You'd probably see the same phenomenon in a concentration camp.*

The perception of being a community within a community was interesting and coincided with the sociometry results and journal entries concerning groups of students who talked among themselves.

- *I felt like there was community for the most part. However, I did notice a trend where some people's comments were not responded to as much as others. I'm not sure what the reason for this was, but I felt as if there was a community within the online class - almost like a clique.*

For the most part, comments about the community within the classes were positive.

- *It was formed, and certainly more than my experience with brick and mortar masters classes at another university. I did get to see others' worldviews rather than occasional opinions.*

*How would you define an online learning community?*

Students' definitions of community were consistent and highlighted the elements of interaction, technology, and learning about a particular topic

- *A group that exchanges thoughts, analysis and ideas with the shared goal of furthering individual understanding of a topic or subject matter.*
- *An online learning community is a group of people who regularly interact and converse with one another about specific ideas in an online setting via discussion boards and threads, wikis and other technologies.*

A few students thought more deeply and recognized the differences between online and face-to-face classes and how their communities fit into the educational scheme of things.

- *I'd say an online learning community is a group of people who rely on each other probably more heavily than in a "face-to-face" community. It's a much more intense environment, depending on the specifics of the class (some require more "discussion" than others).*
- *An online learning community is more in-depth than a classroom community. Classmates have the opportunity to discuss all of the class materials without any time constraints. The classmates are able to share their thoughts and opinions with each other, when they might not always be as open with each other in person.*

*How important do you think sense of community is to an online learning environment?*

Students agreed overall that community was important to online learning. Trust, comfort, and safety (i.e., feeling 'safe' to make comments) were mentioned as benefits to developing community.

- *I think it's very important. We state our opinions more in an online class than in a face to face classroom, so I've had to trust my classmates and professors more than I would in a traditional classroom.*
- *A sense of community is vital to the online learning environment. I have two classes this semester (I am a full-on distance learning student, so both are online). One class fosters a sense of community, the other doesn't. I have enjoyed the former SO MUCH MORE than the latter, despite being more familiar and comfortable with the subject matter of the other course. I attribute this mainly to the sense of community fostered on the discussion boards.*
- *I think it really would have helped this class--I would have liked help for my projects and would have maybe cared more about others' work products. But, in general, I think it is important for all online classes because people can become nasty in anonymous environments.*

Some students expressed lukewarm feelings towards establishing community and felt it was not essential. Others brought to light the precariousness of community -- it can be easily broken or disrupted, serves different purposes for different people, and is something that is very much in the eye of the beholder:

- *I think that it helps to enrich the experience, but it is not a necessity. I base this on the fact that for most of the 15 weeks of this course I did not sense any real closeness between group members. Although there was an "unofficial" facebook group for this cohort, not everyone joined, and of those that did, there was no real evidence of closeness until recently. There were some comments back and forth and occasional questions, but a real sense of camaraderie was not evidenced until the past few weeks and that seems to have developed more as a result of the mutual complaints/concerns/frustrations about the [Technology] course which had most of the same members. I don't feel like I have learned any more or any better during these last few weeks than I did at the beginning of the course when there was less a sense of community.*
- *Community-yes. Clique- no. Sometimes it felt like a core group of people responded to each other week after week. At times I posted what I thought were great threads with catchy titles, however no responses. I typically posted late in the week with longer posts- probably to my disadvantage. However it was how I understood and processed the material best.*
- *Initially I would have said VERY, but I think it depends on the course. In an area such as [User Studies], the cohort discourse is key to realizing the depth and breadth of an investigative area beyond what is apparent to you from the start. In [Technology], where much of the activity was centered around individual accomplishment, the online community wasn't as necessary and served more of a supportive role.*

*How did your sense of community impact, or not impact, your information sharing and use in this class?*

The development of community again raised issues of comfort and trust; the more trusting and comfortable students were in the online environment the more apt they were to exchange information. As was revealed by the textual analysis, much of the information exchanged was personal and not dependent on course content.

- *I do notice since the sense of community has grown in these last few weeks that there is more friendly banter in the discussion threads.*

- *I felt free to comment on the discussion board, because it was a very safe, flame-free environment. If I had been slapped back early on, I would have been much more hesitant to post.*
- *One of the course instructors had a facebook group for his section; the other did not. But the real "facebook" difference was in the informal discussions of the unofficial group. Even those who didn't post much lurked and liked and learned.*

As far as students' level of ease in sharing, there were many mentions of shyness and how the online learning environment opens up opportunities for expression and interaction that that students might not have had in a face-to-face setting:

- *The sense of community made me feel more comfortable when sharing information in class. I'm a shy person, but I never felt shy in my responses. I was always able to share everything that I needed to in my discussions because I felt at ease with our strong community.*
- *At first I was shy, but when I saw how supportive and kind everyone was I began to participate more.*
- *I am an introverted person, and tend to keep my discussions concise, so I think it is the same as it is for me in a face to face class - I am a bit on the quiet side, but feel somewhat connected.*

*In the threaded discussions, what prompted you to respond to particular postings?*

Just as community means different things to different people, there are just as many reasons for people to choose to respond to posts in a threaded discussion forum. Motivation for responding included: Grade pressure; connection (personal or intellectual) with a comment made by another person; a desire to express agreement or disagreement; an urge to not let a post go without any response; and, length of the post (shorter ones seemed to receive more replies). Certain students engaged in the threaded discussions because they were genuinely interested in the subject and wanted to exchange information with their peers and the professor.

- *The real motivation to respond was the course requirement since participation in discussion is a significant part of the grade. ... But basically, I would look for comments that touched on something with which I could relate because of my background and prior experiences. ... Usually, however, this was more because of the requirement to respond than any real urge to engage in the discussion. There were times, of course, when I genuinely wanted in on a thread, but that was the exception rather than the rule.*
- *I responded to postings where something stuck out to me when I read them. For example if I read a post and what the person said suddenly made everything click in to place for me, or if they had an idea that stood out to me whether I agreed or disagreed, or if I wanted further clarification on something that was said in their post.*
- *Sometimes I'd pick one nobody had responded to yet.*
- *Length. It is very difficult to read and understand long posts online. Just as in a classroom, discussion comments that are cogent, precise and brief are MUCH easier to respond to than are long, complex comments. People in this class had a hard time keeping their comments brief, which often made the discussion hard to follow.*
- *I tried to engage the most with those whose opinions differed from my own. There was always a certain degree of repetition to much of the content postings, and I can only handle so much of "I agree".*

The modified Classroom Community Scale measured the influence of the formation of a Small World community on the information behaviors of online students. The most explicative information came from information self-disclosed by students in the open-ended questions. Most students indicated a feeling of community, in both the User Studies and Technology classes, and this willingness to engage with their peers and instructor (User Studies course) is confirmed not only by their comments, but through the results of the sociograms and the textual analysis (e.g., the *Connecting* intent). Students expressed feeling safe in the online environment and feeling trust which contributed to the development of community and facilitated the exchange of information and construction of knowledge (in the User Studies course). The open-ended responses revealed a small number of students who did not feel a sense of



community and felt it had no influence on their participation in the class. This speaks to the perception that community formation is a voluntary activity -- while it can facilitate and enhance information interactions and Knowledge Construction, it is not vital.

Findings of this study revealed that people construct knowledge and exchange and use information in multiple cognitive and affective ways in Small Worlds, or online learning communities. The data received from this research study proved to be plentiful, diverse, and rich, and addressed the research questions. A discussion of the findings, suggestions for future research, and implications of this work for the field are given in Chapter Five.

## **Chapter 5: Conclusions and Implications**

People in virtual communities use words on screens to exchange pleasantries and argue, engage in intellectual discourse, conduct commerce, exchange knowledge, share emotional support, make plans, brainstorm, gossip, feud, fall in love, find friends and lose them, play games, flirt, create a little high art and a lot of idle talk. (Rheingold, 1993, p. 3)

### **Summary of Findings and Discussion**

This study focused on the information seeking and use of graduate students in an online learning environment in two classes, User Studies and Technology.

Specifically, it examined the Information Intents demonstrated by students in threaded discussion forums, the construction of knowledge, and the formation of community that occurred as students exchanged information. The findings of this study revealed that people constructed knowledge and exchanged information in both cognitive and affective ways in Small Worlds.

Data for this research were collected from online asynchronous classes in a graduate LIS program, and were examined through learner/context analysis, textual analysis, sociometry, and a survey instrument. The research questions and data analysis plan merged complementary, yet separate, disciplines and bodies of literature and showed the online learning environment to be a holistic social construction that encompasses LIS, education, psychology, communities of practice, and community psychology.

This chapter presents the conclusions of the study as they relate to the research questions, discusses their implications and applications, and identifies possible directions for future research.

### **Answering the Research Questions**

This study answered the following research questions:

RQ1: What information behavior patterns, if any, do students in an online asynchronous learning communities exhibit?

- What information intents are exhibited in the written interactions of the graduate students in an online learning community?
- What patterns of knowledge building are exhibited in the written interactions of the graduate students in an online learning community?
- What patterns of information interactions are exhibited in the written interactions of the graduate students in an online learning community?
- What changes in these patterns, if any, occur over the course of the teaching cycle?

RQ2: How, if at all, are these patterns of information use related to a sense of community, as measured by the Classroom Community Scale?

- What impact, if any, does the context of a small world community have on the information behaviors of online students?

#### **RQ1: What Information Behavior Patterns, If Any, Do Students In An Online Asynchronous Learning Communities Exhibit?**

**What information intents are exhibited in the written interactions of the graduate students in an online learning community?** Similar to results revealed though the measurement of Knowledge Construction, high-quality course design and frequent,

structured, and open-ended threaded discussions elicited substantive discussions. This kind of discussion was sustained, and promoted and facilitated *Explanation* and *Synthesis* statements. All of these factors play a role in the construction of knowledge in online learning environments.

The most important result of this research was the extension of the Information Intents theory. The Information Intents theory, originated by Todd (1997; 2005) was used to analyze the text of the threaded discussions. The Information Intents theory was developed when studying a group of adolescent girls and their understanding about heroin, and the pictures the girls developed when gathering new information about the drug. The girls actually used the word “picture” when discussing how their knowledge was increasing and changing. Using these intents to examine the threaded discussions of online graduate students worked well but they required modification to better suit this new student population, setting, and interdisciplinary framework that informed this research. The difference in the population (adults versus adolescent girls), the difference in content (recreational information versus formal graduate content), the difference in context (face-to-face in a secondary school, versus graduate school in an online setting), and the addition of a new domain (affective), warranted a revision of the intents and their names to make them more interdisciplinary and focused on the activities and outcomes of the online learning environment.

The three major changes to the Information Intents chart included:

- Renaming the Information Intents
- Modifying the manifestations/definitions of the Intents

- Adding the affective domain to the Intents schema

**What patterns of knowledge building are exhibited in the written interactions of the graduate students in an online learning community?** Students in the Technology class demonstrated interaction and sharing, but there was no significant evidence of *Knowledge Construction* produced during the semester. Students made statements of *Fact* and *Explanation and Result*, and this indicated a lower level of Knowledge Construction. The class did not reach the level of making *Synthesis* statements. These findings were possibly influenced by the number and structure of the threaded discussion in which students participated during the semester. The questions posed required students to provide a response and links to resources, but did not require reflection on the resources or the comments of others. (This reflection would have facilitated *Synthesis* statements).

Discussions in this class focused primarily on description, which provided a basis for knowledge building but did not encourage more complex Knowledge Construction that would include *Synthesis*, critical thinking and problem solving. Also, with only three required discussions during the semester (only two of which were completed) students may not have had enough opportunity to construct knowledge in the discussion forums.

The User Studies class produced higher results of *Knowledge Construction*. This can be attributed to higher levels of interaction because the students engaged in 10 times as many discussions as the Technology students, there were discussion requirements, and the course content encouraged in-depth conversation. Frequent threaded discussions, with open-ended questions, elicited sustained discussions that

produced *Explanation* and *Synthesis* statements. All of these factors play a role in the construction of knowledge in online learning environments.

**What patterns of information interactions are exhibited in the written interactions of the graduate students in an online learning community?** Sociograms provided an additional way to view and interpret collected data. Examining the discussions visually allowed easy identification of the social roles assumed in the discussions and of the discussion questions that generated the most interaction. Sociograms can offer pedagogical insight in regards to online classroom management, course design, and discussion facilitation. Patterns revealed can alert instructors to a student who might need correction or encouragement, and can trigger the modification and/or explication of discussion questions and course material.

**Answering the question.** The findings of this research have answered the research question. Graduate students did exhibit information behavior patterns in online learning communities. Patterns of Information Intents were displayed through written interactions (threaded discussions), these patterns contributed to the construction of knowledge, these patterns were visually identified (sociometry) and these patterns did change over the course of a teaching cycle.

**RQ2: How, If At All, Are These Patterns Of Information Use Related To A Sense Of Community, As Measured By The Classroom Community Scale?**

**What impact, if any, does the context of a Small World community have on the information behaviors of online students?** The main differences between the two classes were *where* and *why* each class felt community was formed. The network of

bonds appeared to have a greater impact on them, according to their posts, than more conventional measures of academic success. The Technology class bonded offline -- on *Facebook*<sup>®</sup> -- due to a negative classroom experience, and the User Studies students formed feelings community inside the online learning environment through prolonged and content rich discussions with each other and with their instructor.

**Answering the question.** The findings of this research have answered the research question. The Classroom Community Scale results revealed that Small Worlds do influence the information behavior of online students. Small Worlds are forged through interaction and exchanges of information. These interactions increased the sense of community felt by students, and in turn this sense of community encouraged more interaction. In this way Small Worlds are cyclical and dynamic entities.

### **Relationship to the Literature**

The results of the study related to the studies described in the literature review (Chapter Two) and were applicable to related areas of research, namely the body of work treating the affective dimension of information behavior and the literature relating to e-learning and accompanying virtual communities.

### **Human Information Behavior**

The newly discovered Information Intent, *Connecting*, is related to the affective or emotional realm of information behavior. Literature about the affective domain of information behavior is growing, and includes the feelings and mental states of users as they seek, use, and avoid information. Nahl's (2001) work addresses users' feelings of frustration, impatience, information overload, resistance to new information, and

confusion (Nahl, 2004). Mellon (1986) discusses feeling of anxiety, while Harris, Stickney, Grasley, Hutchinson, Greaves, and Boyd (2001) address disappointment in relation to information seeking. Kuhlthau (1993) investigates the feeling of uncertainty, often expressed as anxiety or worry, and Heinström (2004) also discusses stress, worry, and feelings of low confidence in information consumers. The findings of this research and their relation to this literature provides a natural link back to Chatman's (1992; 1996) work that address the Small Worlds of insiders and outsiders and retired women, and the emotions and feelings resulting from their information seeking and use.

### **Learning Communities**

The formation of community as demonstrated in these classes brings together the dimensions described in the literature of communities of practice, cohort learning, and the psychological sense of community. Community was developed both inside and outside the formal course environment. This coalescence of connections enabled students to work with the course content collectively, and this group engagement made each class a community of practice (albeit one with a finite life cycle).

It is now generally accepted that people engaging in electronic exchanges are able to create communities—places with socially constituted norms, values, and expectations. Text serves as the lifeblood of these electronic places, conveying the ideas and feelings of participants that lead to the growth and evolution of a community or to its demise. ... A virtual community is comprised of members 'bound together for mutual service'. Members of virtual communities tend to provide advice and solutions to problems expressed by other members, even though they may be strangers to one another. In virtual communities of practice, information is shared not on a *quid pro quo* basis, but on the basis of generalized reciprocity. (Burnett et al., 2003, paras. 1 & 5)



The idea of reciprocity was common in the threaded discussions of both courses, particularly in the Technology class, where students were especially diligent about helping one another and providing information necessary to complete assignments.

As some students expressed, forging connections and creating community in an online environment can be difficult to accomplish due to the anonymity, asynchronicity, and lack of personal interaction and visual cues. Students said it was difficult to communicate solely by text, and expressed the desire to see their classmates. Forming relationships and a Small World in this environment is different and perhaps more challenging than doing so in a face-to-face environment and requires effort, risk-taking, and a willingness to trust (Finlay & Willoughby, 2008).

Developing and supporting cooperative learning groups is a major challenge, since the participants are asked to engage in more personal risk-taking behavior than in typical courses. ... Creating online groups of any form tacitly requires finding ways to support the social processes that would be typical of face-to-face groups. (Kling & Courtright, 2003, p. 226)

With these pieces in place, students were able to socially construct their environment.

The literature on social constructivism discusses the formation of the environment through interaction and dialogue, precisely what the students in both classes accomplished in their discussions. Interacting in the threaded discussions enabled the students to engage with course content while interacting with one another. The resulting conversations allowed students to "... publish, reflect, discuss, critique, and connect their knowledge" (Finlay & Willoughby, 2008, p. 54).

## E-Learning

This research study focused on how people engaged with information and peers in an online learning environment. The data confirmed that the online learning environment is not comprised of any one major component, but rather multiple ones, including: Discussion forums; social presence; instructor immediacy; cognitive and affective communication and information interaction; group work and cohort learning; and, social roles. Yet, it is a sum greater than its parts. The social construction of an online learning environment can no longer simply be referred to as distance education -- this holistic view of the online learning environment supersedes it and is now referred to as e-learning. This represents a paradigm shift that moves away from the teacher-centered instruction of distance education to student-centered and student-led learning (Wenger et al., 2009). The change from basic learning to 'communal constructivism' is described by Holmes and Gardner (2006).

Communal constructivism, which like the notion of communities of practice, deals with "a process in which individuals not only learn socially but contribute their learning to the creation of a communal knowledge base for other learners." Online learning affords them the linked community, the knowledge bases, the knowledge-creation tools and the facility to provide their learning for others. (Holmes & Gardner, 2006, p. 76)

The threaded discussion forums in the User Studies and Technology classes demonstrated that the information exchanges and conversations occurring were "... pivotal to understanding virtual communities," and were key in developing the online learning environment's "... shared meaning and culture", also known as class norms (Burnett et al., 2003, para. 7). In addition, the importance of instructor immediacy has been confirmed several times by the study's sociometry results and survey comments;

instructor immediacy can enable students (User Studies) or the lack of instructor immediacy can greatly hinder students (Technology). Immediacy was a contributing factor to fostering students' social presence, defined in the literature as "person-to-person awareness" (Dow, 2008, p. 231). Social presence is inextricably tied to students' affective information behavior and communication and depends upon: User-centered course design (e.g., the Dick, Carey and Carey model); transparency; ease-of-use of the environment; online communication and interactivity; and, self-reflection (Finlay & Willoughby, 2008). The students in the Technology class also showed remarkable social presence in their course, although it waned as the semester progressed from lack of instructor immediacy. That group's social presence was the result of bonding through a negative experience which caused them to migrate from their *Facebook*<sup>®</sup> page to the course site, and then back to the *Facebook*<sup>®</sup> page. Demonstrating and maintaining social presence in an online learning environment is an emotionally strenuous but essential factor for satisfaction (Dow, 2008).

### **Communities of Practice**

Communities of practice refers to groups that include "... a set of relations among persons, activity, and world, over time and in relation with other tangential and overlapping communities of practice." (Lave & Wenger, 1991, p. 98) The literature on COPs describes them as voluntary, and because online courses are not entirely so, there was some hesitation whether they could in fact be considered COPs. However, enrollment in a program of study can be viewed as voluntary on the part of the student, even if it is a formal process that involves receiving a grade. On this point, Lave and

Wenger's work (1991) treats learning by doing and learning by apprenticeship, and how these involve participating in COPs. Therefore, there is precedent that such learning communities *can* be considered communities of practice, even if they are short-lived and not completely voluntary (Lave & Wenger, 1991).

The results of this research supported the idea that communities of practice can indeed be formed in online learning environments, even though online classes are not strictly voluntary and occur over a short period of time. The development of the Information Intent *Connecting* demonstrated that students made sustained and concerted efforts to initiate and maintain relationships with peers and the instructor. It is the formation of relationships, in conjunction with prolonged and directed interaction with specific content, which is a sign of a community of practice. The students' admissions in the CCS survey revealed students felt a relationship with their peers and instructor, which also indicated that a community of practice existed in these online courses or Small Worlds.

The results of the research demonstrated that COPs can occur even within the short span of a 15 week semester. Lave and Wenger (1991) also specified that communities of practice "... cannot be judged by standards of length, every community has its own ebb and flow, its own cycle; its duration is just one characteristic of a COP 'for each cycle has its own trajectory, benchmarks, blueprints' and accomplishments." (p. 99) All communities, and consequently online learning communities, have a shelf life and will eventually end. For students enrolled in formal courses or degree programs a process to disengage from the community is to be expected (Kazmer 2006;

Haythornthwaite et al., 2000). Such disengagement occurs at the end of every semester as students complete a class and prepare to move on to new courses and their accompanying community.

### **Knowledge Construction**

The results of the textual analysis of the discussion threads revealed that Knowledge Construction did occur in the User Studies class. This is especially evident in those comments labeled (in Chapter Four) as related to the intents of *Get Practical* (a subcategory of *Contextualizing*) and *Creating*. The most illustrative of these statements involved students' synthesizing acquired information and applying it to their professional and personal lives. The assumption was that *Fact* statements would decrease during the semester and students would make more *Explanation* and *Synthesis* statements as they progressed in the class. There was actually an increase in *Fact* statements made throughout the semester and a peak of *Explanation* comments in week 3, and then a decline over the remainder of the semester.

An important result of the study was that numerous *Synthesis* statements were made during the semester (peaking at 34 statements in week 9). This corresponded with the initial assumptions for Knowledge Construction and suggested that students did indeed build new and sustainable knowledge as they progressed through the course. In the User Studies class useful information was exchanged, the students managed to form a level of community during the semester, and according to the Knowledge Construction framework they constructed new knowledge over time.

Knowledge Construction counts in the Technology course demonstrated that there was an increase in *Fact* statements made, a low but consistent number of *Explanation* statements made, and only one *Synthesis* statement made all semester. While useful information was exchanged in the course, and the students managed to form a level of community during the semester, according to the *Knowledge Construction* framework they constructed little new knowledge during the semester.

Graesser and Clark (1985) discuss 'bridging inferences' and 'projection inferences'. "Bridging inferences fill gaps between explicit statements in order to establish conceptual connectivity. Projection inferences elaborate and expands a coherent passage structure (or temporary structure on-line), but do not fill gaps." (p. 30) The authors continue by stating "... the bridging inferences are part of structures that connect explicit statements whereas projection inferences are part of structures that radiate outward from the bridging structures." (p. 30) Bridging and projecting occur in the threads as *Contextualizing* and *Creating* processes.

### **Limitations of the Research**

Despite the rich results from the study there were several limitations. The study was limited by sample size, limited duration of data collection, concentrating on one mode of online learning (asynchronous), and examining one LIS master's program. The study looked at 38 online graduate students and this population yielded considerable data through the threaded discussions and sociograms. However, only 20 students responded to the CCS, and this sample size was inadequate for a quantitative analysis of results.

While Rovai's scale has been fully validated and replicated, the modifications made by this researcher (i.e., the addition of demographic and open-ended questions) have been untested. Future studies can remedy this limitation and should also consider incorporating additional classes having more students. If this were the case, consideration will need to be given to the various types of data analysis methods. Qualitative techniques work well with a small sample size but if mixed methods and/or quantitative methods are employed a larger sample will be necessary.

In addition to small sample size, there were several other similarities between the two classes that could be considered limiters: Both classes were in the same graduate program at the same university; both relied on asynchronous methods; and, both had enrollment from students new to the program. While there was deliberate uniformity in this sample selection, future studies should consider other combinations of students and classes to discover how results might differ if the overall context of the online learning environment is altered. Future studies might consider studying the following: Classes at different institutions; two or more classes of the same type (e.g., all technology classes or all theory classes); classes with students not new to the program; classes lasting more than one semester; students who move through an entire online program in a true cohort model; multiple classes taught by the same instructor or instructors with similar backgrounds and experience in online teaching and learning; and, classes at different levels of study (i.e., undergraduate vs. graduate). Another significant consideration for designing future studies is to use classes having synchronous modes of communication and interaction as well as those utilizing hybrid

content deliveries. Additional comparisons should be made between online and seated classes to determine the differences and similarities in the sense of community established by learners in each venue.

Concerning the methodology used in this research, reflection suggests that instead of modifying the existing Classroom Community Scale with open-ended questions, a second survey could have been distributed. Also, these questions could have been used to interview students individually or in small groups. Interviewing using synchronous communication would have provided an opportunity to follow up on certain comments made by students. For example, in response to the open-ended questions students in the Technology class likened their negative experience and subsequent bonding with peers to that of the bonds formed among concentration camp survivors. Another mentioned they felt abandoned by the instructor. Following up with the students about their language choice and strong feelings would have yielded more in-depth results that could have further characterized the class and altered the study results. The opportunity to interview the instructors in person would also have been of value.

The learner/context analysis was useful and appropriate for generating a holistic view of the online learning environment and worked well with the textual analysis of the threaded discussions. The sociograms were also beneficial and provided additional information to substantiate the relationships that occurred in the threaded discussions. These techniques aided in answering the research questions.



### **Implications for Future Research**

When considered an interdisciplinary topic, the information exchanges and interactions that occur in the online graduate classroom can be further examined through the lenses of various fields, chiefly LIS, communication, sociology, education, and gender studies. There are a variety of theories, and their various aspects of study, that would further advance and expand this line of inquiry. Theories that would add richness to the study of human information behavior in online learning environments include Vygotsky's Social Learning (education), Latour's Actor Network (sociology), the concept of Social Capital, as discussed by Bourdieu and Putman (sociology), Wilson's Cognitive Authority (LIS), and Insiders and Outsiders, as discussed by Chatman (LIS) and Merton (sociology). The specialized areas of cooperative learning, computer mediated community and computer-supported collaborative learning would also support this topic.

Future studies of the information behavior of students in online learning environments might consider the following areas of inquiry, individually or collectively:

- How does the level of community developed in online courses compare to that developed in a face-to-face or hybrid course?
- What, if any, differences are there between the communication styles of women and men in threaded discussion forums?
- What boundary objects are found in the online learning environment and how are they used by students?
- In what ways are threaded discussions considered discursive communities?

- What explicit roles do students play in the threaded discussions?
- What sociomental connections (Chayko, 2002) are formed in threaded discussions?
- What do peer-to-peer interactions in the threaded discussions reveal about the group dynamics occurring among the students?
- Using the Affective Immediacy Indicators identified by Swan (2003), identify the elements of social presence in the online threaded discussions.
- Thinking of information seeking and use as a form of knowledge sharing, what motivators and barriers to sharing of knowledge (Hew & Hara, 2003) are present in the threaded discussions?

These questions have emerged as possibilities in the course of this research. These inquiries would be interesting and continue the goal of enhancing the literature in the disciplines of LIS, distance education, cohort learning, communities of practice, psychological sense of community, and Knowledge Construction.

### **Conclusions/Importance of the Study**

#### **Implications for Practice**

**Pedagogy and instructional design.** This research provided a basis for understanding how students in online LIS courses create connections and build knowledge during a semester. The roles students adopt in these temporary communities were also described. This examination, derived from Chatman's theory of Small Worlds (1991), included insights from studies in communities of practice, cohort learning, community psychology, and distance education, and shed new light on online learners -- their information behaviors and patterns of Knowledge Construction.

Further, the instructional design of LIS distance education can benefit from these results and lead to more productive pedagogies in online classes. 'Productive pedagogies' refer to the classroom infrastructures needed for in-depth learning by students. (This framework is found in teacher education literature and is suitable for training future librarians and information specialists, as well as learners in other disciplines). The goal of productive pedagogies is to create learning environments that emphasize process over substance, hands-on learning, knowledge integration, higher-order thinking, learner engagement, and cultural inclusivity (Gore, Griffiths, & Ladwig, 2004; McFadden & Munns, 2002). Productive pedagogies speak to the important role of the instructor in the creation of effective online learning environments. Instructor involvement and immediacy set the tone for the learning environment and facilitate the construction of knowledge and exchange of information that occur in successful online classes.

The insights gained from this research benefit not only the discipline of LIS, but all others that utilize distance education technologies, that is, e-learning. Examining the online environment in this way merges inquiries that relate to instructional design, cohort learning, communities of practice, psychological sense of community, and distance education -- making this truly an interdisciplinary endeavor. Distance education is not just about delivering course content in an online format, but rather a way to put the learner first in the course design process by considering how they learn best and facilitating the development of learning communities.

**Information behavior and knowledge construction.** In the LIS field, specifically in the areas of information behavior and Knowledge Construction, this study bridged the

specialties noted above and extends existing theory (Todd's Information Intents) by adding an important affective dimension. Also, threaded discussions were seen in three vital ways: 1) Through a distinctly information behavior lens, 2) within a course management system, and 3) with the assumption that knowledge can be constructed in an online environment. A number of studies have examined online environments and discussion forums, but are typically in the areas of sociology and education. Turner's (2008) dissertation is the only previous scholarly consideration of threaded discussions from an information behavior perspective that was identified. However, Turner's examined discussions took place within non academic user discussion boards, not within a CMS, and did not include users' construction of knowledge. A new population, graduate students in a closed and specialized online environment, was successfully studied. It is hoped that this work provides impetus for further research and progress in this important area, since most LIS graduate programs are experiencing their growth in the virtual arena.

With its interdisciplinary focus and mixed methods approach, this dissertation addressed the initial research problem and bridged six areas of literature (in four disciplines) to answer the questions of what information behavior patterns students in online asynchronous learning communities exhibited, what role the formation of community played in the online learning environment, and what changes occurred in these patterns over time. Small Worlds are developed around context and depend upon interaction, norms, cognitive and affective information seeking and utilization, and can foster deep and sustained learning and construction of knowledge.

**Appendix A**  
**Survey Instrument**

**Classroom Community Scale (CCS)**

Developed by  
Alfred P. Rovai, PhD

This version of the CSS has been modified by **Nicole A. Cooke**, doctoral candidate at Rutgers University.

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**PART I**

**DIRECTIONS:**

Place an X in the space next to the most appropriate response.

You are:

- ☐ Male
- ☐ Female

You are:

- ☐ 20-29 years of age
- ☐ 30-39 years of age
- ☐ 40-49 years of age
- ☐ 50-59 years of age
- ☐ 60 years of age and above

Number of previous online courses taken:

- ☐ none
- ☐ 1-3
- ☐ 4-6
- ☐ 7-9
- ☐ 10 or more

How many hours a week, on average, do you spend on online discussions for this course?

(This includes reading the materials, posting comments, and responding to others' comments)

How would you define an online community?

How important do you think sense of community is to an online learning environment?

How do you feel, if at all, that community was formed in this online class?

In the threaded discussions, what prompted you to respond to particular postings?

What were the criteria you used to choose which messages to respond to?

What do you think helped to form a sense of community in this class?

What do you think hindered the formation of a sense of community in this class?

How did your sense of community impact, or not impact, your information sharing and use in this class?

## **PART II**

Below you will see a series of statements concerning a specific course or program you are presently taking or recently completed. Read each statement carefully and place an X in the parentheses to the right of the statement that comes closest to indicate how you feel about the course or program. You may use a pencil or pen. There are no correct or incorrect responses. If you neither agree nor disagree with a statement or are uncertain, place an X in the neutral (N) area. Do not spend too much time on any one statement, but give the response that seems to describe how you feel.

### **KEY:**

(SA) = strongly agree; (A) = agree; (N) = neutral; (D) = disagree; (SD) = strongly disagree

### **Please respond to all items**

1. I feel that students in this course care about each other..... (SA) (A) (N) (D) (SD)
2. I feel that I am encouraged to ask questions..... (SA) (A) (N) (D) (SD)
3. I feel connected to others in this course..... (SA) (A) (N) (D) (SD)
4. I feel that it is hard to get help when I have a question..... (SA) (A) (N) (D) (SD)

5. I do not feel a spirit of community..... (SA) (A) (N) (D) (SD)
6. I feel that I receive timely feedback..... (SA) (A) (N) (D) (SD)
7. I feel that this course is like a family..... (SA) (A) (N) (D) (SD)
8. I feel uneasy exposing gaps in my understanding..... (SA) (A) (N) (D) (SD)
9. I feel isolated in this course..... (SA) (A) (N) (D) (SD)
10. I feel reluctant to speak openly..... (SA) (A) (N) (D) (SD)
11. I trust others in this course..... (SA) (A) (N) (D) (SD)
12. I feel that this course results in only modest learning..... (SA) (A) (N) (D) (SD)
13. I feel that I can rely on others in this course..... (SA) (A) (N) (D) (SD)
14. I feel that other students do not help me learn..... (SA) (A) (N) (D) (SD)
15. I feel that members of this course depend on me..... (SA) (A) (N) (D) (SD)
16. I feel that I am given ample opportunities to learn..... (SA) (A) (N) (D) (SD)
17. I feel uncertain about others in this course..... (SA) (A) (N) (D) (SD)
18. I feel that my educational needs are not being met..... (SA) (A) (N) (D) (SD)
19. I feel confident that others will support me..... (SA) (A) (N) (D) (SD)
20. I feel that this course does not promote a desire to learn..... (SA) (A) (N) (D) (SD)

**Appendix B**  
**Consent Form**

**INFORMED CONSENT FORM**

Thank you for taking part in this survey. It is being undertaken by Nicole A. Cooke, who is a doctoral candidate in the School of Communication & Information at Rutgers University. The purpose of this research is to determine if and how graduate students form community in the online classroom, and how information is shared and utilized in this environment.

The study involves completing the survey during this unit of your online course, and should take no more than 15-20 minutes of your time. The information provided here will be anonymous and cannot be linked to any other course discussions or content.

Your responses will aid in understanding the information behaviors of the online learning environment, how these dynamics may shape the instructional design of online classes, and how people exchange and engage with information in formal online education settings. Because your responses are anonymous, there are no foreseeable risks to participation in this study. Non-participation in this study will not affect your grade or ability to enroll in future graduate coursework at Rutgers.

Participation in this study is voluntary. You may choose not to participate, and you may withdraw at any time during the study without any penalty to you. In addition, you may choose not to answer any questions with which you are not comfortable.

If you have any questions about the study or study procedures, you may contact me at:

Nicole A. Cooke  
LIS / SC&I  
4 Huntington St.  
New Brunswick, NJ 08901  
nicole.cooke@rutgers.edu



or you may contact my advisor Dr. Ross J. Todd at:

Rutgers, The State University of New Jersey  
184 College Avenue, New Brunswick, New Jersey, 08901  
Tel: 732-932-7500 Extension 8223  
[rtodd@rutgers.edu](mailto:rtodd@rutgers.edu)

If you have any questions about your rights as a research subject, you may contact the  
IRB Administrator at Rutgers University at:

Rutgers University, the State University of New Jersey  
Institutional Review Board for the Protection of Human Subjects  
Office of Research and Sponsored Programs  
3 Rutgers Plaza  
New Brunswick, NJ 08901-8559  
Tel: 732-932-0150 ext. 2104  
Email: [humansubjects@orsp.rutgers.edu](mailto:humansubjects@orsp.rutgers.edu)

By continuing to the next page, you are providing your consent to participate in this study.

THANK YOU for your participation and insight!

## References

- American Library Association, The. (2012). ALA Accredited Programs. Retrieved from <http://www.ala.org/accreditedprograms/>
- Anagnostopoulos, D., Basmadjian, K. G., & McCrory, R. (2005). The decentered teacher and the construction of social space in the virtual classroom. *Teachers College Record*, 107(8), 1699-1729.
- Aviv, R., Erlich, Z., Ravid, G., & Geva, A. (2003). Network analysis of knowledge construction in asynchronous learning networks. *Journal of Asynchronous Learning Networks*, 7(3), 1-23.
- Barron, D. D. (Ed). (2003). *Benchmarks in distance education: The LIS experience*. Westport, CT: Libraries Unlimited.
- Bates, A. W. (2003). *Technology, e-learning and distance education* (2nd Ed.). London: Routledge Falmer.
- Biocca, F., Harms, C., & Burgoon, J. K. (2003). Criteria for a theory and measure of social presence. *Presence: Teleoperators & Virtual Environments*, 12(5), 456-480.
- Blanchard, A., & Horan, T. (1998). Virtual communities and social capital. *Social Science Computer Review*, 16(3), 293-307.
- Blanchard, A. L. (2008). Testing a model of sense of virtual community. *Computers in Human Behavior*, 24(5), 2107-2123.
- Blanchard, A. L., & Markus, M. L. (2004). The experienced sense of a virtual community: Characteristics and processes. *The DATA BASE for Advances in Information Systems*, 35(1), 64-79.
- Bliss, C. A., & Lawrence, B. (2009). From posts to patterns: A metric to characterize discussion board activity in online courses. *Journal of Asynchronous Learning Networks*, 13(2), 15-32.
- Bloom, B. S. (1956). *Taxonomy of educational objectives, Handbook I: Cognitive domain*. New York, NY: Longmans.
- Bourdieu, P. (1986). The forms of capital. In J. Richardson, (Ed.), *Handbook of theory and research for the sociology of education* (pp. 241-258). New York, NY: Greenwood.
- Bower, B. (2001). Distance education: Facing the faculty challenge. *Online Journal of Distance Learning Administration*, 4(2). Retrieved February 1, 2012 from <http://www.westga.edu/~distance/ojdla/summer42/bower42.html>
- Brandt, D.S. (1997). Constructivism: Teaching for understanding of the Internet. *Communications of the ACM*, 40(10), 112-117.
- Brookes, B. (1980). The foundations of information science. Part 1. Philosophical aspects. *Journal of Information Science*, 2(3/4), 125-133.
- Brookes, B. (1980). Measurement in information science: objective and subjective metrical space. *Journal of the American Society for Information Science*, 31(4), 248-255.
- Brookes, B. (1974). Robert Fairthorne and the scope of information science. *Journal of Documentation*, 30(2), 139-152.
- Brooks, C. F. (2008). *Exploring face-to-face and online classroom discourse: A case study of social roles as performed in a college course*. (Unpublished doctoral dissertation). University of California, Riverside.

- Bruce, C., Buckingham, L., Hynd, J., McMahon, C., Roggenkamp, M., & Stoodley, I. (2004). Ways of experiencing the act of learning to program: A phenomenographic study of introductory programming students at university. *Journal of Information Technology Education*, 3, pp. 143-160.
- Burnett, G., Besant, M., & Chatman, E. A. (2001). Small worlds: Normative behavior in virtual communities and feminist bookselling. *Journal of the American Society for Information Science & Technology*, 52(7), 536-547.
- Burnett, G., Dickey, M.H., Kazmer, M.M., & Chudoba, K.M. (2003). Inscription and interpretation of text: a cultural hermeneutic examination of virtual community. *Information Research*, 9(4) paper 162. Retrieved from <http://InformationR.net/ir/9-1/paper162.html>
- Burnett, G., Jaeger, P. T., & Thompson, K. M. (2008). Normative behavior and information: The social aspects of information access. *Library & Information Science Research*, 30(1), 56-66.
- Burroughs, S.M. and Eby, L.T. (1998). Psychological sense of community at work: A measurement system and explanatory framework. *Journal of Community Psychology*, 26, 509-532.
- Carter, D. (2005). Living in virtual communities: An ethnography of human relationships in cyberspace. *Information, Communication & Society*, 8(2), 148-167.
- Chatman, E. A. (2000). Framing social life in theory and research. *New Review of Information Behaviour Research*, 1, 3-17.
- Chatman, E. A. (1999). A theory of life in the round. *Journal of the American Society for Information Science*, 50(3), 207-217.
- Chatman, E.A. (1996). The impoverished life-world of outsiders. *Journal of the American Society for Information Science*, 47(3), 193-206.
- Chatman, E.A. (1992). *The information world of retired women*. Westport, CT: Greenwood.
- Chatman, E. A. (1991). Life in a small world: Applicability of gratification theory to information-seeking behavior. *Journal of the American Society for Information Science*, 42(6), 438-449.
- Chayko, M. (2002). *Connecting: How we form social bonds and communities in the Internet age*. Albany, NY: SUNY Press.
- Chayko, M. (2008). *Portable communities: The social dynamics of online and mobile connectedness*. Albany, NY: SUNY Press.
- Chen, L-L. (1997). Distance delivery systems in terms of pedagogical considerations: A re-evaluation. *Educational Technology*, 37(4), 34-37.
- Choemprayong, S. & Wildemuth, B. M. (2009). Case studies. In B. M. Wildemuth (Ed.), *Applications of social research methods to questions in information and library science* (pp. 51-61). Westport, CT: Libraries Unlimited.
- Cooke, N.A. (2004). The role of libraries in web-based distance education: An account and an analysis of the impact of web technology on distance learning - what remains unchanged, what is changing. *Journal of Library & Information Services in Distance Learning*, 1(4), 47-57.

- Crystal, A. J. & Wildemuth, B. M. (2009). Naturalistic inquiry. In B. M. Wildemuth (Ed.), *Applications of social research methods to questions in information and library science* (pp. 62-72). Westport, CT: Libraries Unlimited.
- Dervin, B. (1998). Sense making theory and practice: an overview of user interests in knowledge seeking and use. *Journal of Knowledge Management*, 2(2), 36–45.
- Denzin, N. K., and Lincoln, Y. S. (1998). *Strategies of qualitative inquiry*. Thousand Oaks, CA: Sage.
- Dick, W.O., Carey, L., & Carey, J.O. (2004). *The systematic design of instruction*. Boston, MA: Allyn & Bacon.
- Dick, W.O, Carey, L., & Carey, J.O. (1996). *The systematic design of instruction*. New York, NY: HarperCollins.
- Dow, M. J. (2008). Implications of social presence for online learning: A case study of MLS students. *Journal of Education for Library and Information Science*, 29(4), 231-242.
- Downes, S. (2005). E-learning 2.0. *eLearn Magazine. Education and Technology in Perspective*. Available at <http://www.elearnmag.org/subpage.cfm?section=articles&article=29-1>
- Erlandson, D.A., Harris, E.L., Skipper, B.L., & Allen, S.D. (1993). *Doing naturalistic inquiry: A guide to methods*. Newbury Park, CA: Sage.
- Fairclough, N. (2003). *Analysing discourse: Textual analysis for social research*. London, UK: Routledge.
- Flanagan, J. C. (1954). The critical incident technique. *Psychological Bulletin*, 51(4), 327-358.
- Finlay, J. & Willoughby, L. (2008). Exploring online learning relationships: A case study in higher education. In S. Holland (Ed.), *Remote relationships in a small world* (pp. 53-73). New York: Peter Lang.
- Garber, D. (2004). Growing virtual communities. *The International Review of Research in Open and Distance Learning*, 5(2). Electronic journal. No pagination. Available at <http://www.irrodl.org/index.php/irrodl/article/viewArticle/177/259>
- Garrison, D. R., & Anderson, T. (2003). *E-learning in the 21st century: A framework for research and practice*. London: Routledge/Falmer.
- Glaser, B.G. & Strauss, A.L., (1967). *The discovery of grounded theory: Strategies for qualitative research*. Chicago, Aldine.
- Gleave, E., Welser, H. T., Lento, T. M., & Smith, M. A. (2009). *A conceptual and operational definition of 'social role' in online community*. Paper presented at the 42nd Hawaii International Conference on System Sciences, Waikoloa, Big Island, Hawaii. Retrieved from [http://www.hicss.hawaii.edu/hicss\\_42/bestpapers42/digitalmedia/scoailspace.pdf](http://www.hicss.hawaii.edu/hicss_42/bestpapers42/digitalmedia/scoailspace.pdf)
- Golder, S. A. & Donath, J. (2004). Social roles in electronic communities. *Internet Research*, 5, 19-22.
- Goodson, C. (2001). *Providing library services for distance learning students*. New York: Neal-Schuman Publishers, Inc.

- Gordon, S. (1992). Implications of cognitive theory for knowledge acquisition. In R. Hoffman (Ed.) *The psychology of expertise: Cognitive research and experimental AI* (pp 99-120). New York, NY: Springer.
- Gore, J. M., Griffiths, T., & Ladwig, J. G. (2004). Towards better teaching: Productive pedagogy as a framework for teacher education. *Teaching and Teacher Education*, 20, 375-387.
- Granovetter, M. (1973). The strength of weak ties. *American Journal of Sociology*, 78, 1360-1379.
- Graesser, A. & Clark, L. (1985). *Structures and procedures of implicit knowledge*. Norwood, NJ: Ablex.
- Gunawardena, C.N. et al. (1997) Analysis of a global online debate and the development of an interaction analysis model for examining social construction of knowledge in computer conferencing. *Journal of Educational Computing Research*, 17(4), 397-431.
- Gunawardena, C. N., & Zittle, F. J. (1997). Social presence as a predictor of satisfaction within a computer-mediated conferencing environment. *American Journal of Distance Education*, 11(3), 8-26.
- Haig, E. (2008). A critical discourse analysis of discourse strategies in reports of youth crime in UK radio news. *Media and Culture* 4(1): 33-65.
- Hammond, M. (1998). Learning through on-line discussion: What are the opportunities for professional development and what are the characteristics of on-line writing? *Journal of Information Technology for Teacher Education*, 7(3), 331-346.
- Hargittai, E., & Hinnant, A. (2006). Toward a social framework for information seeking. *New Directions in Human Information Behavior*, 8(2), 55-70.
- Harris, R., Stickney, J., Grasley C., Hutchinson, G., Greaves, L., & Boyd, T. (2001). Searching for help and information: Abused women speak out. *Library and Information Science Research*, 23(2), 123-141.
- Hashway, R. & Hashway, S. (1990). Solving mathematical word problems: Integrating frames of reference and world models. *Forum for Reading*, 21(2), 32-38.
- Haythornthwaite, C. (1996). Social network analysis: An approach and technique for the study of information exchange. *Library & Information Science Research*, 18(4), 323-342.
- Haythornthwaite, C. & Hagar, C. (2005). The social worlds of the web. *Annual Review of Information Science and Technology*, 39, 311-346.
- Haythornthwaite, C., Kazmer, M.M., Robins, J. & Shoemaker, S. (2000). Community development among distance learners: Temporal and technological dimensions. *Journal of Computer-Mediated Communication*, 6(1). Retrieved from: <http://jcmc.indiana.edu/vol6/issue1/haythornthwaite.html>
- Haythornthwaite, C. (2001). Exploring multiplexity: Social network structures in a computer-supported distance learning class. *The Information Society*, 17(3), 211-226.
- Haythornthwaite, C. (2002). Building social networks via computer networks: Creating and sustaining distributed learning communities. In A. Renniger & W. Shumar

- (Eds.). *Building virtual communities: Learning and change in cyberspace* (pp. 159-190). Cambridge, UK: Cambridge University.
- Haythornthwaite, C. (2005). Social networks and internet connectivity effects. *Information, Communication & Society*, 8(2), 125-147.
- Heinström, J. (2004). *Fast surfers, broad scanners and deep divers: Fast surfing, broad scanning and deep diving*. *Journal of Documentation*, 61(2), 228-247.
- Herring, S. C. (2004). Computer-mediated discourse analysis: An approach to researching online behavior. In S. A. Barab, R. Kling, and J. H. Gray (Eds.), *Designing for virtual communities in the service of learning* (pp. 338-376). New York, NY: Cambridge University.
- Hersberger, J. A., Murray, A. L., & Rioux, K. S. (2007). Examining information exchange and virtual communities: An emergent framework. *Online Information Review*, 31(2), 135-147.
- Hersberger, J. A., Rioux, K. S., & Cruitt, R. O. (2005). *Examining information sharing and relationship building in online social networks: An emergent analytic framework*. Paper presented at the *Annual Conference of the Canadian Association for Information Science (CAIS)*, London, Ontario. Retrieved from [http://libres.uncg.edu/ir/uncg/f/J\\_Hersberger\\_Examining\\_2005.pdf](http://libres.uncg.edu/ir/uncg/f/J_Hersberger_Examining_2005.pdf)
- Hew, K. F., & Hara, N. (2007). Knowledge sharing in online environments: A qualitative case study. *Journal of the American society for Information Science and Technology*, 58(14), 2310-2324.
- Hibbert, K. & Rich, S. (2006). Virtual communities of practice. In J. Weiss, et al. (Eds.). *The international handbook of virtual learning environments* (pp. 563-579). Netherlands: Springer.
- Hillery Jr., G. A. (1955). Definitions of community: Areas of agreement. *Rural Sociology*, 20(2), 111-123.
- Hine, C. (2000). *Virtual Ethnography*. London, Sage.
- Hine, C. (2008). Virtual ethnography: Modes, varieties, affordances. In N. Fielding, R. M. Lee and G. Blank (Eds.), *The SAGE handbook of online research methods* (pp. 257-268). Los Angeles, CA: Sage.
- Holzner, B. & Marx, J. (1978). *Knowledge application: A knowledge system of society*. Wellesley, MA: Allyn and Bacon.
- Honeycutt, C. (2005). Hazing as a process of boundary maintenance in an online community. *Journal of Computer-Mediated Communication*, 10(2), article 3. Retrieved from <http://jcmc.indiana.edu/vol10/issue2/honeycutt.html>
- Huang, H-M. (2002). Toward constructivism for adult learners in online learning environments. *British Journal of Educational Technology*, 33(1), 27-37.
- Huotari, M., & Chatman, E. (2001). Using everyday life information seeking to explain organizational behavior. *Library & Information Science Research*, 23(4), 351-366.
- Imel, S. (2002). *Adult learning in cohort groups*. Columbus, OH: ERIC Clearinghouse on Adult, Career, and Vocational Education. (ERIC Document Reproduction Service No. ED 472 604).

- Imel, S. (1999). *Distance learning myths and realities*. Columbus, OH: ERIC Clearinghouse on Adult, Career, and Vocational Education. (ERIC Document Reproduction Service No. ED 426 213).
- Ingwersen, P. (1982). Search procedures in the library – Analysed from the cognitive point of view. *Journal of Documentation*, 38(3), 165-191.
- Jaeger, P. T., & Thompson, K. M. (2004). Social information behavior and the democratic process: Information poverty, normative behavior, and electronic government in the United States. *Library & Information Science Research*, 26(1), 94–107.
- Jaffee, D. (2007). Peer cohorts and the unintended consequences of freshman learning communities. *College Teaching*, 55(2), 65-71.
- Jeong, A. C. (2003). The sequential analysis of group interaction and critical thinking in online threaded discussions. *American Journal of Distance Education*, 17(1), 25-43.
- Jennings, H. H. (1972). *Sociometry in group relations: A manual for teachers*. Westport, CT: Greenwood Press.
- Jo Kim, A. (2000) *Community Building on the Web: secret strategies for successful online communities*. Berkeley, CA: Peachpit Press. Retrieved from <http://www.ilt.ac.uk/public/cti/ActiveLearning/al9pdf/jones.pdf>
- Joinson, A. N. (2005). Internet behavior and the design of virtual methods. *Virtual methods: Issues in social reseach on the internet*. In C. Hine (Ed.), New York, NY: Berg.
- Jonassen, D. H. (1994). Thinking technology: Toward a constructivist design model.. *Educational Technology Research and Development*, 34(4), 34-37.
- Jonassen, D. H. (2000). Toward a design theory of problem solving. *Educational Technology Research and Development*, 48(4), 63-85.
- Jones, C. (1999). From the sage on the stage to what exactly? Description and the place of the moderator in co-operative and collaborative learning. *Association for Learning Technology Journal*, 7(2), 27-35.
- Jones, C. (1998) Evaluating a collaborative online learning environment. *Active Learning*, 9, 31-35.
- Jones, Q. (1997). Virtual-communities, virtual settlements & cyber-archaeology: A theoretical outline. *Journal of Computer Mediated Communication*, 3(3). Electronic journal, no pagination. Retrieved from <http://jcmc.indiana.edu/vol3/issue3/jones.html>
- Jones, S. G. (1998). Information, internet, and community: Notes toward an understanding of community in the information age. In S. G. Jones (Ed.), *Cybersociety 2.0: Revisiting Computer-Mediated Communication and Community* (pp. 1-34). Thousand Oaks, CA: Sage.
- Kazmer, M. M. (2006, Summer). Creation and loss of sociotechnical capital among information professionals educated online. *Library & Information Science Research*, 28(2), 172-191.
- Kazmer, M. M. (2000). Coping in a distance environment: Sitcoms, chocolate cake, and dinner with a friend. *First Monday*, 5(9). Electronic journal, no pagination. Retrieved from

- <http://http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/791/700>.
- Kearsley, G. (1998). Educational technology: A critique. *Educational Technology*, 38(2), 47-51.
- Kehrwald, B. (2008). Understanding social presence in text-based online learning environments. *Distance Education*, 29(1), 89-106.
- Keller, J. M. (1998) Motivation in Cyber Learning Environments. *International Journal of Educational Technology*, 1(1), 7-30.
- Kling, R. & Courtright, C. (2003). Group behavior and learning in electronic forums: A sociotechnical approach. *The Information Society*, 19(3), 221-235.
- Krathwohl, D. R., Bloom, B. S., & Masia, B. B. (1964). *Taxonomy of educational objectives, Handbook II: Affective domain*. New York, NY: David McKay.
- Krippendorff, K. (2004). *Content analysis: An introduction to its methodology*. Thousand Oaks, CA: Sage Publications, Inc.
- Kuhlthau, C. C. (1993). *Seeking meaning: A process approach to library and information services*. Norwood, NJ: Ablex.
- Larreamendy-Joerns, J. and Leinhardt, G. (2006). Going the distance with online education. *Review of Educational Research*, 76(4), 567-605.
- Lawrence, R. L. (2002). A small circle of friends: Cohort groups as learning communities. *New Directions for Adult and Continuing Education*, 95, 83-92.
- Lave, J. & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. New York, NY: Cambridge University Press.
- Library and Information Studies*. (2009). Retrieved March 1, 2012, from <http://grad-schools.usnews.rankingsandreviews.com/best-graduate-schools/top-library-information-science-programs/library-information-science-rankings>
- Lincoln, Y.S. & Guba, E.G. (1986). But is it rigorous? Trustworthiness and authenticity in naturalistic evaluation. *New Directions for Program Evaluation*, 30, 73-84.
- Lindlof, T. R. & Taylor, B. C. (2010). *Qualitative communication research methods*. Thousand Oaks, CA: Sage Publications, Inc.
- Lock, J.V. (2002). Laying the groundwork for the development of learning communities within online courses. *Quarterly Review of Distance Education*, 3(4), 395-408).
- Liu, X., Magjuka, R. J., Bonk, C. J., & Lee, S. (2007). Does sense of community matter? *Quarterly Review of Distance Education*, 8(1), 9-24.
- Lu, Y. (2007). The human in human information acquisition: Understanding gatekeeping and proposing new directions in scholarship. *Library & Information Science Research*, 29(1), 103-123.
- Mack, N., Woodson, C., MacQueen, K. M., Guest, G., & Namey, E. (2005). *Qualitative research methods: A data collector's field guide*. Research Triangle Park, NC: Family Health International.
- Marton, F. (1981). Phenomenography—describing conceptions of the world around us. *Instructional Science*, 10(2), 177-200.
- McFadden, M. & Munns, G. (2002). Engagement and the social relations of pedagogy. *British Journal of Sociology of Education*, 23(3), 357-366.



- Mellon, C.A. (1986). Library anxiety: A grounded theory and its development. *College & Research Libraries*, 47(2), 160-165.
- McDermott, R. (1999). How to build communities of practice in team organizations: Learning across teams. *Knowledge Management Review*, 2(2), 32-39.
- McKee, A. (2003). *Textual analysis: A beginner's guide*. London, UK: Sage.
- McMillan, D. W., & Chavis, G. (1986). Sense of community: A definition and theory. *Journal of Community Psychology*, 14, 6-23.
- Means, B., Toyama, Y., Murphy, R., Bakia, M., & Jones, K. (2010). *Evaluation of evidence-based practices in online learning: A meta-analysis and review of online learning studies*. Washington, DC: US Department of Education, Office of Planning, Evaluation, and Policy Development.
- Meyer, K. A. (2006). The method (and madness) of evaluating online discussions. *Journal of Asynchronous Learning Networks*, 10(4), 83-97.
- Meyer, K. A. (2002). *Quality in distance education: Focus on on-line learning* (ASHE-ERIC Higher Education Report, 29 (4). San Francisco: Jossey-Bass.
- Meyrowitz, J. (1990). Using contextual analysis to bridge the study of mediated and unmediated behavior. In B. D. Ruben and L.A. Lievrouw (Eds.) *Mediation, Information and Communication, Volume 3* (pp. 67-94). New Brunswick, NJ: Transaction Publishers.
- Miles, M. & Huberman, M. A. (1994). *Qualitative Data Analysis: An Expanded Sourcebook*. 2<sup>nd</sup> Ed. Thousand Oaks, CA: Sage.
- Moller, L. (1998). Designing communities of learners for asynchronous distance education. *Educational Technology Research and Development*, 46(4), 115-122.
- Moore, M. G. (1993). Theory of transactional distance. In D. Keegan (Ed.), *Theoretical principles of distance education* (pp. 22-38). New York, NY: Routledge.
- Moore, M. G. & Kearsley, G. (1996). *Distance learning: A systems view*. Belmont, CA: Wadsworth Publishing Company.
- Nahl, D. (2004). Measuring the affective information environment of Web searchers. *Proceedings of the 67<sup>th</sup> Annual Meeting of the American Society of Information Science & Technology*, 41, 191-197.
- Nahl, D. (2001). A conceptual framework for explaining information behavior. *Studies in Media and Information Literacy Education*, 1(2), 1-16.
- National Center for Educational Statistics (NCES). (2003). *Distance learning at degree granting postsecondary institutions: 2000-2001*. Washington, DC: National Center for Education Statistics.
- Neuendorf, K. A. (2002). *The content analysis guidebook*. Thousand Oaks, CA: Sage.
- Nincic, V. (2006). Why don't we trade places? Some issues relevant for the analysis of diasporic Web communities as learning spaces. In J. Weiss, et al. (Eds). *The international handbook of virtual learning environments* (pp. 1067-1088). Netherlands: Springer.
- Northway, M. L. (1952). *A primer of sociometry*. Toronto, Ontario, Canada: University of Toronto Press.
- Olsson, M. (1998). *Discourse: A new theoretical framework for examining information behaviour in its social context*. Paper given at the Information Seeking in Context

- Conference (ISIC), Sheffield, UK. Retrieved from [http://informationr.net/isis/ISIC1998/98\\_Olsson.pdf](http://informationr.net/isis/ISIC1998/98_Olsson.pdf)
- Paccagnella, L. (1997). Getting the seats of your pants dirty: Strategies for ethnographic research on virtual communities. *Journal of Computer-Mediated Communication*, 3(1). Retrieved from <http://jcmc.indiana.edu/vol3/issue1/paccagnella.html>
- Palloff, R. M., and Pratt, K. (2001) *Lessons from the Cyberspace Classroom: The realities of online teaching*. San Francisco, CA: Jossey-Bass.
- Pennanen, M. & Vakkari, P. (2003). Students' conceptual structure, search process, and outcome while preparing a research proposal: A longitudinal case study. *Journal of the American Society for Information Science*, 54(8), 759-770.
- Pendleton, V. E. M., & Chatman, E. A. (1998). Small world lives: Implications for the public library. *Library Trends*, 46(4), 732-751.
- Petraglia, J. (1998). The real world on a short leash: The (mis)application of constructivism to the design of educational technology. *Educational Technology Research and Development*, 46(3), 53-65.
- Piaget, J. (1950). *The psychology of intelligence*. New York: Routledge.
- Preece, J. (2000). *Online communities: Designing usability and supporting sociability*. New York, NY: Wiley.
- Preece, J., Nonnecke, B., & Andrews, D. (2004). The top five reasons for lurking: Improving community experiences for everyone. *Computers in Human Behavior*, 20(2), 201-223.
- Quan-Haase, A., Wellman, B., Witte, J. C., & Hampton, K. N. (2002). Capitalizing on the Internet: Social contact, civic engagement, and sense of community. In B. Wellman & C. Haythornthwaite (Eds.), *Internet and everyday life* (pp. 291-324). London, UK: Blackwell.
- Radford, A. W. (2011). *Learning at a Distance: Undergraduate Enrollment in Distance Education Courses and Degree Programs*. Washington, DC: National Institute for Education Statistics, Institute of Education Sciences.
- Rettie, R. (2003). Connectedness, awareness and social presence. *PRESENCE 2003, 6th Annual International Workshop on Presence*. Aalborg, Denmark. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.101.9820&rep=rep1&type=pdf>
- Rheingold, H. (1993). *The virtual community: Homesteading on the electronic frontier*. Reading, MA: Addison-Wesley.
- Roberts, J. (2006). Limits to Communities of Practice. *Journal of Management Studies*, 43(3), 623-639.
- Richardson, J. C., & Swan, K. (2003). Examining social presence in online courses in relation to students' perceived learning and satisfaction. *Journal of Asynchronous Learning Networks*, 7(1), 68-88.
- Rogoff, B. (1994). Developing understanding of the idea of communities of learners. *Mind, Culture, and Activity*, 1(4), 209-229.
- Rovai, A. P. (2007). Facilitating online discussions effectively. *Internet and Higher Education*, 10(1), 77-88.

- Rovai, A. P. (2004). A constructivist approach to online college learning. *Internet and Higher Education*, 7(2), 79-93.
- Rovai, A. P. (2003a). Strategies for grading online discussions: Effects on discussions and classroom community in internet-based university courses. *Journal of Computing in Higher Education*, 15(1), 89-107.
- Rovai, A. P. (2003b). The relationships of communicator style, personality-based learning style, and classroom community among online graduate students. *The Internet and Higher Education*, 6(4), 347-363.
- Rovai, A. P. (2002a). Development of an instrument to measure classroom community. *Internet and Higher Education*, 5, 197-211.
- Rovai, A. P. (2002b). *CCS Test Booklet*. Unpublished document received from the author.
- Rovai, A. P. (2002c). A preliminary look at the structural differences of higher education classroom communities in traditional and ALN courses. *Journal of Asynchronous Learning Networks*, 6(1), 41-56.
- Rovai, A. P. (2002d). Building sense of community at a distance. *International Review of Research in Open and Distance Learning*, 3(1).
- Rovai, A. P. (2002e). Sense of community, perceived cognitive learning, and persistence in asynchronous learning networks. *Internet and Higher Education*, 5(4), 319-332.
- Rovai, A. P. (2001). Building classroom community at a distance: A case study. *Educational Technology Research and Development*, 49(4), 33-48.
- Rovai, A. P. (2000). Building and sustaining community in asynchronous learning networks. *Internet and Higher Education*, 3(4), 285-297.
- Rovai, A. P., & Barnum, K. T. (2003). On-line course effectiveness: An analysis of student interactions and perceptions of learning. *Journal of Distance Education*, 18(1), 57-73.
- Rovai, A. P., & Gallien Jr., L. B. (2005). Learning and sense of community: A comparative analysis of African American and Caucasian online graduate students. *Journal of Negro Education*, 74(1), 53-62.
- Rovai, A. P., & Jordan, H. (2004). Blended learning and sense of community: A comparative analysis with traditional and fully online graduate courses. *International Review of Research in Open and Distance Learning*, 5(2). Electronic journal, no pagination. Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/192/274>
- Rovai, A. P., & Wighting, M. J. (2005). Feelings of alienation and community among higher education students in a virtual classroom. *Internet and Higher Education*, 8(2), 97-110.
- Rumelhart, D. E. (1977). *Introduction to human information processing*. New York: Wiley.
- Rutter, J. and G. W. H. Smith (2005). Ethnographic presence in a nebulous setting. In C. Hine (Ed.), *Virtual methods: Issues in social research on the Internet* (pp. 81-92). New York, NY: Berg.

- Rybas, N. and R. Gajjala (2007). Developing cyberethnographic research methods for understanding digitally mediated identities. *Forum: Qualitative Social Research* 8(3): 1-15.
- Savolainen, R. (2009a). Epistemic work and knowing in practice as conceptualizations of information use. *Information Research*, 14(1). Retrieved from <http://informationr.net/ir/14-1/paper392.html>
- Savolainen, R. (2009b). Information use and information processing: Comparison of conceptualizations. *Journal of Documentation*, 65(2), 187-207.
- Savolainen, R. (2009c). Interpreting informational cues: An explorative study on information use among prospective homebuyers. *Journal of the American Society for Information Science and Technology*, 60(11), 2244-2254.
- Savolainen, R. (2009). Small world and information grounds as contexts of information seeking and sharing. *Library & Information Science Research*, 31(1), 38-45.
- Savolainen, R. (2008). *Everyday information practices: A social phenomenological perspective*. Lanham, MD: Scarecrow.
- Savolainen, R. (2006). Information use as gap-bridging: The viewpoint of sense-making methodology. *Journal of the American Society for Information Science and Technology*, 57(8), 1116-1125.
- Savolainen, R. (2000). Incorporating small parts and gap-bridging: Two metaphorical approaches to information use. *The New Review of Information Behaviour Research*, 1, 35-50.
- Savolainen, R. (1992). The sense-making theory - an alternative to intermediary-centered approaches in library and information science? In P. Vakkari & B. Cronin (Eds.), *Conceptions of library and information science: historical, empirical and theoretical perspectives. Proceedings of the International Conference held for the celebration of 20th Anniversary of the Department of Information Studies, University of Tampere* (pp. 149-164). London, UK: Taylor Graham.
- Schultz-Jones, B. (2009). Examining information behavior through social networks. *Journal of Documentation*, 65(4), 592-631.
- Scribner, J. P. & Donaldson, J. F. (2001). The dynamics of group learning in a cohort: From nonlearning to transformative learning. *Educational Administration Quarterly*, 37(5), 605-636.
- Shen, D., Nuankhieo, P., Huang, X., Amelung, C., & Laffey, J. (2008). Using social network analysis to understand sense of community in an online learning environment. *Journal of Educational Computing Research*, 39(1), 17-36.
- Spooner, F., Spooner, M., Algozzine, B. & Jordan, L. (1998). Distance education and special education: Promises, practices, and potential pitfalls. *Teacher Education and Special Education*, 21(2), 121-131.
- Spurigin, K. M. & Wildemuth, B. M. (2009). Content analysis. In B. M. Wildemuth (Ed.), *Applications of social research methods to questions in information and library science* (pp. 297-307). Westport, CT: Libraries Unlimited.
- Stein, D., & Wanstreet, C. (2003). Role of social presence, choice of online or face-to-face group format, and satisfaction with perceived knowledge gained in a

- distance learning environment. *2003 Midwest Research-to-Practice Conference in Adult, Continuing, and Community Education*, 193-198. Retrieved from <https://scholarworks.iupui.edu/bitstream/handle/1805/358/Stein%20&%20Wanstreet.pdf?sequence=1>
- Storberg-Walker, J. (2008). Wenger's communities of practice revisited: A (failed?) exercise in applied communities of practice theory-building research. *Advances in Developing Human Resources*, 10(4), 555-577.
- Swan, K. (2003). Developing social presence in online course discussions. In S. Naidu (Ed.), *Learning & teaching with technology: Principles and practices* (pp. 147-164). London, UK: Kogan Page.
- Tanni, M. & Sormunen, E. (2008). A critical review of research on information behavior in assigned learning tasks. *Journal of Documentation*, 64(6), 893 – 914.
- Taylor, J. (2001). Fifth generation distance education. Keynote Address presented at the *20th ICDE World Conference*, Düsseldorf, Germany.
- Teli, M., F. Pisanu, et al. (2007). The internet as a library-of-people: For a cyberethnography of online groups. *Forum: Qualitative Social Research* 8(3), 1-18.
- Thompson, C. (2011, July 15). How Khan Academy is changing the rules of education. *Wired Magazine*. Retrieved March 10, 2012, from [http://www.wired.com/magazine/2011/07/ff\\_khan/all/1](http://www.wired.com/magazine/2011/07/ff_khan/all/1)
- Thorpe, M. (1998). Assessment and third generation distance education. *Distance Education*, 19(2), 265-286.
- Todd, R.J. (2006). From information to knowledge: Charting and measuring changes in students' knowledge of a curriculum topic. *Information Research*, 11(4). Retrieved from <http://InformationR.net/ir/11-4/paper264.html>
- Todd, R. J. (2005). Information intents. In K. E. Fisher, S. Erdelez & L. McKechnie (Eds.), *Theories of information behavior* (pp. 198-203) (ASIST Monograph Series). Medford, N.J: Information Today.
- Todd, R. J. (1999a). Back to our beginnings: Information utilization, Bertram Brookes and the Fundamental Equation of Information Science. *Information Processing & Management*, 35(6), 851-870.
- Todd, R. J. (1999b). Utilization of heroin information by adolescent girls in Australia: A cognitive analysis. *Journal of the American Society for Information Science*, 50(1), 10-23.
- Todd, R. J. (1997). *Information utilization: A cognitive analysis of how girls utilize drug information based on Brookes' fundamental equation* (unpublished Doctoral dissertation). University of Technology, Sydney, Australia.
- Todd, R. J. & Kuhlthau, C. (2005). Student learning through Ohio school libraries, Part 1: How effective school libraries help students. *School Libraries Worldwide*, 11(1), 63-88.
- Tu, C. H. (2000). On-line learning migration: From social learning theory to social presence theory in a CMC environment. *Journal of Network and Computer Applications*, 23(1), 27-37.

- Tu, C. H. & Mclsaac, M. (2002). The relationship of social presence and interaction in online classes. *American Journal of Distance Education*, 16(3), 131-150.
- Tuominen, K. & Savolainen, R. (1997). A social constructionist approach to the study of information use as discursive action. In P. Vakkari, R. Savolainen & B. Dervin (Eds.), *Information seeking in context: proceedings of an international conference on research in information needs, seeking and use in different contexts* (pp. 81-96). London, UK: Taylor Graham.
- Turner, T. C. (2008). *Understanding community: the implications of information flow and social interactions in online discussion groups*. (Unpublished Doctoral dissertation). University of Washington Seattle.
- Valentine, D. (2002). Distance learning: Promises, problems, and possibilities. *Online Journal of Distance Learning Administration*, 5(3). Retrieved February 1, 2012 from <http://distance.westga.edu/~distance/ojdl/fall53/valentine53.html>
- Vesely, P., Bloom, L., & Sherlock, J. (2007). Key elements of building online community: Comparing faculty and student perceptions. *MERLOT Journal of Online Learning and Teaching*, 3(3), 234-246.
- Vygotsky, L. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- Ward, K. (1999). Cyber-ethnography and the emergence of the virtually new community. *Journal of Information Technology*, 14(1), 95-105.
- Wegerif, R. (1998). The social dimension of asynchronous learning networks. *Journal of Asynchronous Learning Networks*, 2(1), 34-49.
- Wellman, B. (1983). Network analysis: Some basic principles. *Sociological Theory*, 1, 155-200.
- Wellman, B., Garton, L., & Haythornthwaite, C. (1997). Studying online social networks. *Journal of Computer Mediated Communication*, 3(1). Retrieved from <http://jcmc.indiana.edu/vol3/issue1/garton.html>
- Welser, H. T., Gleave, E., Fisher, D., & Smith, M. (2007). Visualizing the signatures of social roles in online discussion groups. Online journal. No pagination. *Journal of Social Structure*, 8(2). Retrieved from <http://www.cmu.edu/joss/content/articles/volume8/Welser/>
- Wenger, E. C. (1998). *Communities of practice: Learning, meaning, and identity*. New York, NY: Cambridge University Press.
- Wenger, E., McDermott, R., & Snyder, W. P. (2002). *Cultivating communities of practice: A guide to managing knowledge* Boston, MA: Harvard Business School Press.
- Wenger, E., White, N., & Smith, J. D. (2009). *Digital habitats: Stewarding technology for communities*. Portland, OR: CPsquare.
- Wingens, M. (1990). Toward a general utilization theory: A systems theory reformulation of the two-communities metaphor. *Knowledge: Creation, Diffusion, Utilization*, 12(1), 27-42.
- Zhu, E. (1996). *Meaning negotiation, knowledge construction, and mentoring in a distance learning course*. Indianapolis, IN: Association for Educational Communications and Technology. (ED 397 489)

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- Cooke, N. A. (In press). It takes a village to teach online. In A. Sigal (Ed.), *Advancing Librarian Education: Technological Innovation and Instructional Design*. Hershey, PA: IGI Global.
- Cooke, N. A. and Teichmann, J. (2012). *Instructional Strategies and Techniques for Information Professionals*. Oxford: Chandos Publishing.
- Cooke, N. A. (2012, April). DO believe the hype. *School Library Monthly*, 28(7), 18-20.
- Cooke, N. A. (2010). Becoming an andragogical librarian: Using library instruction as a tool to combat library anxiety and empower adult learners. *New Review of Academic Librarianship*, 16(2), 208-227.
- Cooke, N. A., & Edwards, S. (2010). The Spectrum Doctoral Fellowship Program: The Future is Overdue. *JELIS*, 51(3). Retrieved from <http://jelis.org/featured/the-spectrum-doctoral-fellowship-program-the-future-is-overdue-by-nicole-a-cooke-and-sheri-edwards/>
- Cooke, N. A. (2009). Eating forbidden fruit: Censorship, intellectual freedom, and banned books. In R. Sittler and D. Cook (Eds.), *The Library Instruction Cookbook*. Chicago: The Association of College and Research Libraries.



- Hawthorne, P., & Cooke, N. A. (April 2008). Trendspotting and microtrends in academic libraries. *College and Research Libraries News*, 69(4), (pp. 214-215).
- Cooke, N. A. (2008). Clara Stanton Jones. In H. L. Gates & E. B. Higginbotham (Eds.), *The African American National Biography: Vol. 4.* (pp. 642-643). New York: Oxford University Press.
- Cooke, N. A. (2008). Sadie Peterson Delaney. In H. L. Gates & E. B. Higginbotham (Eds.), *The African American National Biography: Vol. 2.* (pp. 631-632). New York: Oxford University Press.
- Cooke, N. A. (2007). Plagiarism and distance education. In S. Clayton (Ed.), *Going the Distance: Library Instruction for Remote Learners* (pp. 73-79). New York: Neal-Schuman Publishers, Inc.
- Cooke, N. A. (2006). Conquering library anxiety. In K. Manuel (Ed.), *Information Literacy Course Handbook for Distance and In-class Learners: Active Learning Handbook Series No. 1* (pp. 37-40). Pittsburgh, PA: Library Instruction Publications.
- Cooke, N.A. (2004). The role of libraries in web-based distance education: An account and an analysis of the impact of web technology on distance learning - what remains unchanged, what is changing. *Journal of Library & Information Services in Distance Learning*, 1(4), 47-57.
- Cooke, N.A. (2003). Web Watch: Eating disorders. *Library Journal*, 128(14), 28 & 30.