

INTERACTION EQUIVALENCY IN SELF-PACED ONLINE LEARNING  
ENVIRONMENTS: AN EXPLORATION OF LEARNER PREFERENCES

by

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## Abstract

This mixed methods study explored the dynamics of interaction within a self-paced online learning environment utilizing both rich media and a mix of traditional and emerging asynchronous computer-mediated communication tools to determine what forms of interaction learners in a self-paced online course value most as well as what impact they perceive interaction to have on their overall learning experience. This study demonstrated that depending on the specific circumstance, not all forms of interaction may be either equally valued by learners or effective. Participants reported that informal interactions were as important as formal interactions in determining the quality of the online learning experience. In addition, participants reported the activity of blogging as being equally valued and in some ways superior to instructor-directed asynchronous discussion via the discussion board in a learning management system. While it may be possible to design opportunities for interpersonal interaction that may in fact rival interaction with the instructor or content, in the particular self-paced online learning environment that was studied, this was not the case. As a result of this study, the researcher developed the Interaction Matrix as one potential model for considering the incorporation of the holistic interaction forms available when designing online learning environments. The results of this study provide guidelines for instructional designers developing instructional strategies for online environments when neither the instructor nor course requirements impose pace upon the learners. The components of what may be deemed “well-designed instruction” can span beyond stimulus-response or drill and practice activities to include a wide range of dynamic interactions as outlined in the Interaction Matrix. Such diverse interactions all collectively comprise a dynamic learning

environment consisting of one or more learning communities that can extend beyond the restrictions of any single course section, connecting learners in unique ways.

## Dedication

This dissertation is dedicated to my wife Teara who has supported me at every step of my education. Her undying support through what at times admittedly seemed like an unending journey has made it possible to successfully reach this milestone.

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## CHAPTER 1. INTRODUCTION

### Introduction to the Study

It is widely accepted that learning takes place through active engagement rather than passive transmission (S. W. Brown & King, 2000; Dobrovolny, 2006; Jonassen, 1999; Mezirow, 1997). This principle of active intercourse with either concepts or agents has been commonly labeled as “interaction.” It is through such interactions that knowledge can be constructed in a meaningful and memorable fashion. The precept of interaction is perhaps one of the most documented and disputed aspects of education, serving as a foundational component for many seminal and contemporary approaches to understanding the phenomenon of learning (Anderson, 2003). Having been hailed as one of the catalysts for movement from teacher-directed to learner-centered approaches, interaction is understood to be a fundamental element for quality learning environments (Flottemesch, 2000; Garrison & Anderson, 2003; Juwah, 2006; Kearsley, 1995; Picciano, 2002; Sherry, 1996). Often conceptualized as the mechanism whereby participants in the learning environment communicate with each other and respond to each other’s needs, interaction can also be generalized to reflect a wide array of processes—whether intrapersonal, interpersonal, or even interfacing with other technology agents (Hirumi, 2006; Mayes, 2006). In the simplest context however, interaction is engagement in learning (Wanstreet, 2006). Yet, the design and support of learning interactions that are

both genuinely engaging and conceptually stimulating within online learning contexts remains a significant challenge in contemporary education (Ravenscroft & McAlister, 2006).

No matter how one defines interaction, based on recent research it is clear that when the level of interaction is inadequate or nonexistent, learners often feel isolated and an overall degradation of the learning experience can take place (Bibeau, 2001; Howland & Moore, 2002; Mann, 2005; Wanstreet, 2006). Conversely, the learning experience is enriched as learners engage in interactions within the learning environment that serve to scaffold the synthesis, evaluation, and application of knowledge (Rovai & Barnum, 2003; Wiley, 2006). Interaction has been identified as a central component of such engaging learning environments and a catalyst for the development of thriving learning communities (Hodge, Bossé, Foulconer, & Fewell, 2006; Swan, 2002). The higher education establishment has been quick to recognize the value of interaction as new distance education programs are emerging that embrace a socially constructed paradigm in an attempt to foster various levels and types of interaction (M. Brown & Long, 2006). Often, the goal of such efforts is for a sense of engagement to develop as learners interact in meaningful ways with each other, the instructor, and the content of the course (Ouzts, 2006; Rovai, 2002).

The rapid advancement of communications technology continues to spawn new applications and opportunities within online education for interpersonal interaction, forcing designers and instructors to revisit the construct of interaction and make purposeful selections of the activities that will foster the most beneficial learning experience. The rise of synchronous and asynchronous computer-mediated

communication (i.e., e-mail, threaded discussion, synchronous chat) combined with the integration of a structured learning management system environment has been mistakenly hailed by some as the panacea for developing quality online learning (Koszalka & Ganesan, 2004). Reminiscent of the Clark (1994) versus Kozma (1994) debate, the battle of media versus instruction continues to rage as educators and designers make decisions concerning appropriate implementation of various media and communication technologies within the development of online learning environments. The needs and preferences of learners ought to influence such decisions.

In an effort to meet the ever-increasing needs of adult learners, educational institutions are recognizing the potential of emerging educational models that place increasing emphasis upon both formal and informal learning networks values and are seeking to develop more flexible learner-paced models that provide learners the freedom to customize aspects of the learning experience to meet their personal and educational preferences (Dron, 2007; Kahn, 2007; Twigg, 2003). These new models appear especially attractive to administration because of the potential to not only meet the needs of the rapidly growing demographic of adult learners but also to support economies of scale (Anderson, Annand, & Wark, 2005; R. A. Ellis, Jarkey, Mahony, Peat, & Sheely, 2007; Taylor, 2001). Such flexible learning environments represent a unique and still rather unexplored segment of the expansive territory of online learning. Whereas an imposed-pace model sets definitive parameters for the course stipulating that all learners engage in the same learning activities at specific time periods, the self-paced approach affords more autonomy to the learner and provides benchmarks for progress and achievement while allowing learners to proceed at an individualized pace. While an

imposed-pace course lends itself to regular or occasional collaborative activities, the self-paced course presents a more challenging environment for fostering collaboration among learners as individual learners may be at different stages of the course at any given time (Anderson et al., 2005). Rather than implying a lack of guidance, the self-paced approach affords learners an increased measure of flexibility as to the pace in which they engage in the various course activities and communications with others. Emerging tools and approaches for interaction based upon the new social computing capabilities of the semantic Web now make possible a wide array of interactions not only within the specified course environment but also across learner-defined domains that span beyond the virtual “walls” of the course (Dalsgaard, 2006; Dron, 2006b). As the options for interaction within the online learning environment grow, so does the necessity for identifying the types of interactions valued most by learners.

Substantial attention has been paid in the literature to focusing upon interaction within cohort-based, instructor-paced online environments characterized by specified start and end dates, limited entry points, and instructor-led discourse (Ho, 2005; Jung, Choi, Lim, & Leem, 2002; Joyce Lee, Carter-Wells, Glaeser, Ivers, & Street, 2006; Maor, 2003; Ouzts, 2006). Yet, the perspectives of students concerning their experiences regarding interactions within learner-paced education models is notably absent from the literature (Anderson et al., 2005). Online learning initiatives that incorporate a more open and self-paced approach incorporate unique learning environments differing significantly in format and structure from aforementioned instructor-led modes (Ngwenya, Annand, & Wang, 2004). This study explored the dynamics of interaction within a self-paced online learning environment utilizing both rich media and a mix of traditional and emerging

asynchronous computer-mediated communication tools to determine what forms of interaction learners in a self-paced online course value most as well as what impact they perceive interaction to have on their overall online learning experience. The results of this study provide guidelines for instructional designers developing instructional strategies for online environments when neither the instructor nor course requirements impose pace upon the learners.

### Background of the Study

Contemporary approaches to online learning are marked by the trend toward social constructivist learning modalities (Bednar, Cunningham, Duffy, & Perry, 1991; Driscoll, 2006). Social constructivism, first attributed to Piaget (1969), purports that the learning process is active, stemming from constructing rather than acquiring knowledge. The theory contends that individuals acquire knowledge through social interaction rather than individual exploration. It is the delicate balance between independent and collaborative educational experiences that fosters a thriving social constructivist learning environment. While recent technological advances with respect to computer-mediated communication certainly have helped make the goal of a social constructivist environment even more tangible, many early distance educators have made efforts to balance interaction with independent intellectual development (Daniel & Marquis, 1988).

The shift away from traditional instructivist practices toward more learner-centered models over the past several decades has opened the door for a resurgent emphasis on individualized learning to emerge. Such independent learning designs, commonly referred to as self-paced or learner-paced approaches, have dominated

distance education research and practice for many years. The seminal research of distance education theorists such as Keegan (1996), Brockett and Hiemstra (1991), and Holmberg (1989) point to the strengths of self-paced education, including the ability to overcome time and place constraints, choices for learners concerning media content type and pace, and the economic scalability.

These flexible online learning environments, while providing learners with increased freedom and access, have been historically criticized for limiting learners' ability to interact with peers in the learning community (Danaher, 1994). New social networking technologies, such as blogging, link sharing, collaborative authorship, and content syndication are being introduced that enable learners to collaborate in new and meaningful ways, therefore extending the theoretical and pragmatic bounds for the use of computer-mediated communication in online learning contexts. Whereas the use of traditional learning management systems creates a very organized, secure, and restricted learning environment, such emerging social technologies afford new distributed student-centered approaches to learning allowing individual learners more control of the learning experience. No longer restricted to participating in the learning activities defined by the instructor or housed within a centralized learning management system, learners can take an increasingly proactive role in the development of their own personal learning landscape through the individualized selection and development of personal tools and networks that will extend beyond the duration of the course and foster a lifelong approach to learning (Attwell, 2006; Downes, 2006; Tosh & Werdmuller, 2004).

Studies have explored the benefits of using emerging social software tools, such as wikis, blogs, and RSS, that allow individuals with little or no technical programming

skills to collaborate and quickly and easily contribute to the expanding body of information online (Boulos, Marambo, & Wheeler, 2006; Schwartz, Clark, Cassarin, & Rudolph, 2004). Such studies overwhelmingly praise the strengths of these new communication tools (Beldarrain, 2006; Brescia & Miller, 2006; Cameron & Anderson, 2006; Mason, 2006; West, Wright, Gabbitas, & Graham, 2006). The aforementioned social software tools are among the many that allow individuals to easily create and share content and will be explained further in chapter 3. The horizon is promising for the implementation of such decentralized and predominantly free tools within pre-existing learning environments as they enable a level of informal interactions previously non-existent outside the confines of formal course activities. Yet, the perspectives of students and faculty concerning the effects of incorporating such learner-centered interpersonal interactions in self-paced learning environments is notably absent from the literature (Anderson et al., 2005). The continued investigation of the experiences and preferences of learners concerning the use of these new tools is essential to realizing the full pedagogical implications and best practices for implementation (Sims & Salter, 2006).

The dynamic of online learning includes interactions at numerous levels, spanning from interactions with systems to individuals. The work of Moore (1989) laid the foundation on which successive researchers have sought to explain the principles of interaction. Varying frameworks have resulted, each seeking to explain the dynamics of interaction within learning environments. For example, Garrison and Anderson (2000) focused on the structure of the teaching and learning transaction while simultaneously using the principles of interaction to form the theoretical basis of their seminal work concerning communities in inquiry (Garrison, Anderson, & Archer, 2000; Rourke,

Anderson, Garrison, & Archer, 1999). These early efforts at examining interaction within online learning sought solely to analyze the substance and frequency of interpersonal interactions, with hopes of gleaned clues as to the motivation for participants and their subsequent experiences.

The effects of interaction on both the traditional and online student have been explored within the literature and researchers have consistently found that interaction is essential for a successful learning experience within either the traditional classroom or the contemporary online learning environment (Friesen & Anderson, 2004; Keenan, 2002; Su, 2006; Swan, 2002; Wallace, 2003). Yet, the functions of interaction within the educational transaction are varied. Hannafin (1989) proposed five basic purposes for computer-based interactions: confirmation, pacing, inquiry, navigation, and elaboration. Sims' (1999) classification identified the functions as providing the learner with control, facilitating program adaptation through learner input, allowing diverse forms of participation and communication, and scaffolding the development of meaningful learning. Numerous researchers have since devised similar approaches to classifying the value of interaction while arguing the necessity for purposeful design of interaction into online instruction (e.g., Grooms, 2000; Northrup, 2001; Roblyer & Wiencke, 2003, 2004). The resulting taxonomies that have been developed to explain dynamics of interaction have been tested primarily to demonstrate the importance of the construct, not to differentiate between the varying types of interaction that have been identified.

Interaction may serve numerous purposes within the online learning environment, but the primary focus for many instructional designers and instructors centers around improving student outcomes within the online learning experience. To that end, a number

of important studies examining the dynamics of interaction within the online learning ethos have been conducted. One recent study, for example, examined instructor-student interaction and found significant relationships between student-instructor interaction and student satisfaction (Restauri, 2006). Chang (2003) studied the effect of previous online learning experience on preferences for online interaction and found that learners' preferences for interaction were affected very little by their previous level experience. Prammanee (2005) explored the nature of interaction in an online course and noted that a combination of the learner-content, learner-learner, and learner-instructor interaction, along with an instructor-led analytical model, increased the level and patterns of interaction of students. Learners typically followed the example that the instructor set in terms of modeling the frequency and substance of interaction. The findings of this study suggest that the role of the instructor within the development of interactive and engaging online community should not be marginalized.

The effects of interaction have been measured using various outcomes, such as: learner satisfaction (Stein, Wanstreet, Calvin, Overtoom, & Wheaton, 2005; Strachota, 2003), engagement (Lim, 2004), achievement (Jung et al., 2002), reflection (Roberts, 2002), and retention (Koper, 2005). Yet, questions remain largely unanswered concerning the preferences of students concerning the various interactions that they engage and the degree in which such interactions are perceived to be equivalent. The study of online learning premises from the students' perspective certainly isn't without precedent. Wang (2004) explored the relationship between learner presence and various communication settings within an online course to detect a correlation between visibility learning outcomes, allowing students to rank the perceived order of importance for various online

activities. Willging and Johnson (2004) sought to learn from the personal accounts of students of the factors that influence students to leave an online course. First-hand accounts from learners have been shown to provide rich perspectives of online learning phenomena that have otherwise not been captured. Such insights do not serve to presuppose results to other contexts but rather to gain a holistic understanding of the specific intervention under study. As subsequent research studies are conducted, the rich accounts provided in numerous studies can form a solid foundation for future inductive or empirical studies, therefore adding great value to the body of knowledge.

### Statement of the Problem

Interaction has long been identified as a key element to successful online learning programs (Beldarrain, 2006; Moore, 1993). While not the sole indicator of high-quality and effective online education programs, there is significant evidence to suggest that meaningful interaction with other students and the instructor is integral to the development of thriving learning environments (R. E. Brown, 2001; Garrison & Cleveland-Innes, 2005; H. C. Greene, 2005; Joyce Lee et al., 2006; Swan, 2002). Such engaging interactions are integral to the development of a sense of social connectedness and has been found to enhance both the learning experience and course completion rates (Garrison, 2003; Su, Bonk, Magjuka, Liu, & Lee, 2005; Swan & Shih, 2005).

The rapidly expanding approaches to online education have given rise to varying theoretical bases for judging the appropriateness of incorporating interaction. Insufficient or ineffective interaction may lead to student isolation, while exorbitant levels may lead to overload or frustration (Berge, 1999; Willging & Johnson, 2004). This study aimed to

explore the preferences of learners concerning the various interactions they engage in during a self-paced online course while questioning the presumption espoused by Anderson (2003) that a measure of equivalency exists among these commonly identified forms of interaction in an online learning environment. Anderson's theoretical basis for judging the essential quantities of each of the various types of interaction maintains that as long as one of three primary forms of interaction (student-teacher; student-student; student-content) is at a high level, other forms may be minimized or eliminated without adversely affecting the learning experience. This hypothesis is increasingly attractive to institutions pursuing initiatives to rapidly expand online course offerings as it addresses the limitation that such institutions commonly face regarding the ratio of faculty to students and the amount of student-teacher interaction. This rationale is being extrapolated to support the design of learning approaches that maximize the student-content and student-student interaction while seeking to reduce the level of student-instructor interaction. Yet, little empirical evidence currently exists as to the value that learners place upon the various types of interactions in a self-paced learning environment. This mixed methods study provides a valuable contribution to the body of knowledge concerning socially constructed learning environments by examining the preferences of learners regarding the types of interaction they engage in to learn whether an attribute of interaction equivalency does in fact exist.

### Purpose of the Study

The purpose of this study was to expand upon previous research advocating for the purposeful design of interaction within the online learning experience (C.-W. Chang,

2006; Hirumi, 2002). While numerous researchers have found the construct of interaction in general to be fundamental to the success of an instructor-led and paced online learning initiative, few have either examined the individual elements of interaction within the self-paced learning context or sought to grasp the tenets of such a learning experience through first-hand accounts of learners (Anderson et al., 2005; Wallace, 2003). Such previous studies have primarily focused upon quantitative measures of interaction, but lack the rich insights possible through in-depth interviews of students concerning the substance and quality of their learning experience as well as their preferences for interaction (Ho, 2005; Rovai & Barnum, 2003). This study extends the bounds of previous research into interaction within the online learning experience by examining the relationships of learner preference to the attributes of interaction.

The extent to which various interactions are deemed equivalent by learners has not been well documented within the research literature, and the dynamics of interaction and community formation within socially-constructed self-paced learning environments is even more scarce. Each learning environment is unique based on the design elements and characteristics of the participants and it is therefore problematic to generalize findings from a few deemed “standardized” contexts to all learning venues. Further research is needed to support the intuitive assumption that interaction is necessary and provide empirical evidence for the utility of interaction fostered by emerging models within a variety of online learning environments. This study builds upon existent knowledge of online education by specifically examining the composition of the online learning experience of adult learners in a hybrid self-paced learning environment that includes numerous interactive components and instructor facilitation designed to foster an

engaging and meaningful learning experience. This study sought to learn what forms of interaction learners value most and gain an understanding of their perceptions of the impact that interaction has on their self-paced online learning experience.

### Rationale

New types of technologies that support the needs of students in learner-paced courses are being developed and implemented, promoting the incorporation of an increasing number of informal interaction types. For example, emerging social networking solutions allow for interaction to take place among instructors and students beyond the confines of the learning management system. Such informal learning environments provide a more open venue for learners to connect with others who may be interested in the same subject matter but are either at a different stage of the course or in an entirely different course section (Rhode, 2006). Participation in such an organic learning landscape blurs the lines that have been previously drawn between formal learning applications and informal personalized learning environments that promote lifelong learning. As these traditionally separate learning venues converge, the underlying precepts previously understood need to be re-examined.

It is reasonable to assume that the constructs of the course as well as the individual preferences of learners may influence the development of the learning environment and dynamics of interaction. This study explored the dynamics of interaction within a self-paced learning environment in which interpersonal interaction with fellow learners and the instructor is strongly encouraged but not necessarily required. Rather than mandating asynchronous communication solely within an

instructor-driven threaded discussion board, emerging approaches to fostering interaction encourage the formation of online learning communities and communities of practice outside of the prescribed course boundaries that can serve to scaffold a rich and meaningful learning experience. This study examined the experiences of adult learners who participated in an online course incorporating a variety of traditional computer-mediated communication and emerging educational social software to learn what modes of interaction learners prefer and to what extent such interactions with fellow learners as well as instructor-generated multimedia are perceived as being equivalent.

### Research Questions

This exploratory study sought to examine the experiences and preferences of adult learners concerning the various interactions that they encounter in a self-paced online course. The following four primary research questions guided data collection and analysis efforts:

1. What forms of interaction do adult learners engage in most in self-paced online courses?
2. What forms of interaction do adult learners value most in self-paced online courses?
3. What forms of interaction do adult learners identify as equivalent in self-paced online courses?
4. What impact do adult learners perceive interaction to have on their self-paced online learning experience?

## Significance of the Study

Within distance education frameworks, interactivity is often esteemed as paramount to the development of meaningful and memorable learning experiences (Brewer & Klein, 2006; Joyce Lee et al., 2006) and yet it is a concept that has received relatively little research attention in the literature regarding self-paced learning. In an attempt to add to the body of knowledge concerning the nature and value of interaction in self-paced online learning environments, this study will explore the preferences of learners concerning the various interactions they engage in during a self-paced online course while examining Anderson's (2003) interaction-based model of e-learning within the context of an actual self-paced online program to determine whether or not learner experiences support or refute his "Interaction Equivalency Theorem" in which he proposes,

Deep and meaningful formal learning is supported as long as one of the three forms of interaction (student–teacher; student-student; student-content) is at a high level. The other two may be offered at minimal levels, or even eliminated, without degrading the educational experience. High levels of more than one of these three modes will likely provide a more satisfying educational experience, though these experiences may not be as cost or time effective as less interactive learning sequences (Anderson, 2003, para. 10).

While preferences may vary among learners in regards to the definition and means for evaluating interaction (Sims, 2003; Su et al., 2005), it is important to determine whether participants in online learning experiences identify the various modes of interaction as congruent or disparate. The perceived value of each available interaction

modality will to a large extent determine its current and future role within the online learning experience. The findings of this study have implications for all those involved in online course design, development and instruction as it provides a rich look into the perspectives and preferences of online learners concerning the forms and frequency of interaction.

The findings of this study are important in that they are a significant contribution to the body of empirical research in the expanding field of online education. The results serve to fortify and extend the knowledge base within the field and lay the foundation for successive studies utilizing similar methods. Suggestions for future research studies are proposed within Chapter 5 under the recommendations section.

It is further noted that this study yields valuable findings concerning the online teaching and learning transaction within socially-constructed self-paced learning environments. The experiences of adult learners participating in online courses that incorporate such approaches have to this point been underrepresented in the literature and are a key component to be considered in the both expansion of existing programs as well as the design and development of future initiatives. The results may be of particular value to those seeking to develop online learning programs that promote economies of scale while integrating emerging methodologies.

It has been proposed that the achievement of the full potential of interaction and community networks is dependent upon a repositioning of instructional design roles and processes (Irlbeck, Kays, Jones, & Sims, 2006). To that end, this study and others like it provide valuable insights concerning the role of adult learners in the formation of socially-constructed learning and will serve to inform future design and development

efforts seeking to incorporate such models. The results hold implications for designing and sequencing e-learning interactions to foster the achievement of instructional objectives.

Finally, the findings provide an initial look at the incorporation of informal interactions, such as blogging and educational social software, within the teaching and learning transaction. As the read/write Web continues to develop and increasing emphasis is placed upon including such emerging computer-mediated communication tools within online learning, the value of this and other similar studies focusing on the experiences of learners engaging in learning activities leveraging these promising new tools can not be overstated.

#### Nature of the Study

Building upon previous research in human-human interaction in online learning environments, this qualitative study documents and explores the experiences of adult learners concerning the various types of interactions they engage in throughout the duration of their participation in a self-paced course employing various levels of collaboration with peers and the instructor. This qualitative study provides a naturalistic description of the dynamics of interaction within an online learning environment through the lens of self-paced learners.

Employing a mixed methods approach to gain first-hand accounts from learners regarding their experiences, a convenience sample of learners enrolled in a self-paced online course was selected to participate in in-depth interviews to share first-hand accounts of their interaction experiences and preferences in an effort to glean a holistic

understanding of the dynamics of and learner preferences for interaction within less structured online learning environments. Interviews consisted of a mix of quantitative and qualitative questions allowing participants to indicate their level of engagement in the various types of interactions in the learning environment as well as share first-hand the preferences for interaction in the self-paced online environment. Such rich learner perspectives provide an enlarged and deepened range of immediate experience, adding great value to the body of knowledge by forming a solid foundation for future inductive or empirical studies. Transcripts of the interviews with learners were analyzed and coded for emerging themes while frequencies of engagement were noted and compared.

#### Definition of Terms

The following terms are operationally defined for the sake of this study:

*Adult learner.* For the purpose of this dissertation, the adult learner is an adult older than age 22, who may or may not have already earned a postsecondary education, and who is undertaking a learning venture to expand his/her knowledge and skills.

*Andragogy.* The theory and process of adult learning.

*Asynchronous learning.* Online learning format allowing learners enrolled in a course to login to the online course room and participate in assigned learning activities at their discretion. Learners are not required to be present in the course room at specified times.

*Blog, Weblog.* A personal Web page or online journal consisting of a series of contributions in reverse chronological order that reflect the thoughts and perspective of an individual. Readers have the opportunity to make comments to the postings of the

author. The author and readers can contribute with little to no technical skills background beyond basic Web navigation.

*Course community.* A network of learners interacting throughout the duration of the course without restriction to the confines of a single course section within a learning management system. Whereas learners may be placed in a small cohort with an instructor, they may also have opportunity to communicate with the larger community of all learners within an academic program who may have interest in the subject matter of the course. Learners have the opportunity to continue to participate in the ongoing dialogue after the academic term of the course ends.

*Children's ministry.* The act of training children about spiritual matters. While children's ministry can happen in a variety of contexts, the local church is the most common venue. References to "children's ministry" will imply the local church setting.

*Children's ministries.* The collective religious education classes and activities for children within a local church setting.

*Children's ministry workers.* Individuals volunteering from within the local church congregation to serve in one or more children's ministry classes or activities offered by the local church. Many are parents of children and often times have no previous training or experience prior to volunteering to serve. Some of these individuals may serve for a lengthy period of time and may become coordinators or directors of children's ministry areas within a church. More commonly however, these individuals will serve for only a brief period of time.

*Children's ministry training.* Efforts aimed at equipping and empowering volunteers to serve children within the local church setting. These training opportunities

could include peer mentoring, training classes, worker orientations, or any other efforts to provide ministry development training for volunteers. The connotation of the term used here refers more to training of vocational children's ministry leaders, working either full-time or part-time within a local church enrolled in either a postsecondary certificate program, associate degree, and bachelor degree program offered by a seminary or religious postsecondary institution.

*Community of Inquiry (COI).* A model to represent the diverse elements and yet interrelated aspects to a quality online educational experience, including: cognitive presence, social presence, and teaching presence.

*Distance education.* Learning taking place when the learners and instructors are separated physically by time and space. Access to learning is not limited by geography or physical demands and may involve the use of computer technology and the Internet.

*Educational social software.* "Networked tools that support and encourage individuals to learn together while retaining individual control over their time, space, presence, activity, relationship, and identity" (Anderson, 2006a, p. 83).

*Educational semantic Web.* "The application of advanced Web tools and Web organization to education applications" (Anderson, 2006b, p. 142).

*Formal interaction.* Interaction purposefully designed, often by the instructor or instructional designer, to take place during and facilitate the learning experience.

*Informal interaction.* Extemporaneous interaction, often initiated by learners, that takes place beyond the formal learning environment.

*Interaction.* Process of individuals, objects, materials, or agents directly influencing each other.

*Interactivity.* “Those functions and/or operations made available to the learners to enable them to work with content material presented in a computer based environment” (Sims, 2000, p. 46).

*Learning Management System.* Web-based suite of tools for managing the delivery of instructional content and facilitating computer-mediated communication. Also commonly referred to as a course management system, examples include Blackboard, WebCT, Moodle, Sakai, Angel, and Desire2Learn.

*Learning networks.* Informally connected groups of learners characterized by an environment in which members are autonomous, diverse, and able to control the frequency, substance, and duration of their participation (Downes, 2006).

*Mixed methods research.* “Collecting, analyzing, and mixing both quantitative and qualitative data in a single study or series of studies” (Creswell & Plano Clark, 2007, p. 5)

*Online learning.* Learning facilitated by computer, Internet, e-mail and/or Web site enabling learners separated physically by time and space to collaborate. This mode of learning can include either synchronous or asynchronous communication among students and the instructor.

*Personal learning environment.* Individualized set of loosely-connected tools that allows an individual to engage in a distributed environment consisting of a network of people, services, and resources.

*Podcasting.* Process of publishing media files to the Internet with an RSS feed, allowing users to subscribe to receive new content automatically.

*Qualitative data.* “Open-ended information that the researcher gathers through interviews with participants” (Creswell & Plano Clark, 2007, p. 6).

*Quantitative data.* “Closed-ended information such as that found on attitude, behavior, or performance instruments” (Creswell & Plano Clark, 2007, p. 6).

*RSS.* Abbreviation referring to *Rich Site Summary* or *Really Simple Syndication*, the XML-based process of distributing and aggregating new content on the Web.

*Self-paced online course.* An online learning experience involving a cohort of learners and an instructor, beginning at a specified date. Learners are allotted a certain period of time in which to complete all course activities but are afforded the freedom to proceed through requirements and engage in communications with members of the learning community at an individual pace. Learning community members may utilize both restricted communication tools (ie: asynchronous threaded discussion, e-mail) as well as open tools (ie: course blog, individual blog, synchronous chat) to communicate.

*Social bookmarking.* Web-based approach to saving, categorizing, and sharing bookmarks of favorite online resources with others.

*Social computing.* Open computer-mediated communication technologies enabling the masses to interact, exchange, and sort information.

*Social networks.* Relations or connections between people engaged in different forms of interpersonal communication.

*Social presence, cognitive presence, teaching presence.* While separate definitions for each of these terms may be found within the literature, for the purpose of this study these terms collectively refer to the elements of the online learning experience related to the degree in which participants in a learning environment feel effectively

connected and are able to project themselves and construct meaning through sustained discourse.

*Synchronous learning.* Online learning format requiring learners enrolled in a course to be present online at specified times rather than at the learner's discretion.

*Social software.* Software applications that allow individuals to create online profiles, disseminate a wide variety of rich media, and easily share or co-create resources with members of the network.

*Tringulation design.* Quantitative and qualitative data are collected simultaneously and analyzed together, with results compared to see if findings are similar.

*Wiki.* Web site allowing users to collectively add and edit content.

### Assumptions

The following assumptions are made for this study:

1. Reasonable similarity as well as diversity among the learners within the online certificate program is assumed. Students will not be selected or rejected for participation based on age, ethnicity, or gender but this data will be collected to assess potential differences in response patterns.
2. Learners enrolled in a self-paced online course have experienced the various interactive components of the course.
3. Through expressed measures of confidentiality, the participants will respond in a truthful manner.

## Limitations

No matter what approach is selected when conducting scientific inquiry, limitations invariably exist and must be considered. Due to the extensive contact that the qualitative researcher has with the setting of the study and the participants, efforts must be made to address bias, reliability, and validity (McMillan & Schumacher, 2006; Merriam, 1998). While such precautions will be taken, the following limitations to this study are recognized:

1. As with any qualitative study, the researcher is afforded extensive exposure to the setting and participants of the study. This presents the opportunity for bias as well as threats to reliability and validity to exist. In this study the researcher currently teaches as adjunct faculty for the institution that the participants will be selected from and has served as the instructor for the course(s) that the interviewees will be sharing experiences from. Explicitly detailed research design and methods are therefore essential.
2. The focus of this qualitative study is specific to understanding an educational intervention from the perspective of those involved. The very nature of such inquiry is based on the premise that multiple perspectives for any given experience exist and that the significance of the experience to the participants is what comprises reality (McMillan, 2000). The rich insights gleaned from the participants are specific to that population and cannot be projected upon other classifications of individuals. This study focuses on learner preferences for interaction in a self-paced online learning environment and does not

simultaneously investigate instructor-preferred or administration-preferred tenets worthy of analysis.

3. The sample of adult students is drawn from the same northeastern, private, four-year institution currently enrolled in a self-paced online course offered as part of an online certificate program for children's ministry professionals. It is possible that this may limit the ability to generalize the findings of this study to other learning environments. The findings of this study offer an initial understanding of learner preferences for interaction that may serve as the baseline from which further studies may be conducted.

## CHAPTER 2. LITERATURE REVIEW

### Introduction

The field of online learning is rapidly advancing to meet the evolving needs of 21<sup>st</sup> century learners. The recognized progress is truly evolutionary in nature, whereby the influence of constant technological advances combined with ever-expanding understanding of pedagogical implications and best practices is fostering an environment poised for innovation. The amount of burgeoning research examining various factors pertinent to the development of successful online learning environments is proportionate to the rapid expansion of new developments within the field. The following literature review examines the primary theoretical underpinnings and current findings within the literature concerning the substance and quality of interaction in online learning.

### Theoretical Framework

A host of theoretical foundations have been identified and expanded over the years to help explain the phenomenon of distance education. While the field was initially preoccupied with structural and organizational constraints, the theoretical development is continuing to shift focus from organizational to transactional issues and assumptions (Garrison, 2000). Early theorists such as Wedemeyer (1971), Keegan (1996), and Holmberg (1989) focused upon moving distance education beyond a sole primary format

of “correspondence courses” to embrace more individualized and customizable approaches. As technology has advanced to the point where structural constraints are now a rather insignificant challenge, contemporary distance education theories place communication at the core of the teaching and learning transaction rather than focusing on the mechanics of implementation. Such theoretical ideologies are positioning the field to move into a postindustrial era characterized by an increasing measure of learner diversity and choice, where the primary energy is placed upon facilitation of teaching and learning at a distance. Contemporary theories, such as those serving as foundational components for the generation of the research questions for this study and guiding the following exploration of the literature, concentrate primarily upon the substance of the teaching and learning process and seek to identify approaches that are most conducive to fostering meaningful and memorable learning.

#### *Transactional Perspective*

In concurrence with the dawn of the postindustrial era of distance education, much attention has been placed on understanding the nature of educational transactions (Rovai, 2002; Saba, 2000; Stein et al., 2005). Proponents esteem such active encounters with the concepts of the curriculum as vital to the construction of new knowledge that is both practical and long lasting. The transactional perspective of teaching and learning is based upon the precept that, “Information has meaning and value only when interconnections are made among facts, ideas and experience” (Garrison & Archer, 2000, p. 7). This perspective maintains that knowledge is constructed rather than acquired, claiming that collaboration is essential for the creation and reinforcement of new

knowledge. Therefore, as learners build communication networks with fellow learners and the instructor, avenues for critical inquiry and dialogue are established. The transactional perspective is progressive, recognizing the ability for learners to take responsibility for their learning and capability for independent critical thinking. Incorporating the individual learning contexts of all members of the learning community, this approach recognizes that the unique perspective of each learner adds great richness and therefore is ideally suited for applications related to continuing education, particularly adult education.

#### *Transactional Distance vs. Transactional Control*

Moving a step beyond looking at a macro analysis of educational transactions, Michael Moore's (1986) theory of transactional distance is a widely acknowledged framework of distance education, positing that the extent of dialogue and structure categorizes all educational transactions. Moore's conjecture, independently confirmed by Saba and Shearer (1994), states that the constructs of dialogue and structure are inversely interdependent. This notion of the nature of distance is radically different from previous viewpoints concerning distance education, as geographic distance was no longer the predominant issue to be addressed. Rather, this view acknowledges a measure of "distance" to exist in all learning contexts, characterized by the mix of structure and communication defining any learning event. In effect, transactional distance holds that the greater the structure, the lesser the dialogue within learning encounters. Moore adds a third dimension of autonomy to this framework, recognizing that autonomous learners require neither dialogue nor structure. It is this assertion of the uniqueness of a self-

directed learning experience that introduces a measure of variability to an otherwise straightforward rationale. While Moore's theory has been widely applied and expanded in numerous contexts, it is so broad in scope that it alone does not sufficiently account for the diverse variables constituting a rich distance learning experience (Y.-J. Chen, 2000; Garrison, 2000; Gorsky & Caspi, 2005).

Jon Dron (2006c) proposed a subset of transactional distance that is concerned primarily with the choices afforded to participants in the learning experience. His theory of transactional control, while not aimed at replacing Moore's seminal work regarding transactional distance, does further clarify the dynamics of structure and dialogue within an educational event by defining the associated precepts. Transactional control views structure as equating teacher control, dialogue to negotiated control, and autonomy to learner control. At any point along the learning trajectory, transactional control will vary based upon the extent to which particular individuals make choices regarding the substance of the learning experience. In any educational endeavor, the teacher makes some choices while others are left to the learner. Mapping transactional control to transactional distance, Dron views dialogue as the unifying factor in a teaching and learning transaction, affording both the learner and teacher a measure of control over the learning experience. It is this idea of varying levels of control throughout the learning process supported by rich communication that makes possible the accommodation of the needs and preferences of all participants in the learning environment.

### *Theory of Cooperative Freedom*

While an element of collaboration has certainly been shown to be beneficial to learning in a variety of contexts, the value of individuality and learner autonomy has also been recognized and promoted. Morten Paulsen (1993) was truly a pioneer for his day, proposing the theory of cooperative freedom that surpassed the more popular arguments at the time for the superiority of self-paced education, such as its economic scalability and ability to overcome time and space constraints. His theory of cooperative freedom is classified as one of independence and autonomy, perceiving distance learners as being both motivated and self-directed while possessing the innate desire to control learning outcomes. Paulsen, while recognizing the pedagogical challenge to creating and sustaining meaningful group communication in unpaced learning, argues that many students who choose a distance learning format do so in search of freedom from not only the time and place learning constraints, but also freedom to choose the type of media and content, times of access, and pace of the learning. He elaborates on this notion by proposing six key freedoms prized by distance learners that computer-mediated communication utilized within an online learning environment can foster. These include the well-known freedom of time and freedom of space that have widely defined traditional distance education programming. Paulsen notes the freedom to pace learning to best meet the learner's individual schedule and time availability as well as competencies. The fourth dimension pertains to the freedom to choose the learning medium that best addresses the learning style and preferences of the learner. The next freedom, the freedom of access, includes removing the barriers of prerequisites, high

costs, and exorbitant technology requirements. Finally, the freedom of curriculum allows learners to choose from among a wide array of course offerings and permits the transfer of credits between programs and institutions. According to Paulsen, the ideal distance education solution embraces these key dimensions of cooperation and freedom, maximizing the amount of control afforded to learners.

*Interaction Equivalency Theorem*

Recognizing the wide range of learner needs and distance education program formats afforded by the emerging computer-mediated communication as well as the reality that no single medium supports the educational experience in a manner superior to all others (Russell, 2005), Terry Anderson (2003) sought to formulate a theoretical framework for explaining the dynamics of learner interactions in the context of self-paced courses delivered online. He noted the utility for institutions involved in distance and online education to routinely examine and adjust delivery models to accommodate both the largest number of students and significant niche groups of learners. In an effort to account for the numerous approaches to designing online learning curriculum and to build upon previously espoused theoretical rationale regarding interaction, Anderson proposed his “Interaction Equivalency Theorem” in which he posits:

Deep and meaningful formal learning is supported as long as one of the three forms of interaction (student–teacher; student-student; student-content) is at a high level. The other two may be offered at minimal levels, or even eliminated, without degrading the educational experience. High levels of more than one of these three modes will likely provide a more satisfying educational experience,

though these experiences may not be as cost or time effective as less interactive learning sequences (Anderson, 2003, para. 10).

This theorem forms the foundation for an extensible model of community based learning support permitting learner-learner interaction in a cost effective manner while also maintaining the qualities of self-paced learning (Anderson et al., 2005). While maintaining the value of diverse types and quantities of interaction in any educational experience, Anderson's theorem opens the door for exploration of emergent curriculum designs and interaction approaches that extend beyond the common instructor-paced, class model of education. This theorem implies that one type of interaction may be substituted for others without a degradation of the educational experience. Yet, this proposition of substitutivity isn't as straightforward as a first glance at Anderson's theorem may suggest. Not all students may interact meaningfully with peers or content and may therefore require or prefer interaction with an instructor. Yet, some students certainly may prefer to interact with the content or other students in a greater proportion than with the instructor. The key to Anderson's thesis is that each student is different and requires a specific mix of interaction to fit specific preferences and needs. Numerous corollaries and implications for the design and facilitation of learning stem from the extent to which such varying interaction truly is perceived as being equivalent by learners.

## The Emergence of Online Education

The influence of technology upon society is astounding and continues to evolve. The field of education is certainly not exempt from the technological advances of this past century. Recent technological innovations over the past quarter century have had a particularly profound influence on postsecondary distance education. The rapid proliferation of the World Wide Web and vast advancement of multimedia technologies have opened the door to new approaches for designing and delivering teaching and learning in higher education. Online education certainly continues to expand and influence higher education (M. F. Williams, III, 2003). This is no recent phenomena, as distance education within the online setting has been continually developing and expanding since the advent of the Internet (Khan, 1997). Even though growth in online education has been steady, it has not been equal among varying educational contexts. While over 90% of public colleges and universities in the United States have embraced online education at some level, only 53% of private, non-profit postsecondary institutions offer any form of online courses (Allen & Seaman, 2004).

The advancement of online education in the United States over the past decade is evidenced by both numerical and programmatic growth. By 1998, 44% of higher education institutions offered distance learning courses, with 8% providing an entire program on the World Wide Web (Council, 2001, as cited in M. F. Williams, III, 2003). Those figures have increased rapidly, as the same study repeated just two years later showed that 56% of postsecondary institutions offered distance education courses, with 34% offering a degree or certificate program that could be completed entirely online. An

additional 12% of institutions indicated that they planned to begin offering distance education courses in the next three years (Waits & Lewis, 2003). The research further showed that among the institutions reportedly offering distance education courses in 2000-2001, 30% offered degree programs and 16% offered certificate programs” (Waits & Lewis, 2003). Large public institutions have been at the forefront of online education, leading the way in terms of the number of course offerings. In 2005 more than 96% of institutions with more than 15,000 enrollments reported offering online courses, with the rate of online program development proportional to the increase of overall institutional enrollment (Allen & Seaman, 2006). In the fall of 2003, over 1.9 million students were studying online, with online enrollments growing at a faster rate than for the overall student body (Allen & Seaman, 2004). The number of higher education students taking at least one online course during 2005 rose to 3.2 million, an increase of 40% in just two years (Allen & Seaman, 2006). No signs of decline in these trends are anticipated anytime soon.

Online education is quickly becoming the norm rather than the exception for many higher education institutions seeking to attract and retain adult learners. An increasing number of both traditional-age and older adult learners are seeking flexible, technology-based learning experiences (Allen & Seaman, 2006). Reasons for these preferences vary and include a wide range of factors from learning styles to convenience. These expectations are prompting institutions to look for new instructional design theories and methods for delivering instruction, updating curriculum and delivery methods (M. F. Williams, III, 2003). In order to accommodate an ever-increasing

potential body of learners, administrators and designers of online learning initiatives look to solutions that can address both the quality of the learning experience as well as economies of scale. Technology-based learning has been shown to offer a flexible educational option for students who desire to proceed through a course in a self-directed fashion (Jiyeon Lee & Gibson, 2003; Oladoke, 2006). These education options, in the form of online education, offer institutions and administrators flexibility as they seek to meet the evolving demands of 21<sup>st</sup> century learners and remain competitive (M. F. Williams, III, 2003).

Institutions seeking to remain relevant to student's needs must consider changes to the traditional paradigm of the manufacture, distribution, and delivery of learning (Wulf, 2003, as cited in McLaughlin, 2004). By offering courses in the online format, institutions provide educational opportunities to individuals who may be unable to physically travel to a campus due to time and geographic restraints (M. F. Williams, III, 2003). Thus, online courses aid in reaching students who otherwise might not be able to attend college or who wish to expand their education later in life.

The preferences people have for online instruction has been recognized for quite some time and continue to strengthen as new online programs are established and graduates demonstrate competence in their fields stemming from their online education.

Online instruction using Web technologies arouses great enthusiasm among educators and students. It provides a convenient environment for academic discourse, debate, discussion, collaboration, and friendly communication for people who are separated by time and place. It facilitates the involvement of

outside experts and allows mature learners to bring their own experience and expertise to the learning process. Online learning also introduces new organizational, structural, intellectual, and cultural approaches to the educational process (Heath, 1997, p. 148).

Adult learners are an especially ripe learning population for institutions offering online programs, possessing learning needs that vary from more traditional college-age students (McLaughlin, 2004). Online students tend to be older and often have additional family and employment responsibilities as compared to the “traditional student” – the 18-21 year old attending a brick and mortar institution of higher education (Allen & Seaman, 2006). The commonly cited educational requirements of flexibility and anytime/anywhere access combined with the increased capabilities of self-directedness are ones that can often be more easily met through the online learning environment as compared to face-to-face settings.

#### Relationship of the Research Questions to Literature Themes

This exploratory study examined the experiences and preferences of adult learners concerning the various interactions that they encounter in a self-paced online course to determine whether a perceived equivalency exists among the various interactive elements. The following review of the literature explores the theoretical frameworks and empirical research conducted to date, examining the dynamics of interaction in online learning environments.

## Informal Versus Formal Learning

Despite the emphasis that is placed upon the design and development of formal educational initiatives, holistic education has always been categorized by both formal and informal learning opportunities. Individuals learn throughout their lives in a variety of settings and contexts, many of which do not involve formal educational settings. Jay Cross (2006) contends that as much as 85% of learning takes place outside of formal educational settings, yet proportionately little attention has been paid to understanding informal learning and how it takes place (Attwell, 2006).

A myriad of taxonomies have been employed in an effort to quantify the characteristics that distinguish informal learning from formal learning endeavors (Hamilton, 2006). A fitting entry into the discussion of formal versus informal learning is to identify the attributes typifying informal learning. Tusting (2003) notes four features of informal learning that are commonly used to determine the degree to which a learning endeavor is deemed informal: the setting for the learning to take place, the degree of flexibility and planning, the approach to accreditation and external specification of outcomes, and the nature of the relationship between expert and learner (p. 12). Livingstone (2000) offers the following definition in an effort to encapsulate the essence of informal learning,

Informal learning is any activity involving the pursuit of understanding, knowledge or skill which occurs outside the curricula of educational institutions, or the course or workshops offered by educational or social agencies. The basic

terms of informal learning (e.g. objectives, content, means and processes of acquisition, duration, evaluation or outcomes, applications) are determined by the individual and groups that choose to engage in it. Informal learning is undertaken on one's own, either individually or collectively, without either externally imposed criteria or the presence of an institutionally authorised instructor (p. 2).

Ranging from personal to corporate settings, opportunities for individualizing one's learning to meet specific interests and desired skills are abundant. The use of computers and the development of the Internet are among recent developments that have served as catalysts for the development of new forms of informal learning environments marked by openness and autonomy of learners (Selwyn, Gorard, & Furlong, 2006). The rise of educational technology in general, and online learning in particular, has spawned a rapidly accelerating emphasis upon such informal learning opportunities that afford the individuals with the utmost potential for customizing their learning experiences.

These contemporary online learning environments are marked by a shift from the formal online classroom to a learning space where both formal participants and informal participants are able to interact in new and diverse ways (Sims & Stork, 2007). No longer restricted to only interacting with the members of the formal class, learners have access to a myriad of resources, individuals, and learning objects that can be accessed as either primary or secondary learning aids. The rapid development of new and open information through emergent online communication modes characterized by user-generated content, places a virtually unlimited number of resources and ideas at the fingertips of learners.

The organic nature of these informal connections to information makes possible new collaboration and learning environments that formerly were arduous to form (Downes, 2007). Learners are subsequently able to easily select the individuals and resources that they identify as most helpful for their individual learning at the moment. In the sphere of informal learning, individuals are able to form such personal learning environments (PLEs) whereby they select their own unique set of learning resources and interactions that they deem most valuable to their learning experience (Attwell, 2007; Wilson, Liber, Beauvoir, Milligan, Johnson, & Sharples, 2006). The composition of a PLE and the interactions fostered can evolve whenever the learner chooses to make the change. It is conceivable that the online learning space can be comprised of formal and informal participants who all can provide valuable contributions to the formal and informal learning experiences of students.

The lines previously understood between the formal course and informal environment are therefore becoming increasingly blurred as communication technologies become ubiquitous and interoperable. Flexible learning designs can incorporate the context of the individual, allowing for maximum control by the learner and therefore integrate both the formal and informal learning environments (Sims & Stork, 2007). The assumption can be made that as highly personalized communications technologies become commonplace, the opportunities to integrate these communications modes within formal learning environments increase. It is therefore of paramount importance to understand the dynamics of interaction in both formal and informal learning contexts.

## Interaction

The concepts of *interactivity* and *interaction* are hardly well-defined constructs and are often either used interchangeably or confused when referring to the dynamics of e-learning (Sims, 2000). Nonetheless, a variety of definitions have been proposed to help provide clarity to the understanding of what constitutes interaction. In fact, Bannan-Ritland (2002), in a meta-analysis of 132 studies conducted from 1995-2000 identifying interaction as a variable or theoretical construct, found 20 different operational definitions of *interaction*. While no one single definition of interaction exists within the literature, several predominant rationales have guided contemporary understanding of the nature and function interaction in online learning frameworks.

According to Wagner (1994), *interaction* involves behaviors where individuals directly influence each other, whereas *interactivity* tends to focus on the aspects of the technology system. Sims (2000) elaborates further, defining *interactivity* as, “those functions and/or operations made available to the learner to enable them to work with content material presented in a computer based environment” (p. 46). Palloff and Pratt (2005) draw additional distinction between these constructs by defining *interaction* as interpersonal communication while referring to the inclusion of materials helping to create an active online learning environment as *interactivity*. Despite attempts such as these to focus the use of related terminology, these terms invariably are often used interchangeably in the literature. However, the aforementioned distinctions between the terms will be maintained for the sake of this review, as the stated focus is upon examining various aspects of interpersonal communication and the extent in which such

interactions are deemed equivalent in self-paced learning environments. To that end, additional examination of the nature and substance of interaction is warranted.

### *Taxonomies*

While it is commonly held that interactions are central to successful online learning environments, a wide array of taxonomies exist in the literature seeking to explicate the composition of interaction. Moore (1989) suggests three types of interaction that occur within educational contexts: (1) between the learner and instructor, (2) among learners, and (3) between learners and the content they are working to master. Moore's taxonomy seeks only to quantify the existent interactions by describing the agents involved in or affected by a given interaction and does not take into account intended outcomes. Yet, Moore's communication-based framework identifying the primary entities involved in interaction helped pave the way for continued expansion of the types of interaction and factors considered important to the overall quality of a learning experience.

A host of subsequent typologies have emerged seeking to further classify the diverse interaction existent in the learning environment. Some are very broad in nature, while others attempt to provide a detailed classification of specific constructs of interaction. For example, Juwah (2006) approaches interaction by distinguishing the key elements in the learning cycle: conceptualization, construction, and dialogue. Jung, Choi, Lim, and Leem (2002) identify three broad categories of interaction: academic, collaborative, and social, while many others have gone into much greater depth exploring the dynamics of various categories of interaction. Yet, no matter how one wishes to

classify the interactions existing in a learning transaction, the fact remains that active engagement is a requirement for meaningful learning to take place (Anderson & Garrison, 1998).

Some classify interaction in terms of purposes and functions rather than consistency. Hannafin (1989) considers interaction to function on a variety of domains from providing procedural control to causing differentiated levels of cognitive processing. He points to the diverse functions of interactions: confirmation, pacing, inquiry, navigation, and elaboration. Rather than choosing a restricted view, Hannafin maintains a utilitarian perspective concerning interaction and notes the wide range of benefits of purposeful interaction within education.

Anderson and Garrison (1998) extend the discussion of interaction beyond involving students to also include teacher-teacher, teacher-content, and content-content interactions. Like Hannafin, they call for recognition of the numerous domains in which interaction takes place beyond two-way interpersonal interaction that is most commonly recognized. Their perspective broadens the borders of interaction to include subsets that had not previously been seriously deliberated.

Wagner (1997) expands even further upon Moore's basic categorization schema to consider the outcomes of interactions, emphasizing the communicability of educational experiences. Such interactions involve objects and events mutually influencing one another in a meaningful way. Wagner identifies the following types of interaction classified by intended outcomes: interaction to increase participation, interaction to develop communication, interaction to receive feedback, interaction to enhance

elaboration and retention, interaction to support learner control/self-regulation, interaction to increase motivation, interaction for negotiation of understanding, interaction for discovery, interaction for exploration, interaction for clarification of understanding, and interaction for closure. Wagner argues for the existence of two primary purposes for interaction: to change learners and to move them toward an action state of goal attainment. Therefore, if learners are to truly be changed by interaction, a measure of intrinsic motivation must exist, resulting from an educational environment where active learner participation is encouraged and learning experiences are tailored to meet the needs of the learners.

Northrup (2002) investigated the types of interactions that students perceived to be important for online learning and argues for the existence of four primary purposes of interaction: to interact with content, to collaborate and converse, to help monitor and regulate learning, and to support performance. Her case study of 52 graduate students in an online masters program in instructional technology found learners' preferences for interaction and individual experiences to center upon meeting their needs. Learner responses indicated that the concept of self-regulated learning and the existence of timely feedback from the instructor were most valued by participants.

Whether recognizing the agents or purposes of interaction, early taxonomies of interaction lacked recommendations for planning and implementing a comprehensive set of interactions necessary for achieving specified objectives. Hirumi (2002) proposes yet another framework for interaction, stressing the necessity for practical guidelines to guide a comprehensive set of interactions essential to meeting specified outcomes. His three-

tiered framework for classifying e-learning interactions seeks to demarcate the relationship between fundamental communication-based interactions by proposing a theoretical framework for analyzing, designing, and sequencing planned e-learning interactions. According to Hirumi, Level I interactions occur within each individual learner, such as the cognitive and metacognitive processes of learning, whereas Level II interactions take place between the learner and human or non-human resources. While both levels of interaction are distinct and commonly accepted, Level III interactions proposed by Hirumi define an e-learning strategy involving a purposefully crafted set of Level II interactions designed and sequenced to foster Level I interactions. Hirumi's hierarchical approach underscores the complexity of the collective set of interactions possible in e-learning contexts and stresses the importance of considering the full range of benefits to combining different interactive activities into an engaging learning experience.

While interaction and interactivity both contribute to active learning and tend to be oriented toward implied or expressed goals, neither were commonly used in the same instructional event prior to the Internet (Dempsey & Van Eck, 2007). Hirumi (2006) groups such taxonomies for classifying e-learning interactions into four categories: (a) communication, (b) purpose, (c) activity, and (d) tool-based taxonomies. No matter the classification framework selected, the underlying criteria generally fall into one of these four of categories.

*Learner-content interaction.* Hirumi (2006) identifies learner-content interaction interactions as those taking place when learners access various media representations of

the subject matter under study. It is this type of interaction that is involved in what Holmberg (1986) refers to as the “internal didactic conversation” as learners “talk to themselves” regarding the ideas and information they encounter. Early distance education programs were largely content-interactive in nature. The rapid development of new communications technologies over the past century have made possible the development of other types of interaction within the distance education experience.

*Learner-instructor interaction.* Interaction between learner and teacher is considered by many to be essential to any successful online learning experience (Restauri, 2006; Rovai, 2002; Sher, 2004). Learner-instructor interactions are defined as, “student or instructor initiated communications that occur before, during and immediately after instruction” (Hirumi, 2006, p. 50). Depending on the format and frequency of such interactions, they may result in a substantial workload for both the instructor and learners beyond what may otherwise be expected from a face-to-face course.

*Learner-learner interaction.* Learner-learner interactions, whether in the face-to-face or online contexts, provide a valuable venue for collaboration, idea sharing, and knowledge construction. Moore (1989) defined such interactions as those occurring, “between one learning and another learner, alone or in group settings, with or without the real-time presence of an instructor” (p. 4). For years, a wide assortment of asynchronous and synchronous computer-mediated communication technologies has been leveraged to facilitate rich interpersonal interactions in distance education contexts. Yet, as the next generation of digital students who have grown up with digital technology enter academia, the educational establishment must recognize the unique ways in which digital students

use technology and be poised to continue advancing methodologies and practices to meet the unique needs of learners (Andone, Dron, Pemberton, & Boyne, 2007).

*Learner-others interaction.* Each online learner has opportunity to build a unique network of individuals beyond the parameters of the online course for ongoing dialogue and relationship building. Such interactions may exist simultaneously along with other forms of course-community interactions. Learner-others interaction embraces the existence of external learning networks and includes the wide range of interactions enabling learners to acquire, interpret and apply information from various resources (Hirumi, 2006).

*Learner-interface interaction.* Noting the increase in computer-based delivery systems, Hillman, Willis, and Gunawardena (1994) propose a communication-based classification of interaction that notes the importance of the interface in facilitating the interaction that takes place between the learner and fellow learners, the instructor, and the content. Defining this type of interaction as the, “process of manipulating tools to accomplish a task” (Hillman et al., 1994, p. 34), the technology incorporated into the learning experience is seen as a crucial element to the success of other learning encounters. This perspective is one that has been reinforced in the literature, asserting that the interactive experience of learners will either be aided or hindered by dynamics of the learner experience with the available technology (Sims, 1999, 2000; Vonderwell & Zachariah, 2005; H. Wang, Gould, & Fulton, 2007). The online learning environment fostering an atmosphere in which learners are uninhibited from meaningful engagement must be characterized by sound interface design principles.

*Learner-tool interaction.* As online technologies continue to rapidly advance, online learners are exposed to an increasing number of tools that can be utilized within the learning process. No longer are learners restricted to only use the utilities within a learning management system. Rather, an ever-increasing number of Web tools are emerging, providing learners with virtually endless approaches to accomplishing prescribed learning tasks. Learner-tool interaction involves the full scope of experiences learners have using various tools to complete tasks both within and outside the online environment (Hirumi, 2006).

*Learner-environment interaction.* Learner-environment interactions occur when learners work with resources outside the computer environment or visit external locations (Hirumi, 2006).

*Learner-designer interaction.* Hedberg and Sims (2001) postulate that since any learning experience is largely determined by the designer, the interactions that take place between designer and learner must be considered in learning design process. This indirect discourse between learner and designer is directed in large part by the role that design and development has in orchestrating effective interactive encounters (Sims, 1999). Emergent models repositioning the roles and processes traditionally associated with instructional design embrace this relationship between learners and designers. It is through such progressive design approaches that the full potential of teaching and learning within online environments can be realized (Irlbeck et al., 2006).

*Vicarious interaction.* While the predominant number of identified formats of interaction involve active participation in one means or another, Sutton (2000, p. 5)

suggests that a more passive form of interaction, entitled *vicarious interaction* also exists whereby learners vicariously interact through reading and processing the online interactions of others without directly participating themselves. Expanding the work of Fulford and Zang (1993), Sutton found that learners who interacted vicariously read and learned from the interactions of others but chose not to contribute themselves to the discussion. The value of interaction for such learners who may not be inclined to directly participate in interaction for one reason or another should not be discounted, as these learners can still benefit from actively observing and processing the interactions of others. While not a distinctly independent form of interaction as it only occurs in conjunction with other forms of interaction, it is one of the many useful learning modalities associated with an engaging learning environment.

### *Approaches*

Numerous approaches to fostering interaction exist, all of which desire to enrich the learning experience. While asynchronous, textual computer-mediated communication has been a staple of interpersonal interaction in distance education for decades, synchronous communication modes are becoming increasingly popular. Proponents of asynchronous discussion point to convenience of participation as a key feature, allowing learners and the instructor the flexibility to contribute to the discussion at the time of day that fits their personal schedule. Also commonly touted is the inherently reflective nature of such time-independent communication, in which the participants are provided with time to thoughtfully craft a response considering the full range of issues involved. While generally only text-based, contributions to the discussion are in a format accessible for all

learners. Synchronous discussion differs from asynchronous modes, requiring real time participation by participants. The premier attribute of immediate feedback associated with synchronous approaches is often noted as a shortcoming of traditional asynchronous communication. Once considered to be a restrictive communication means reserved only for the few with the means to purchase expensive equipment and high speed bandwidth, synchronous communication is becoming much more common as most computer users now possess the necessary computer hardware and Internet connectivity. Hines and Pearl (2004) point to the ability to provide an increased sense of presence and generation of spontaneity as key strengths of synchronous communication. However, formidable technical and logistical challenges still exist and must be considered when implementing synchronous instruction (Ng, 2007).

In an effort to explore in greater depth the empirical work concerning the two primary modes of interpersonal interaction, Johnson (2006) conducted a review of recent research examining the utility of text-based synchronous and asynchronous computer-mediated communication and found the effectiveness of such tools to be frequently measured by student achievement and satisfaction. Her review notes a host of studies confirming that student achievement is fostered by structured asynchronous online discussion. Johnson reiterates the value that both asynchronous and synchronous formats of communication bring to a learning experience, maintaining that when used in moderation to meet specified learning outcomes either format can effectively scaffold the achievement of desired learning objectives.

Threaded discussion, one common form of asynchronous communication, is perhaps the most common interpersonal communication vehicle within online learning today, as such technology is a central feature of contemporary learning management systems (West, Waddoups, Kennedy, & Graham, 2007). Also known as *electronic conferencing*, such discussions are topical in nature, with new topics referred to as *threads*. Hewitt (2005) provides a more exact definition of this format of asynchronous discussion, defining a *thread* as, “A hierarchically organized collection of notes in which all notes but one (the note that started the thread) are written as ‘replies’ to earlier notes” (p. 568). As participants make new contributions to the discussion and post responses to one another, the discussion forum grows based directly upon the contributions of participants.

Numerous studies within the literature explore the vast applications of threaded discussion to distance education contexts. Angeli, Valanides, and Bonk (2003) examined the extent to which an electronic conferencing system facilitated communication among pre-service teachers outside their classroom. They reviewed the electronic conferencing transcripts of 146 undergraduate student teachers from one university in the United States who were completing a 20-hour early-field experience while at the same time also completing a required corresponding laboratory course. The intention of the electronic conferencing component was to provide the student teachers with a venue in which to discuss in greater depth the issues they experienced in the field. While anticipating that quality discourse and critical-thinking skills, Angeli et al. found that the online discourse did not reflect well-supported reasoning and consisted mostly of exchanges of personal

experience. They stress the value of explicit expectations for discussion activities and suggest future research to explore motivation and affective variables related to the implementation of interaction methods.

Fung (2004) sought to develop a framework for analyzing online discussion as well as participation levels in an online master's degree program in education. She analyzed the content of threaded discussion of 60 students in a single online course and also distributed a questionnaire to the students' three other courses ( $N=212$ ), receiving responses from 83 students, in an attempt to learn why some students chose not to participate actively in the optional online course discussion. Fung found that peers affected students' level of participation. Those who felt socially connected were more likely to participate than those who did not. In addition, she noted that the lack of available time as well as students' preference for spending more time reading the required text than participating in discussion were the most significant hurdles.

Greene (2005) conducted a pilot study of 39 pre-service teachers and eight practicing teachers participating in a virtual field trip experience to glean the advantages and disadvantages of incorporating both asynchronous and synchronous discussion with video case studies. Through transcript analysis of various participant communications, focus group interviews and exit interviews, participants expressed that they found the video case studies beneficial in terms of making sense of the theories studied in class, while the interpersonal communication aided learners in making practical application of the new information. The findings, albeit bordering on common-sense, point to the utility

of threaded discussion as well as other forms of interpersonal communication for reflection and application of new information in real world contexts.

Topper (2005) took a similar approach, exploring the dynamics of online discussion while serving as the instructor in each of the courses, enabling him to report his findings in conjunction with an instructor's perspective. His study encompassed 61 graduate students enrolled in at least one of four different graduate online courses for education professionals involving three face-to-face sessions during the 15-week term: once during the first week of the course, once during the middle of the term, and once during the end of the term. Through qualitative content analysis of threaded discussion postings as well as surveying students to learn of more concerning their overall experience completing an online course, Topper notes the important role that the instructor has in guiding course-related online discussion and highlights the value that purposed communication can have in determining the overall value of an online learning experience. He presents several recommendations for instructors or designers crafting boundaries for asynchronous discussion that promote both active engagement and meaningful learning. Such counsel is consistent with similar exhortations from the literature (Garrison & Cleveland-Innes, 2005; Palloff & Pratt, 2005; Salmon, 2003).

Yet, no matter how well intentioned, designed, or facilitated a threaded discussion may be, inevitably asynchronous discussion topics cease to continue growing. Hewitt (2005), concerned with the challenges of sustaining asynchronous discourse, examined how and why discussions shut down. He studied one graduate course in distance education offered online from a university in Canada that was comprised of 14 students

and one instructor. The selected course incorporated a conventional Web-based threaded discussion board in which discussion was broken into five separate discussion areas throughout the duration of the 13-week course. Hewitt's three-phased study explored the content of discussions for a causal link between discussion transitions and the death of threads, elicited responses from learners through an online questionnaire concerning the experiences regarding the thread death phenomenon, and analyzed patterns of learners' online activity in search of explanations of how learner behavior affects thread life. Findings suggest that learners stop contributing to threads when they feel as though there is nothing further to add to the discussion or if they lose interest in the specific topic. Observations of learners' online behavior revealed the existence of "single-pass" behavior in the case of 9 of the 14 students studied, in which the individuals didn't re-read postings from earlier sessions. Rather, they focused primarily on unread postings and replied only to these new contributions. Such habitual, single-pass routines are a normal part of the life of asynchronous discussion and must be considered in the design and facilitation of discussion activities. The task of maintaining active discussion throughout the duration of a course is therefore a formidable challenge.

One solution may be to look beyond traditional discussion board tools to facilitate asynchronous discussion. Cameron and Anderson (2006) compare Weblogs to threaded discussion tools and point out the opportunities that this next generation of asynchronous discussion offers beyond current threaded discussion within contemporary learning management systems. While a greater explanation will be provided later, Weblogs, also referred to as "blogs," are a relatively easy-to-use interpersonal communication solution.

Blogs are truly learner-directed, affording learners with complete control to manage the design, content, and organization of the communication. While both discussion boards and blogs have their own strengths, one may be more appropriate for a specific activity or group of learners than the other. Blogs are yet another manifestation of technology that can facilitate communication bridging chasms of time and distance among those in a learning community.

Yet another approach to exploring interaction is to examine its community development attributes. Swan (2002) identified 22 independent course design factors and correlations to student perceptions of interaction, learning, and satisfaction from data collected from 73 courses offered via the State University of New York Learning Network. Qualitative data analysis revealed three key indicators of student satisfaction: clarity and consistency of course design, contact with and feedback from the course instructor, and active discussion. These components were integral to the development of learning community and support. Wallace (2003) affirms the importance of interaction in the development of learning community, noting in her review of the literature several outstanding questions, such as how collaboration and community differ, as well as whether the existence or strength of learning community is related to student learning outcomes. Hodge et al. (2006) point to the interaction that takes place within a learning community as pivotal to the success of contemporary distance education initiatives. They note that a measure of proximity that is fostered by learning communities in which interaction is strategically promoted and call for a learning environment establishing, “camaraderie, safety, collegiality and a feeling of belonging while reducing the sense of

remoteness” (para. 31). Purposefully implementing interaction and communication within the online learning environment is crucial to the development of community.

### *Composition*

Beyond the many approaches in which interaction is realized, a plethora of studies in the literature have examined the composition of various interactions to gain a better understanding of the elements comprising valued interaction. Maor (2003) built upon the basic pedagogical, social, managerial, and technical instructor roles identified by Berge (1995) to discuss the instructor activities necessary to establish and maintain a community of learners. Others have examined instructor perspectives and preferences in greater depth, noting factors influencing the substance and format of interaction (T.-s. Chang, 2003; McIsaac, Blocher, Mahes, & Vrasidas, 2002; Monson, 2003). Orellana (2006) conducted a study of 131 online instructors having taught at least one online course in the past five years from across United States higher education institutions. Utilizing an online version of Roblyer and Wiencke’s (2004) Rubric for Assessing Interactive Qualities in Distance Courses, Orellana explored instructor-perceived interaction levels and the preferred class sizes for optimal levels of interaction. The average online class size reported by participants was 22.8. While instructors on average classified their courses as highly interactive, the class size of 15.9 was perceived to be optimal for achieving the highest possible level of interaction. Even though the self-reported numbers are suspect, Orellana’s study demonstrates a correlation between the size of a class or learning community and the quality of the interaction possible. Class size is just one of the potentially many variables influencing the quality and substance of

interaction. No data was discussed concerning minimal class sizes for interaction, as it is certainly conceivable that a critical mass is necessary in order for optimal interaction levels to be actualized.

Instructors' perceptions, preferences and skill level with the available technology are additional factors influencing the composition of interaction in an online learning environment. Su et al. (2005) conducted a case study involving an online survey of 102 students from among 27 online courses within an online MBA program offered by a large mid-western university in the United States and then conducted follow-up interviews with 26 faculty members and 10 second-year online MBA students to better understand the perceptions of both learners and instructors concerning the quality of the online interaction in the online coursework. Sue et al. observed that instructors perceived learner-instructor and learner-learner interactions as crucial for high quality online programs. Such preferences may certainly drive the format and curriculum of future program development efforts to feature such interactions. Notably absent from the responses was any mention of alternative interactions, such as learner-content and learner-environment interactions. Yet, it is conceivable that such interactions are equally important to the overall quality of an online learning experience. The undeniable fact remains that perceptions of what constitutes quality interaction vary.

In comparison to the literature exploring attributes of interaction from an instructor perspective, an equally expansive number of studies have examined students' preferences for interaction (Abdulla, 2006; Fulford & Zhang, 1993; H. Johnson, 2007; Martens, Bastiaens, & Kirschner, 2007; Rovai & Barnum, 2003). While many parallels

can be drawn among the viewpoints of learners and instructors in regards to interaction, the learner perspective is unique and merits the special attention it is afforded in the literature.

Grooms (2000) sought to examine from the perspective of adult distance education learners enrolled in an online doctoral leadership program the importance of interaction as well as what activities might comprise such interactions. She developed and administered the Computer-Mediated Interaction Questionnaire to 105 doctoral learners, seeking to explore perceived value of learner-content, learner-facilitator, and learner-peer interactions. Yielding a reliability coefficient of .86, Grooms' study found interaction to be extremely important to learners with interpersonal interaction deemed more important than intrapersonal interaction. Learners also classified interaction with instructors as more valued than interactions with other learners.

Northrup (2002), interested in exploring the types of interactions that students deem important for online learning at her particular institution, developed an instrument similar to Grooms' for gathering such initial insights from learners. The online survey Northrup designed was based upon four primary interaction variables: content interaction, conversation and collaboration, intrapersonal/metacognitive, and support. The resulting Online Learning Interaction Inventory (OLLI) underwent extensive review and validation tests, yielding Cronbach's alpha reliability coefficient of .95. This survey tool has been shown to capture an introductory look at the interactions of learners in an online learning environment, serving as the foundation whereby follow-up inquiry into the experiences of learners can provide an authentic understanding of their viewpoints.

The OLLI was administered to 52 graduate students in an online masters program, allowing for learners to rate interaction attributes on a five point Likert scale. Interaction indicators were noted in each of the interaction domains, with self-regulated learning and timely instructor feedback reported as being most valued by learners. While both survey tools yielded valuable data concerning baseline preferences of learners in terms of interaction, both studies lacked rich insights into the substance of learners' current experiences and rationale for their expressed preferences.

Certain universal interaction qualities appear to emerge as desired no matter how varied the instructional context may be. Russo and Benson (2005) studied student perceptions of others in online courses in relation to affection and cognitive learning outcomes. Data collected from student survey responses indicated a correlation between perceptions of the instructor's presence and both affective learning and student satisfaction. Students noted interaction frequency and responsiveness as key attributes to a quality online learning experience. The findings illustrate that while a certain degree of asynchronicity regarding online interactions is expected, it is possible for excessive response time or lack of frequency in response to adversely affect student perceptions of quality and performance. In a similar study, Russo and Campbell (2004) found that students recognized the following communication practices as influential of whether participants in a course were perceived to present or not: frequency of interaction, responsiveness, the use of non-verbal communication channels, and participants' communication style. The challenge for online instructors, as Sims and Bovard (2004) explain, is to strive to be perceived by students as present enough to meet their needs for

interaction and yet do so without inhibiting students' learning from one another. Such effective communication skills within the online arena involve instructor competencies that are distinctly different from those necessary for face-to-face instruction (Klein, Spector, Grabowski, & Teja, 2004; Varvel, 2007).

Elementary components of the online learning experience, such as the structure of the course itself, also contribute to the composition of the interaction. Stein, Wanstreet, Calvin, Overtoom, and Wheaton (2005) recognize the diverse range of factors influencing course design as well as the potential for pedagogically sound designs to impact the transactional distance that so commonly exists in distance education. They found through their study of 34 postsecondary learners from among three Midwestern United States universities that learner satisfaction with the structure of the course led to greater satisfaction with perceived knowledge acquired. Learners indicated through the completion of pre and post-course questionnaires that consistent patterns in regards to both the course design and facilitation techniques were keys to a positive learning experience. Consistent with previous studies, the quality and perceived value of learner-initiated interaction contributed greatly to overall course satisfaction. Herrington, Reeves, and Oliver (2006) point to the relationship between the quality of interaction in a course and the authenticity of the learning activities. They contend that the more similar activities are to actual "real world" activities that learners will engage in, the more likely learners are to both engage in the activities in the course as well as transfer newly acquired knowledge, skills, and attitudes attained to individualized contexts beyond the

course. The social aspect of such interactions is a key ingredient to the engagement that interaction brings to distance learning in an online venue (N. Jones & Peachey, 2005).

The composition of interaction involves the combination of a plethora of variables spanning from the design to facilitation. Hirumi (2006) expresses caution when considering the design and implementation of interaction and stresses attention to both the quantity and quality of interactions designed, as unnecessarily complex or inadequate interactions may result in learner dissatisfaction, poor performance, or attrition. Poorly designed or exorbitant interactions not only can overwhelm the instructor and learners but also necessitate costly revisions to the learning activities. If learners perceive interaction to be mere busywork, they may quickly become dissatisfied and lose interest in the subject matter. Yet, if interaction is deemed by learners to be relevant to the achievement of stated learning outcomes and of personal value, learners will be much more likely to actively participate. The challenges to guiding the development of such engaging learning experiences are therefore formidable but not insurmountable. One must always keep both the preferences of learners in perspective with the plausible outcomes of interaction.

### *Outcomes*

No matter the composition or approach to interaction selected, the goal should be to facilitate the realization of specified outcomes for learners. Numerous outcomes often result when interaction is purposefully designed and well facilitated within the online learning environment. Initially, one goal for interaction may be simply to encourage an increased level of participation in course activities. Jung et al. (2002) noted that adult learners identified social interaction with instructors and peers to be an important key to

enhancing active participation in online discussion. Vonderwell and Zachariah (2005) took a closer look at specific factors influencing participation and found the following factors to affect student participation in online interactions: technology and interface characteristics, content area experience, student roles and instructional tasks, and information overload. Their findings echo others in the literature calling for online learning that is both well-designed and meets the individual needs of learners (Anderson et al., 2005; Gayton, 2007; Mimirinis & Bhattacharya, 2007). If learners are to actively participate in such environments, it is logical to conclude that the design must take into consideration learners' perceptions of and preferences for interaction. Since it certainly is neither feasible nor prudent to try to incorporate excessive amounts of interaction types and technologies, decisions must be made as to what interactive approaches best promote attainment of the learning objectives while also considering institutional goals and available resources.

Outcomes closely aligned with participation include learner achievement and satisfaction. Restauri (2006) built upon the work of McDaniel (2003) and Roblyer and Wiencke (2003) to explore student-instructor interaction and whether perceived interaction had any effect upon such outcomes. She found distinct relationships between several student-instructor instruction predictor variables and levels of student achievement attained. The results support the notion that learners who are in fact actively participating, interacting in meaningful ways with both their peers and the instructor, are much more likely to achieve the instructional goals for the course. Throughout the literature the recurring themes of learner satisfaction and achievement continue to be

sought as desirable outcomes of online education, with the quality and frequency of interaction being shown to significantly influence such outcomes (G. M. Johnson, 2006; Jung et al., 2002; Russo & Benson, 2005). Namely, the more satisfied learners are with course structure and learner-initiated interaction, the higher their overall satisfaction with the course tends to be (Stein et al., 2005). As learners who indeed express satisfaction in their learning experience are generally more likely to enroll in successive online courses than those who have a less than desirable experience, overall learner satisfaction is a laudable outcome to pursue.

Varying metrics for measuring achievement regarding interaction have been identified in the literature and have also been viewed as results of successful interactive and experiential learning experiences. Roberts (2002) highlights reflection as a dimension of experiential learning, noting the value of designs that leverage interaction to promote reflection. As learners reflect upon their learning experiences, they often become engaged at a deeper level with the subject matter as the associated metacognitive processes aid in the reinforcement of new learning (A. K. Ellis, 2001). Lim (2004) calls for the development of truly engaging learning environments that promote increased levels of retention and higher-level thinking skills. The associated challenge for designers and educators is to determine the most effective mix of methods, activities, and materials to engage learners and then to develop learning environments that will support the realization of such goals. While information delivery and computer-mediated communication technologies continually advance, the steadfast principles of interaction

evidenced in the literature persist and must be considered no matter what the specific format of the educational endeavor.

### Transactional Perspective of Adult Learning

For centuries, scholars and practitioners have sought to understand the foundations of education. Early theories from researchers following in the wake of such prominent behaviorists as Pavlov, Thorndike, Watson, and Skinner looked at education from a behaviorist perspective. These educational theorists believed that the way to improve the educational process and therefore change the response or output from learners was to simply adjust the stimulus that learners are exposed to. During the early nineteenth century, cognitive theory became increasingly dominant, stipulating that the mental processes by which learning takes place to be more closely examined. Piaget, Vygotsky, Miller, and Bruner were among those who focused not on the behavior of students but rather the thought processes involved in learning (Ormrod, 1999). As cognitive theories became more sophisticated, the related and yet quite distinct learning approach of constructivism was born from the idea that knowledge cannot have the purpose of producing representations of an independent reality but rather must be adapted to fit the context of the learner (Jonassen, 1999).

Subsequently, many learning theories have surfaced over the years attempting to characterize the nature of education under the philosophical umbrella of behaviorism, cognitivism, or constructivism. Merriam and Caffarella (1999) define a theory as “a set of interrelated concepts that explain some aspect of the field in a parsimonious manner” (p.

267). The goal of any educational theory is to provide “explanations about the underlying mechanisms involved in the learning processes” (Ormrod, 1999, p. 4). Theories take many approaches and at times may seem completely abstract and impractical. However, the goal of any learning theory is to bring to a logical and tangible semblance the underlying elements of a given educational process.

No matter the theoretical tradition one subscribes to, the undeniable fact remains that process and content are inseparable in education. In fact, it is the process of education that is often overshadowed by the content of a curriculum. However, it is ultimately the well-defined and developed educational process that will determine the overall success of the educational initiative.

#### *Transmission versus Constructivism*

Garrison and Archer (2000) base the transactional perspective upon the belief that “Information has meaning and value only when interconnections are made among facts, ideas and experience” (p. 7). Yet, it has not been without much debate over the nature of educational processes that this precept has become accepted along with many other constructivist views of education. To gain a greater appreciation for the development of constructivist perspectives, a brief review of the historical transformation of educational is in order.

For centuries, educators practiced a transmission model of education, built upon the ideology that instructors are to be subject matter experts whose task within education is to dispense their knowledge to students. Students were then to be tested to determine if they had acquired the required knowledge from the teacher. This transmission model of

education dates back as far as any historical accounts of education, depicting a very restricted and structured approach to the learning process. The transmission model stipulates that the quality and quantity of the students' knowledge is dependent upon the ability of the instructor to convey knowledge to the students. The emphasis of such a model is placed upon the information to be learned with no regard for the context in which it is to be applied (Jonassen, 1991; Vrasidas, 2000).

Behaviorism was one theory of education that has been very common within transmission models. Behaviorist teachers maintain that learning can only be realized through observation (Watson, 1930). They assert that students learn through a combination of positive and negative reinforcement following actions. Therefore, drill and practice activities are seen to be essential, whereby the student is able to assimilate knowledge and demonstrate proficiency. Consistent with all transmission models, the focus is placed upon the knowledge to be learned rather than any context for its application.

Cognitivist educators take a different approach to the acquisition of knowledge, examining the thought processes or "mental events" (Ormrod, 1999, p. 3) rather than specific behavior outcomes. It is much more important for the cognitivist to understand how learners mentally process the information rather than whether or not the result of the process is the correct answer. As the learning processes are better understood, educators can tailor instructional activities to meet the learning needs of students. Only once the learners' are able to mentally process the information can they apply the knowledge to real-life contexts.

As previously mentioned, constructivism represents a drastic shift from traditional instructivist learning approaches. Certainly within the past several decades, constructivism has become the dominant theoretical framework among educators and has caused a radical transformation from traditional instructivist models to more contemporary constructivist models, in which educational activities and the implications for learners are viewed much more holistically. Since the outset of constructivist frameworks, many pioneers of education have taken a progressive mindset and have contributed greatly to the present framework of constructivism. For the sake of this review, the views of the most influential theorists on the transactional perspective are briefly reviewed.

Arguably one of the most influential educational theorists of the twentieth century, John Dewey (1938), states the importance of interactive and constructivist learning environments, claiming the necessity for interaction in any meaningful educational experience. He states that control resides in the learning activity and therefore is shared by teacher and students (Dewey, 1938). As a pragmatic, Dewey saw the purpose of education to meet the needs of human experience and society at the time. Therefore, progressive education, based upon a constructivist ideology, seeks to consider student needs and interests within the grander scope of the curriculum. The fundamental tenet argued by progressives since Dewey is that students should not be allowed to passively attempt to absorb information from the teacher. Furthermore, if students are to truly engage in meaningful and memorable learning, their experiences should include varying phases of reflection and active inquiry (Garrison & Archer, 2000).

Dewey was one of the first to refer to the process of constructing meaning and cogitation as “reflective thinking.” His goal wasn’t to adopt a radical form of student-centeredness (1938), but rather to engage students actively in the learning process, in both communal and individual reflective processes. He believed that as students are actively engaged in the learning process and given the opportunity to reflect upon their experiences both individually and corporately, the learning that results will be much richer and deeper than the acquisition of mere tangential information.

Akin to Dewey, Rogers (1969) believes that education stems from experience and can transform individuals as meaning is discovered through experience. In some regards taking an even more extremist view than Dewey, Rogers places individual freedom as paramount to the learning experience, empowering students with freedom within learning experiences. Rogers (1969) examines the important role of the facilitators to create and manage the educational climate and cause students to be confronted with relevant problems through which knowledge can be built. The roots of contemporary research on the role of the facilitator in the constructivist learning environment reach to the distinct claims of Rogers.

The ideas of Jürgen Habermas are significant to the theoretical framework of contemporary andragogy. Habermas posits two seminal doctrines in his educational theory: knowledge constitutive interests and communicative competence (Habermas, 1968). He maintains that no one methodology or process is inherently sufficient for all forms of knowledge. Rather, learning activities must be customized to meet the needs of both the learners and the nature of the knowledge to be grasped. Not to exclude the value

of collaborative engagement, Habermas builds his learning theory on the value of interactive experiences where collaboration is built upon “reciprocal communication processes” (Garrison & Archer, 2000, p. 29). The union of engaging and didactic learning experiences, based upon the needs of learners with the element of collegial communication, forms a solid foundation for meaningful education.

At the core of all the claims of Dewey, Rogers, and Habermas is a desire to improve the quality of learning. The definition of learning is the foundation for any educational framework. “Learning is the process of constructing meaning from raw information and confirming knowledge” (Garrison & Archer, 2000, p. 6). The goal therefore is for learners in any context to construct meaning, defined by Garrison & Archer (2000) as “the personal discovery of connections amongst information and facts” (p. 11).

Constructivism touts the experiences of learners and the practical application of knowledge as principle to any learning activity. Constructive learning environments are authentic (Barab, Squire, & Deuber, 2000), simulating actual environments where the knowledge will be applied. Within the constructivist framework, the teachers’ role moves from being a dispenser of knowledge to a facilitator who guides the learning experience, creating a setting where students explore, collaborate, and reflect upon their understanding of the curriculum. Critical thinking is fostered, as learners have opportunities to make practical application of new concepts and skills. Garrison and Archer (2000) point to this central value of critical thinking to the overall learning experience noting, “Critical thinking is essential to meaningful learning and the

construction of worthwhile knowledge” (p. 14). Such viewpoints have characterized progressive educational approaches for decades, as pioneers such as Dewey (1938) have maintained that all meaningful knowledge results from reflecting upon experience. These tenets of constructivism are evident in the andragogical principles that form the foundation for modern adult education.

### *Brief Overview of Andragogy*

At its core, andragogy is simply the study of adult learning. First appearing in the work of the German teacher Alexander Kapp in 1833, the term was initially used to describe precepts of Plato’s theory of education (Smith, 2005). Malcolm Knowles popularized the term through his research and publication during the 1970s and 1980s. Knowles (1984) defines andragogy as “the art and science of helping adults learning” (p. 43) in contrast with pedagogy, which is generally more focused upon assisting children to learn. Knowles contends that andragogy proceeds from five basic assumptions, including: self-directedness of adult learners (1980), increased volume and quality of adult experiences over children (1990), timing of learning activities related to developmental tasks (1990), problem centered nature of adult learning rather than subject centeredness (1980), and internal motivation for adults to learn rather than external motivation for children (1980).

Andragogy lacks a specific quantifiable definition, but refers in broad terms to the various assumptions that Knowles and others have articulated with respect to adult learning. Often included theories within the framework of andragogy include self-directed learning theory (Brockett & Hiemstra, 1991; Brookfield, 1984; Caffarella &

Caffarella, 1986; Garrison, 1992, 1997; Knowles, 1975), transformative learning theory (Boyd & Myers, 1988; Daloz, 1999; Freire, 1970; Mezirow, 2000), critical theory (Freire, 1994; Habermas, 1968), and postmodern theory (Derrida, 1978; Lyotard, 1984, 1992). Garrison and Archer's transactional perspective is yet another flavor of application of common principles to andragogy that have been articulated for years.

The principles of andragogy have been applied extensively among contemporary online learning endeavors and have ultimately contributed to the academic rigor and quality of such programs (Burge, 1988). While many theoretical frameworks can be applied to e-learning, the transactional perspective clearly identifies key principles of andragogy that are most relevant within adult online learning environments.

#### *Transactional Perspective Defined*

Garrison and Archer (2000) propose the transactional perspective as a “coherent theoretical framework” (p. 3) for the various avenues by which reflective education practice of adult learning proceeds. Formed upon the assumption of an ideal learning environment, the transactional perspective considers learners as able to take responsibility for their own learning and capable of critical thinking.

As Garrison and Archer (2000) note, “The transactional perspective is built upon two foundational concepts – that a constructivist approach is necessary for learners to create meaning, and that collaboration is essential for creating and confirming knowledge” (p. 4). Therefore, the critical thinking and self-directed learning processes are integral to the teaching and learning transaction.

The transactional perspective is a coherent theoretical framework that embraces both the individual and societal perspectives of learning experiences, recognizing that content and process are inseparable. At the foundation is the development of constructivist and collaborative learning opportunities. Next, the questions of responsibility and control of learning are to be engaged and concluded with the responsibility for learning placed upon the student and the control of the learning experience shared among the learning community. Individual learning is therefore situated socially, requiring that the values and needs of both the individual and the community of learners be considered at all times.

The ultimate goal is to create an educational experience, characterized by the synergy between critical thinking and self-directed learning in which the learner is able to construct shared meaning and understanding within a community. The mere acquisition of information is by no means as complex or transformational as a collaborative, constructivist learning experience defined by “a dynamic interaction of relationships among intentions, activities and learning outcomes” (Garrison & Archer, 2000, p. 9).

Figure 1 depicts the conceptual framework of the transactional perspective, illustrating three pairs of concepts from both the cognitive and social viewpoints. It is the dichotomy of the transactional perspective that makes it versatile enough to account for the complex interplay of internal and external factors within the online learning environment.

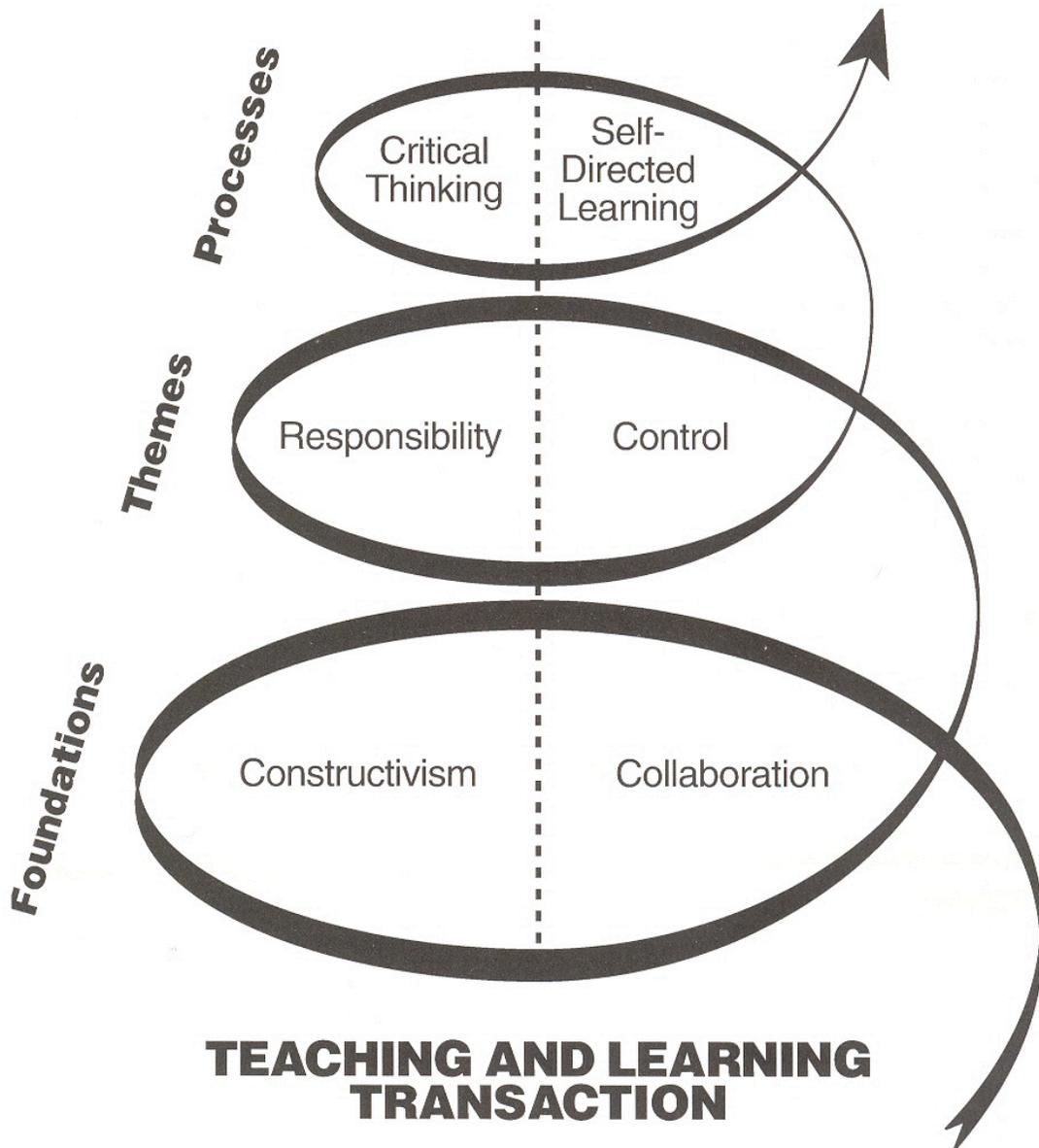


Figure 1. Conceptual framework of the transactional perspective

Reproduced by permission from Elsevier. From Garrison, D. R., & Archer, W. (2000). *A transactional perspective on teaching and learning: A framework for adult and higher education*. Amsterdam: Pergamon.

### *Transactional Perspective Examined*

The transactional perspective, while it initially may seem rather ambiguous, is focused upon the simple objective of fostering critical thinking and self-directed learning opportunities for adult learners. Garrison and Archer (2000) define self-directed learning as, “an approach where learners are motivated to assume personal responsibility and collaborative control of the contextual and cognitive processes involved in constructing meaningful and worthwhile learning outcomes” (p. 93). In order for such outcomes to be realized, learners must be provided with an educational environment whereby they can engage in various learning transactions, both individually and corporately with the learning community. Whether or not technology is used to facilitate the learning transactions is inconsequential as long as critical thinking and reflection are taking place in community.

Critical thinking is the cornerstone to all learning processes within higher education. Involving a set of complex and iterative processes, critical thinking is characterized by both individual and collaborative perspectives of meaning, woven together through the activities and experiences of the learners in community. This dynamic process includes not only learners reflecting individually and sharing new insights with the broader community but also the community challenging each member to build upon previously constructed knowledge.

The unique perspective of each learner adds richness to the learning ethos and must be recognized and encouraged. Yet, such individual and societal approaches can't be considered in isolation. In fact, the transactional perspective incorporates the learning

context and experiences of all the participants. The critical thinking/learning cycle illustrates the iterative process that adult learners engage in when exploring, identifying, and integrating knowledge within the context of an identified problem or experience. Because this learning process involves both individual and community learning experiences, learners are involved in a dynamic means of constructing knowledge that can be immediately applied. As learners move through the cycle of individual and shared experiences of knowledge construction they are able to apply and integrate new knowledge while expanding their knowledge base for future learning experiences (see Figure 2).

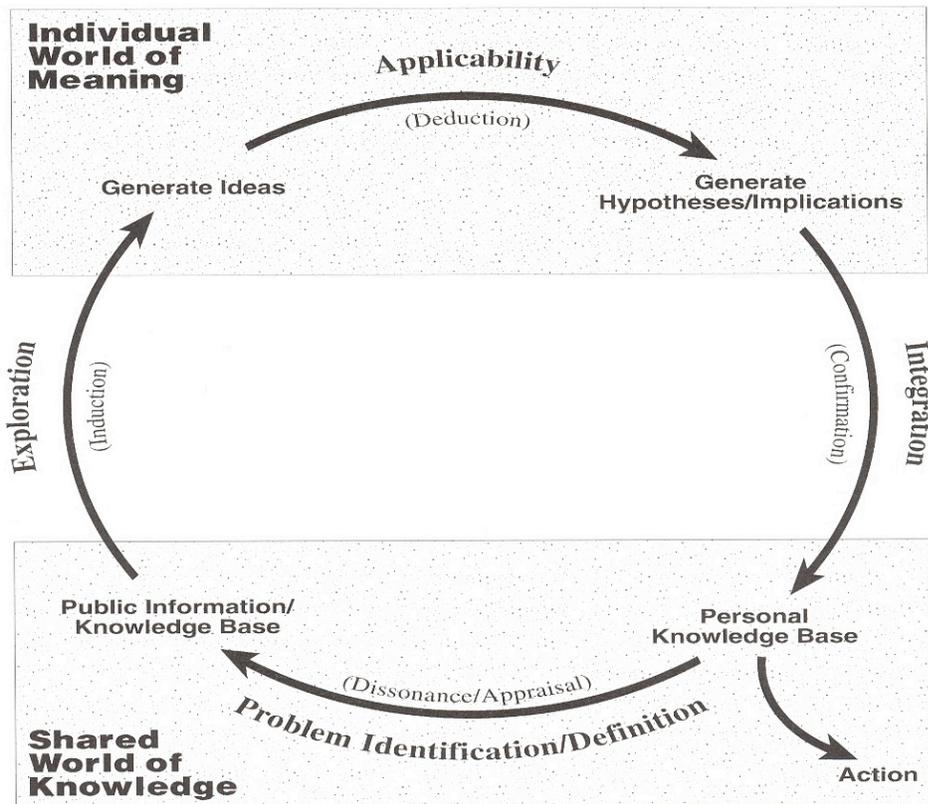


Figure 2. Critical thinking/learning cycle

Reproduced by permission from Elsevier. From Garrison, D. R., & Archer, W. (2000). *A transactional perspective on teaching and learning: A framework for adult and higher education*. Amsterdam: Pergamon.

A plethora of research studies have been conducted recently centering on the concept of a transactional perspective of learning in online environments (Conrad, 2002; Kanuka & Garrison, 2004; Perry & Edwards, 2005; Richardson & Newby, 2006; Tu & Corry, 2003). Online learning is demanding and rewarding, requiring learners to both set boundaries and intentionally enter into collaborative, constructivist learning experiences. Conrad (2002) found that learners define online community different and have varied strategies for how they prefer to have community built and maintained in their courses. In

the online environment, students must assume greater responsibility to match the increased responsibility that is inherent in online learning (Garrison & Cleveland-Innes, 2005). Likewise, it is also incumbent upon the online instructor to create an environment where the processes of the teaching and learning transaction can take place.

Many argue that it is the goal of education to teach students how to learn to learn so that the learning process will continue throughout their lifetime. If this goal is to be attained, students undoubtedly need to become adept at critical analysis and collaboration with peers. The transactional perspective places these aspects of the learning experience at the core of the learning process, focusing attention upon the practical application and integration of new knowledge, skills, and attitudes into everyday life.

While much work remains concerning the implementation of new socially-constructed learning environments and the development of best practices of andragogy, it is evident that no single adult learning theory will ever account for all the complexities of adult learners (Merriam, 2001). Research has shown that both the cognitive and social dimensions must be considered when developing meaningful learning experiences (J. S. Brown, 2000). The transactional perspective holds great promise for researchers seeking to study many different modes of adult learning and forms the foundation for examining the development of learning communities.

### Community of Inquiry (COI) Model

Online learning is more than simply a temporal fad as it is proving to be a permanent facet of higher education. Since its inception, online learning has rapidly

advanced and evolved as the pedagogical implications for this relatively new mode of learning are explored and the available technology is leveraged to bring to fruition learning experiences that have previously not been possible. Yet, online education has not escaped criticism, as it has been frequently compared to traditional face-to-face face learning. Early comparisons justifiably found online education to lack many of the attributes of its face-to-face counterpart. However, as technology has advanced and allowed for the implementation of learning features that quality online pedagogy demands, the quality of learning available online has progressed rapidly. Today, it is widely accepted that “no significant difference” exists between online and face-to-face learning (Russell, 2001, 2005).

However, there are still many in higher education who refute such notions of equality and maintain a bias against online learning (Noble, 2001). What these cynics fail to recognize is that despite the research that asserts the equivalency of online learning to face-to-face instruction, online learning in many ways provides a superior experience and quality of learning than traditional face-to-face approaches. What distinguishes online learning from other modes isn't the technology used but rather the pedagogical potential when online technologies are harnessed effectively to craft the learning experience. Quality education, no matter what venue it takes place in, has always included the “dynamic integration of content and context created and facilitated by a discipline expert and pedagogically competent teacher” (Garrison & Anderson, 2003, p. 4). Online learning extends the bounds of what has traditionally been possible in education and provides educators with an incredibly expansive set of tools for crafting quality

educational experiences for learners today. It is this enhanced learning experience that sets online learning apart from its face-to-face and traditional distance education counterparts.

Communication is the primary factor often recognized as contributing to quality online learning initiatives (R. E. Brown, 2001; Ortiz-Rodriguez, Telg, Irani, Roberts, & Rhoades, 2005). Collaboration, reflection, and higher-order thinking are all possible through asynchronous online learning environments (Garrison, 2003). These interactions among participants are integral to the development of online learning networks. A Community of Inquiry (COI) model has been used to define the complex interactions among participants in a collaborative online learning experience (Anderson, Rourke, Garrison, & Archer, 2001).

### *Theoretical Framework*

The COI model assumes a collaborative constructivist view of education where the private and shared worlds of experience are intimately connected. Based upon the established work of educational theorists like Dewey, Rogers, and Habermas, the COI model embraces the notion that self-reflective learning is both intrapersonal and interpersonal.

The COI model provides a tangible application of the transactional perspective of education in an online learning environment. It views education as having the dual purpose for the learner of both constructing meaning from experience and then refining and confirming this newly gained understanding through collaboration with a community of learners.

In order for these processes of internalization of learning and extension of knowledge through collaborative discourse to be realized, issues of responsibility and control must be addressed. The learners in particular must possess the ability to undertake a measure of responsibility for their learning and control over their learning experience. COI is especially well suited for online adult learning contexts where self-directed learning is inherent.

COI views collaboration as integral to the overall success of any online learning experience. Collaboration goes beyond simple interaction and must, “draw learners into shared experiences for the purposes of constructing and confirming meaning” (Garrison et al., 2000, p. 14). In this regard, communication in a truly collaborative fashion extends far beyond the establishment of social acquaintance to that of deep intellectual exchange. COI views this high level intellectual interaction as not only possible but also necessary for meaningful and memorable learning to take place.

A variety of distinct roles exist among participants in the online learning experience. While the role of the online instructor is diverse and expansive, radically different from face-to-face contexts (Berge, 1995, 2001; Liu, Bonk, Magjuka, Lee, & Su, 2005; Palloff & Pratt, 2005; Salmon, 2003), the same is true for online learner roles. Garrison, Cleveland-Innes, & Fung (2004) found that learners perceived their role in the online learning environment as different from previous face-to-face learning experiences. The COI model accounts for these differences and allows for the complex interactions that take place among learners and the instructor in the online learning environment.

### *Community of Inquiry Model Defined*

Based upon their extensive backgrounds in online learning, Garrison, Anderson, and Archer (2001) developed the COI model to represent the diverse elements and yet interrelated aspects to a quality online educational experience. They propose three key elements crucial to the success of any online learning endeavor: cognitive presence, social presence, and teaching presence. Specific tasks such as selecting course content, setting the climate of the online community, and supporting discourse throughout the course all take place within the interplay of the cognitive, social, and teaching activities. Figure 3 illustrates the integration of these elements of the online learning environment. The elements of the COI model will be explored further throughout the balance of this review.

## Community of Inquiry

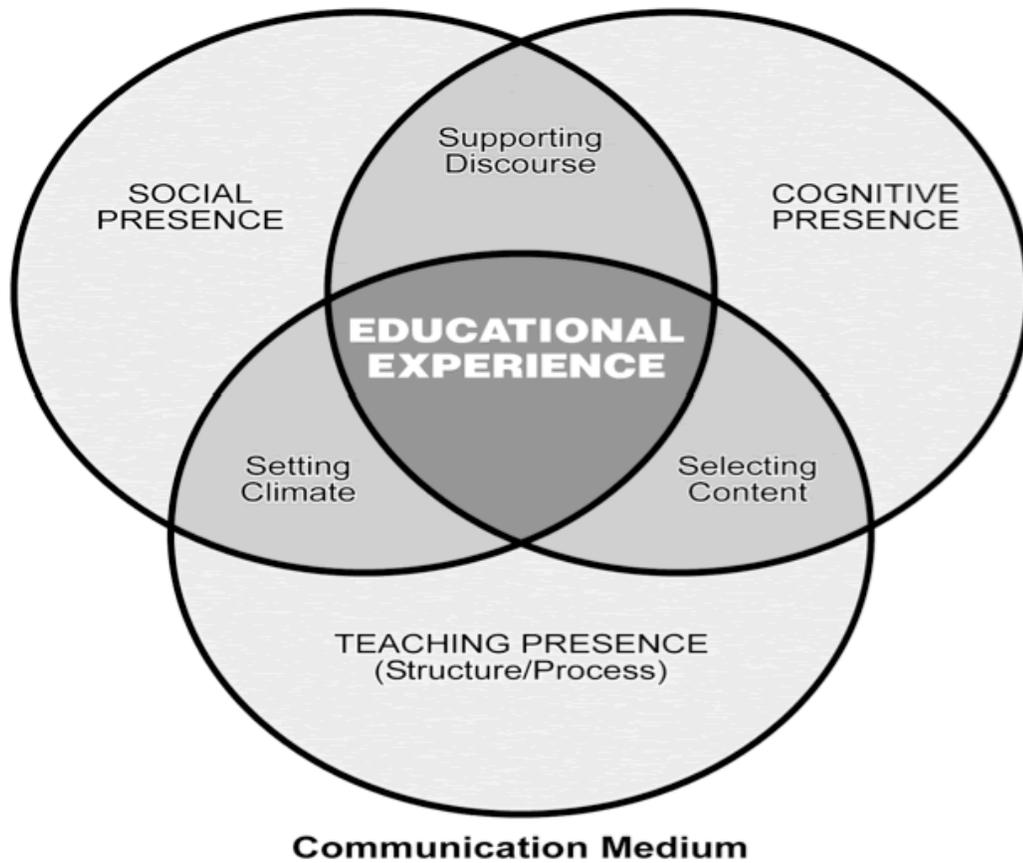


Figure 3. Community of inquiry

(Reproduced by permission from Pergamon. From Garrison, D. R., Anderson, T., & Archer, W. (1999). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education*, 2(2-3), 87-105.)

### *Cognitive Presence*

A variety of analytical frames have been utilized to examine the level of cognitive substance of asynchronous communication within online courses (Meyer, 2004).

Cognitive presence accounts for the intellectual processes and refers to the degree to which participants in any community of inquiry are able to construct meaning through

sustained communication (Garrison et al., 2000). It is this aspect of online learning that is at the core of the e-learning experience as learners engage in the teaching and learning transaction.

Cognitive presence reflects the higher-order thinking processes and knowledge acquisition associated with critical thinking (Garrison et al., 2001). In fact, critical thinking and practical inquiry are chief concepts principle to the cultivation of cognitive presence. As learners reflect upon their learning experiences and incorporate their insights into the collaborations, their cognitive presence in the learning community is shaped (Garrison, 2003). The experience of actively engaging with the concepts of learning in both a self-reflective fashion internally as well as exploring and refining understanding in community is the benchmark of quality online learning experiences.

The differences between the nature of spoken and written communication is foundational to an understanding of computer-mediated communication and its applications in creating a COI (Garrison et al., 2001). The spoken word is immediate and temporal whereas written communication is more deliberate and permanent. Online learning makes it possible for learners to reflect and contribute equally to the overall learning experience, as each member has equal opportunity to enhance the learning experience for others through their unique intellectual insights. The contributions of each member of the learning community add richness to the learning, making each course section distinct from others.

Meyer (2005) sought to examine cognitive processes of learners as apparent through the asynchronous discussion and classify the level of such processes using

Blooms' taxonomy. Her goal was to use Blooms' established metrics to evaluate the measure in which contributions to the online discussion in two online doctoral courses in educational leadership were substantive. She conducted a content analysis of 17 student-led discussions from among 2 different doctoral courses and found that while online discussion seldom remains at the highest levels of Blooms' taxonomy for extended durations, it is the fluidity of the online discussion and learning processes, facilitated by social and teaching presence, that truly makes cognitive presence possible. Her findings support the supposition that rigorous cognitive activities are in fact possible in the online learning environment.

### *Social Presence*

The Internet has become an increasingly social venue. Users look to the Internet as means for staying connected socially with others they are separated from by time or distance. This social connectedness is one key factor to the attractiveness of online learning. A myriad of factors contribute to the development of social networks within online learning environments (Aviv, Erlich, & Ravid, 2005). It is the development of social presence within the online course that helps to set the climate for the learning experience to take place.

Social presence is defined as, "The ability of participants in the community of inquiry to project their personal characteristics into the community, thereby presenting themselves to the other participants as 'real people'" (Garrison et al., 2000, p. 89). Social presence is the avenue whereby cognitive presence is realized. As learners develop their social presence in the course, they are given opportunity to build networks with their

peers whereby meaningful dialogue surrounding concepts foundational to course content can take place.

Social presence isn't developed automatically. Online instructors and facilitators have the responsibility to create an environment which promotes interaction and collaboration (Gunawardena, 1995). There are many ways in which social presence is cultivated, including concerted efforts by both the instructor and students in the online environment (Palloff & Pratt, 1999, 2003; Salmon, 2003). While general principles can apply to the development of social presence, each individual learning context and learner population requires a unique approach.

Many examples exist in the literature concerning best practices of social presence development in online learning communities. Rourke, Anderson, Garrison, and Archer (1999) developed a framework for assessing the social presence in a computer mediated communication environment. They identify issues of intimacy and immediacy as integral to the success of the social fabric of the online learning environment and formulated a rubric for evaluation of communication, labeling messages within discourse as interactive, affective, or cohesive. Further classification is made through various subordinate indices. They found that rich online communication generally exhibits characteristics of all three domains.

Rourke and Anderson (2002a) were among the many who utilized the framework of Rourke et al. (1999) and identified specific communicative practices that promote favorable student perceptions of the social atmosphere of textual discourse, including: “addressing others by name, complimenting, expressing appreciation, posting messages

using the reply feature, expressing emotions, using humor, and salutations” (p. 7-8).

While such aspects may seem trivial, they have been shown to be integral components to the development of the social climate of the course.

Richardson and Swan (2003) found that online students with high perceptions of social presence also exhibited high perceived satisfaction with the course instructor.

Swan and Shih (2005) conducted further research and found perceived presence of instructors to be a more profound influence on student satisfaction than the perceived presence of peers. This indicates the importance of the instructor in the online learning experience. It is the development of teaching presence that may perhaps be the most important and complex aspect of the COI model to be developed.

### *Teaching Presence*

Teaching presence refers to functions within the learning experience often performed by the instructor, including the design and facilitation of the educational experience (Garrison et al., 2000). These roles need not be limited to simply the instructor, as students can lead online discussion and exhibit teaching presence in the course. In fact, Rourke and Anderson (2002b) found that students actually preferred peer teams leading online discussion as compared to the course instructor.

Online instructors carry out many different roles in the creation and facilitation of online learning environments (Berge, 1995, 2001; Liu et al., 2005). Anderson et al. (2001) identified teaching presence to consist of the following characteristics: design and organization, facilitating discourse, and direct instruction. Whereas numerous elements contribute to meaningful and memorable learning, teaching presence is the binding

element of any online learning experience, balancing cognitive and social aspects consistent with purposed educational objectives (Garrison et al., 2000).

Online students have indicated that exemplary online instructors are those who create a learning climate that includes strong elements of social, cognitive, and teaching presence (Perry & Edwards, 2005). Pawan, Paulus, Yalcin, and Chang (2003) found that without the instructor's definitive teaching presence and modeling of collaborative discussion contributions, learner discussions primarily consisted of low-level cognitive interactions. While there certainly is a place for such cognitively insignificant postings in the creation of the social climate, the ultimate goal should be for learners to engage in high-level thinking and communication of new knowledge gained in a way that stimulates the learning experience for all members of the community.

Shea, Li, Swan and Pickett (2005) developed an instrument to evaluate the role between online learning community and teaching presence. They found that a strong and active presence of the instructor in the course correlates to students' sense of connectedness and learning. Their work shows that the instructor plays an important part in eliminating the sense of distance among online learners.

The facilitative and guiding role of the online instructor has been shown to be critical to the success of online learning experiences (Kanuka & Garrison, 2004). A host of approaches and activities that have proven effective in online learning environments are available to the online instructor today (Palloff & Pratt, 2005), but the instructor must be cognizant of their existence and implement select activities within a context of

teaching presence. No matter how intellectually stimulating the activity, it cannot be void of the control and guidance of instructor presence.

Learners expect to be reciprocated for their efforts (Aviv et al., 2005) in the online learning community. The instructor's influence within the online learning environment is crucial to ensuring that communication flows freely and that dialogue proceeds in a collegial and responsive fashion. As the instructor sets the climate for the dialogue to take place, the expectations established help guide the interactions of all members of the learning community.

### *Strengths and Limitations of the Community of Inquiry Model*

The COI model has been touted by many as one successful recipe for the creation of transformative online educational environments. Many benefits of the COI model exist, making it applicable to a wide array of online learning applications.

Critical thinking and self-directed learning are valued as the core of the meaningful and memorable online learning experience. For instructors and designers new to online learning, the COI model presents a holistic view of the complex attributes proven to be integral to the successful online learning environment. In one shape or another, cognitive presence, social presence, and teaching presence must be accounted for if the online learning environment is to be utilized to the fullest extent possible.

The COI model is built upon a collaborative constructivist approach to learning, maintaining that the instructor is not the dispenser of knowledge but rather a facilitator who guides the learners' journeys through the course content. As learners are encouraged to engage in a process of practical inquiry, they have opportunity to frequently reflect

upon knowledge gained and share that newly found knowledge with their colleagues. As understanding is shared, the insights expressed within the community extend the learners' perception of issues and application beyond their individual perspectives. The learning community therefore is the mechanism for the rich learning experiences rather than necessarily dynamic instructional materials or insights from the instructor.

Focusing primarily on the pedagogy rather than technological implementation, the COI model views technology not as the catalyst for the learning experience but rather the tool whereby engaging, meaningful, and collaborative learning can take place. It provides a basic framework of emphasis for both design and facilitation efforts to be built upon. The designer seeking to develop an online learning experience will be well served by addressing the elements of the COI model within course design. When the online course is implemented, the instructor can look to the elements of COI as a roadmap for where the online interactions should travel throughout the duration of the course. While certainly not an all-inclusive model, COI addresses the key elements proven essential to successful online learning.

COI values diverse experiences, as each individual learner brings unique worldview to the learning experience. As learners collaborate with one another and extend each other's ideas, a deep understanding of the concepts discussed emerges. One of the primary advantages of online learning over face-to-face education is the opportunity for a much more diverse student body to participate in the learning experience. Whereas geographical constraints determine who can and cannot enroll in a face-to-face course, access to the online experience is restricted only by the prospective

users access to basic computing and Internet technology. The resulting community of learners includes an incredible range of perspectives to the learning material. As learners share their perspectives and exchange in meaningful dialogue, the experience for all members of learning community is enriched. Therefore, the instructional context shared by the instructor or through various instructional media is only the springboard for the further exploration.

The COI model is not without its limitations. It looks at online community almost to the detriment of the instructional content. While the “teaching presence” piece of COI does account for the role of the instructor in providing applicable instructional content to correspond to instructional objectives, no mention is made of learning that may in fact take place through the interaction with instructional materials. Certain technical and procedural subjects exist in which quality instructional materials are required before meaningful construction of learning can take place. COI does not fully accommodate the need for both interaction and interactivity in the learning experience. Palloff and Pratt (2005) make a clear distinction between these two qualities, defining “interaction” as “the all-important student-to-student and student-to-instructor interaction” (p. 4). They see “interactivity” as a desirable attribute that is fostered through including multi-sensory materials that help to engage the learners in the content and subsequently engage in activities whereby learning is constructed. While it is true that adult learners need to construct their learning, there certainly is a place for instructional content, delivered in any number of ways. The specific format and technology used in the delivery is immaterial, but there most certainly are instances where adult learners do need an initial

presentation of concepts pertinent to the unit of study in order for an informed dialogue and inquiry into hierarchical principles to take place. Even though COI implies the value of instructional materials, the novice designer or instructor might assume that discussion alone may suffice.

COI addresses only issues of presence in the stated course. It does not account for the holistic community that each individual learner is a member of outside the confines of the online learning community. Adult learners undoubtedly develop a support network of colleagues, family, and acquaintances long before enrolling in the online course. As they proceed through the online learning experience, they connect on many levels with the instructor and classmates within the course. However, during this online experience, learners retain their relationships outside of the online community. These social and cognitive influences from without are unique to each learner and add to the overall learning experience. In some cases, it is quite possible that these connections from without may take the place of certain learner needs typically met from within the online community. The COI model implicitly attempts a task that is nearly impossible: to account for the sum total of the online learning experience. While it is vital that the online learning community incorporate healthy levels of cognitive, social, and teaching presence, the learning experience of each adult will be influenced by a wide variety of external, off-line influences as well.

Balance is always essential when implementing any learning framework. COI focuses primarily on issues related to the development of community in the online course. It is important to remember that COI is not an exhaustive learning theory, but rather just

one explanation for the dynamic of community and cognitive development in an online learning environment.

As online life becomes ubiquitous, adult learners may very well have numerous online networks beyond the particular online course environment that will augment their experiences in the online course(s) they are completing. It is the formation and development of such learning networks that hold promise for the development of socially-constructed learning environments. The COI model has certainly proven to be a robust and flexible model guiding the quality of online educational collaboration and certainly will serve future generations of e-learning. The emergence of new social network technologies and the implementation within e-learning frameworks have opened the door for examining new contexts for the development of learning communities and the implications for the design and development of the next generation of adult online education.

### Self-Paced Learning

This is an exciting time in adult education, as more learning opportunities are available now than ever before for adults seeking to better themselves through education. As online learning continues to evolve and expand to meet the needs of learners, new learning venues will be established that expand the bounds of current theory. Sims and Brovard (2004) suggest that a model of presence for an online course integrate the needs and preferences of learners. These needs and preferences most likely will evolve as society and technology advance and continue to shape learners' perspectives.

Self-paced adult education, also referred to as learner-paced education, is one phenomenon aimed at meeting the diverse needs of adult learners that does not appear to be subsiding. In a self-paced course, adult learners engage in learning activities at an individual pace, whereby they are more independent than those in more tightly constrained online learning communities. In traditional online courses, learners generally progress through the course materials and activities at a prescribed and uniform manner, often with a new set of learning materials and discussion each week. The self-paced model sees adult learners as both members of the online learning community and individual learners, each with specific goals for the course and time schedules that may not coincide with everyone else's. Rather than implying a lack of guidance, self-paced learning simply affords learners with an increased measure of flexibility as to the pace in which they engage in the various course activities.

Critics of such minimally guided learning endeavors point to the consistent reports of successful instructional approaches placing emphasis on guidance of student learning (Mayer, 2004; Sweller, 2003). Some go as far as to denounce minimal guidance entirely, purporting that such approaches are destined for failure (Kirschner, Sweller, & Clark, 2006). These opponents maintain that highly structured direct instruction is the most effective means for learners to grasp complex concepts and procedures. Daniel and Marquis (1988) stress moderation however, challenging distance educators to strive for balance between interactive learning activities and independent learning strategies. In such a way, one need not completely abandon the benefits of one approach to gain those of another.

The concept of self-paced learning parallels that of self-directed learning. Whereas the former involves specified learning activities completed in an individualized manner, the latter is even more flexible and permits the learner the opportunity to select the most appropriate learning path. A plethora of empirical research studies during the 1970s along with the efforts of Malcolm Knowles and Allen Tough (1979) led the way to popularizing the concept of self-directed learning. A prominent framework in the field of adult education for decades, self-directed learning has continued to receive much attention in the literature and is recognized as a bona fide mode of adult learning (Brookfield, 1984; Garrison, 1997; Knowles, 1975; Moore, 1986; Oladoke, 2006; Piskurich, 1993; Song & Hill, 2007).

Self-directed learning emphasizes the fact of learner control over the planning and execution of learning and challenges the assumption that adult learning can only occur in the presence of a professionally certified teacher. This approach implies that learners take the initiative in utilizing resources, rather than simply reacting to transmissions from the resources. Knowing what they want to get from a resource, learners probe the resources until they attain the desired results. They are proactive rather than reactive in their approach. Self-direction is fostered through a high degree of learner participation and initiation in conjunction with meaningful and consistent interaction (Jiyeon Lee & Gibson, 2003).

Another undeniable facet of self-paced learning is that of self-regulation. Whereas self-paced learning primarily characterized an individualized rate at which learners progress through prescribed learning activities, self-regulation includes the sum total of

cognitive and social processes that comprise an individualized learning environment. Referring to the degree in which learners are “metacognitively, motivationally, and behaviorally active participants in their own learning process” (Zimmerman, 1989, p. 329), self-regulation involves learners thoughts, feelings, and actions and is largely determined by a host of behavioral, environmental, and individual elements (Hodges, 2005). Recognizing that the online learning environment presents unique opportunities and challenges, scholars have pointed out that unique strategies are employed by online learners to achieve success in self-regulating their learning experience (Dell, 2006; P. E. Williams & Hellman, 2004).

Noting the limited amount of research on self-regulation in Web-based learning environments, Whipp and Chiarelli (2004) explored self-regulation in online learning in an effort to determine whether the methods utilized by learners to self-regulate the online learning process differ from those of more traditional face-to-face or distance education contexts. Conducting a case study of 15 students in an online graduate course, they found that learners employed a number of notable adaptations of traditional self-regulation strategies to fit the online learning environment. These included goal setting and planning, organizing and transforming instructional materials, structuring the learning environment, seeking help, self-monitoring and record-keeping, and self-reflection. For each of the aforementioned strategies, online learners adapted traditional approaches to fit the unique aspects of their online learning experience. They noted that support from the instructor as well as the course design both were influential in guiding the specific self-regulation steps that they took. Successive studies have reinforced these claims, noting

the importance of course design in determining the specific self-regulation steps taken by learners (M.-M. Chang, 2005; Fisher & Baird, 2005).

At the core of many course designs often chosen to foster self-regulation are sequenced learning activities. Sequenced learning activities combined with purposed, interpersonal communication have been a hallmark of recent online learning initiatives. Holmberg (1989) notes that a self-paced distance education environment that includes sequenced learning activities entwined with frequent communication and assignment exercises is favorable for institutions seeking to provide maximum access while embracing an approach that accommodates the needs and preferences of the individual learner. Yet, it is presumptuous to assume that all learners will prefer such structured and socially-dependent forms of learning over less-structured, independent approaches. Ke and Carr-Chellman (2006) recognized the uniqueness of learners who prefer more solitary learning experiences and sought to answer the question, “In online learning environments that require collaboration, how do solitary learners experience their own learning?” Through a phenomenological study of five solitary learners in an online collaborative environment, Ke and Carr-Chellman report that learners preferred interpersonal interactions that were more academic rather than social and that were not interdependent upon other participants. Such findings are indicative of the preferences for some learners to remain more independent in their learning. Self-paced course offerings are one means of meeting the desire of many adult learners for autonomy.

The perspectives of students and faculty concerning incorporating learner-centered interpersonal interactions and discussion concerning the means to facilitate

group collaboration in learner paced education models is notably absent from the literature (Anderson et al., 2005). Anderson et al. (2005) argue for the development of new technologies and implementation of pedagogies that support the interaction needs of students in learner-paced courses. Such enhancements would permit learners to build organic learning networks and engage in interactions with numerous agents. As concerted efforts are made to balance meaningful collaboration with learner autonomy, it is conceivable that learners may be able to enjoy the benefits of both independence and discourse.

Learning opportunities that do not restrict learner freedoms and yet foster meaningful, learner-centered interaction are becoming increasingly popular among adult learners. Studies of adult students enrolled in self-paced online courses at Athabasca University, Canada's Open University, showed that a majority of students chose not to participate in collaborative activities even if they are built into the course and a lack of participation adversely affects course marks. Anderson (2006a) reported that 78% of respondents either agreed or strongly agreed that they would interact with other students as long as they could proceed through the course at an individual pace. Students preferred interactions that were neither tied to specific course outcomes nor defined the pace of course progress.

Challenges to the development of self-paced learning environments incorporating interactions that best meet the needs of adult learners are formidable, but not insurmountable. Most notable is the task of bridging the transactional distance existent in such approaches while permitting learners to retain maximum control over their learning

experience. Learners enrolled in self-paced learning programs are free from the constraints of imposed pace and yet many view ongoing dialogue with other learners and the instructor as integral to a meaningful learning experience. While only minimal evidence exists suggesting that effective learning is dependent upon a cohort of students moving together in a specified sequence, significant evidence from the literature suggests that providing opportunities for meaningful interaction with other learners and community members in the context of structured learning activities enhances both learning as well as course completion rates (Anderson et al., 2005; Strachota, 2003; Su et al., 2005).

One central task for those developing such learner-paced online learning is to therefore discover how to structure collaborative activities in learner-paced courses so that both learner pacing and collaboration can be retained. The facilitation of interaction among groups of learners in a self-paced setting is problematic, as such collaboration has traditionally been based upon completion of specific learning activities at specified times. Learner-paced programs also struggle to generate a critical mass of students necessary to maintain a learning community, as learners are often afforded the flexibility to enroll in a new course whenever most convenient to their personal and professional schedules. Therefore, not only do course sizes often vary greatly, but also the number of students participating in any given activity at a particular time.

Traditional asynchronous discussion in a closed learning management system may not be the answer, as such technologies ideally suit interpersonal interaction in imposed pace learning. These communication technologies also disallow interaction with

entities outside the confines of the learning community, such as other established learning communities and may ultimately inhibit learner participation. Emerging forms of open, learner-directed computer-mediated communication hold great promise for enabling learners to remain connected and participate in meaningful interactions with fellow learners at varying stages of the learning process as well as those who are not enrolled in the same program or course section. Yet, academia is only just beginning to realize the potential of such emerging social networking and communication modes in supporting the unique interaction and learning needs of adults.

### Social Networks

It has long been recognized that communication within education should have an interactive component, whereby all parties have the ability to participate rather than simply being recipients of one-way transmission. Educators have pointed to the importance of the development of learning community in conjunction with the implementation of dichotomous communication modalities, recognizing that community creates opportunities for learning in addition to imposing constraints upon its members (Rovai, 2002; Wegerif, 1998). It is through such a structured and yet organic environment that some have claimed that the most transformational learning experiences take place (C. Jones & Steeples, 2001; Siemens, 2004).

As the semantic Web is realized within the age of ubiquitous connectivity, online social networks are becoming an increasingly prominent aspect of daily life. While the concept of social networks is by no means a new phenomenon, online technology has

vastly expanded the potential scope and reach of any given network. Without any advanced technical skills or knowledge of any HTML code, an individual with access to the Internet can join from one to many online networks and begin collaborating on any topic or point of interest imaginable. In such an environment, individuals can join and leave networks as they wish and are free to engage in any number of social networks simultaneously. Rather than simply sending electronic messages to friends or acquaintances, such social software tools provide a host of capabilities for individuals to create online profiles, disseminate a wide variety of rich media, and easily share or co-create resources with members of the network.

The benefits of integrating emerging online collaborative tools that embrace the characteristics of the semantic Web have been noted as holding great promise for addressing the characteristics of lifelong learning and meeting the varying needs of adult learners (Beldarrain, 2006; Friesen & Anderson, 2004). The structure of such frameworks is much more loosely connected than more traditional collaborative environments. These frameworks comprise learning that is based on creation, sharing, and participation. Downes (2006) elaborates on the potential of these new approaches, drawing the distinction between traditional structure of groups in online learning environments versus networks. Noting the distributed nature of networks versus the centralized nature of groups, Downes highlights several points of distinction between groups and networks: groups are unified, networks are diversified; groups are coordinated, networks are autonomous; groups are closed, networks are open; groups are distributive, networks are connective. Downes points out that while many overlaps exist among these two

categories of collaboration, networks do provide an alternative viewpoint to approaching the development of interpersonal interaction as compared to the traditional group frameworks. While structured learning communities have been an established pedagogical method in higher education for years, there is much still to be learned concerning the dynamics of networked learning environments and the extent to which such communities benefit instructors and learners (Chute, Sayers, & Gardner, 1997; McConnell, 2005).

One primary goal of networked learning environments, characterized by the incorporation of computer-mediated communication within distance education, has been the development of learning community. With the advent of contemporary electronic communication technologies, significant progress has been made in leveraging emerging communication practices to bridge the chasms of time and space that have traditionally separated distance learners. Rovai (2002) highlights the dimensions of classroom community, affirming that community can be developed online in as rich a manner as in the face-to-face classroom. He notes the diverse range of factors that contribute to a development of learning community in a distance learning environment. Greene (2005) found through a pilot study of an online community of learners that purposeful communication involving practical application of course materials is an effective strategy for improving both the learning experience and sense of learning community. In an effort to further explore the conditions that students identify as being highly conducive to community development, Lee, Carter-Wells, Glaeser, Ivers, and Street (2006) conducted a case study of a cohort of 18 students in an online master's degree course and analyzed

online learning community development among the cohort. The results of the first year of the 3-year longitudinal study show that students ranked participation in discussion across multiple forums as well as communication for the sake of technological support as highly conducive to community development. The theme of support through community development is one that continues to surface through the literature as being highly desirable by students and pedagogically beneficial to the learning experience (Fisher & Baird, 2005; Strachota, 2003; Swan, 2002). Administrators and instructors alike are taking notice of the design and substance of communication in distance education programs, as learners have expressed that communication is an integral component of a quality distance education program (Ortiz-Rodriguez et al., 2005).

Beyond the capacity for aiding learners to achieve learning objectives, community development is often viewed as a means for supporting ongoing dialogue. Mann (2005) asserts that the focus should be placed on such efforts of dialogue support rather than focusing on specific techniques fostering learning community. Her point is valid, stressing that community development is the natural product of effective communication efforts, leading to engaged, collaborative learning. The dynamics of social presence in the online venue assume increasing importance, as the perceived presence of the instructor and fellow learners in the online course may affect not only the level of student satisfaction but also the quality of the learning experience (Swan & Shih, 2005).

It is shortsighted to simply view the mere existence of an online communication environment as indicative of a beneficial social network for learning. Some may even go as far as to assume that merely enabling asynchronous discussion via the discussion

board feature of a learning management system (LMS) will foster learning community. Yet, one must remember that the LMS is simply a suite of tools that when incorporated through purposeful design can aid in providing a technological structure and continuity to the course. While the LMS can provide the organization, it is the affordances of an engaging learning community and the associated networks that learners form that ultimately create the ecology for the learning environment.

To move beyond the limitations of traditional instructor-driven, asynchronous threaded discussion, institutions are beginning to embrace emerging social networking technologies that allow for the creation of a virtual social space extending beyond the boundaries of a single course section or program. As social software, at times clumped together with the smorgasbord of participatory online communication technologies referred to as “Web 2.0” becomes more universally adopted, it’s becoming easier than ever before to morph academic communication with forms of personal and social communication. One blaring complaint of online learning environments that are restricted solely to existence within a LMS is the closed nature of such systems, preventing communication from taking place outside of the specified electronic venue (Dalsgaard, 2006; Dron, 2006a). Once the term of the online course is over, access is typically terminated for all participants in the course, and the discourse from the course is no longer accessible.

New capabilities of networked learning are needed within both formal and informal learning environments to meet the expectations for online learners already accustomed to participating in such open communication modes. Yet, the mere existence

of a social network is no guarantee for the development of a meaningful learning community. Rather, in order for such social networks to be a significant element of the total learning experience, they should be fully integrated with the course activities. McPherson and Nunes (2004) discuss how the existence of a virtual social space designed to support the creation of a learning community is not a panacea. They found through their study of adult learners in a continuing professional development program that learners desired to interact in ways outside of the restricted online course environment, utilizing communication technologies that they were previously familiar with. While further study into the preferences of learners in terms of interaction is certainly warranted, preliminary recommendations from the literature suggest that social networks yielding the most educational benefit are those purposefully incorporated into the learning environment (McPherson & Nunes, 2004; Tan, 2006).

### Educational Social Software

It has been argued that learning management systems do not support the dynamics of a social constructivist approach emphasizing self-governed learning activities and that it is necessary for e-learning to move beyond learning management systems to engage students in active use of the Internet (Dalsgaard, 2006). Educational Social Software (ESS) is a relatively new subset of communication tools that have been recognized as offering aspects to the communication landscape that up until recently have not been available. These tools leverage the affordances of the Semantic Web, permitting the active contribution to the form and substance of the World Wide Web in a manner

previously restricted to the few with extensive technical and programming skills. It is just this participatory nature of content creation and collaboration that Tim Berners-Lee (1997) envisioned when laying the groundwork for the Internet. A host of implications exist for the educational establishment in general and online learning in particular as the communication potential of such emerging communication practices is realized.

The Educational Semantic Web (ESW) serves as the foundation whereby various applications of educational social software are built upon. Akin to the Semantic Web, the ESW serves as the framework whereby individuals are free to actively construct their learning networks and resources. Anderson (2006b) points to three fundamental tenets of the ESW that have risen to prominence, characterizing the unique nature of such applications. First, the capacity of the Semantic Web to support effective retrieval of vast amounts of content has radically shaped new approaches to information management. As the amount of information available online increases at an astronomical rate, users need to be able to identify content in a manner that it is meaningful and can be easily retrieved. The ESW involves the capacity for users to quickly and easily tag resources in such a way that they can be quickly retrieved as well as shared with others. Second, the ESW supports and enhances human communication. Since communications can be both syndicated and aggregated, producers of communication and content can determine the scope of the impact of their communications while retaining the autonomy of all users. Users can subscribe to information sources and communication feeds they find to be most relevant and helpful at any given time, further selecting the communication modes they find most beneficial. Finally, the ESW possesses the capacity to support autonomous

agents. Built on a structure of universal content encoding, users can configure agents that will filter new information and contributions, providing only communication updates that meet predetermined criteria. The ESW therefore facilitates the development of learner-learner interaction, fostering the creation and preservation of learning communities (Anderson, 2006b). In addition, the ESW can help address the widely varying characteristics of lifelong learning, often shaped by learner-defined contexts and requirements. The set of technologies possible by the ESW, when combined with appropriate services and practices, can be of great assistance in meeting the unique needs of lifelong learners (Friesen & Anderson, 2004).

Anderson (2005) recognizes the difficulty in orchestrating and supporting meaningful student-student and student-content interactions and points out the value of social software in permitting the maximum student freedom while at the same time supporting opportunity for community building. In support of a working knowledge of ESS, Anderson (2006a) offers the following definition: “Networked tools that support and encourage individuals to learn together while retaining individual control over their time, space, presence, activity, relationship, and identity” (p. 83). While it can be argued that such a definition is broad enough to encompass more traditional communication forms such as e-mail and threaded discussion, the expansive nature is necessary to envelop the wide range of capabilities that ESS offers.

A host of social software tools have been classified as ESS, with more seemingly being added to the list each day. Weblogs, wikis, podcasts, e-portfolios, and social bookmarks are just a few such collaborative tools that have powerful implications for

learning, permitting learners to communicate via rich media and form multifaceted learning networks (Sims & Salter, 2006). These innovative online communication vehicles facilitate content creation and dialogue in radically different ways from previous computer-mediated communication approaches (Alexander, 2006). Studies have explored the benefits of using such emerging social software to encourage meaningful e-learning interaction (Beldarrain, 2006; Brescia & Miller, 2006; Cameron & Anderson, 2006; Konieczny, 2007; West et al., 2006), noting the enhanced communication and networking capabilities. The shift from conventional one-to-one and one-to-many communication to incorporation of ESS has ushered in a new approach to e-learning, marked by new interaction capabilities that are qualitatively different from traditional methods (Dron, 2006b).

    Blogging is one of the many emergent computer-mediated communication tools considered to be ESS, offering distinct advantages over common threaded discussion by promoting learner-centered and learner-controlled communication approaches (Cameron & Anderson, 2006). A blog, the shortened and more common term used for Weblog, is a Web publishing solution in which the individual is able to quickly post new content. Readers can post comments, whereby engaging in a didactic conversation with the author. It is this free flow of communication among the author and readers that make blogs such an attractive and popular form of online interpersonal communication. In an educational context, blogging affords individuals with the capability to share ideas with a broader community beyond the defined course boundaries (Martindale & Wiley, 2005).

While at first glance a blog may simply appear to be a Web site with content entries that are date and time stamped and listed in reverse chronological order, the underlying framework is qualitatively different from static HTML. At the core of every blog is an XML file, also referred to as a Really Simple Syndication (RSS) feed, which serves as the index of the most recent additions to the blog. RSS is a core element of any blog, making it possible for individuals to subscribe to view all new information updates via an aggregator without having to continually revisit the blog. In effect, the aggregator does the work of checking for new content. Whenever the author of a blog makes a new entry, commonly referred to as a posting, the blog software automatically updates the XML file of the blog to include information about the new posting such as the title, the date and time it was posted, the first portion of the body of the posting, as well as a link to read the entire posting. For each new posting that is subsequently added, the blog software updates the XML file to include details about the new postings. Therefore, a blog is much more than simply a collection of postings, as it serves as a mechanism for syndication and aggregation of new content and communication.

Another popular and versatile ESS tool is a wiki. While blogs are primarily utilized as a communication means for a single individual, wikis allow for collaborative authorship, encouraging free editing of information. A wiki is powered by software, referred to as a wiki engine, that tracks changes and makes it easy for anyone with the appropriate access to be able to contribute to a document without any special programming skills. Rather than a single author being responsible for a specific portion of a writing project, members of the team are able to simultaneously contribute new

information as well as make changes to existing content. Maximizing on the collective intelligence of the community, a wiki is a very organic collection of content and communication, continually evolving as the community collectively creates and edits it. Similar to blogs, wikis require little technical skill and can be either publicly accessible or privately secure.

E-portfolios have emerged as yet another powerful form of ESS, harnessing the functionality of blogs and wikis in a centralized Web publishing and communication application. Tosh and Werdmuller (2004) use the term “Learning Landscape” to refer to the makeup of such systems, noting the wide range of pedagogical possibilities afforded learners. Existing in many different forms, e-portfolios are in the most simplistic terms digital repositories of learning artifacts that demonstrate competencies or achievement of specified learning objectives. Yet, contemporary e-portfolios often extend far beyond simple collections of learning resources to include reflections of learning processes, communications of learning experiences, and even sharing of select digital objects with others.

One primary characteristic evident within the literature uniting all social networking and educational social software applications is the element of community building. Brown (2001) examined the process in which community formed within an adult distance learning class implementing asynchronous computer-mediated communication and identified three stages characterizing community formation: 1) friendship building; 2) community acceptance through ongoing discussion; 3) camaraderie development through prolonged interpersonal communication. As learners

progressed through these various stages, a greater degree of engagement with the course and the dialogue was noted. Greene (2005) took a similar approach in studying the development of an online community of adult learners and found community development to be a valuable aspect of learners' ability to make practical application of new concepts. ESS facilitates the creation and growth of learning communities on a variety of levels.

The implementation of educational social software into the learning environment not only enhances the feeling of connectedness among participants in the learning experience but also equips learners with tools to use available resources on the Web to solve future problems (Dalsgaard, 2006). Once the course or learning program ends, the established networks continue to exist. The continued participation in existing social networks combined with the knowledge of and capability to create new networks provides learners with access to an enormous number of people and resources that can truly support a lifelong approach to learning. Learners can adjust their networks and participation at any given time to meet their learning needs for the moment. ESS therefore can serve as the bridge between the episodic course learning experience and the lifelong learning process.

With such characteristics of ESS in mind, Tu (2005) calls for a transition from viewing such technology as means for storage and retrieval to recognizing the enormous pedagogical potential for active engagement in the process of knowledge construction. When considering that instructor-learner interaction is not scaleable (Anderson, 2006b), alternative approaches may be necessary for initiatives seeking to expand course size or

curriculum offerings while maintaining a quality learning experience. ESS is one solution aimed at supporting learner-learner and learner-instructor interaction while still allowing students to individually pace their learning.

### Summary

The development of a collaborative learning environment is one critical factor to the success of an e-learning initiative (Garrison & Anderson, 2003; Jung et al., 2002). Almost as diverse as the construct of interaction itself is the number of possible approaches to fostering meaningful interaction in online contexts. Yet, arbitrarily adopting new approaches simply because technological tools permit doing so is both imprudent and impractical. Facing the reality of scarce resources, institutions may select methodologies that best meet course objectives while potentially overlooking learner needs and preferences. In reality, these decisions should be grounded upon sound insights into the online learning experience that is being developed, with the implicit focus of fostering the types of interactions that learners find most beneficial to their learning experience and potentially have the greatest impact on the quality of the learning experience.

Recognizing the important role that interaction has in the overall e-learning framework, many studies have examined the amount and frequency of communication representative of interaction within instructor-paced contexts (Angeli et al., 2003; Curtis & Lawson, 2001; Pawan et al., 2003; Rourke & Anderson, 2002a). Others have gone the next step of exploring in greater depth the quality of such interaction and the impact that

such interactions have on learning outcomes (Ho, 2005; Meyer, 2004; Picciano, 2002; Rovai & Barnum, 2003). Yet few have neither specifically explored learners' preferences for interaction in alternative, self-paced online learning environments (Anderson et al., 2005) nor sought to determine whether various forms of interaction are deemed equivalent. As Picciano (2002) notes, "new situations created through new technology require new study and evaluation" (p. 25). As online education continues to advance, both in terms of the pedagogical approaches utilized and the technologies incorporated to foster learning processes, the opportunities for extending understanding of such emerging approaches expand proportionally. This study provides a valuable contribution to the literature concerning the perceived role, function, and value of varying types of interaction in one such emerging online learning context.

## CHAPTER 3. METHODOLOGY

### Statement of the Problem

Interaction has long been identified as a key element to successful online learning programs (Beldarrain, 2006; Moore, 1993). While not the sole indicator of high-quality and effective online education programs, there is significant evidence to suggest that meaningful interaction with other students and the instructor is integral to the development of thriving learning environments (R. E. Brown, 2001; Garrison & Cleveland-Innes, 2005; H. C. Greene, 2005; Joyce Lee et al., 2006; Swan, 2002). Insufficient or ineffective interaction may lead to student isolation, while exorbitant levels may lead to overload or frustration (Berge, 1999; Willging & Johnson, 2004). Yet, little empirical evidence currently exists as to the value that learners place upon the various types of interactions in a self-paced learning environment.

### Purpose of the Study

The purpose of this study was to expand upon previous research advocating for the purposeful design of interaction within the online learning experience (C.-W. Chang, 2006; Hirumi, 2002). This study builds upon existent knowledge of online education by specifically examining the composition of the online learning experience of adult learners in a hybrid self-paced learning environment that includes numerous interactive

components and instructor facilitation designed to foster an engaging and meaningful learning experience. The goal of this study was therefore to extend the bounds of previous research into interaction within the online learning experience by examining what forms of interaction learners in a self-paced online course value most as well as what impact they perceive interaction to have on their overall online learning experience.

### Research Questions

This exploratory study sought to examine the experiences and preferences of adult learners concerning the various interactions that they encounter in a self-paced online course. The following four primary research questions guided data collection and analysis efforts:

1. What forms of interaction do adult learners engage in most in self-paced online courses?
2. What forms of interaction do adult learners value most in self-paced online courses?
3. What forms of interaction do adult learners identify as equivalent in self-paced online courses?
4. What impact do adult learners perceive interaction to have on their self-paced online learning experience?

## Research Design

Building upon previous research in human-human interaction in online learning environments, this mixed methods study utilizing a concurrent data collection methodology documented the experiences of adult learners participating in a self-paced online course employing various levels of interpersonal interaction. A brief overview of mixed methods research is warranted in justifying why the selected approach was ideal for this study.

Mixed methods research has been operationally defined in chapter 2 as, “collecting and analyzing quantitative and qualitative data within either a single study or multiple studies.” Mixing such qualitative and quantitative datasets provides richer insight into the phenomenon than if either dataset were to be used alone and provides strengths that offset the weaknesses inherent in each sole approach (Creswell & Plano Clark, 2007; Jick, 1979, December). Rather than being limited to a single ideology, the researcher is free to utilize all possible methods to explore a research problem.

While researchers have been collecting both quantitative and qualitative data in the same studies for years, the notion and acceptability of mixing different data types in the same study to result in a distinct research methodology has emerged only within the past decade (Creswell & Plano Clark, 2007). Disagreements still exist among scholars concerning many fundamental tenets related to the field of mixed methods research, such as: nomenclature and basic definitions used, design issues, issues in drawing inferences, and logistics of conducting mixed methods research (Teddlie & Tashakkori, 2003). Yet, mixed methods research has grown from a subset of traditional quantitative and

qualitative approaches to be recognized as a viable and effective methodology that stands alone from other research frameworks (Creswell & Plano Clark, 2007; Tashakkori & Teddlie, 2003). It is a research approach that can bridge the rift that still exists in some venues between quantitative and qualitative research (Onwuegbuzie & Leech, 2005).

The evolution of mixed methods research parallels the following development movements of qualitative research that took place during the twentieth century, characterized by Denzin and Lincoln (1994): the traditional (1950-1970), blurred genres (1970-1986), the crisis of representation (1986-1990), and postmodern or present movements (1990-present). Tashakkori and Teddlie (2003) note the similarities between the development of qualitative research and mixed methods research methodologies, pointing out that a substantial amount of important mixed methods took place as early as the time period from 1900-1950. These early examples of mixed methods research predominantly involved extensive use of interview and observation protocols. Tashakkori and Teddlie further note that the traditional period (1950-1970) was characterized by efforts aimed at debunking positivism while also encouraging multimethod designs. As such approaches gained traction among the research communication and increasing numbers of studies utilizing a mix of methods appeared, the debate surrounding the merits of such studies grew (Tashakkori & Teddlie, 1998). The so-called “paradigm wars” resulted in mixed methods approaches being openly received as an opportunity to discredit strictly positivistic mindsets that had previously dominated for centuries. As mixed methods research has become increasingly popular and has been rigorously scrutinized, it now is considered to be a separate methodology that can leverage the

strengths of both the qualitative and quantitative approaches (J. C. Greene, 2008; R. B. Johnson & Onwuegbuzie, 2002).

Numerous reasons exist as to why researchers choose to employ mixed methods in research. As previously mentioned, one primary reason is to leverage both qualitative and quantitative data in a single research study. Such methods allow for the measurement of, “overlapping but also different facts of a phenomenon, yielding an enriched, elaborated understanding of that phenomenon” (J. C. Greene, Caracelli, & Graham, 1989, p. 258). Green et .al use the analogy of “peeling the layers of an onion” when characterizing this application of mixed methods research when seeking to learn of the different levels of a phenomenon. While a single approach may only yield data at the surface level, utilization of several alternative methods can yield a much deeper level of understanding (McMillan & Schumacher, 2006). This expansion of knowledge from one method to another is a definite strength and often leads to united or substantiated findings from different data sources. Some have gone as far as to claim that the methodological pluralism indicative of mixed methods research frequently results in superior research as compared to monomethod research (R. B. Johnson & Onwuegbuzie, 2002).

The growth of interest in mixed methods research is evident through the vast number of books, journal articles, and funded research projects available today utilizing the mixed methods model of research. In fact, entire journals, such as the *Journal of Mixed Methods Research*, are now devoted entirely to scholarly dialogue and dissemination of mixed methods research. Examples are not limited to any single discipline, but rather are pervasive among virtually all social science research

(Tashakkori & Creswell, 2008). Many previous studies in the literature illustrate the utility of mixed methods approaches to addressing research questions particularly in the field of online education (Franklin, Peat, Lewis, & Sims, 2001; Mehanna, 2004; Oladoke, 2006; Swan & Shih, 2005).

As with any research methodology, inherent challenges exist with mixed methods research that researchers must consider. For one, mixed methods research is complex and involves exploring differing approaches to investigating a research problem. Additional time and resources are often necessary to collect and analyze both quantitative and qualitative data (Lodico, Spaulding, & Voegtle, 2006). Research procedures are usually more complicated and require additional effort to provide clear presentation of findings. These are all aspects one must consider when deciding on the appropriate research design.

As many research questions can be most effectively answered through mixed research solutions (R. B. Johnson & Onwuegbuzie, 2002), the selection of the mixed methods framework for this research study incorporating a concurrent data collection method was based upon the value of resulting first-hand accounts from participants of their experiences and perceptions of interaction within a unique online learning environment. The resulting data from the mix of quantitative and qualitative interview questions included a combination of rich narrative accounts along with numeric frequencies of engagement. The mixed methods approach was ideally suited for addressing the proposed research questions, as such an approach has been utilized successfully by previous researchers to glean important insights from participants of the

dynamics of novel online education initiatives (Mehanna, 2004; Oladoke, 2006; Swan & Shih, 2005). Data was collected in the form of semi-structured, in-depth interviews conducted near the conclusion of the course to understand from the perspective of learners the perceived value of various modes of interaction as well as interaction experiences and preferences. Such rich learner perspectives provided an enlarged and deepened range of immediate experience, adding great value to the body of knowledge by forming a solid foundation for future inductive or empirical studies.

Sechrest and Sidani (1995, p. 78) note that both quantitative and qualitative methodologies, “describe their data, construct explanatory arguments from their data, and speculate about why the outcomes they observed happened as they did.” While this mixed methods study was predominantly qualitative in nature and the majority of the interview questions yielded rich narrative responses from participants regarding their individual experiences, the frequencies of engagement in the different types of interactions provided great insights into the overall experiences and ultimately the value that participants placed upon the various types of interaction that they experienced.

## Sampling Design

### *Participants*

The participants for this study were online adult learners enrolled in a fully-online professional development certificate program for children’s ministry professionals and laity offered by a private, higher education institution located in the northeastern part of the United States. This study was specifically limited in scope to investigating the

interaction experiences and preferences of self-paced online learners in order to provide in-depth data concerning the distinctive aspects of interaction within this unique learning ethos. The one-year online certificate program in Children's Ministry (CMUO) offered by Valley Forge Christian College (VFCC) employs such a self-paced, emergent and flexible design and was selected as an appropriate context in which to explore the dynamics surrounding the interaction preferences of adult online learners. VFCC Academic Affairs granted permission for the study to be conducted with the desired VFCC student body and pledged to provide the necessary access to the selected group of adult learners.

#### *Sample Course Characteristics*

The study sample included all learners successfully completing either of two concurrent sections of an undergraduate certificate program course offered by VFCC. This course utilized a unique self-paced format whereby a new cohort of learners began the course with an instructor each month. Participants were afforded the freedom to proceed through the course materials and activities at an individualized pace with the only stipulated deadline being an end-of-course deadline. The researcher happened to also serve as the course instructor for this course and therefore was privy to the intimate details of the wide range of course design, development, and facilitation processes. Explicitly detailed research design and methods were therefore essential to combat the existent opportunity for bias as well as threats to reliability and validity.

The course selected, while constructed within the Blackboard learning management system (LMS) and incorporating a variety of asynchronous computer-

mediated communication tools standard in the LMS, also included integration of a personal learning landscape consisting of an assortment of various social networking features such as blogging, tagging of resources, e-portfolios, and learner-driven communities. This social learning landscape entitled “CMUOnet” and branded likewise for consistency with the VFCC certificate program, was powered by the open source social networking platform Elgg and available for learners to access at <http://cmuonet.org>, as shown in Figure 4.

The screenshot displays the CMUOnet website interface. At the top left, the logo reads "CMUOnet Personal Learning Landscape". To the right is a search bar with a "Go" button and a dropdown menu set to "-- all --". Below the search bar are links for "Browse" and "Tag cloud".

The main content area features a welcome message: "Welcome to CMUOnet, the personal learning landscape for Children's Ministries University Online!". It describes the platform as a fully featured electronic portfolio, weblog, and social networking system. Below this is a registration notice: "CMUOnet is restricted to students, instructors, and staff of Children's Ministries University Online. To participate in CMUOnet you must signup using the form below. Registration confirmation and instructions for logging on will be sent to you via email within 24-48 hours."

A "New User Sign-up Form" is provided with the following fields:

|                            |  |  |  |
|----------------------------|--|--|--|
| First Name                 |  | Last Name  |  |
| CMUO Username              |  | CMUO Password  |  |
| Email Address              |  |  |  |
| Preferred CMUOnet Username |  | 2nd Choice CMUOnet Username (used only if preferred username is taken) |  |

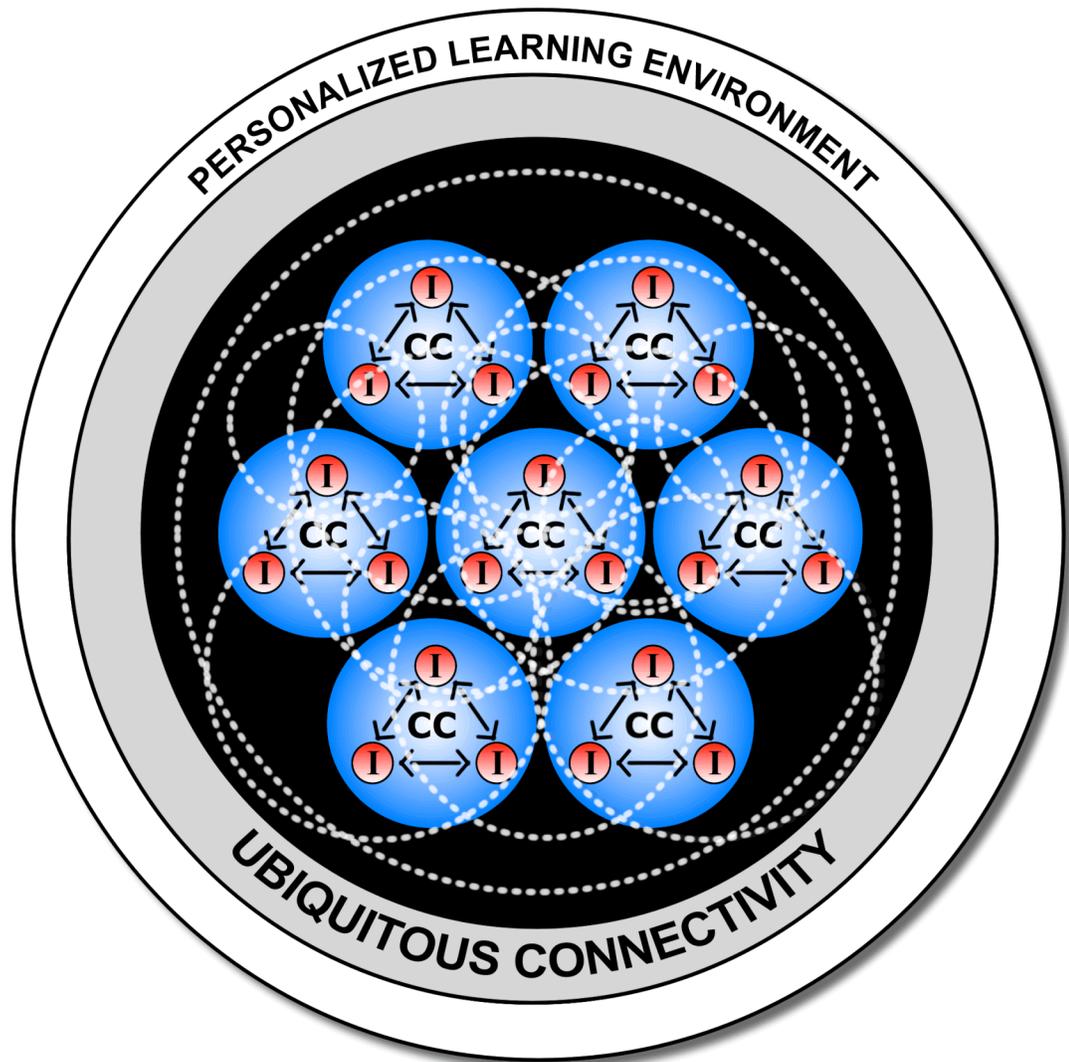
A note at the bottom of the form states: "\*Note - Your username will become part of your CMUOnet account and blog address (ie: ...".

On the right side, there is a sidebar with the "Children's Ministries University Online" logo. It includes a "Log On" section with fields for "Username" and "Password", a "Log on: Go" button, and a "Remember Login" checkbox. Below this is a "User Statistics" section showing "There are 124 active users. (1 logged on.)" and a link for "Recent Blog Postings".

Figure 4. Elgg Instance – CMUOnet (<http://cmuonet.org>)

CMUOnet is a learning landscape consisting of a fully featured electronic portfolio, Weblog and social networking system, connecting CMUO learners and creating communities of learning. It allows CMUO learners and instructors to connect both socially and academically. CMUOnet exists to promote collaboration and reflection in an academic and social setting. CMUO learners are able to meet fellow students, either online or face-to-face, without invading their privacy. While communications taking place within the framework of a given CMUO course only last for the duration of the course, learners can use CMUOnet to collaborate and build ministry networks that will last and be accessible long after the course(s) the learner is enrolled in have ended.

Incorporating features of both the LMS and learning landscape, course activities and the resulting interactions were designed to integrate a full complement of asynchronous communication and social networking tools available today in creating a socially-constructed self-paced learning environment. This model displayed in Figure 5 serves as one emerging approach to adult online learning that embraces a socially-constructed framework (Rhode, 2006).



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*Figure 5. Anatomy of a socially constructed self-paced learning environment*

Such a learning environment involves the creation of a personalized learning environment (PLE) to incorporate a cohort-based approach whereby learners could begin any given course at a designated regular timeframe (e.g., monthly, quarterly, weekly, etc.). The learner is placed into a cohort (i.e., class) with other learners beginning the course at that given time and at least one instructor. This small group comprises a

restricted Course Community (CC) in which the members of the community are able to interact throughout the duration of the course. For example, during the first week of the course, the instructor could facilitate some introduction and ice-breaker activities in which the learners and instructor(s) could begin to connect. As the course progresses, learners begin to advance at individual rates and may choose to remain connected closely with the cohort or may seek support from other communities (either online or face-to-face).

While self-paced learners should have continual access to the CC throughout the course, a true socially-constructed environment should allow for learners the freedom to join interest/subject matter communities to individually construct the learning networks deemed most beneficial. These self-selected and formed communities should provide learners with the opportunity to create, communicate, and collaborate within a context of ubiquitous connectivity (ie: community members should remain connected throughout the duration of the course). Whereas traditional online learning environments built within a learning management system (LMS) are available to learners only for the duration of the course, a socially-constructed self-paced learning environment (SCSPLE) should allow for access to designated communities after the course is completed.

Figure 5 is an initial attempt to illustrate the complexities of SCSPLE's. Individuals (I) within course communities (CC) have access to both the restricted CC but also to numerous learner-initiated interest communities. An individual can belong to numerous course and interest communities simultaneously and can join or leave these communities at any time. If learners do not find a community for the desired

topic/interest, they can create a new community and invite others to join. Each CC is comprised of a specific and defined population (ie: the learners and instructor(s) for the course) while each interest community (IC) is dynamic, allowing for the members to freely join or leave at any time and engage in a wide assortment of formal and informal interpersonal interactions. The course serving as the self-paced learning environment that was explored in this study incorporated this SCSPLE model for online learning.

This course was also a unique learning environment selection for this study in that it mandated the use of both the Blackboard LMS and CMUOnet by each of the learners as part of the required learning activities. This made possible a unique discovery of learner preferences for different types of interactions fostered by these varying suites of online communication tools. Such emergent collaborations included blogging, podcasting, social bookmarking, and informal search for additional supplementary resources. In addition, the course sections selected were equally unique, as one section had only a single learner as compared to fourteen learners in the other. One might expect that such a disparity of course sizes would adversely affect results as a course scenario with a lone learner would be limited and therefore eliminate all possible interpersonal interactions beyond one-on-one contact with the course instructor. However, due to the integration of a course community and course blog that included learners in multiple sections of the same course, the lone learner in the August 2007 course section had opportunity to interact with others outside of the formal learning space in Blackboard. Therefore, unique comparisons and contrasts were gleaned between the perspective of the learner in a course section where formal interaction with other learners was limited as

compared to the perspectives of learners in a simultaneous course section where formal interactions with other learners was much more feasible.

### *Participant Selection*

Adult online learners having currently enrolled in at least one self-paced online course in the online children's ministry certificate program of Valley Forge Christian College (VFCC) served as the convenience sample for this study. A common approach within education research, the convenience sampling technique, is often utilized when the characteristics of a specific group of individuals matches the attributes of the phenomenon being studied (McMillan & Schumacher, 2006). The study sample included all learners enrolled in two concurrent sections of a VFCC undergraduate certificate program course. The sample size was restricted to this select group of learners as they were the most current cohort of learners to be actively enrolled in a self-paced online course at the institution at the time of the study and had the freshest memory of their experience, considered vital by researchers who claim that the farther removed a participant is from the direct experience, the more problematic recall becomes (Fink & Kosecoff, 1998). The course enrollment for the August 2007 and September 2007 sections of the course totaled fifteen learners, with one learner enrolled in the August 2007 section and fourteen learners enrolled in the September 2007 section. Of the fifteen learners who began in either of the selected course sections, only eleven successfully completed at least three of possible four units of the course to qualify to participate. Invitations to participate were sent via e-mail to the eleven learners who successfully completed 75% or more of the course, of which 10 responded and agreed to participate in

the study. The lone learner from the August section was among those who successfully completed the course and agreed to participate. Therefore, the resulting study sample size was 10 ( $n=10$ ), a remarkable response rate of 91%.

### *Participant Demographics*

Of the 10 participants in this study, 7 were female and 3 were male. The age range of participants varied from 18-25 to 56-65, representing a truly diverse cross-section of adult learners. The majority of the participants ( $n=6$ ) were in the 36-45 age range which also happens to represent the largest age group of all CMUO learners. Table 1 displays the demographic characteristics gathered regarding the participants.

Table 1

*Demographic Characteristics of Participants (n=10)*

| Characteristic | <i>n</i> | %   |
|----------------|----------|-----|
| <i>Gender</i>  |          |     |
| Male           | 3        | 30% |
| Female         | 7        | 70% |
| <i>Age</i>     |          |     |
| 18-25          | 1        | 10% |
| 36-45          | 6        | 60% |
| 46-55          | 2        | 20% |
| 56-65          | 1        | 10% |

Two participants confirmed that this course was the first online course with CMUO that they had completed, while the remaining eight learners noted that they had previously enrolled in a self-paced CMUO course. Table 2 depicts the range of previous online learning experiences as noted by the participants.

Table 2

*Number of CMUO Courses Completed (n=10)*

| Prior Courses Completed | <i>n</i> | %   |
|-------------------------|----------|-----|
| 0 Courses               | 1        | 10% |
| 1 Course                | 3        | 30% |
| 2 Courses               | 2        | 20% |
| 3 Courses               | 1        | 10% |
| 4 Courses               | 1        | 10% |
| 6 Courses               | 2        | 20% |

The context of the participants' experience is certainly an important factor worth noting. When participants were asked how many courses they were taking presently, responses were split exactly in half, with 50% currently taking just the single course while the remaining 50% confirming that they were simultaneously enrolled in another course.

No further demographic or background data was reviewed. Interview questions were largely qualitative in nature and addressed various aspects of the types of interactions built into the course and participants' preferences for each. Chapter 4 provides an overview of the rich experiences of participants that was captured. While the resulting data was primarily qualitative in nature consisting of rich narrative experiences, graphical representations of frequency are provided where appropriate to further illustrate the quantitative responses received.

### *Time Frame*

The nature of the self-paced online learning experience raises a unique set of variables for consideration. New CMUO course sections begin monthly, allowing learners to commence and conclude their learning experiences when most convenient. While courses have specific starting and ending dates, the self-paced nature of the course learning activities further individualizes the overall learning experience, as learners are able to progress through the course at an individualized pace. Therefore, the experiences of the collective body of learners enrolled within the program are unique to each individual, as learners are routinely at different stages of course completion. In order to collect data that most accurately reflects the overall experiences and perspectives of learners at the time of study, it was conducted with learners enrolled in the August 2007 and September 2007 sections of the course near the end of their learning experience. Such summative reflections from learners provided valuable insights into the overall online learning experience and the perceived equivalency of various interactive attributes of VFCC's self-paced online learning program.

This study was conducted during a six-week time period during the fall of 2007. The course studied was self-paced, affording learners the flexibility to complete the course in as short as 1 week or up to a full 8 weeks. Therefore, all learners enrolled in the selected course were contacted via e-mail once they had begun the final unit of the course and therefore finished at least 75% of the course and were invited to participate in the interview. Reminder e-mails were sent at 1-week and 2-week time periods for those who did not initially respond to the e-mail invitations. With each interview lasting

approximately one hour, interviews were scheduled over a 4-week time period. Consistent with recommendations from the literature concerning transcription and data analysis, an estimated five hours was allotted for transcription of each one hour of interview. Actual transcription time frames remained consistent with estimates provided in the literature. Therefore, a goal of conducting 3 interviews per week was set and successfully adhered to.

### Measures

A convenience sample of learners having recently completed a self-paced online course was selected to participate in in-depth interviews to share first-hand accounts of their interaction experiences and preferences in an effort to glean a holistic understanding of the dynamics of and learner preferences for interaction within less structured online learning environments. Such rich learner perspectives provided an enlarged and deepened range of immediate experience, adding great value to the body of knowledge by forming a solid foundation for future inductive or empirical studies. Transcripts of the interviews with learners were analyzed and coded for emerging themes. Self-reported frequencies of engagement in the various interactive components of the course were collected from participants during the interviews and analyzed as well. The resulting findings include both the collective and comprehensive perspectives of VFCC adult learners as they share their experiences and preferences for interaction within the self-paced online education environment.

The semi-structured open-ended interview method was selected for data collection as it provides a consistent and yet flexible inquiry framework (McMillan & Schumacher, 2006; Patton, 1990). At the core of this process is the desire to understand adult learners' perceptions, perspectives, and understandings of interaction within self-paced online learning. This mixed methods approach facilitated the examination of experiences from multiple perspectives involving data in multiple forms, leading to the formation of generalizations concerning the true essence of the experience from an insider's point-of-view (Leedy & Ormrod, 2001). Interview questions addressed the three main types of interaction described in the literature (e.g., student-student interaction, student-instructor interaction, and student-content interaction) in regards to both formal and informal learning activities and also explored the tenets of Anderson's (2003) Interaction Equivalency Theorem. The interviews yielded rich narrative descriptions of learners' interaction experiences, preferences, and frequencies of interaction engagement in an attempt to understand the interaction dynamics and optimal integration within an online self-paced adult learning program.

#### Data Collection Procedures

This study involved semi-structured open-ended interviews with each learner agreeing to participate ( $n=10$ ). Permissions to conduct this study was granted by Capella University via submission of appropriate documentation to the Institutional Review Board (IRB) as well as Valley Forge Christian College Department of Academic Affairs. Since sampled learners were distributed across North America, interviews were

conducted over the phone rather than in person. Interviews were comprised of semi-structured, open-ended interview questions concerning learner perceptions and preferences for interaction in the self-paced online learning environment and were conducted to gain deeper insight into learners' experiences engaging in the various forms of interaction within the course (see Appendix A). All interviews were recorded digitally and then manually transcribed and coded as part of the data analysis process. The QuickTap telephone handset tap, in conjunction with a laptop computer and the audio recording software Audio Hijack Pro was used to record each phone interview. Interviews were then manually transcribed using the software package HyperTRANSCRIBE and then coded for emerging themes. Member checking strategies were utilized and involved sending transcripts of interviews to the corresponding interviewees to confirm accuracy prior to coding.

Each interview consisted of a total of ninety-four pre-determined questions. Interview questions were derived from a review of premier themes within interaction literature and addressed the three main types of interaction described in the literature (e.g., student-student interaction, student-instructor interaction, and student-content interaction) in regards to both formal and informal learning activities. The questions also explored the tenets of Anderson's (2003) Interaction Equivalency Theorem. Questions were provided to all participants prior to the interview to allow learners to reflect on the questions and subsequently give more substantive responses. At times throughout the interview, additional follow-up questions were asked to help clarify or expanded upon responses. The complete list of interview questions is found in Appendix A.

Chapter 4 includes a summary of the process and substance of data collection efforts followed by analysis of the research questions in relation to study interview findings. Where appropriate, responses from participants are included to support conclusions reached from the data. Pseudonyms are used in place of the actual names of participants to protect their identities.

### *Pilot Testing*

The necessity for pilot testing any research protocol or instruments prior to distribution or deployment within a research study is widely recognized and stressed throughout the literature (Leedy & Ormrod, 2001; McMillan & Schumacher, 2006). Such pilot testing practices are helpful in identifying needed changes to an instrument or set of instructions and provide the researcher with not only an estimate of the amount of time it will take for the data collection intervention but also an initial view of the pattern of likely responses. Interview instructions and questions were pilot tested with an adult learner representative of the target learner population and who completed at least one course within the online program. However, this learner's participation did not fall within the target range and therefore was not eligible to be officially included in the study. The field test included a review of instrument clarification, technological presentation, recording and transcription protocols, and data analysis testing. Specific feedback concerning improvements or clarifications was documented and a few minor adjustments were subsequently made prior to implementation.

## Ethical Issues

The ethical veracity of any study is of utmost importance, as the protection of participants is among the most important characteristics of reputable and reliable research. Every effort was made throughout this study to ensure that the privacy of each participant was protected. All eligible learners enrolled in the selected course sections were contacted via e-mail and invited to participate in the study. Those agreeing to participate in the interview were asked to return to the researcher a signed copy of the informed consent form and to contact the researcher either via the e-mail or phone contact information provided to set up a mutually convenient time to conduct the interview via phone. Participants were informed that interviews were recorded confidentially for the purposes of the study only. Once transcribed, the resulting interview transcription was sent via e-mail to the participant to ensure accuracy. Interview data, including recorded audio files and transcribed text data, was securely stored electronically using assigned identification codes in place of any participant names or other identification information. Pseudonyms were used in place of participants' actual names in the data analysis and results to ensure that identities of the participants are protected.

## Data Analysis Procedures

At the core of many mixed methods research approaches is the quest for collecting and analyzing a mix of quantitative and qualitative data within a single study in order to grasp the truest sense of participants' first-hand experience of phenomena. In

fact, it has been argued that such approaches to empirical inquiry affording methodological pluralism frequently result in superior research as compared to monomethod research (R. B. Johnson & Onwuegbuzie, 2002). Consistent with inductive research, data analysis efforts involved recognizing categories of description as a primary outcome of the research activities (Marton, 1988). In a more simplistic sense, the goal of such a study is ultimately to take the perspectives of participants experiencing the phenomenon first-hand and categorize such individual experiences into collective groupings where conclusions can then be drawn from. To that end, the data analysis process involved identifying emergent themes from the data that will serve as foundational schema for further data organization and analysis.

While there is no single approach for coding all qualitative data, certain techniques have been shown effective in organizing and classifying data for further analysis. In particular, the coding scheme that includes selection procedure based upon criteria of relevance provides a solid foundation for organizing, coding, and categorizing data (Charles & Mertler, 2002; McMillan & Schumacher, 2006). Transcripts of learner interviews were reviewed and coded to determine emergent themes. Responses were grouped by question as part of the initial analysis process to aid in the comparison of responses to similar questions. As additional patterns and categories were identified, successive codes emerged that were utilized to further describe the data. The qualitative data analysis software HyperRESEARCH was used to aid in the data analysis process. The triangulation of data through multiple sources, including verbatim transcripts, comparisons of qualitative responses to quantitative data from interview questions, and

reviewer notes in conjunction with member checks of transcribed interviews aided in strengthening and validating findings.

Select interview questions yielded quantitative data, particularly in terms of the frequencies in which learners engaged in the various types of interactions in the course. As such resulting data is used solely to more fully understand the experiences of the sample of participants rather than making any attempt to generalize findings, statistical analysis of such numerical data was unnecessary and therefore minimized. Where appropriate, responses to questions that either utilized Likert-scale or “yes/no” questions are noted in numeric form.

#### Expected Findings

Based on a review of the literature concerning interpersonal interaction, it was expected that one or more types of interaction would surface as being preferred for adult learners in the self-paced online learning environment. While others have hypothesized that learners may value formal, learner-instructor interaction highest, little evidence is available in the literature to support or refute the notion of interaction equivalency among interaction modalities. And, while learners may in fact value one mode of interaction over others, it is certainly possible that they may value other types of interaction as equal.

## CHAPTER 4. DATA COLLECTION AND ANALYSIS

### Statement of the Problem

Interaction has long been identified as a key element to successful online learning programs (Beldarrain, 2006; Moore, 1993). While not the sole indicator of high-quality and effective online education programs, there is significant evidence to suggest that meaningful interaction with other students and the instructor is integral to the development of thriving learning environments (R. E. Brown, 2001; Garrison & Cleveland-Innes, 2005; H. C. Greene, 2005; Joyce Lee et al., 2006; Swan, 2002). Insufficient or ineffective interaction may lead to student isolation, while exorbitant levels may lead to overload or frustration (Berge, 1999; Willging & Johnson, 2004). Yet, little empirical evidence currently exists as to the value that learners place upon the various types of interactions in a self-paced learning environment.

### Purpose of the Study

The purpose of this study was to expand upon previous research advocating for the purposeful design of interaction within the online learning experience (C.-W. Chang, 2006; Hirumi, 2002). This study builds upon existent knowledge of online education by specifically examining the composition of the online learning experience of adult learners in a hybrid self-paced learning environment that includes numerous interactive

components and instructor facilitation designed to foster an engaging and meaningful learning experience. The goal of this study was therefore to extend the bounds of previous research into interaction within the online learning experience by examining what forms of interaction learners in a self-paced online course value most as well as what impact they perceive interaction to have on their overall learning experience.

### Research Questions

This exploratory study sought to examine the experiences and preferences of adult learners concerning the various interactions that they encounter in a self-paced online course. The following four primary research questions guided data collection and analysis efforts:

1. What forms of interaction do adult learners engage in most in self-paced online courses?
2. What forms of interaction do adult learners value most in self-paced online courses?
3. What forms of interaction do adult learners identify as equivalent in self-paced online courses?
4. What impact do adult learners perceive interaction to have on their self-paced online learning experience?

## Data Collection and Analysis

Interview questions aimed to explore the recent experiences of participants as they completed the course, noting their preferences for various interactive components of the self-paced learning experience. Questions sought both quantitative and qualitative descriptors from participants and are described in detail in successive portions of this chapter.

This study examined the dynamics of interaction within a self-paced online learning environment utilizing both rich media and a mix of traditional and emerging asynchronous computer-mediated communication tools to determine what forms of interaction learners in a self-paced online course value most as well as what affect such interactions have on their overall learning experience. Four primary research questions guided this research, analyzed below.

### Analysis of Research Question 1

Research Question 1: What forms of interaction do adult learners engage in most in self-paced online courses?

#### *Strongest and Weakest Aspects of the Course*

In order to gain a sense of the forms of interaction that learners engaged in most in a self-paced online course, participants were asked to first of all reflect on their overall self-paced learning experience and share what were the best as well as weakest aspects of the course. Successive questions inquired as to their preferences for various components of the course as well as the frequency in which they utilized such features.

Participants expressed overwhelming pleasure with the various course activities and instructional content that were utilized. Such instructional content included a mix of both instructor-developed online multimedia presentations including audio and static slides as well as supplementary video presentations linked to from outside of the online course room. Dan noted that the best parts of the course for him were, “Hands down all the videos and the links and the stuff of that sort. The resources that were provided.” Sue concurred, further noting,

I think the presentation videos and the instruction videos that you included from YouTube. Those were just, it was like the presentation videos gave me an idea of where I was going because this time I was totally in the dark but the instructional videos from YouTube were like, ‘Oh my, I can do this, this is really simple.’ I was trying to complicate it.

Others identified other more overarching characteristics of the course as being what they found to be the best parts of their learning experience. John selected the self-paced format in general along with the immediate application of the concepts to his real-life ministry context as being the strongest aspects of the course, stating, “I liked being able to go through it and if I needed to take more time on something or something ‘Oh, I caught that’ and I could zip through it. Being able to do that was good.” John went on to say, “Really, the application assignments. Learning about blogs but then having to go and make your own blog and the same with the podcasting and those things, that was good.” Brenda fully agreed, stating, “Probably being able to immediately put into practice the things that we just learned.” Recurring among the responses from participants regarding

the strongest aspects of the course experiencing included the various rich media instructional components and the practical application assignments that were intentionally designed into each unit providing opportunities for learners to immediately put into practice skills and new knowledge acquire.

In terms of areas of the course identified as weakest, sentiment was mixed. Robert highlighted the textbook readings as weakest, noting “It seemed like the online readings were a little more relevant or whatever but the textbook was a little bit on the dry side.” Christine felt that the course discussion board and the requirement of having to post 1-2 paragraph “I Learned” reflection statement describing at least three key concepts, ideas, or practices from the unit presentations, reading, and study activities that can be applied to her unique children's ministry setting was one of the weaker aspects of the course, stating, “It was good but...probably was the weaker part of the whole course.”

Karen made an interesting observation, stating, “Well for me, obviously, the weakest aspect was that I was the only student.” She happened to be enrolled in a section of the course in which she was the online student. When asked to describe how she thought that impacted her learning, she responded as follows:

I really don't know if I would have learned more with other students or not. I feel like I learned the material. So I don't feel like I was hurt in that way that I learned the material. But hearing other people's feedback and being able to go back and forth and say, "I'm not sure I'm doing this right", you know, that's helpful. But I didn't feel like I couldn't come to you if I didn't understand something. But I think

that's part of the learning experience is the feeding back from each other and I didn't have that. Actually in two of my courses I don't have that.”

In her response, Karen alluded to the course community that consisted of a learning space that encompassed all the current sections of the course and involved a community blog and individual blogs for each learner and instructor. Although she happened to be the only student in a particular section of the course, she had access to the course blog as well as the blogs of all learners currently taking the course where she did have opportunity to interact outside the “walls” of her specific course section. Karen noted the value of this component of the course especially in the case of students who may happen to be in a small section of the course. Therefore, the course size need not necessarily have a direct impact on the quality or frequency of the interpersonal interaction. Yet, Karen mentioned that in other courses she has taken where she in fact isn't the only student, the feedback from other learners was lacking in those courses as well. She provided more insights into her unique learning experience as the interview continued.

#### *Most Beneficial Course Activities*

Participants were next asked to identify what they perceived to be the most beneficial activities of the course. The unanimous consensus among participants was that the hands-on activities involving practical application of new skills and knowledge were most beneficial. Sue defined these assignments collectively as, “The total package of practical application.” Karen further elaborated on the necessity for these assignments, stating,

If you had not required me to go and subscribe to blogs and podcasts, I probably wouldn't have done it. Because, you know, you're busy, you're working and I probably just wouldn't have done it and would never have realized the value.

The pertinence of such activities may have been further exacerbated by the technical nature of the course in which the objectives involved learners demonstrating proficiency in a host of advanced Web communication skills. Yet, educational best-practices commonly reiterate the value of application and reflection activities no matter the discipline or subject matter being discussed (A. K. Ellis, 2001; Jonassen, 1991; Vrasidas, 2000).

#### *Course Community - CMUOnet*

All participants confirmed that they did in fact make use of the course community, CMUOnet. This was anticipated as participation in CMUOnet was mandated by the course design, as many of the required course activities involved learners utilizing the various tools of CMUOnet.

When provided the opportunity to elaborate upon their experiences with CMUOnet, participants shared overwhelming positive responses of the availability of the tool regardless of whether or not they made active use of the full suite of communication features. Robert mentioned, "I enjoyed and appreciated the opportunity to use it. I just didn't find that much need to use it at this time." Pam stated,

I would say it was good to have. I enjoyed reading (the postings). I wouldn't say that it was critical to have that in order to learn what I learned. It was good to know that I wasn't the only one struggling.

Amy enjoyed the networking opportunities, stating, “It's kinda like you read it and then find out what some others, not just their blog but also find out what they've been doing.”

John echoed Amy's comments, stating, “I know we had to post assignments and stuff on there but I went on and read some of the other learners the stuff that they had put on there and checked out some of the things that they had linked to.” Brenda mentioned yet another facet of the community, noting,

I guess to me it was that nice safe place to start. Whatever you did just took place between you and the other students. It was a nice safe place to try things before you went out and did it online live.

Karen found the course community to be much more than simply a helpful add-on to the course, explaining, “It was helpful to me because I didn't have any other students. So when I really wasn't sure, am I doing it right, I kind of went through and said, ‘OK, they're having the same issues.’” In the instance of students who are in a very small course section, the course community does in fact serve as a venue for interaction and social networking to take place beyond the restricted course environment consisting of the participants in a single course section.

One primary component of CMUOnet was the course community and blog where all members of the course community could post and comment. All participants reported making use of the course blog. Again, this was expected as the course blog was an obligatory component of the course requirements.

### *Course Blog*

Experiences expressed by participants concerning the course blog were very similar to that of the course community in general. Some noted just using the course blog as required by the various course assignments while others went beyond what was required to use the course blog as a way of networking with others in the course. Participants' comparisons of the discussion board to the course blog are provided in Analysis of Research Question 3 later in this chapter.

### *Social Bookmarking*

When asked whether the activity of bookmarking relevant links added to the course experience, participants noted unanimously that the requirement of engaging in the activity of social bookmarking to share resources relevant to the course subject matter with others was of great value. The course utilized social bookmarking activities in several different ways allowing learners to not only easily access shared resources from the instructor but also to tag and share resources they found throughout the course as well as their assignment samples that they wished to share with their peers. While a fabulous component in theory, not all participants were as enthusiastic about its utility. Pam noted, "I did it because I had to do it but with my time constraint I did not have a chance to glean anything from it... I just haven't had time."

Sue found the social bookmarking component to be much more critical than Pam, mentioning,

It was VERY important to me because it was so easy to tag things. Once I figured out how to get them under a certain topic, I found myself going back day to day

using it for this or for that. Yes, it's definitely something that I used then (during the course) but I will definitely use all the time.

Karen echoed Sue's comments, stating, "Everything I found and everything I'm still finding, even if I don't have time to deal with it, well I just bookmark it." Christine was equally enthusiastic in regards to the value of the social bookmarking activities, pointing out,

It saved so much time when you're actually looking for Web sites and that sorta thing and even like looking at other people's bookmarks and that kinda thing. So it's really a great resource to have. I really, really enjoyed that.

#### *Nature of the Self-Paced Approach*

After reflecting on their overall learning experience, participants were asked to reflect upon the nature of the self-paced learning approach. In particular, the fact that they were able to proceed through the course materials and activities at their own pace. Participants were asked to share what they felt were the best parts of the experience as well as what were the hardest or most difficult. These reflections were especially illuminating as they provided greater insight into the forms of interaction in the self-paced learning environment that learners engaged in most found to be most beneficial.

Participants unanimously mentioned the flexibility afforded by the self-paced format. Pam praised the self-paced approach, noting, "It leant itself to my schedule which is challenging at best. As opposed to having to actually go to the classroom on a specific day at a specific time." Dan referenced the fact that new course sections begin monthly, as he commented,

I think the best part is I get to pick kind of the pace. I know that's even how I picked even when I'm going to go through the course. I look at my calendar and say I've got a month that I can use morning times to work on the assignments. So that was kind of nice and obviously online I'm a huge fan of that just cause then I can plug in when I need to and go as fast as I want, get a couple extras done, so that's always very good for me.

John also noted the benefits of the self-paced online format, mentioning, I personally enjoyed the self-paced. I understand that it's probably not for everybody but I enjoy that because sometimes it's hard to block the same time every week without things coming up. So, being able to go home, put the kids to bed, and then work for an hour here or an hour on my day off, I enjoyed being able to do that.”

Sue exclaimed,

I love it that if I want to set down at midnight and work on something that I can. I like that I can move ahead. I like that if I'm feeling like I'm falling behind that there's a chance to move ahead but it's ok if I'm behind today because probably next week I'll be where I need to be. So, it has definitely taken that pressure off. I like to have the convenience of choosing when I'm going to sit down because that's the only way that I think I would be able to use it because there's too many things going on.

When asked to mention what perhaps were the hardest or most difficult aspects of the self-paced approach, participants noted self-discipline as well as simply finding the

available time as chief oppositional factors. Sue stated, “The hardest and most difficult was finding the time.” Christine pointed out the importance of being self-disciplined in a self-paced course, noting,

Probably just lack of self-discipline. If you're not a self-disciplined person then it's not a great option but like I said there's still plenty of time allotted for it so you should be able to get it down in time.

Along those same lines, John said, “Probably the hardest thing is at times just getting started and getting going.”

When participants were asked if they found the self-paced nature of the course to be either a help or a hindrance, the unanimous consensus was that the self-paced approach was definitely a help and that if given the opportunity to take the course over in either a self-paced or instructor paced format, self-paced would be the preferred format of choice.

Karen elaborated on her choice, noting,

For me personally it was a help. It allows people that are in, that are not just students, that are people working full-time, have families, it allows them to be able to go to school and get the training that they want.

Pam referred to her individual experience in the self-paced course,

For a lot of the unit presentations, there were a lot of those that I actually listened to at ten-eleven o'clock at night because that's when I finally got everyone in bed and could pay attention to what I was listening to.

Christine likened the self-paced format to that of online learning in general, stating, “Like I said, just the flexibility of it and even kinda also you can take it anywhere. Like I can do it while I'm at work or while I'm at home or whatever so it's great.”

### *Instructor Interactions*

To begin a series of questions regarding interactions with the instructor, participants were asked to rate how involved the instructor was in the overall learning experience. Robert noted, “I felt you were very involved. Anytime I didn't quite get something you were there and you tested out everything that I posted.” Pam concurred, noting, “There was not a question that didn't get answered in a quick, honestly quicker than I had even anticipated.” Sue spoke of the level of instructor presence, commenting,

I actually felt like I was in a classroom with you... I felt like you took a personal interest in me, whether you did or not, it doesn't matter. The point is that when you would make just the little comment, like on the grades in the grading area where you posted your little comment. I actually felt like I had turned in a paper and you had written that.

Participants were asked to continue discussing their experiences interacting with the instructor in more informal ways throughout their learning experience. When asked if they had communicated with the instructor outside of the course room, such as via e-mail, phone, or CMUOnet, the majority confirmed that they had communicated with the instructor either via e-mail or the blogging capabilities of CMUOnet. In a follow-up question inquiring as to how such communications varied from those in the course room

environment, participants commonly noted that such interactions were more personal and informal.

A variety of emerging communication technologies were incorporated into the course, including such approaches as blogging, podcasting, and social bookmarking. The majority of the participants confirmed that they did in fact take read and enjoy the instructor's personal blog, as depicted in Table 3.

Table 3

*Utilization of Instructor's Blog (n=10)*

| Participant Response | <i>n</i> | %   |
|----------------------|----------|-----|
| Yes                  | 8        | 80% |
| No                   | 2        | 20% |

Another very popular element of the course experience was the instructor's collection of shared resources. This collection included bookmarked resources via del.icio.us, photos on Flickr, and videos on YouTube. All participants reported making use of these external resources compiled and shared by the instructor.

These resources served as examples of how the skills being learned in the course could be applied in a practical ministry setting. The utility of such resources may certainly have contributed to the reported popularity of this course component. Sue mentioned in regards to the instructor's shared resources, "It helped me to see that what I was learning, how I would be able to use and it was practical."

When asked if they had ever tried contacting another expert apart from the course instructor or their fellow learners, the majority of the participants noted that they did not

take this step. Rather, they predominantly felt content with the instructor's expertise and responsiveness.

### *Learner Interactions*

When asked to rate how involved other learners were in the online discussion in Blackboard, responses were mixed. Some felt that ample discussion took place while others mentioned that the discussions lacked much extra participation other than what was required. Most noted that they did in fact read the "I Learned" statements posted by other learners after posting their own statement. A few indicated that they did periodically read the statements of others prior to posting their own in order to get an idea for the quality and substance of the postings of others. No one chose to respond to the "I Learned" statements of others but rather perceived the reflection requirement as simply a place for learners to post their reflections for the instructor to read and for a grade. It is worth noting that learners were not required to respond to each others' reflection statements but it was hoped that such interpersonal interactions would blossom naturally. This unfortunately was not the case.

Participants were asked to also reflect upon the various informal interactions that they engaged in with other learners throughout the duration of the course. Responses were mixed concerning whether or not participants took advantage of various opportunities to connect with other learners outside of the formalized online learning environment as evidenced by Table 4.

Table 4

*Communication with Learners Outside Online Course Environment (n=9)*

| Participant Response | <i>n</i> | %   |
|----------------------|----------|-----|
| Yes                  | 5        | 50% |
| No                   | 4        | 40% |

Amy was among those who were not aware of the full potential of the course community for facilitating communications outside of the specific course section that they were enrolled in, noting, “No, because I didn't even think we anybody was doing it. I never thought of doing that and I didn't think that anybody else doing that.” Some took advantage of the opportunity to e-mail or comment on the blogs of others, whereas others simple couldn't afford to take the time for such additional communications.

Many did read the blogs of their fellow learners in order to see not only examples of the various kinds of assignments being accomplished but also as a way of connecting in a more social way with peers. Table 5 displays the frequency of participants who reported reading the blogs of other learners.

Table 5

*Consumption of Learners' Blogs (n=9)*

| Participant Response | <i>n</i> | %   |
|----------------------|----------|-----|
| Yes                  | 7        | 78% |
| No                   | 2        | 22% |

In addition to being provided access to read the personal blogs of other learners, learners were afforded the opportunity to comment on any of the individual postings. Table 6 displays the number of participants who reported commenting on the blogs of other participants in the course.

Table 6

*Commenting on Learners' Blogs (n=10)*

| Participant Response | <i>n</i> | %   |
|----------------------|----------|-----|
| Yes                  | 2        | 20% |
| No                   | 8        | 80% |

While many did in fact read the blog postings of others, they were not as inclined to post comments to peers. This resulted in the blog communications being primarily a one-way means of communication rather than reaching a truly engaging level of interaction.

Participants were asked if they recalled anyone commenting on any of their blog postings. As the instructor for the most part made an effort to comment on at least one posting of each student, participants responded primarily that they did receive a comment from the instructor but many didn't receive comments from anyone else.

For the most part, participants reported containing their interactions with other CMUO learners to those enrolled in their specific course section. However, the participant in particular who was alone in August section reported that she did take advantage of the course learning community to see what other learners taking the course where doing, etc. Table 7 displays the frequency in which participants reported communication with learners in other sections of the course.

Table 7

*Communication with Learners in Other Sections (n=10)*

| Participant Response | <i>n</i> | %   |
|----------------------|----------|-----|
| Yes                  | 3        | 30% |
| No                   | 7        | 70% |

Those who did not attempt to communicate with learners outside the course section were asked to elaborate as to why they chose to not do so. A lack of time was the most commonly cited mitigating factor inhibiting participation.

Along a similar line of questioning, response was mixed when inquiring as to whether participants took the initiative of subscribe to blogs or access resources of individuals outside of the course to help understand concepts covered within the course. Table 8 shows the number of participants who chose to utilize outside resources to better grasp course concepts.

Table 8

*Utilization of Outside Resources to Better Grasp Course Concepts (n=10)*

| Participant Response | <i>n</i> | %   |
|----------------------|----------|-----|
| Yes                  | 4        | 40% |
| No                   | 6        | 60% |

Sue clarified the reason why she did in fact make use of available outside resources, noted that, “For me it wasn't so much to better grasp what was in the course but to again build on what was in the course...to see what else was out there.”

### *Summary*

In terms of Research Question 1, the analysis of responses from participants leads to the conclusion that participants engaged most frequently in interactions involving either the course content or course instructor, on both formal and informal levels. Such interactions support the notion of the influence of the “network” and “collective” proposed by Anderson and Dron (2007). Such emerging influences extend beyond the confines of the defined learning space and can potentially serve as an option for learners and designers alike to leverage within the self-paced learning environment. The Interaction Matrix displayed as Figure 10, has been developed as one potential model for considering the incorporation of the holistic interaction sources available to date. The Interaction Matrix will be provided and described in further detail in chapter 5.

### Analysis of Research Question 2

Research Question 2: What forms of interaction do adult learners value most in self-paced online courses?

#### *Value of Course Elements*

Participants were asked to rate on a scale of 1-5 with 5 being *most important* and 1 being *least important* 30 different elements of the course. These elements varied from specific technological tools employed to pedagogical components of the course experience. Of the 30 course elements that participants rated, Tables 9-11 depict how collectively the respondents ranked each of the thirty course elements they were presented with. Rankings were computed by multiplying the number of responses at each

rating level by the corresponding rating numerical value and then totaling. Relative frequencies and rankings are displayed in three sections of importance: highest, intermediate, and lowest. Table 9 displays the course elements ranked by participants as having highest importance.

Table 9

*Course Elements of Highest Importance*

| Course Element                            | Response Frequencies |                 |   |   |   | Rank |
|---|----------------------|-----------------|---|---|---|------|
|   | Most Important       | Least Important |   |   |   |      |
|   | 5                    | 4               | 3 | 2 | 1 |      |
| Application Assignments                   | 10                   | 0               | 0 | 0 | 0 | 1    |
| Communications from Instructor            | 8                    | 2               | 0 | 0 | 0 | 2    |
| Instructional Presentations               | 8                    | 2               | 0 | 0 | 0 | 2    |
| External Resources                        | 8                    | 2               | 0 | 0 | 0 | 2    |
| Comments from Instructor to Blog Postings | 8                    | 1               | 1 | 0 | 0 | 5    |
| Receiving E-mail from Instructor          | 8                    | 1               | 1 | 0 | 0 | 5    |
| Supplementary Instructional Media         | 7                    | 2               | 1 | 0 | 0 | 7    |
| Sending E-mail to Instructor              | 7                    | 2               | 1 | 0 | 0 | 7    |
| Course Blog                               | 4                    | 4               | 2 | 0 | 0 | 9    |
| Instructor's Bookmarks                    | 5                    | 3               | 1 | 1 | 0 | 9    |

Of the top ten elements ranked highest by participants, they all involved interactions either with the content or instructor. Table 10 presents course elements

ranked by participants as being of intermediate importance. Again, the course content and instructor interaction items were ranked among some of the highest elements.

Table 10

*Course Elements of Intermediate Importance*

| Course Element                          | Response Frequencies |   |   |   |   | Rank |
|---|----------------------|---|---|---|---|------|
|   | 5                    | 4 | 3 | 2 | 1 |      |
| CMUOnet                                 | 4                    | 2 | 4 | 0 | 0 | 11   |
| Instructor Comments to Discussion Board | 3                    | 5 | 1 | 0 | 1 | 12   |
| Course Bookmarks                        | 5                    | 3 | 0 | 1 | 0 | 12   |
| Learners' Bookmarks                     | 4                    | 4 | 0 | 1 | 0 | 14   |
| Personal Blog                           | 3                    | 4 | 1 | 2 | 0 | 14   |
| Course Podcast                          | 5                    | 1 | 3 | 1 | 0 | 16   |
| Learners' Blogs                         | 2                    | 4 | 3 | 0 | 0 | 17   |
| Reflection Activities                   | 0                    | 6 | 2 | 2 | 0 | 18   |
| Course Textbook                         | 5                    | 1 | 4 | 0 | 0 | 19   |
| Receiving E-mail from Learners          | 0                    | 6 | 2 | 2 | 0 | 20   |

Table 11 contains the course elements ranked by participants as being of least importance. While participants ranked the majority of course elements as being at least moderately important, they consistently ranked elements involving interactions with other learners as lowest in comparison to all the possible choices. The narrative responses by participants to the remaining interview questions served to validate this trend, as

participants indicate their preferences for quality content and instructor interactions and the necessity for such components in preferred self-paced online learning experiences.

Table 11

*Course Elements of Intermediate Importance*

| Course Element                            | Response Frequencies |   |   |   |   | Rank |
|---|----------------------|---|---|---|---|------|
|   | 5                    | 4 | 3 | 2 | 1 |      |
| Communications from Learners in Course    | 0                    | 4 | 5 | 0 | 1 | 20   |
| Discussion Board                          | 0                    | 3 | 6 | 0 | 1 | 22   |
| Synchronous Chat with Instructor          | 3                    | 1 | 3 | 1 | 0 | 23   |
| Sending E-mail to Learners                | 1                    | 2 | 4 | 1 | 2 | 24   |
| Posting Comments to Discussion Board      | 1                    | 2 | 3 | 2 | 1 | 25   |
| Posting Comments to Learners' Blog Posts  | 1                    | 2 | 3 | 1 | 2 | 26   |
| Comments from Learners to Blog Postings   | 1                    | 2 | 4 | 1 | 2 | 27   |
| Learner Comments to Discussion Board      | 0                    | 4 | 2 | 1 | 1 | 27   |
| Communications from Learners Diff. Sects. | 0                    | 3 | 2 | 1 | 3 | 29   |
| Synchronous Chat with Learners            | 0                    | 1 | 5 | 1 | 1 | 30   |

Participants overwhelmingly rated interactions with the instructor and quality course content as the overall most important aspects of a self-paced course, with interaction with other learners trailing behind. Such sentiment directly supports previous research emphasizing the importance of the roles of the instructor and content in the overall quality online learning experience (Abdulla, 2006; Heinemann, 2003; Perry &

Edwards, 2005; Strachota, 2003; Su, 2006; Yang & Cornelious, 2005). Simultaneously, these findings refute the notion purported by some that collaboration with fellow learners is either preeminent or can potentially compensate for well-designed content and active instructor involvement (Anderson et al., 2005; Rovai & Barnum, 2003; Russo & Benson, 2005; Tu & McIsaac, 2002). Participants noted that while they enjoyed the interactions with other learners and often wished that there was more interaction among learners taking place in the online learning environment, they conceded that in the self-paced environment that such interactions are often more challenged. The qualitative rankings applied to the aforementioned course elements correspond with the qualitative responses that participants shared concerning their values and importance of various course elements.

#### *Instructor Interactions*

When asked what types of interactions with the instructor are most beneficial, common responses included communications either via e-mail or blog. Robert preferred e-mail, stating, "From a personal preference standpoint, I prefer to e-mail back and forth just 'cause its quick, it's easy, you don't have to do anything special to get them."

Christine further stated, "It just provides enough room, or as much room as you need to explain something and then also I'm checking it regularly." Amy agreed, remarking,

Definitely your personal e-mail. That one is the most important. I think also your blog is also very important. Your presentations are important because otherwise we would not have comprehensive learning starting from that. But I got that out of your blog and definitely your e-mails.

Karen didn't select one communication tool in particular, but rather opted for a mode of interaction, stating,

I think that personal feedback, to me, is most important because it makes you feel like you just didn't go to a library and check out a book, but that actually you are learning and have somebody that you're responding to. So, more so than just a presentation that you see. Knowing that there is that personal contact, that personal guidance if you need it.

Karen's comments in conjunction with all the others reiterate the value that participants place in the connection with the instructor throughout the self-paced learning experience.

When asked to comment upon the value of the instructor's postings in the course environment to the overall learning experience, participants again found such contributions by the instructor as beneficial. John stated,

Yeah, I found 'em good as you answered other people's questions. If I had the same question or was wondering about something. Or a lot of times you'd post things like resources and just hey, I found this, check this out. I thought they were all good.

Brenda agreed and noted, "Yeah. When you put them all together, yeah, they are very valuable. Because even there were times when you would just post your general announcements and things. I found that really helpful." So, despite the apparent non-use of elements of the formal course environment in Blackboard, participants in general appreciated the instructor's contributions in that communication venue.

As instructor feedback was rated as such an important aspect of the self-paced learning experience, similar questions were asked concerning the importance of receiving feedback from other learners. Responses were much more subdued, noting that while feedback from other learners is certainly valued, its perhaps is not a requirement for a quality self-paced online course. Amy explains regarding feedback from other learners,

I can do without it but then it it's kinda nice to know that we have the same problem and then when we have something and somebody wrote back and said ok, you're doing great or I had that problem too. So just very encouraging.

Christine felt learner feedback was rather important, stating,

I think it's pretty important. I didn't have a lot of feedback as far as the blog and that sorta thing or discussion board, but I think it's pretty important just reading some other people's feedback on other people's blogs. I thought it was good and they were kinda being honest about their responses and oh this is what you had to do or I think it would be better if you did this.

Brenda mentioned,

I don't think it's really valuable to the outcome of your class. Only because I've done six (courses) and I've really not had much of that. But, I've had to admit that there are times when it would be nice.

As a final question regarding formal interactions in the online course room, participants were asked to reflect upon the value of various announcements posted by the instructor at different intervals within the course in Blackboard. Some found these to be of great value, such as Brenda who noted, "I like the announcement area. It's just kinda

that initial 'welcome back' after you've been logged out and you pop back on. I like it.” Others reiterated the value over the type of communication rather than the mode of technology used to transmit, such as Karen who stressed, “I'd rather have feedback than announcements.” The value of meaningful communications among the instructor and learners can not be overstated as evidenced by consistent calls from participants for feedback from the instructor.

When asked what value the instructor's blog had on their overall learning experience, participants spoke positively of the blog as not only a means for communication but also a resources for students to refer back to even after the course draws to a close. Mary mentioned,

I think it was an extra nice thing to have, but I also think I remember some of the stuff that was there was actually helpful. I remember at one point there was something I was struggling with and I think I'd e-mailed you and then I went on your blog and funny the answer was there and yet I hadn't even, you hadn't even received the question yet.

Brenda further noted,

The blog really added something to what we're doing...Plus then you have the benefit, like if I start a class in October and I'm going to the instructor's blog, I have the benefit of seeing what past students have dealt with and how the instructor has interacted with them and that gives you a feel for what lies ahead.

### *Learner Interactions*

Participants were asked to discuss how valuable the interactions with other learners in the course room were to the overall learning experience. Responses predominantly downplayed such interaction within Blackboard. Dan noted that,

It was very, very low” to begin with. Robert elaborated by saying, “Since there wasn't a lot of interaction there I can't really speak to that in depth. But I felt like as far as from a giving standpoint where I could share some of my knowledge and expertise, it was nice to be able to help some other people out. Amy didn't view such interactions as crucial, mentioning, “I think for me it is not really a big thing because I would say about 95% of my learning is or what I receive is from the instructor - the presentations and everything else. So, I wouldn't not say that it's really, really important if I could not have those things - the Blackboard discussion.”

Christine disagreed, noting, “I think it's pretty important. It's, like I said, a great benefit to be able to see what other people are learning and how they're learning and that sorta thing and kinda reflect on that.”

When asked to compare how interactions within the course blog or individual blogs compared to communication within the discussion board, participants did note a difference. Sue mentioned that, “A lot of times it would shed more light on whatever a subject might have been at the time.” This may be in part due to the fact that learners were by and large more engaged in the course blog and used their personal blogs more than the discussion board.

Participants noted that the discussion board was mandated whereas the blog was generally a more optional form of communication. Pam made an interesting analogy in comparison, stating,

If there was any variance, I would say the course blog was a little more if you want to describe it, the course blog had more of a ‘friends living room’ feel to it as opposed to the discussion board which was more of ‘meeting at the library.’

Sue expressed the same sentiment, stating, “The discussion board to me, and maybe it was just the way I read into it but to me the discussion board was more of a formal area as far as posting what I learned whereas in the blog is was more like, ‘Wow, did you see?’ like you were actually having a conversation with the person because it was more relaxed.” In general, the terms *requirement* and *formal* were often used by participants when describing the discussion board, whereas the terms *conversation*, *relaxed*, *in-depth*, and *open* were used by participants to describe the discussion board. Responses from participants suggest that the pedagogical value that traditionally has been attributed to asynchronous threaded discussion took place in the more learner-driven blogging context.

#### *Content Interactions*

Participants were provided opportunity to discuss their various interactions with the various types of content and activities in the course. First of all, participants were asked to describe which aspects of the course content or activities were most helpful. Similarly to the ranking questions asked earlier, participants predominantly enjoyed the instructor-developed instructional multimedia presentations as well as the supplementary

external media that was incorporated into the course. Robert noted the utility of the instructor presentations, admitting, “I really liked the slide presentations and was really wanting a way to save those locally so that I could go back and listen to 'em again in the future.” Mary pointed to the practical applications assignments, claiming,

I could have done all the reading...and I could have watched all the presentations in the world. But until I actually went through it and messed it up and went through it again and did everything again to actually get it, I would have never got it. So definitely doing it.

Brenda agreed, confirming,

I think it comes down to the practical application things. You can read all you want to read to read. You can answer those questions on what the textbook says. But until you actually do it a lot of times that is when it like hits. I think it makes sense.

It was therefore no surprise that when asked to discuss how valuable the instructional presentations were to the overall learning experience, the response from participants was overwhelmingly positive. Robert stated, “Those were very valuable. I felt like they brought more stuff to the course than any of the other instructional materials did.” Mary concurred,

You're going step by step and actually that's great because when you actually get to the place where you're supposed to be doing this you already have a mental picture of what I'm supposed to be seeing next, what I'm supposed to be doing next. So I think that they're very, very important as well.

Another component of the course instructional content was unit introductions in the form of podcast episodes. These short audio recordings offered a brief introduction to the unit and outlined the various activities that learners would be engaging in. While participants seemed to agree that these unit audio introductions were nice to have, they were not deemed as important the other more formal and in-depth unit instructional presentations. Dan responded, “I thought it was more of just an exercise actually I thought that's the reason you did it.” Karen stated, “I thought they were helpful. They went over the objectives of what was going to happen and I had a perspective in mind, so I knew what I was looking for.”

Yet another component of the course content included required textbook readings. Participants shared the full spectrum of responses regarding the textbook readings with no apparent trend distinguishable. Robert referred to the textbook readings as, “a little bit dry” while Dan’s comment was, “Excellent, great book.” Pam reflected by saying, “You covered I'd say 98% of it in the course presentations within the Wikipedia readings you had us do. So again, it was a little redundant but good.” The single recurring sentiment concerning the course textbook was that it could possibly be replaced by many of the other online resources that were incorporated into the course.

Participants were asked to then discuss how valuable the practical application assignments were to their overall learning experience. Again, consistent with previous responses, participants unanimously viewed these activities as integral to the success of the course and in fact were identified as potentially the most important component of the

course. Sue stated, “For me that was the most valuable of all.” Karen further elaborated in terms of the practical application assignments by stating,

The course would have been wasted for me without them, because I wouldn't have done em'. I thought it was a key because I would have read everything and said, ‘Oh this is great. I can use this’ and it would have gone on the back-burner and the day to day demands. But because I had to do, I was gonna make it applicable to me.

The practical application assignments certainly have been shown to be a crucial component to this course. It remains to be seen if this is the case in other self-paced courses or simply in this particular instance.

#### *Informal Interactions*

In concluding questions pertaining to participants’ experiences with various interactive components of the course, participants were asked to reflect upon their experiences interacting on a more informal level with various types of content. When asked about whether they found other external resources such as text, videos, tutorials, or other helpful Web sites during the course, most confirmed that they did in fact come across other helpful content. Mary described her experience, sharing,

Yeah, I did. A few things I saved in my bookmarks. A couple times I was really struggling as you know and I would set aside time late in the night to do it and then I would get stuck. So, of course I couldn't reach anybody to help me at that point. So I would start looking up some stuff to try to help me to figure it out past that point so I could move on.

Others pointed to simply the fact of such external resources being accessible after the course ends and that they served to be a just-in-time learning aid. In general, participants found such external resources to be a valuable contribution to their overall learning experience.

When participants were asked whether they preferred the external resources to the instructional presentations and various content resources in the course, participants still overwhelmingly preferred the course-specific content. Robert noted,

The step-by-step, it seemed like you gave step-by-step instructions to several of the things and you were really able to tie some of those things into what you could use them in the children's ministry whereas the other stuff was just generic 'ok this is blogging, this is RSS' and things like that.

Karen agreed, stating, "My preference would be the instructional presentations specific to children's ministry. Because I could always find those on my own, but I couldn't find the specific to children's ministry."

#### *Preferences for Interactions*

After having been given the opportunity to reflect on the various individual interactive elements of the self-paced online course, participants were finally asked to reflect upon their experiences in sharing their preferences for interaction. First and foremost, participants were asked to identify which of the different types of interaction that they believe to be most important to the overall success of a self-paced online course. Participants overwhelmingly selected either interaction with the content or interaction with the instructor as most important to the overall success of self-paced courses.

When asked why they made their particular selections, participants shared candidly their rationale. Robert said,

Probably the interaction with the instructor and again just because the instructor is the expert and when I'm going to a course or studying I want to talk to experts so that's probably the most important interaction that I could get.

Sue shared,

I think the quality presentations with examples because it allows different levels of learning. You could either take it for what it was at face value and do what you needed to do for the basics or you could go deeper and try and figure out 'Oh my goodness, how much deeper can we go and what else can this be used for?' The various applications that you can have. So for me, the presentations with examples were the most important.

Karen responded,

Because it's a self-paced course, I would say the interaction of the content. Because if it's self-paced and it was just reading and not applying you could just read through all that in no time at all and never apply it. But that's the danger of a self-paced course. You're just working towards the end goal and then you go to apply it at some future date, which you never will.

Brenda summarized by saying, "To be honest with you, what I saw to start with what was the most valuable was the instructional presentations. Whether you made an actual connection with your instructor, you felt like you did."

### *Summary*

The analysis of responses from participants regarding Research Question 2 leads to the conclusion that participants value quality interaction with the instructor and course content as being most important to the overall success of a self-paced online course. Through not only ranking of importance but also in rich narrative dialogue, participants expressed their preferences for quality interaction with the instructor and course content over interaction with other learners. Data presented in Tables 9-11 displayed the preferred importance participants placed upon the various elements of a self-paced online course. Subsequent interview results reported throughout the remainder of chapter 4 support the quantitative rankings that participants assigned to the various course components and forms of interaction. Adult learners reported that while a balance of all interaction forms are most desirable, they value most the interactions with the instructor and content. Participants concurred that well-designed application exercises fostering meaningful interactions with the course content were crucial to the success of their self-paced online learning experience.

### Analysis of Research Question 3

Research Question 3: What forms of interaction do adult learners identify as equivalent in self-paced online courses?

#### *Course Blog vs. Discussion Board*

Participants were asked to compare the course blog to the Blackboard discussion board. They were asked to share which communication tool they preferred as well as to

whether they felt both were necessary or if one could replace the other. The design of the course involved a few redundant communication tools, of which the discussion board and course blog were among those who did overlap in many ways. The course blog, while accessible as a standalone communication tool as part of the learning landscape CMUOnet, was also integrated into the structured learning environment in Blackboard and was accessible from the course navigation menu as depicted in Figure 6.

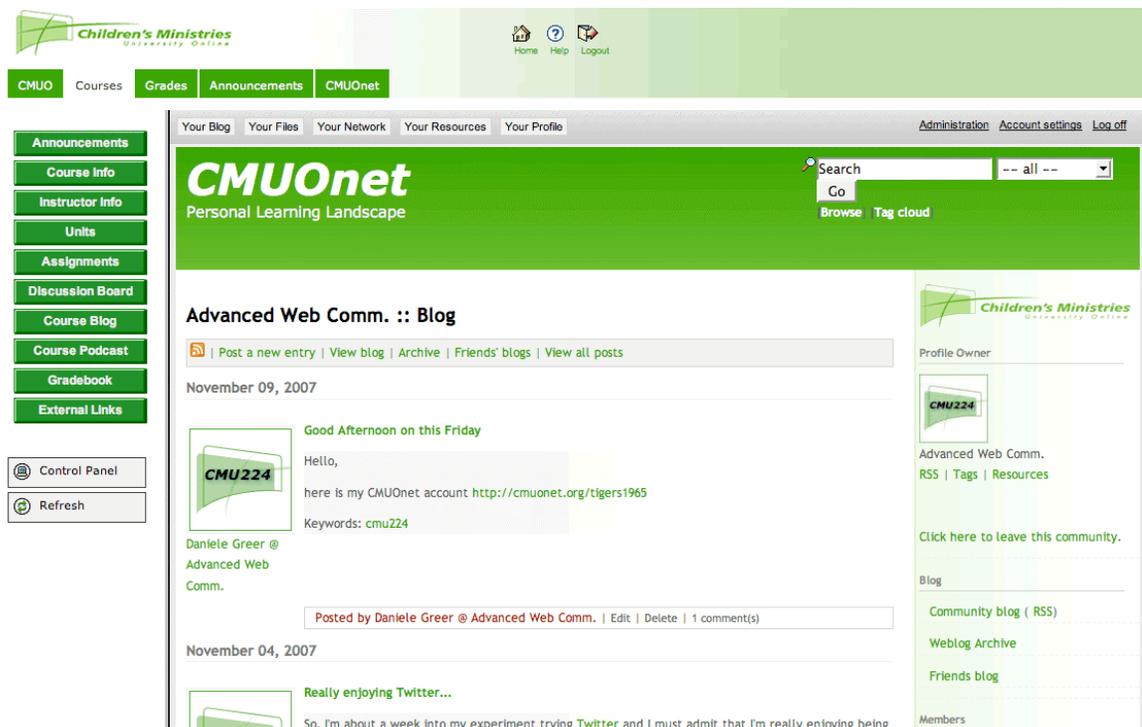


Figure 6. Course blog integration with Blackboard course

Robert admitted that he was very experienced with asynchronous threaded discussion and compared the discussion board and course blog as follows:

The discussion board has the advantage of being easy to post things to and you've got definite threads within it. I can see for a user who is unfamiliar with blogs and kinda doesn't really know how to do the things there I could see those users really liking the discussion board. In fact, it was a whole lot easier for me before I started this course to post things to the discussion board than it was to the blog. By the time I reached the end of the course, I preferred to use the blog.

When probed as to why the change in preference by the end of the course Robert referenced the distinction and yet similarities of the individual versus course blogs and stated, "It just seemed like it was the easiest place to post things and links to. I could something either on my personal side or switch over very quickly to the course side and kinda do 'em both there."

Pam noted the similarities among the tools and didn't recognize many notable differences, stating,

Really, they're basically the same thing. I had been familiar with course discussion board because of my previous courses so honestly, just in all fairness, I think I probably preferred that one over the other just because I was used to it.

Not, necessarily that one was better than the other. For the most part, the information was the same. I don't know that I would have both. I would kinda do a one or the other.

Sue found the discussion board to be more of an assignment submission tool rather than communication mechanism. She mentioned,

As far as the discussion board, I felt for me that it was just a place to put an ‘I learned’ statement, not to actually get involved or interact. But, and I know it seems ironic, but I felt more comfortable with the blog because to me it felt like it would be more one-on-one even though several people could be reading it.

In contrast to Pam, Brenda found the discussion board and blog to be vastly different, stating,

I like them both because they are both very different. When you're going on the discussion board, it's very much targeted to this certain chapter. But when you go on the course blog, it's a little more in general and I think you kinda feel like the course blog is more like between students and the discussion board is more between the teacher and the students.

When asked whether they felt as though they had the support of the instructor and other learners throughout the learning process, participants unanimously concurred that they did in fact feel supported. When asked what made them feel that way, participants frequently noted responsiveness to questions as well as a sense of camaraderie among participants as key factors. Pam boiled it down to simply, “Quick responses to any e-mails or questions that I had, both from you and from other students.”

#### *Perceived Equivalency Among Interactions*

Next, participants were asked whether they felt that the different types of interaction discussed are in any way equal. Consistent with previous responses, many viewed interaction with content and the instructor as either equal or very close to being equal but felt that interaction with other learners was inferior in some respects. Robert

stated, “Probably the interaction with instructor and the course content is actually probably pretty equivalent.” When asked why he made this claim, Robert responded, “Again, it goes back to the expertise of the interaction. Getting as much information into my hands as possible.” Amy explained her position as follows:

I think the instructor one and the general presentations like the one you did that those are probably equal although they're different way because without the general instructions if it's a self-paced and you said ask me any questions and I can help you, it would not be useful because I would not know how to ask you questions. So, I mean if there's a course in such as an expert would say ok I'm here and I will help you with whatever questions in advance. Well then that course would not be good for me 'cause I would not know how to ask but so those are two equal of importance.”

Along a similar line of questioning, participants were asked if one type of interaction is more important than others and whether that type of interaction could be replaced by an increased level of the others. Dan’s response contradicted others, noting,

Out of the content, instructor, others, if any, the instructor part could be limited down, I know that sounds very strange, but from the standpoint of increasing possibly some of the content or others. In an online course, I don't view the instructor as the main, I don't mean any disrespect, but the instructor is really just more on the facilitator side and as long as I've got content and sources coming in I'm able to do what I need to do without the instructor.

Robert noted the necessity of both the instructor and content interaction, stating, “I really don't...I can't say that instructor interaction or course interaction is either one greater than the other, they're just different. No, I don't believe that either one of those could be replaced by increasing anything else.”

Participants were next asked if interactions with the instructor were to be either diminished or eliminated from the course if an increase in other types of interaction would fill that void. While participants stated earlier the importance of the instructor, several conceded that it would be possible to in a way diminish the instructor interaction to an extent if learners were more engaged and if the instructional content was of superior quality. Yet, many were hesitant to agree to any degradation of the instructor interaction in exchange for increasing others.

Next, participants were asked to identify whether they believed interactions with other learners could be diminished or eliminated from the course and adequately compensated for by increasing other types of interaction. Of all three types of interaction, the interaction with other learners was by far the most dispensable. This may in part be due to the fact that for this particular course, it was the weakest of the three types of interaction utilized. Robert supported his position, stating, “Again, I didn't, as far as this course, I didn't do a whole lot of interaction with the students so it's not gonna really make a difference in what I took away from the course.” Dan agreed, noting,

I definitely think content could fill that void. Like I've stated before, there really wasn't a lot of interaction with other students. That's why I don't think it wouldn't

make from a student's standpoint on my side it doesn't really make a difference even how large the course is. How large the class is irrelevant to me.

Christine concurred and explained,

I found that the students and other students in the course that it was just more of like encouragement and support and so I think that was pretty important. The course podcast and the course instructional videos they can't really provide that. So I thought that the students like the feedback from the students and that sorta thing was very important. So I don't know, it again is like they all have their own place and it's not they're all very equally important so it's hard to.

Finally, when asked if content could be diminished or eliminated from the course by being compensated for by increasing other interaction types, participants unanimously denounced such a notion, claiming that the content of self-paced course is truly indispensable. Participants mentioned both formal and informal content sources as very important, noting that the optimal self-paced learning experience involves a balance of all available interaction sources.

### *Summary*

In summary, in terms of Research Question 3, the analysis of responses from participants leads to the conclusion that adult learners identified interaction with the instructor and content as very nearly equivalent in a self-paced online course. Participants pointed out that quality interaction with content is indispensable in the self-paced learning environment and can not in any way be replaced, while interaction with the instructor could potentially be diminished to an extent and compensated for through

increased quality interactions with content or learners. Participants further noted that while interaction with other learners is desirable within the self-paced learning environment, the self-paced nature of the course makes such interactions challenging and therefore participants were willing to forgo such interpersonal interactions deemed by some as more tangential in exchange for the flexibility afforded by the self-paced learning approach.

#### Analysis of Research Question 4

Research Question 4: What impact do adult learners perceive interaction to have on their self-paced online learning experience?

##### *Isolation*

To catch a glimpse of learners' perceptions of the impact that interaction has on the self-paced online learning experience, participants were asked if they ever felt isolated from the rest of their classmates or all alone. Robert mentioned that to an extent he did feel a bit isolated, stating, "From the rest of the class, I kinda felt like I was sorta on my own. On the other hand, from you as the instructor, no I felt like you were there the whole time." Pam's experience however was different, responding in regards to whether she ever felt isolated, "Not unless I intentionally tried to do it, no." John made an interesting statement, "No. It was one of those things where I didn't always need the contact but in the back of your mind, you knew it was there. You knew that you could fall back on that, and that was good."

### *Self-Paced vs. Instructor-Paced Approach*

Questions concerning the nature of the self-paced approach to the course were concluded by providing participants with the theoretical choice between taking this course again in its self-paced format as compared to a more instructor-paced format, in which certain deadlines had to be met completed by a specific dates. As might be expected, participants unanimously chose the self-paced format.

When asked why the choice for the self-paced format, participants predominantly mentioned the flexibility factor. Pam defined this aspect as, “The level of grace afforded for completion of the work” whereas John described it as, “You can tackle it as time permits.” Karen elaborated on the value of the self-paced approach for her, noting,

My time is so limited and so I like the self-paced because I can still do it without being totally stressed out. I like the fact that, with the self-paced, I wasn't just turning in to you an assignment to meet the deadline, which I would have done. But because it was self-paced, I made it applicable to my situation and I'm actually using what I did.

Participants expressed consistent positive regard for the self-paced approach of the course largely due to the flexibility that such a format affords. Questions shifted to query the experiences of participants regarding the different types of interactions they engaged in and their preferences for each.

### *Feedback*

Participants concurred that feedback from the instructor was very important to the overall course experience. This sentiment may have been elevated by the fact that this

particular course was very technical in nature, requiring technical assistance from the instructor at various intervals. Participants noted that their experiences interacting with the instructor within Blackboard was limited, as primary interactions took place with the instructor's blog, course blog, or in responses to questions submitted via e-mail.

#### *Preferred Method of Instructor Interaction*

Next, participants were asked to share their preferred method for having the instructor interact with them. E-mail was overwhelmingly the most popular choice with the instructor's blog also receiving a substantial positive response. It appears that familiarity is one of the primary reasons why e-mail was preferred, as it is the most ubiquitous online communication technology for this population of adult learners. Pam points this out, noting, "Now that I've completed the course and understand the blog, probably the blog. Prior to this course, it would've been e-mail." Brenda also chose the blog and explains why her preference is not the discussion board,

I think the blog is a nice place to start. The discussion board is kinda cold, to be honest with you. I guess you don't honestly see a lot of reaction from the instructor where actually the blog would be a neat way to get more interaction.

#### *Preferred Method of Learner Interaction*

Conversely, participants were then asked to indicate how they prefer to interact with other learners. Blogging edged out e-mail for pre-eminence among learners. Brenda summarizes the responses received, stating,

Blogging honestly yeah would be my first choice because like I said the discussion board it just kinda feels cold. You are there to answer the questions

required by the class, where the blogging gives you the freedom to say, "Ok I took this away from that class. Did anybody else get that?"

For many participants, the blog had a user-friendly appeal to it and once participants grasped the concept of subscription via RSS, they found consumption of postings and responses much easier and less time consuming than the course discussion board. Also, the blog software powering CMUOnet includes a feature whereby new comments to a blog posting are automatically delivered via e-mail to the author of the original posting. The convenience factor was certainly a notable reason why the blogging was valued higher than the discussion board for informal interactions among learners.

#### *Course Size vs. Quality*

Next, participants were asked to consider the size of a self-paced online course in relation to the quality of the overall learning experience. Participants were asked to discuss how important in their opinion the size of the class is to the overall learning experience and whether a self-paced course could be too large or too small. Responses included an interesting mix of perspectives. Dan noted, "No. For me as a learner I don't think it makes much of a difference to me. I have no idea how many people have plugged in." Karen, who had the unique perspective of being the only student in a section of the course, didn't feel that being the only student negatively impacted her learning experience. On the contrary, she mentioned in regards to class size,

I think it can be too large. I think it can be too large because of the larger the class is the greater demand on the instructor and the less personal attention you can get

from instructor...So I think it can be too large. Do I feel like I was hurt by being the only student? I really don't.

*Perceived Impact of Interaction on the Experience*

As the interviews drew to a close, participants were asked to consider the impact that interaction has on the quality of the online learning experience. Participants in general identified a correlation between the quality of the interaction in a self-paced online course and the overall quality of the learning experience. Robert explained,

I think the quality of the interactions directly affects the quality of the overall learning experience. If you halfway answer a question or the instructor halfway answers a question then the student is not going to get near as much out of course but it seemed like you went over and above to make sure that we understood what we were doing.

Pam stated,

I would say it definitely impacts the quality because if you didn't interact at all then the quality of learning experience would have been just baseline. And the more I interacted with your blog, the course blog, and maybe following rabbit trails to other Web sites it gave me more information that I wouldn't have gotten had I not interacted in that way.

Dan was a bit less supportive of the importance of interaction, but affirmed a utilitarian perspective, stating, "Again, I think it's just one of those that I think while you're doing the course, as long as I can get answers when I need answers I think that was good."

### *Summary*

In analyzing the responses from participants regarding Research Question 4 it is recognized that interaction invariably may have a direct impact on the self-paced online learning experience. Participants reported their experiences regarding the various types of interactions they engaged in throughout the duration of a self-paced online course and pointed to the important part that the interactions with the instructor and course content played in their overall online learning experience. While interaction with other learners was not the most influential component of the particular course studied, the logical assumption may be drawn that in other courses where interpersonal discussion with other learners is in fact maximized, such interactions could also be equally important. Further study will be necessary to explore whether such hypotheses are in fact confirmed. More recommendations regarding future studies will be shared in chapter 5.

### Summary

This study explored the dynamics of interaction within a self-paced online learning environment utilizing both rich media and a mix of traditional and emerging asynchronous computer-mediated communication tools to determine what forms of interaction learners in a self-paced online course value most as well as gain an understanding of their perceptions of the impact that such interactions have on their overall learning experience. The results of this study to be further discussed in chapter 5 provide guidelines for instructional designers developing instructional strategies for

online environments when neither the instructor nor course requirements impose pace upon the learners.

## CHAPTER 5. RESULTS, CONCLUSIONS, AND RECOMMENDATIONS

### Introduction

This study embraced a mixed methods approach to explore the dynamics of interaction within a self-paced online learning environment utilizing both rich media and a mix of traditional and emerging asynchronous computer-mediated communication tools to determine what forms of interaction learners in a self-paced online course value most as well as what affect such interactions have on their overall learning experience. Prior to this study, little empirical evidence existed as to the value that learners place upon the various types of interactions in a self-paced online learning environment.

Four primary research questions guided the research study, each discussed individually below. The primary focus of this research was to investigate the preferences of learners concerning the various interactions they engage in during a self-paced online course while questioning the presumption espoused by Anderson (2003) that a measure of equivalency exists among these commonly identified forms of interaction in an online learning environment. A total of ten learners from among two sections of a self-paced online course participated semi-structured in-depth interviews sharing first-hand from their experience regarding their preferences for interaction. Interview transcripts were reviewed and coded to determine emergent themes. The triangulation of data through multiple sources, including verbatim transcripts, comparisons of qualitative responses to

quantitative data gleaned from interview questions, and reviewer notes in conjunction with member checks of transcribed interviews aided in strengthening and validating findings.

### Discussion of Research Questions and Findings

*Research Question 1: What forms of interaction do adult learners engage in most in self-paced online courses?*

Within distance education frameworks, interactivity is often esteemed as paramount to the development of meaningful and memorable learning experiences (Brewer & Klein, 2006; Joyce Lee et al., 2006) and yet it is a concept that has received relatively little research attention in the literature regarding self-paced learning.

The self-paced online environment represents a unique and still rather unexplored segment of the expansive territory of online learning. Whereas an imposed-pace model sets definitive parameters for the course stipulating that all learners engage in the same learning activities at specific time periods, the self-paced approach affords more autonomy to the learner and provides benchmarks for progress and achievement while allowing learners to proceed at an individualized pace. While an imposed-pace course lends itself to regular or occasional collaborative activities, the self-paced course presents a more challenging environment for fostering collaboration among learners as individual learners may be at different stages of the course at any given time (Anderson et al., 2005). Rather than implying a lack of guidance, the self-paced approach affords learners

an increased measure of flexibility as to the pace in which they engage in the various course activities and communications with others.

Emerging tools and approaches for interaction based upon the new social computing capabilities of the semantic Web now make possible a wide array of interactions not only within the specified course environment but also across learner-defined domains that span beyond the virtual “walls” of the course (Dalsgaard, 2006; Dron, 2006b). The one-year online certificate program in Children’s Ministry (CMUO) offered by Valley Forge Christian College (VFCC) employs such a self-paced, emergent and flexible design and was selected as an appropriate context in which to explore the dynamics surrounding the interaction preferences of adult online learners.

Participants self-reported that they engaged most frequently in interactions involving either the course content or course instructor, on both formal and informal levels. Such interactions support the notion of the informal influence of the “network” and “collective” proposed by Anderson and Dron (2007). Emerging influences extend beyond the confines of the defined learning space and can potentially serve as an option for learners and designers alike to leverage within the self-paced learning environment.

Participants further noted that they actively engaged most actively with interactions with the instructor and course content, commensurate with findings of previous research pointing to the necessity of such fundamental interactions (Heinemann, 2003; Pawan et al., 2003; Perry & Edwards, 2005; Stein et al., 2005). The results of this study further strengthen the literature calling for the development of specific competencies not only for those designing online learning but also for those who

facilitate online learning experiences of various formats (Klein et al., 2004; Varvel, 2007). Therefore, the interactions with the instructor as well as with the content of the learning experience should not be discounted.

*Research Question 2: What forms of interaction do adult learners value most in self-paced online courses?*

Interaction may serve numerous purposes within the online learning environment, but the primary focus for many instructional designers and instructors often centers around improving student outcomes within the online learning experience. This study sought to explore the forms of interaction that adult learners valued most in the self-paced learning experience.

Self-paced online courses present unique opportunities and challenges for designers and participants alike. Distance education theorists such as Keegan (1996), Brockett and Hiemstra (1991), and Holmberg (1989) point to the strengths of self-paced education, including the ability to overcome time and place constraints, choices for learners concerning media content type and pace, and the economic scalability. Yet, these flexible online learning environments, while providing learners with increased freedom and access, have been historically criticized for limiting learners' ability to interact with peers in the learning community (Danaher, 1994). New social networking technologies, such as blogging, link sharing, collaborative authorship, and content syndication are being introduced that enable learners to collaborate in new and meaningful ways, therefore extending the theoretical and pragmatic bounds for the use of computer-mediated communication in online learning contexts (Alexander, 2006; Beldarrain,

2006). Whereas the use of traditional learning management systems creates a very organized, secure, and restricted learning environment, such emerging social technologies are allowing for new distributed student-centered approaches to learning, affording individual learners more control of the learning experience (Dron, 2007). No longer restricted to participating in the learning activities defined by the instructor or housed within a centralized learning management system, learners can take an increasingly proactive role in the development of their own personal learning landscape through the individualized selection and development of personal tools and networks that will extend beyond the duration of the course and foster a lifelong approach to learning (Attwell, 2006; Downes, 2006; Tosh & Werdmuller, 2004).

Through not only ranking of importance but also in rich narrative dialogue, adult learners expressed their preferences for quality interaction with the instructor and course content as being most important to the overall success of a self-paced online course. Data presented in Tables 9-11 displayed the preferred importance participants placed upon the various elements of a self-paced online course. Subsequent interview results reported throughout chapter 4 supported the quantitative rankings that participants assigned to the various course components and forms of interaction. Participants reported that while a balance of all interaction forms is most desirable, they value most the interactions with the instructor and content.

Studies have explored the benefits of using emerging social software tools, such as wikis, blogs, and RSS, that allow individuals with little or no technical programming skills to collaborate and quickly and easily contribute to the expanding body of

information online (Boulos et al., 2006; Schwartz et al., 2004). Such studies overwhelmingly praise the strengths of these new communication tools (Beldarrain, 2006; Brescia & Miller, 2006; Cameron & Anderson, 2006; Mason, 2006; West et al., 2006). The aforementioned social software tools are among the many that allow individuals to easily create and share content and will be explained further in chapter three. The horizon is promising for the implementation of such decentralized and predominantly free tools within pre-existing learning environments as they enable a level of informal interactions previously non-existent outside the confines of formal course activities. Yet, the perspectives of students and faculty concerning the effects of incorporating such learner-centered interpersonal interactions in self-paced learning environments has been notably absent from the literature (Anderson et al., 2005). The continued investigation of the experiences and preferences of learners concerning the use of these new tools is essential to realizing the full pedagogical implications and best practices for implementation (Sims & Salter, 2006).

Participants hailed the blogging and social bookmarking activities incorporated into the particular course that was studied as integral to the quality of the overall learning experience, noting the synergy of formal and informal interactions that such activities fostered. Responses reinforced the value of components of informal, learner-directed learning environments that extend beyond the restrictions of the formal online learning space. While learners did not take full advantage of the numerous external resources and informal interactions that were available, participants expressed overwhelming satisfaction with the content and formal interactions designed and therefore may have

been less likely to engage in superfluous interactions. Yet, the informal learning environment that was crafted placed maximum control with the learners. Such informal learning environments provide a more open venue for learners to connect with others interested in the same concepts either in a different course section or at a different stage of the course (Rhode, 2006).

Responses from participants support Paulsen's (1993) Theory of Cooperative Freedom, which argues that many students who choose a distance learning format do so in search of freedom from not only the time and place learning constraints, but also freedom to choose the type of media and content, times of access, and pace of the learning. Participants unanimously noted that the unique self-paced format was a pivotal factor enabling them to enroll in an online program of study. Such responses give credence to the call for flexible and emergent learning designs that meet the needs of an ever-changing adult learner population.

The fact that participants in this study esteemed quality interactions with content and the instructor above other interactions with other learners reiterates the necessity for concerted effort to be placed upon the design of instructional materials, activities, and interactions that foster active engagement with the content while also providing opportunities for instructor-learner interaction. While some may contend that true self-paced learning models diminish the role of the instructor and therefore are not compatible with such recommendations, a host of hybrid approaches to self-paced online education such as that employed by VFCC have been shown to accommodate the flexibility and customizability of the self-paced model while also incorporating considerable measures

of instructor-learner and learner-learner interactions. As participants' responses in this study reiterate, a balanced approach to incorporating the various interactions is often preferred by adult learners in the self-paced online course.

*Research Question 3: What forms of interaction do adult learners identify as equivalent in self-paced online courses?*

While preferences may vary among learners and contexts in regards to the definition and means for evaluating interaction (Sims, 2003; Su et al., 2005), it continues to remain important to determine whether participants in online learning experiences identify the various modes of interaction as congruent or disparate. The perceived value of each available interaction modality will to a large extent determine its current and future role within the online learning experience. Insufficient or ineffective interaction may lead to student isolation, while exorbitant levels may lead to overload or frustration (Berge, 1999; Willging & Johnson, 2004).

This study sought to explore the preferences of learners concerning the various interactions they engage in during a self-paced online course while questioning the presumption espoused by Anderson (2003) that a measure of equivalency exists among these commonly identified forms of interaction in an online learning environment. Anderson's theoretical basis for judging the essential quantities of each of the various types of interaction maintains that as long as one of three primary forms of interaction (student-teacher; student-student; student-content) is at a high level, other forms may be minimized or eliminated without adversely affecting the learning experience. This hypothesis is increasingly attractive to institutions pursuing initiatives to rapidly expand

online course offerings as it addresses the limitation that such institutions commonly face regarding the ratio of faculty to students and the amount of student-teacher interaction. This rationale is being extrapolated to support the design of learning approaches that maximize the student-content and student-student interaction while seeking to reduce the level of student-instructor interaction. Yet, little empirical evidence previously existed as to the value that learners place upon the various types of interactions in a self-paced learning environment.

The results of this study provide an initial glimpse into adult learners' preferences for interaction and serve as just one inquiry into whether a measure of equivalency truly exists among the various types of interactions employed in an online learning environment. Participants identified interaction with the instructor and content as very nearly equivalent in a self-paced online course. Participants pointed out that quality interaction with content is indispensable in the self-paced learning environment and can not in any way be replaced, while interaction with the instructor could potentially be diminished to an extent and compensated for through increased quality interactions with content or learners. Participants further noted that while interaction with other learners is desirable within the self-paced learning environment, the self-paced nature of the course makes such interactions challenging and therefore learners are willing to forgo such interpersonal interactions deemed by some as more tangential in exchange for the flexibility afforded by the self-paced learning approach.

In a granular analysis of the various interaction activities, participants generally reported the activity of blogging as equivalent or superior to asynchronous discussion via

the discussion board in Blackboard. Such findings add to the burgeoning body of research supporting the pedagogical possibilities of blogging as a flexible asynchronous communication alternative to threaded discussion via a restricted learning management system (W. Chen & Bonk, 2008; Schmidt, 2007). Participants also found the mix of formal and informal interactions with the content and instructor as essential to the optimal self-paced online learning experience. Interactions with other learners, both in the formal learning space as well as fostered by informal activities, were seen as tangential and while helpful are not mandatory to achieve a desirable learning outcome.

*Research Question 4: What impact do adult learners perceive interaction to have on their self-paced online learning experience?*

The effects of interaction on both the traditional and online student have been explored within the literature and researchers have consistently found that interaction is essential for a successful learning experience within either the traditional classroom or the contemporary online learning environment (Friesen & Anderson, 2004; Keenan, 2002; Su, 2006; Swan, 2002; Wallace, 2003). While not the sole indicator of high-quality and effective online education programs, there is significant pre-existent evidence to suggest that meaningful interaction with other students and the instructor is integral to the development of thriving learning environments (R. E. Brown, 2001; Garrison & Cleveland-Innes, 2005; H. C. Greene, 2005; Joyce Lee et al., 2006; Swan, 2002).

The effects of interaction have been measured using various outcomes, such as: learner satisfaction (Stein et al., 2005; Strachota, 2003), engagement (Lim, 2004), achievement (Jung et al., 2002), reflection (Roberts, 2002), and retention (Koper, 2005).

Yet, questions have remained largely unanswered concerning the preferences of students regarding the various interactions that they engage in and the degree in which such interactions are perceived to be equivalent.

This study expands upon previous research advocating for the purposeful design of interaction within the online learning experience (C.-W. Chang, 2006; Hirumi, 2002). It is recognized that interaction invariably may have a direct impact on the self-paced online learning experience. Participants reported their experiences regarding the various types of interactions they engaged in throughout the duration of a self-paced online course and pointed to the important part that the interactions with the instructor and course content played in their overall online learning experience. While interaction with other learners was not the most influential component of the particular course studied, the logical assumption may be drawn that in other courses where interpersonal discussion with other learners is in fact maximized, such interactions could also be equally important.

Participants confirm that quality interaction is a critical component of the quality self-paced online learning experience. Such conclusions support long-standing claims stressing the necessity for systematic design of instruction that encourage pedagogically-sound methods and incorporate emerging approaches as appropriate to meet the needs of learners (Kays & Sims, 2006; Koszalka & Ganesan, 2004). The substance and frequency of expressed quality interactions deemed necessary by learners may in fact vary from one learner population to another and may be influenced by the specific context and discipline. When asked if interaction with the instructor or content could be diminished or

eliminated and therefore compensated for by forms of interaction, participants refuted such ideas. Further studies will be necessary to explore whether such hypotheses are in fact confirmed.

As Nicol, Minty, and Sinclair (2003) note, “The social context of online learning is qualitatively different from face-to-face learning and...this has significant implications for online learning design” (p. 270). Interaction is a key component to the development of the distinctive social context of online learning. Interaction may serve numerous purposes within the online learning environment, but the primary focus for many instructional designers and instructors may continue to center around improving student outcomes within the online learning experience.

### Interaction Matrix

As a result of this study, the researcher developed the Interaction Matrix displayed as Figure 10 as one potential model for considering the incorporation of the holistic interaction forms available to date. While numerous taxonomies for interaction exist, the Interaction Matrix provides a collective approach to incorporating such dynamic interactions.

The Interaction Matrix detailed below helps explain the dynamic variety of interactions that are often considered essential in fostering a socially constructed learning environment. What follows is the rationale for the early conceptualization of this model that can help guide the design and development of environments that foster meaningful and memorable learning.

Each diagram that follows was developed by the researcher as an initial attempt to provide a visual representation of relationships among the various forms of interaction available to designers. Geometric elements were chosen to illustrate the interconnectedness and synergistic elements that various interactions possess when purposefully designed. In Figures 8-10, each interaction is symbolized by an equilateral triangle that is comprised of two different interaction elements, noted by smaller right triangles.

At the core of the Interaction Matrix are the essential elements of the learning environment: content, learner, instructor, collective, and network. Figure 7 depicts each of these primary elements as a different triangular piece that comprises the various formal and informal interactions that this study explored. As content, learner, and instructor are most established in the literature and most noted in this study, they are larger in Figure 8 than the emerging network and collective elements. All these components are further described below.

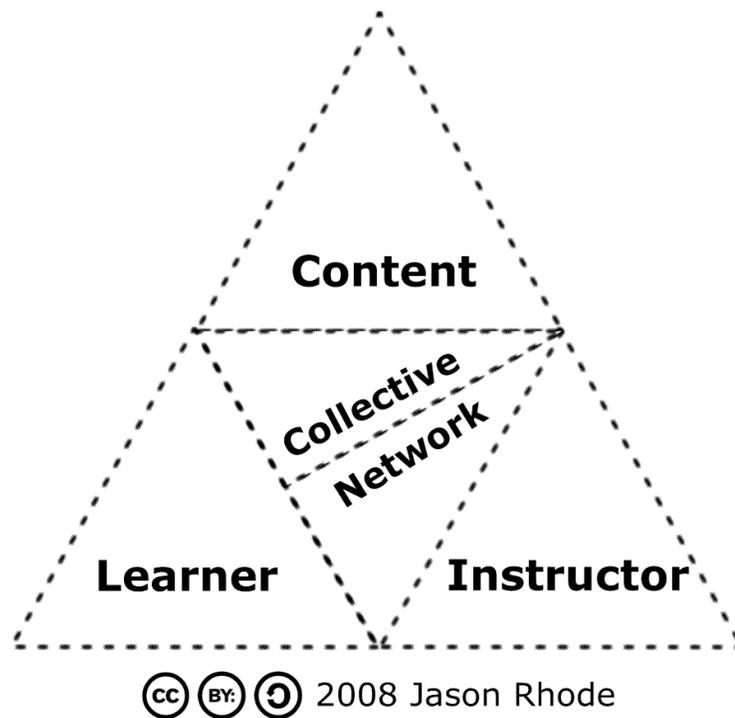


Figure 7. Interaction matrix core

Initial efforts of many learning endeavors are commonly focused upon the integration of course content. The content includes the complete assortment of instructional materials, learning objects, assigned readings, and resources that serve as the reference and resources that the both the instructor and learners will make use of throughout the learning experience. The instructor and learner(s) complete the triad of essential elements commonly understood as foundational to the learning encounter. These elements are therefore enlarged and form the boundary of the Interaction Matrix Core. Yet, two emerging catalytic components should also be included as core elements that learners interact with in informal contexts: the Network and the Collective.

Anderson and Dron (2007) note the distinctive characteristics of each of these granularities of social organization. In particular, they point to the radically new affordances possible through emerging applications of social software in educational contexts. They define the Network as, “a more fluid form of social entity in which members join, create and remove themselves from numerous informal learning and social connections.” The Network is personalized for each learner, as s/he has complete control over the composition of their network, the individuals comprising the Network, and the degree to which the Network is utilized.

The “Network” is further classified by Downes (2006) as being diverse, autonomous, open, connective, and distributed. Downes also notes that networks serve as bridges among individuals and agents in contrast to groups that typically isolate individuals into restricted units. Networks are fluid and generative as members contribute to create a resource that has greater value than any individual or group can solely construct. Examples of networks in education might include e-mail mailing lists, social networks, or subscribers to syndicated blogs.

In comparison to the Network, the Collective is much more expansive and involves the bottom-up interactions of the many. Anderson and Dron (2007) refer to the Collective as, “The largest form of social granularity in which members participate for individual benefit, but their activities are harvested to generate the ‘wisdom of the crowds’.” Anderson and Dron further note that the Collective is, “a kind of cyber-organism, formed from people linked algorithmically...it grows through the aggregation of individual, Group and Networked activities. This distinctive dynamic is one of

aggregation, not networking and the clearest way of distinguishing the two is that collective systems do not require a commitment to the Many.” The Collective might include any type of interactions involving individuals indirectly contributing to the many and can involve such activities as searching, social bookmarking, ranking, reviewing, and voting. In such an environment, the items deemed most valuable by the Collective are elevated and ultimately can influence the behavior of the individual. For example, video clips on YouTube that have been viewed the most appear highest in search results and therefore are more likely to be accessed than others that don’t receive such a high ranking. Dron (2007) suggests that these emergent properties social software fostering interaction with the Collective can facilitate an approach to elearning that is, “Qualitatively different from and capable of significantly augmenting traditional methods, with special benefits for lifelong learners and those outside institutional boundaries” (p. 60). The notions of the Network and Collective help address the dynamic of informal interactions that are possible when individual, group, and network activities are aggregated.

### *Formal Interaction*

Moore (1989) suggested the existence of three main types of interaction within educational contexts: (1) between the learner and instructor, (2) among learners, (3) between learners and the content they are working to master. A host of subsequent typologies have emerged, each seeking to either extend Moore’s basic tenets of interaction or define additional forms of interaction within the instructional context (see, for example, Anderson & Garrison, 1998; Hannafin, 1989; Hirumi, 2002; Juwah, 2006;

Jung, Choi, Lim, & Leem, 2002; Wagner, 1997). The Interaction Matrix draws together the dynamic interactions possible in contemporary online learning environments into a single model that can be utilized in the design, development, and facilitation of online learning initiatives.

In accordance with widespread recommendations from the literature and recommendations from learners in this study, the following formal interactions as depicted in Figure 8 should be considered when designing online learning. Figure 8 is one subset of the Interaction Matrix, utilizing five equilateral triangles to illustrate the five key formal interactions that should be considered when designing online learning environments: instructor-content, learner-learner, content-content, learner-instructor, and learner-content. Combined, these interactions form a trapezoidal unit comprising the full spectrum of formal interactions to be considered.

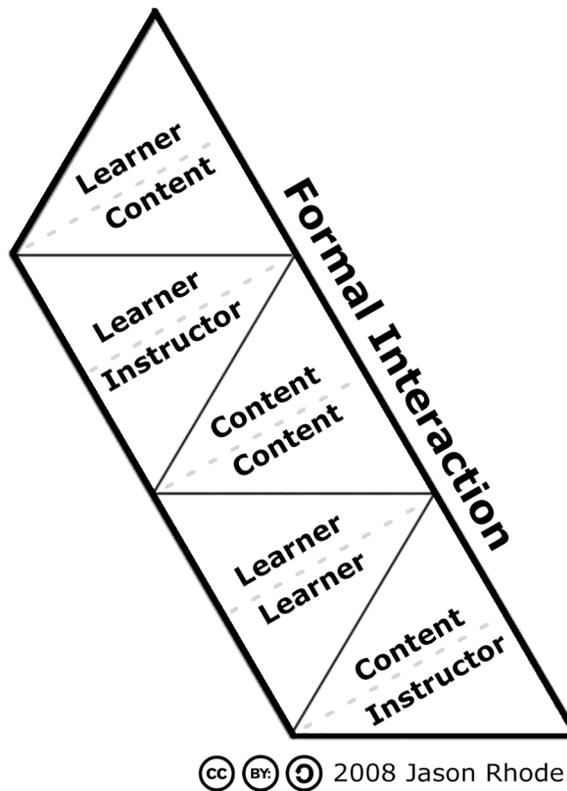


Figure 8. Formal interaction

*Instructor-Content Interaction.* This involves the wide array of interactions that the instructor has with the content and includes activities such as selecting objectives, developing instructional materials, crafting activities for learners to engage in, etc.

*Learner-Learner Interaction.* This includes any number of interactions designed to encourage learners to interact with one another throughout the course. These interactions could be either synchronous or asynchronous, but the parameters for such activities are generally specified by the instructor or the course requirements.

*Content-Content Interaction.* Rather than offering just a single set of activities or interactions for all learners, content-content interaction can facilitate custom learning paths through course content and activities, displaying content to certain users for a

limited period of time or making additional content available based on a variety of pre-defined or dynamic content variables.

*Instructor-Learner Interaction.* Any number of interactions between learners and the instructor are possible. Such interactions may be either synchronous or asynchronous and can be either instructional, supplementary, or evaluative in nature. No matter the specific format of the interactions, learners have reported finding the interactions with the instructor to be essential to the quality of the online learning experience (Restauri, 2006; Richardson & Swan, 2003).

*Learner-Content Interaction.* As learners actively engage with course content, they have opportunity to evaluate, apply, and synthesize course content. Therefore, the interactions that learners have with content should be carefully designed to facilitate meaningful interactions.

#### *Informal Interaction*

In addition to the formal interactions that instructors and designers must consider, numerous informal interactions also are possible and should be considered as contributing to the overall success of the learning encounter and may serve as integral to the quality learning experience preferred by both learners and instructors. These interactions, while some at times exist beyond the control of the designer or instructor, should at least be considered as important components to the complete learning experience. Figure 9 displays the second trapezoidal subset of the Interaction matrix, consisting of the following seven informal interactions: learner-learner, instructor-

content, content-content, learner-instructor, learner-content, learner-network, and learner-collective.

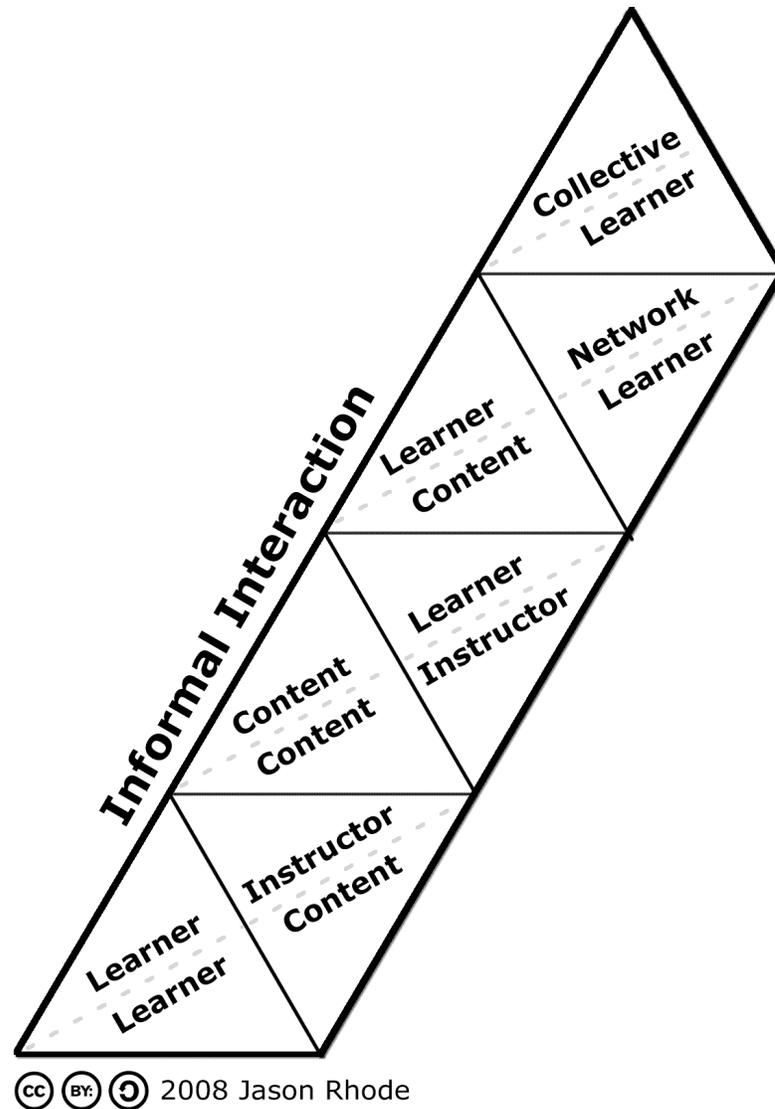


Figure 9. Informal interaction

*Learner-Learner Interaction.* Learners have opportunity to interaction with each other informally outside of the formal learning environment. These interactions may include, but aren't limited to: e-mail, phone, meeting in person, sharing or compiling

bookmarked resources, social networking, subscribing to each other's blogs, commenting on each other's blogs.

*Instructor-Content Interaction.* In addition to the formal efforts of the instructor to design and develop various course content activities, the instructor may come across additional resources or supplementary course content items that may either add to overall understanding or serve as additional resources. The instructor may engage in a variety of ongoing informal interactions with the content, such as bookmarking new resources, subscribing to and commenting on blogs or news feeds, etc. The instructor may choose to incorporate newly-discovered content and resources immediately to the course in-progress or may utilize them when revising the course for the next group of students.

*Content-Content Interaction.* Consistent with the characteristics of the Collective described above, a wide assortment of informal interactions among content items can contribute to the learning experience and be leveraged. Such interactions could involve organic interactions such as the formation and updating of dynamic information feeds or agents that are developed and updated by other forms of information or content. As the available technology continues to develop and the Collective becomes more clever, the format and influence of content-content interactions will only further develop.

*Learner-Instructor Interaction.* Learners may need to reach out to the instructor informally for further clarification or assistance, or, the instructor may need to contact students outside the formal course environment to share announcements or updates. A myriad of other informal interactions are possible, all of which may help learners feel

more connected to the instructor as well as supported throughout the entire learning experience.

*Learner-Content Interaction.* Learners have opportunity to interact with content informally, which may serve to help reinforce formal interactions and therefore solidify the efficacy of designed formal learner-content interactions. While each learner's personal learning environment (PLE) whereby many such interactions take place is unique, it is possible to design opportunities in the learning experience for learners to leverage their PLE to extend formal learning content. Such activities might include searching online for related supplementary resources and then bookmarking them to share with the class or subscribing to blogs and other feeds that further extend the knowledge base.

*Learner-Network Interaction.* As learners develop their own learning network outside the walls of the formal course environment, they have opportunity to form connections that can support more informal interactions on a number of levels. Learner-formed and maintained networks are one plausible alternative to more formally designed, instructor-driven groups that afford learners the opportunity to personalize interactions to individual preferences and needs, integral to incorporating unique experience and socio-cultural perspectives into the teaching and learning ethos (Sims & Stork, 2007).

*Learner-Collective Interaction.* Learners can access a myriad of additional informal resources referred to as "the Collective" in which the input of the many can have a significant and dynamic contribution. Learners also can share their perspectives

with the collective, therefore contributing to the success and future impact of the Collective.

Considering the full range of possible interactions that possible, the Interaction Matrix displayed as Figure 10 depicts the essential elements of a socially constructed learning environment as they are involved in various synergistic interactions. It incorporates both trapezoidal depictions of formal and informal interactions fitting neatly together upon the core of interactive components: content, learner, instructor, collective, and network.

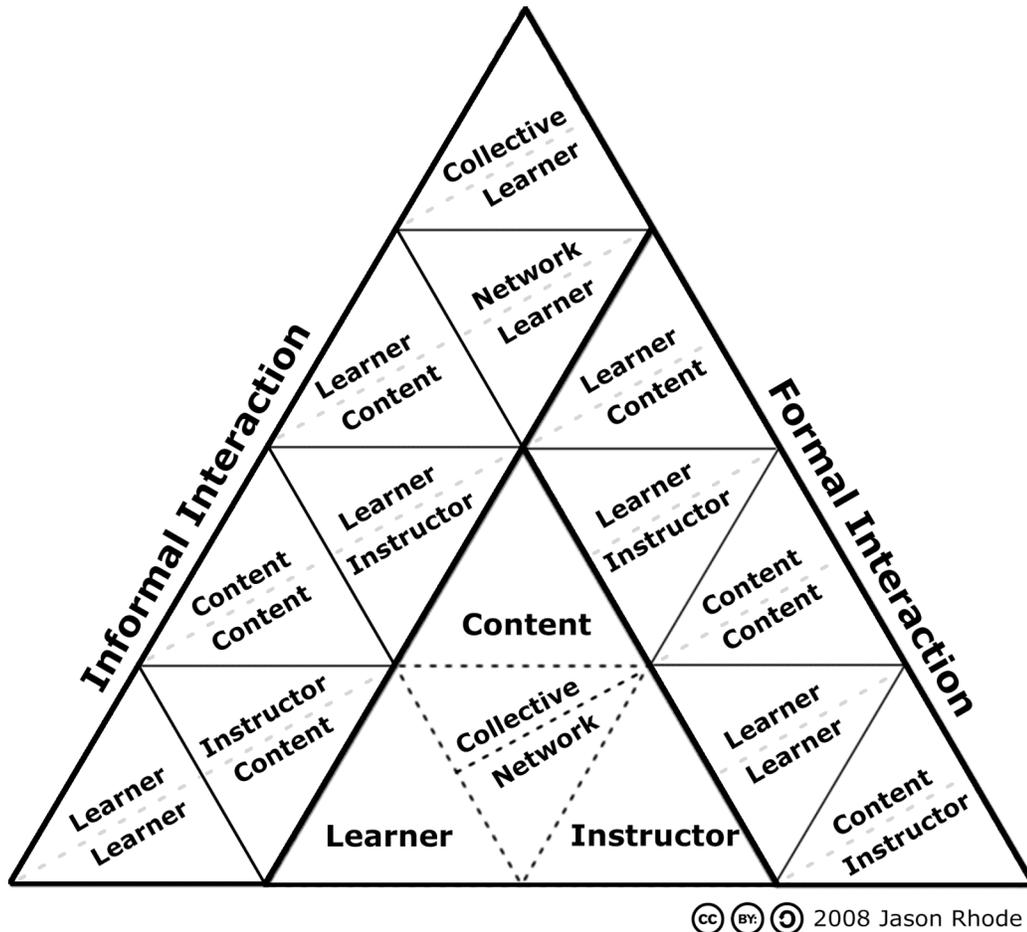


Figure 10. Interaction Matrix

As Sims and Stork (2007) recommend, designers should be cognizant of the unique cultural and situational/social contexts of learners that influence the ability for learners to engage in online learning environments. Emergent designs enable learners to integrate their individuality, experience and culture into the teaching and learning dynamic. Such designs leverage the full suite of interactions possible. Therefore, designers should be aware of each of these potential interactions and incorporate as many such interactions as are possible in an effort to provide learners with the maximum level of control in their learning experience.

### Recommendations

While this study provides important contributions to the field, it is noteworthy to mention recommendations that may enhance the impact as well as guide further studies to be conducted.

As with any exploratory study, the insights gleaned provide an initial and focused understanding of an educational intervention from the perspective of those involved, paving the way for future studies. The very nature of such inquiry is based on the premise that multiple perspectives for any given experience exist and that the significance of the experience to the participants is what comprises reality (McMillan, 2000). The rich insights gleaned from the participants are specific to that population and cannot be projected upon other classifications of individuals. This study focused on learner preferences for interaction in a self-paced online learning environment and did not

simultaneously investigate instructor-preferred or administration-preferred tenets worthy of analysis. Further studies could explore such perspectives within the self-paced online learning environment as well as extend beyond any single institution in order to see if the sentiments expressed by learners in the selected course sections are isolated to the specific course or program selected or are more indicative of interaction trends in other contexts.

Similar future studies would add valuable contributions to the field by studying interaction in similar course environments in alternative institutions where the researcher is not the instructor as well as with multiple sections of a particular course where the same subject matter and learning experiences are facilitated by different instructors with subsequently different approaches to interacting with students. Successive studies could also involve differing learner populations, including various age groups and socio-cultural status to determine whether such influences impact interaction. Furthermore, additional studies are necessary to measure the affect that emerging interaction types have on the overall learning experience.

This study briefly explored learners' preferences for asynchronous discussion and compared asynchronous discussion via a discussion board format as compared to a more open format of a blog. Further research is necessary to explore the unique aspects of emergent asynchronous communications approaches such as blogging, collaborative authorship, social bookmarking, and social networking as compared to more traditional asynchronous online communication approaches. In particular, when given the choice, do learners prefer a more open form a communication feasible through emergent computer-

mediated communication technologies as compared to utilizing the discussion board provided in an LMS? In addition, to what extent can a social network system meet the needs of designers, instructors, and learners and therefore be capable of replacing an LMS? Finally, it would be beneficial to learn in future studies what impact course size may have on the self-paced online learning experience.

### Conclusions

A host of interactions certainly are possible in contemporary online learning environments. Some are viewed as essential while others may assume a more supplemental role. Prior to conducting this study, it was proposed that one or more types of interaction could potentially surface as being preferred for adult learners in the self-paced online learning environment. While others had conjectured that learners may value formal, learner-instructor interaction highest, little evidence was previously available in the literature to support or refute the notion of interaction equivalency among interaction modalities. This study demonstrated that depending on the specific circumstance, not all forms of interaction may be either equally valued by learners or effective. Participants reported that informal interactions were as important as formal interactions in determining the quality of the online learning experience. In addition, the activity of blogging was shown to be equivalent to or even superior to instructor-directed asynchronous discussion via the discussion board in a LMS. While it may be possible to design opportunities for interpersonal interaction that may in fact rival interaction with the instructor or content, in this particular self-paced online learning environment that

was studied, this was not the case. And, as learners' preferences indicated that one or more types of interaction were valued over the other, it is certainly possible that in other learning environments such findings may differ. Further study is necessary to determine whether the initial insights of participants reflect noteworthy trends in interaction or merely an isolated instance.

The results of this study provide guidelines for instructional designers developing instructional strategies for online environments when neither the instructor nor course requirements impose pace upon the learners. The importance of well-designed instruction was reinforced. The components of what may be deemed "well-designed instruction" can span beyond stimulus-response or drill and practice activities to include a wide range of dynamic interactions as outlined in the Interaction Matrix. Such diverse interactions all collectively comprise a dynamic learning environment comprised of one or more learning communities that can extend beyond the restrictions of any single course section, connecting learners in unique ways.

## REFERENCES

- Abdulla, A. G. (2006). Distance learning students' perceptions of the online instructor roles and competencies. *Dissertation Abstracts International*, 65(07), 2409. (UMI No. 3137394)
- Alexander, B. (2006). Web 2.0: A new wave of innovation for teaching and learning? *Educause Review*, 41(2), 32-44.
- Allen, I. E., & Seaman, J. (2004) Entering the mainstream: The quality and extent of online education in the United States, 2003 and 2004. [Electronic version]. Retrieved March 2, 2005, from [http://www.sloan-c.org/resources/entering\\_mainstream.pdf](http://www.sloan-c.org/resources/entering_mainstream.pdf)
- Allen, I. E., & Seaman, J. (2006). *Making the grade: Online education in the United States, 2006*. Needham, MA: Sloan-C.
- Anderson, T. (2003). Getting the mix right again: An updated and theoretical rationale for interaction. *The International Review of Research in Open and Distance Learning*, 4 (2). Retrieved July 8, 2006, from <http://www.irrodl.org/index.php/irrodl/article/view/149/230>
- Anderson, T. (2005, November). *Distance learning - social software's killer app?* Paper presented at the 17th ODLAA Conference, Adelaide, South Australia.
- Anderson, T. (2006a). Higher education evolution: Individual freedom afforded by educational social software. In M. Beaudoin (Ed.), *Perspectives on higher education in the digital age* (pp. 77-90). New York: Nova Science.
- Anderson, T. (2006b). Interaction in learning and teaching on the Educational Semantic Web. In C. Juwah (Ed.), *Interactions in online education: Implications for theory and practice* (pp. 141-155). New York: Routledge.
- Anderson, T., Annand, D., & Wark, N. (2005). The search for learning community in learner paced distance education: Or, 'Having your cake and eating it, too! *Australasian Journal of Educational Technology*, 21 (2), 222-241. Retrieved July 7, 2006, from <http://www.ascilite.org.au/ajet/ajet21/anderson.html>
- Anderson, T., & Dron, J. (2007). Groups, networks and collectives in social software for e-learning, *2007 European Conference on E-Learning*. Copenhagen, Denmark.
- Anderson, T., & Garrison, D. R. (1998). Learning in a networked world: New roles and responsibilities. In C. C. Gibson (Ed.), *Distance learners in higher education: Institutional responses for quality outcomes* (pp. 97-112). Madison, WI: Atwood.

- Anderson, T., Rourke, L., Garrison, D. R., & Archer, W. (2001). Assessing teaching presence in a computer conferencing environment. *Journal of Asynchronous Learning Networks*, 5(2).
- Andone, D., Dron, J., Pemberton, L., & Boyne, C. (2007). E-learning environments for digitally-minded students. *Journal of Interactive Learning Research*, 18(1), 41-53.
- Angeli, C., Valanides, N., & Bonk, C. J. (2003). Communication in a web-based conferencing system: The quality of computer-mediated interactions. *British Journal of Educational Technology*, 34(1), 31-43.
- Attwell, G. (2006). Personal learning environments. Retrieved August 16, 2006, from [http://www.knownet.com/writing/weblogs/Graham\\_Attwell/entries/6521819364](http://www.knownet.com/writing/weblogs/Graham_Attwell/entries/6521819364)
- Attwell, G. (2007). Personal learning environments - The future of eLearning? *eLearning Papers*, 2 (1). Retrieved March 22, 2007, from <http://www.elearningpapers.eu>
- Aviv, R., Erlich, Z., & Ravid, G. (2005). Reciprocity analysis of online learning networks. *Journal of Asynchronous Learning Networks*, 9(4), 3-13.
- Bannan-Ritland, B. (2002). Computer-mediated communication, elearning, and interactivity: A review of the research. *Quarterly Review of Distance Education*, 3(2), 141-160.
- Barab, S. A., Squire, K. D., & Deuber, W. (2000). A co-evolutionary model for supporting the emergence of authenticity. *Educational Technology Research & Development*, 48(2), 37-62.
- Bednar, A. K., Cunningham, D., Duffy, T. M., & Perry, J. D. (1991). Theory into practice: How do we link? In G. J. Anglin (Ed.), *Instructional technology: Past, present, and future*. Englewood, CO: Libraries Unlimited, Inc.
- Beldarrain, Y. (2006). Distance education trends: Integrating new technologies to foster student interaction and collaboration. *Distance Education*, 27(2), 139-153.
- Berge, Z. L. (1995). Facilitating computer conferencing: Recommendations from the field. *Educational Technology*, 35(1), 22-30.
- Berge, Z. L. (1999). Interaction in post-secondary web-based learning. *Educational Technology*, 39(1), 5-11.
- Berge, Z. L. (2001). New roles for learners and teachers in online education. Retrieved February 21, 2006, from <http://www.globaled.com/articles/BergeZane2000.pdf>

- Berners-Lee, T. (1997). *Weaving the web: The original design and ultimate destiny of the World Wide Web*. San Francisco: Harper.
- Bibeau, S. (2001). Social presence, isolation, and connectedness in online teaching and learning: From the literature to real life. *Journal of Instructional Delivery Systems, 15*(3), 35-39.
- Boulos, M. N. K., Marambo, I., & Wheeler, S. (2006). Wikis, blogs, and podcasts: A new generation of web-based tools for collaborative clinical practice and education. *BMC Medical Journal, 6* (41). Retrieved August 19, 2007, from <http://www.biomedcentral.com/content/pdf/1472-6920-6-41.pdf>
- Boyd, R. D., & Myers, J. G. (1988). Transformative education. *International Journal of Lifelong Education, 7*(4), 261-284.
- Brescia, W. F., & Miller, M. T. (2006). What's it worth? The perceived benefits of instructional blogging. *Electronic Journal for the Integration of Technology in Education, 5*, 44-52. Retrieved October 4, 2006, from <http://ejite.isu.edu/Volume5/Brescia.pdf>
- Brewer, S., & Klein, J. D. (2006). Type of positive interdependence and affiliation motive in an asynchronous, collaborative learning environment. *Educational Technology Research & Development, 54*(4), 331-354.
- Brockett, R. G., & Hiemstra, R. (1991). *Self-direction in adult learning: Perspectives on theory, research, and practice*. London: Routledge.
- Brookfield, S. (1984). Self-directed adult learning: A critical paradigm. *Adult Education Quarterly, 35*(2), 59-71.
- Brown, J. S. (2000). Growing up digital. *Change, 32*(2), 10-20.
- Brown, M., & Long, P. D. (2006). Trends in learning space design. In D. G. Oblinger (Ed.), *Learning spaces*: Educause.
- Brown, R. E. (2001). The process of community-building in distance learning classes. *Journal of Asynchronous Learning Networks, 5*(2), 18-35.
- Brown, S. W., & King, F. B. (2000). Constructivist pedagogy and how we learn: Educational psychology meets international studies. *International Studies Perspectives, 1*(3), 245-255.

- Burge, L. (1988). Beyond andragogy: Some explanations for distance learning design. *Journal of Distance Education*, 3 (1). Retrieved April 22, 2006, from <http://cade.athabascau.ca/vol3.1/burge.html>
- Caffarella, R. S., & Caffarella, E. P. (1986). Self-directedness and learning contracts in adult education. *Adult Education Quarterly*, 36(4), 226-234.
- Cameron, D., & Anderson, T. (2006). Comparing weblogs to threaded discussion tools in online educational contexts. *International Journal of Instructional Technology and Distance Learning*, 2 (11). Retrieved December 2, 2006, from [http://www.itdl.org/Journal/Nov\\_06/article01.htm](http://www.itdl.org/Journal/Nov_06/article01.htm)
- Chang, C.-W. (2006). The efficacy of interaction among college students in a web-based environment. *Dissertation Abstracts International*, 67(05), (UMI No. 3220234)
- Chang, M.-M. (2005). Applying self-regulated learning strategies in a web-based instruction--An investigation of motivation perception. *Computer Assisted Language Learning*, 18(3), 217-230.
- Chang, T.-s. (2003). A comparison study of online interaction strategies as perceived by online learners and instructors and the effect of previous online learning experience on preferences for online interaction. *Dissertation Abstracts International*, 64(10), 3564. (UMI No. 3110339)
- Charles, C. M., & Mertler, C. A. (2002). *Introduction to educational research* (4th ed.). Boston: Allyn and Bacon.
- Chen, W., & Bonk, C. (2008). The use of weblogs in learning and assessment in Chinese higher education: Possibilities and potential problems. *International Journal on E-Learning*, 7(1), 41-65.
- Chen, Y.-J. (2000). Transactional distance in world wide web learning environments. *Innovations in Education and Teaching International*, 38, 327-338.
- Chute, A. G., Sayers, P. K., & Gardner, R. P. (1997). Networked learning environments. *Teaching and Learning at a Distance*, 71, 75-84.
- Clark, R. E. (1994). Media will never influence learning. *Educational Technology Research and Development*, 42(2), 21-29.
- Conrad, D. (2002). Deep in the hearts of learners: Insights into the nature of online community. *Journal of Distance Education*, 17 (1). Retrieved March 2, 2006, from <http://cade.icaap.org/vol17.1/conrad.html>

- Creswell, J. W., & Plano Clark, V. L. (2007). *Designing and conducting mixed methods research*. Thousand Oaks, CA: Sage.
- Cross, J. (2006). *Informal learning: Rediscovering the natural pathways that inspire innovation and performance*. Hoboken, NJ: John Wiley & Sons.
- Curtis, D. D., & Lawson, M. J. (2001). Exploring collaborative online learning. *Journal of Asynchronous Learning Networks*, 5(1), 21-34.
- Daloz, L. A. (1999). *Mentor: Guiding the journey of adult learners*. San Francisco: Jossey-Bass.
- Dalsgaard, C. (2006). Social software: E-learning beyond learning management systems. *European Journal of Open, Distance and E-Learning*, 2006 (2). Retrieved September 26, 2006, from [http://www.eurodl.org/materials/contrib/2006/Christian\\_Dalsgaard.htm](http://www.eurodl.org/materials/contrib/2006/Christian_Dalsgaard.htm)
- Danaher, P. A. (1994). Open learning and technology: Problems and potentials. *Social Alternatives*, 13(3/4), 23-26.
- Daniel, J. S., & Marquis, C. (1988). Interaction and independence: Getting the mixture right. In D. Sewart, D. Keegan & B. Holmberg (Eds.), *Distance education: International perspectives* (pp. 339-359). New York: Routledge.
- Dell, C. A. (2006). Emergence of self-regulation among online learners. *Academic Exchange Quarterly*, 10 (4). Retrieved July 1, 2007, from <http://rapidintellect.com/AEQweb/cho3572z6.htm>
- Dempsey, J. V., & Van Eck, R. N. (2007). Distributed learning and the field of instructional design. In R. A. Reiser & J. V. Dempsey (Eds.), *Trends and issues in instructional design and technology* (2nd ed., pp. 288-300). Upper Saddle River, NJ: Pearson.
- Denzin, N. K., & Lincoln, Y. S. (Eds.). (1994). *Handbook of qualitative research*. Thousand Oaks, CA: Sage.
- Derrida, J. (1978). *Writing and difference*. Chicago: University of Chicago Press.
- Dewey, J. (1938). *Experience and education*. New York: Simon & Schuster.
- Dobrovolny, J. (2006). How adults learn from self-paced, technology-based corporate training: New focus for learners, new focus for designers. *Distance Education*, 27(2), 155-170.

- Downes, S. (2006). Learning networks and connective knowledge. Retrieved October 16, 2006, from <http://it.coe.uga.edu/itforum/paper92/paper92.html>
- Downes, S. (2007). Collaboration tools and web 2.0. Retrieved August 21, 2007, from <http://www.downes.ca/presentation/139>
- Driscoll, M. P. (2006). Psychological foundations of instructional design. In R. A. Reiser & J. V. Dempsey (Eds.), *Trends and issues in instructional design and technology*. Upper Saddle River, NJ: Pearson Merrill Prentice Hall.
- Dron, J. (2006a). Any color you like, as long as it's Blackboard, *E-Learn 2006*. Hawaii.
- Dron, J. (2006b). Social software and the emergence of control, *The 6th IEEE International Conference on Advanced Learning Technologies*. Kerkrade, The Netherlands.
- Dron, J. (2006c). The teacher, the learner and the collective mind. *AI & Society*.
- Dron, J. (2007). Designing the undesignable: Social software and control. *Educational Technology & Society*, 10(3), 60-71.
- Ellis, A. K. (2001). *Teaching, learning, & assessment together: The reflective classroom*. Larchmont, NY: Eye on Education.
- Ellis, R. A., Jarkey, N., Mahony, M. J., Peat, M., & Sheely, S. (2007). Managing quality improvement of eLearning in a large, campus-based university. *Quality Assurance in Education*, 15(1), 9-23.
- Fink, A., & Kosecoff, J. (1998). *How to conduct surveys: A step-by-step guide* (2nd ed.). Thousand Oaks, CA: Sage.
- Fisher, M., & Baird, D. E. (2005). Online learning design that fosters student support, self-regulation, and retention. *Campus-Wide Information Systems*, 22(2), 88-107.
- Flottemesch, K. (2000). Building effective interaction in distance education: A review of the literature. *Educational Technology*, 40(3), 46-51.
- Franklin, S., Peat, M., Lewis, A., & Sims, R. (2001). *Technology at the cutting edge: A large scale evaluation of the effectiveness of educational resources*. Paper presented at the World Conference on Educational Multimedia, Hypermedia and Telecommunications.
- Freire, P. (1970). *Pedagogy of the oppressed*. New York: Continuum.

- Freire, P. (1994). *Education for critical consciousness*. New York: Continuum.
- Friesen, N., & Anderson, T. (2004). Interaction for lifelong learning. *British Journal of Educational Technology*, 35(6), 679-687.
- Fulford, C. P., & Zhang, S. (1993). Perceptions of interaction: The critical predictor in distance education. *The American Journal of Distance Education*, 7(3), 8-21.
- Fung, Y. Y. H. (2004). Collaborative online learning: Interaction patterns and limiting factors. *Open Learning*, 19(2), 135-149.
- Garrison, D. R. (1992). Critical thinking and self-directed learning in adult education: An analysis of responsibility and control issues. *Adult Education Quarterly*, 42, 136-148.
- Garrison, D. R. (1997). Self-directed learning: Toward a comprehensive model. *Adult Education Quarterly*, 48(1), 18-33.
- Garrison, D. R. (2000). Theoretical challenges for distance education in the 21st century: A shift from structural to transactional issues. *The International Review of Research in Open and Distance Learning*, 1 (1). Retrieved June 4, 2007, from <http://www.irrodl.org/index.php/irrodl/article/view/2/333>
- Garrison, D. R. (2003). Cognitive presence for effective asynchronous online learning: The role of reflective inquiry, self-direction and metacognition. In J. Bourne & J. C. Moore (Eds.), *Elements of quality online education: Practice and direction*. Needham, MA: The Sloan Consortium.
- Garrison, D. R., & Anderson, T. (2003). *E-learning in the 21st century: A framework for research and practice*. London: RoutledgeFalmer.
- Garrison, D. R., Anderson, T., & Archer, W. (2000). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education*, 2(2-3), 87-105.
- Garrison, D. R., Anderson, T., & Archer, W. (2001). Critical thinking, cognitive presence, and computer conferencing in distance education. *American Journal of Distance Education*, 15(1).
- Garrison, D. R., & Archer, W. (2000). *A transactional perspective on teaching and learning: A framework for adult and higher education*. Amsterdam: Pergamon.

- Garrison, D. R., & Cleveland-Innes, M. (2005). Facilitating cognitive presence in online learning: Interaction is not enough. *American Journal of Distance Education*, 19(3), 133-148.
- Garrison, D. R., Cleveland-Innes, M., & Fung, T. (2004). Student role adjustment in online communities of inquiry: Model and instrument validation. *Journal of Asynchronous Learning Networks*, 8(2), 61-74.
- Gayton, J. (2007). Visions shaping the future of online education: Understanding its historical evolution, implications, and assumptions. *Online Journal of Distance Learning Administration*, 10 (1). Retrieved June 21, 2007, from <http://www.westga.edu/~distance/ojdla/summer102/gaytan102.htm>
- Gorsky, P., & Caspi, A. (2005). A critical analysis of transactional distance theory. *The Quarterly Review of Distance Education*, 6, 1-11.
- Greene, H. C. (2005). Creating connections: A pilot study of an online community of learners. *Journal of Online Interactive Learning*, 3 (3). Retrieved September 2, 2006, from <http://www.ncolr.org/jiol/issues/PDF/3.3.3.pdf>
- Greene, J. C. (2008). Is mixed methods social inquiry a distinctive methodology? *Journal of Mixed Methods Research*, 2(1), 7-22.
- Greene, J. C., Caracelli, V. J., & Graham, W. F. (1989). Toward a conceptual framework for mixed-method evaluation designs. *Educational Evaluation and Policy Analysis*.
- Grooms, L. D. (2000). Interaction in the computer-mediated adult distance learning environment: Leadership development through online education. *Dissertation Abstracts International*, 61(12), 4692. (UMI No. 9999213)
- Gunawardena, C. N. (1995). Social presence theory and implications for interaction and collaborative learning in computer conferences. *International Journal of Educational Telecommunications*, 1(2/3), 147-166.
- Habermas, J. (1968). *Knowledge and human interests*. Boston: Beacon Press.
- Hamilton, M. (2006). Just do it: Literacies, everyday learning and the irrelevance of pedagogy. *Studies in the Education of Adults*, 38(2), 125-140.
- Hannafin, M. J. (1989). Interaction strategies and emerging instructional technologies: Psychological perspectives. *Canadian Journal of Educational Communication*, 18(3), 167-179.

- Heath, M. J. (1997). The design, development, and implementation of a virtual online classroom. *Dissertation Abstracts International*, 58(08), 3097. (UMI No. 9803569)
- Hedberg, J., & Sims, R. (2001). Speculations on design team interactions. *Journal of Interactive Learning Research*, 12(2), 189-214.
- Heinemann, M. H. (2003). Teacher-student interaction online and learning in web-based graduate theological education. *Dissertation Abstracts International*, 64(04), 1189. (UMI No. 3087174)
- Herrington, J., Reeves, T. C., & Oliver, R. (2006). A model of authentic activities for online learning. In *Interactions in online education: Implications for theory and practice* (pp. 91-103). New York: Routledge.
- Hewitt, J. (2005). Toward an understanding of how threads die in asynchronous computer conferences. *Journal of the Learning Sciences*, 14(4), 567-589.
- Hillman, D. C., Willis, D. J., & Gunawardena, C. N. (1994). Learner-interface interaction in distance education: An extension of contemporary models and strategies for practitioners. *The American Journal of Distance Education*, 8(2), 30-42.
- Hines, R. A., & Pearl, C. E. (2004). Increasing interaction in web-based instruction: Using synchronous chats and asynchronous discussions. *Rural Special Education Quarterly*, 23, 33-36.
- Hirumi, A. (2002). A framework for analyzing, designing, and sequencing planned elearning interactions. *The Quarterly Review of Distance Education*, 3(2), 141-161.
- Hirumi, A. (2006). Analysing and designing e-learning interactions. In C. Juwah (Ed.), *Interactions in online education: Implications for theory and practice* (pp. 46-71). New York: Routledge.
- Ho, C.-H. (2005). Evaluating online interaction in an asynchronous learning environment: A conversation analysis approach. *Dissertation Abstracts International*, 66(02), 473. (UMI No. 3164602)
- Hodge, E., Bossé, M. J., Foulconer, J., & Fewell, M. (2006). Mimicking proximity: The role of distance education in forming communities of learning. *International Journal of Instructional Technology & Distance Learning*, 3 (12). Retrieved January 14, 2007, from [http://www.itdl.org/Journal/Dec\\_06/article01.htm](http://www.itdl.org/Journal/Dec_06/article01.htm)

- Hodges, C. B. (2005). Self-regulation in web-based courses: A review and the need for research. *The Quarterly Review of Distance Education*, 6(4), 375-383.
- Holmberg, B. (1989). *Theory and practice of distance education*. New York: Routledge.
- Howland, J. L., & Moore, J. L. (2002). Student perceptions as distance learners in internet-based courses. *Distance Education*, 23(2), 183-195.
- Irlbeck, S., Kays, E., Jones, D., & Sims, R. (2006). The Phoenix Rising: Emergent models of instructional design. *Distance Education*, 27(2), 171-185.
- Jick, T. D. (1979, December). Mixing qualitative and quantitative methods: Triangulation in action. *Administrative Science Quarterly*, 24, 602-611.
- Johnson, G. M. (2006). Synchronous and asynchronous text-based CMC in educational contexts: A review of recent research. *TechTrends*, 50(4), 46-53.
- Johnson, H. (2007). Dialogue and the construction of knowledge in e-learning: Exploring students' perceptions of their learning while using Blackboard's asynchronous discussion board. *European Journal of Open, Distance and E-Learning*, 2007 (1). Retrieved January 14, 2007, from [http://www.eurodl.org/materials/contrib/2007/Henry\\_Johnson.htm](http://www.eurodl.org/materials/contrib/2007/Henry_Johnson.htm)
- Johnson, R. B., & Onwuegbuzie, A. J. (2002). Mixed methods research: A research paradigm whose whose time has come. *Educational Researcher*, 33(7), 14-26.
- Jonassen, D. H. (1991). Objectivism versus constructivism: Do we need a new philosophical paradigm? *Educational Technology Research & Development*, 39(3), 5-14.
- Jonassen, D. H. (1999). Designing constructivist learning environments. In C. M. Reigeluth (Ed.), *Instructional-design theories and models: A new paradigm of instructional theory* (Vol. II, pp. 115-140). Mahwah, NJ: Lawrence Erlbaum Associates.
- Jones, C., & Steeples, C. (2001). *Networked learning: Perspectives and issues*. New York: Springer-Verlag.
- Jones, N., & Peachey, P. (2005). The development of socialization in an on-line learning environment. *Journal of Online Interactive Learning*, 3 (3). Retrieved September 2, 2006, from <http://www.ncolr.org/jiol/issues/PDF/3.3.4.pdf>

- Jung, I., Choi, S., Lim, C., & Leem, J. (2002). Effects of different types of interaction on learning achievement, satisfaction and participation in web-based instruction. *Innovations in Education and Teaching International*, 39(2), 153-162.
- Juwah, C. (2006). Introduction. In C. Juwah (Ed.), *Interactions in online education: Implications for theory and practice* (pp. 1-5). New York: Routledge.
- Kahn, B. H. (2007). *Flexible learning in an information society*. Hershey, PA: Information Science Publishing.
- Kanuka, H., & Garrison, D. R. (2004). Cognitive presence in online learning. *Journal of Computing in Higher Education*, 15(2), 30-48.
- Kays, E., & Sims, R. (2006). Reinventing and reinvigorating instructional design: A theory for emergent learning. In L. Markauskaite, P. Goodyear & P. Reimann (Eds.), *Proceedings of the 23rd annual conference of the australasian society for computers in learning in tertiary education: Who's Learning? Whose Technology?* (pp. 409-412). Sydney: Sydney University Press.
- Ke, F., & Carr-Chellman, A. (2006). Solitary learner in online collaborative learning: A disappointing experience? *The Quarterly Review of Distance Education*, 7(3), 249-265.
- Kearsley, G. (1995). The nature and value of interaction in distance education. In M. Beaudoin (Ed.), *Distance education symposium 3: Instruction* (pp. 83-92). University Park, PA: American Center for the Study of Distance Education.
- Keegan, D. (1996). *Foundations of distance education* (3rd ed.). New York: Routledge.
- Keenan, C. (2002). *Successful strategies: Collaborative learning for blended courses*. Paper presented at the World Conference on E-Learning in Corp, Govt., Health., & Higher Ed.
- Khan, B. H. (Ed.). (1997). *Web-based instruction*. Englewood Cliffs, NJ: Educational Technology Publications.
- Kirschner, P. A., Sweller, J., & Clark, R. E. (2006). Why minimal guidance during instruction does not work: An analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching. *Educational Psychologist*, 41(1).
- Klein, J. D., Spector, J. M., Grabowski, B. L., & Teja, I. (2004). *Instructor competencies: Standards for face-to-face, online, and blended settings*. Greenwich, CT: Information Age.

- Knowles, M. S. (1975). *Self-directed learning: A guide for learners and teachers*. Chicago: Associated Press Follet.
- Knowles, M. S. (1980). *The modern practice of adult education: From pedagogy to andragogy*. Englewood Cliffs, NJ: Cambridge Adult Education.
- Knowles, M. S. (1990). *The adult learner: A neglected species* (4th ed.). Houston, TX: Gulf.
- Knowles, M. S., & Associates. (1984). *Andragogy in action: Applying modern principles of adult education*. San Francisco: Jossey Bass.
- Konieczny, P. (2007). Wikis and Wikipedia as a teaching tool. *International Journal of Instructional Technology & Distance Learning*, 4 (1). Retrieved April 3, 2007, from [http://www.itdl.org/Journal/Jan\\_07/article02.htm](http://www.itdl.org/Journal/Jan_07/article02.htm)
- Koper, R. (2005). Increasing learner retention in a simulated learning network using indirect social interaction. *Journal of Artificial Societies and Social Simulation*, 8 (2). Retrieved November 2, 2006, from <http://jasss.soc.surrey.ac.uk/8/2/5.html>
- Koszalka, T. A., & Ganesan, R. (2004). Designing online courses: A taxonomy to guide strategic use of features available in course management systems (CMS) in distance education. *Distance Education*, 25(2), 243-256.
- Kozma, R. B. (1994). A reply: Media and methods. *Educational Technology Research and Development*, 42(3), 11-14.
- Lee, J., Carter-Wells, J., Glaeser, B., Ivers, K., & Street, C. (2006). Facilitating the development of a learning community in an online graduate program. *The Quarterly Review of Distance Education*, 7(1), 13-33.
- Lee, J., & Gibson, C. C. (2003). Developing self-direction in an online course through computer-mediated interaction. *The American Journal of Distance Education*, 17(3), 173-187.
- Leedy, P. D., & Ormrod, J. E. (2001). *Practical research: Planning and design* (7th ed.). Upper Saddle River, NJ: Prentice Hall.
- Lim, C. P. (2004). Engaging learners in online learning environments. *TechTrends*, 48(4), 16-23.

- Liu, X., Bonk, C. J., Magjuka, R. J., Lee, S.-h., & Su, B. (2005). Exploring four dimensions of online instructor roles: A program level case study. *Journal of Asynchronous Learning Networks*, 9(4), 29-48.
- Livingstone, D. (2000). *Exploring the icebergs of adult learning: Findings of the first Canadian survey of informal learning practices*. NALL working paper no. 10. Unpublished manuscript.
- Lodico, M. G., Spaulding, D. T., & Voegtle, K. H. (2006). *Methods in educational research: From theory to practice*. San Francisco: Jossey-Bass.
- Lyotard, J.-F. (1984). *The postmodern condition: A report on knowledge*. Minneapolis: University of Minnesota Press.
- Lyotard, J.-F. (1992). *The postmodern explained*. Sydney, Australia: Power Publications.
- Mann, S. J. (2005). Alienation in the learning environment: A failure of community? *Studies in Higher Education*, 30(1), 43-55.
- Maor, D. (2003). The teacher's role in developing interaction and reflection in an online learning community. *Educational Media International*, 40(1/2), 127-138.
- Martens, R., Bastiaens, T., & Kirschner, P. A. (2007). New learning design in distance education: The impact on student perception and motivation. *Distance Education*, 28(1), 81-93.
- Martindale, T., & Wiley, D. A. (2005). Using weblogs in scholarship and teaching. *TechTrends*, 49(2), 55-61.
- Marton, F. (1988). Phenomenography: Exploring different conceptions of reality. In D. M. Fetterman (Ed.), *Qualitative approaches to evaluation in education: The silent scientific revolution* (pp. 176-205). New York: Praeger.
- Mason, R. (2006). Learning technologies for adult continuing education. *Studies in Continuing Education*, 28(2), 121-133.
- Mayer, R. (2004). Should there be a three-strikes rule against pure discover learning? The case for guided methods of instruction. *American Psychologist*, 59(1), 14-19.
- Mayes, T. (2006). Theoretical perspectives on interactivity in e-learning. In C. Juwah (Ed.), *Interactions in online education: Implications for theory and practice* (pp. 9-26). New York: Routledge.

- McConnell, D. (2005). Examining the dynamics of networked e-learning groups and communities. *Studies in Higher Education, 30*(1), 25-42.
- McDaniel, S. N. (2003). Faculty variables that influence effectiveness of online classes. *Dissertation Abstracts International, 64*(12), 4341. (UMI No. 3116154)
- McIsaac, M. S., Blocher, J. M., Mahes, V., & Vrasidas, C. (2002). Student and teacher perceptions of interaction in online computer-mediated communication. *Educational Media International, 36*(2), 121-131.
- McLaughlin, K. D. (2004). Toward a new paradigm for teaching and learning: A case study of the process of integrating instructional design and technology at Florida Community College at Jacksonville. *Dissertation Abstracts International, 65*(10), 3667. (UMI No. 3150697)
- McMillan, J. H. (2000). *Educational research: Fundamentals for the consumer* (3rd ed.). New York: Addison Wesley Longman.
- McMillan, J. H., & Schumacher, S. (2006). *Research in education: Evidence-based inquiry* (6th ed.). Boston: Pearson.
- McPherson, M., & Nunes, M. B. (2004). The failure of a virtual social space (VSS) designed to create a learning community: Lessons learned. *British Journal of Educational Technology, 35*(3), 305-321.
- Mehanna, W. N. (2004). e-Pedagogy: The pedagogies of e-learning. *Research in Learning Technology, 12*(3), 279-293.
- Merriam, S. B. (1998). *Qualitative research and case study applications in education*. San Francisco: Jossey-Bass.
- Merriam, S. B. (2001). Andragogy and self-directed learning: Pillars of adult learning theory. In S. B. Merriam (Ed.), *The new update on adult learning theory: New directions for adult and continuing education* (pp. 3-11). San Francisco: Jossey-Bass.
- Merriam, S. B., & Caffarella, R. S. (1999). *Learning in adulthood: A comprehensive guide* (2nd ed.). San Francisco: Jossey-Bass.
- Meyer, K. A. (2004). Evaluating online discussions: Four different frames of analysis. *Journal of Asynchronous Learning Networks, 8*(2), 101-114.

- Meyer, K. A. (2005). The ebb and flow of online discussions: What Bloom can tell us about our students' conversations. *Journal of Asynchronous Learning Networks*, 9(1), 53-63.
- Mezirow, J. (1997). Cognitive processes: Contemporary paradigms of learning. In P. Sutherland (Ed.), *Adult learning: A reader*. Sterling, VA: Kogan Page.
- Mezirow, J. (2000). Learning to think like an adult: Core concepts of transformation theory. In J. Mezirow & Associates (Eds.), *Learning as transformation: Critical perspectives on a theory in progress*. San Francisco: Jossey-Bass.
- Mimirinis, M., & Bhattacharya, M. (2007). Design of virtual learning environments for deep learning. *Journal of Interactive Learning Research*, 18(1), 55-64.
- Monson, J. A. (2003). The importance of human interaction in online learning: Learner and instructor perceptions and expectations. *Dissertation Abstracts International*, 64(06), 1959. (UMI No. 3094140)
- Moore, M. G. (1986). Self-directed learning and distance education. *Journal of Distance Education*, 1 (1). Retrieved March 24, 2007, from <http://cade.athabasca.ca/vol1.1/moore.html>
- Moore, M. G. (1989). Editorial: Three types of interaction. *American Journal of Distance Education*, 3(2), 1-7.
- Moore, M. G. (1993). Three types of interaction. In K. Harry, M. John & D. Keegan (Eds.), *Distance education: New perspectives* (pp. 19-24). New York: Routledge.
- Ng, K. C. (2007). Replacing face-to-face tutorials by synchronous online technologies: Challenges and pedagogical implications. *The International Review of Research in Open and Distance Learning*, 8 (1). Retrieved June 15, 2007, from <http://www.irrodl.org/index.php/irrodl/article/view/335>
- Ngwenya, J., Annand, D., & Wang, E. (2004). Supporting asynchronous discussions among online learners. In T. Anderson & F. Elloumi (Eds.), *Theory and practice of online learning* (pp. 319-348). Athabasca AB Canada: Athabasca University.
- Nicol, D. J., Minty, I., & Sinclair, C. (2003). The social dimensions of online learning. *Innovations in Education and Teaching International*, 40(3), 270-281.
- Noble, D. F. (2001). *Digital diploma mills: The automation of higher education*. New York: Monthly Review Press.

- Northrup, P. T. (2001). A framework for designing interactivity into web-based instruction. *Educational Technology, 41*(2), 31-39.
- Northrup, P. T. (2002). Online learners' preferences for interaction. *The Quarterly Review of Distance Education, 3*(2), 219-226.
- Oladoke, A. O. (2006). Measurement of self-directed learning in online learners. *Dissertation Abstracts International, 67*(01), (UMI No. 3206369)
- Onwuegbuzie, A. J., & Leech, N. L. (2005). On becoming a pragmatic researcher: The importance of combining quantitative and qualitative research methodologies. *International Journal of Social Research Methodology, 8*(5), 375-387.
- Orellana, A. (2006). Class size and interaction in online courses. *The Quarterly Review of Distance Education, 7*(3), 229-248.
- Ormrod, J. E. (1999). *Human learning* (3rd ed.). Upper Saddle River, NJ: Merrill.
- Ortiz-Rodriguez, M., Telg, R. W., Irani, T., Roberts, T. G., & Rhoades, E. (2005). College students' perceptions of quality in distance education: The importance of communication. *Quarterly Review of Distance Education, 6*(2), 97-105.
- Ouzts, K. (2006). Sense of community in online courses. *The Quarterly Review of Distance Education, 7*(3), 285-296.
- Palloff, R. M., & Pratt, K. (1999). *Building learning communities in cyberspace: Effective strategies for the online classroom*. San Francisco, CA: Jossey-Bass.
- Palloff, R. M., & Pratt, K. (2003). *The virtual student: A profile and guide to working with online learners*. San Francisco, CA: Jossey-Bass.
- Palloff, R. M., & Pratt, K. (2005). *Collaborating online: Learning together in community*. San Francisco, CA: Jossey-Bass.
- Patton, M. Q. (1990). *Qualitative evaluation and research methods* (2nd ed.). Newbury Park, CA: Sage.
- Paulsen, M. F. (1993). The hexagon of cooperative freedom: A distance education theory attuned to computer conferencing. *Distance Education Online Symposium, 3* (2). Retrieved February 14, 2007, from <http://www.nettskolen.com/forskning/21/hexagon.html>

- Pawan, F., Paulus, T. M., Yalcin, S., & Chang, C. (2003). Online learning: Patterns of engagement and interactions among in-service teachers. *Language Learning & Technology*, 7(3), 119-140.
- Perry, B., & Edwards, M. (2005). Exemplary online educators: Creating a community of inquiry. *Turkish Online Journal of Distance Education*, 6(2).
- Piaget, J. (1969). *The mechanisms of perception*. New York: Routledge Kegan Paul.
- Picciano, A. G. (2002). Beyond student perceptions: Issues of interaction, presence, and performance in an online course. *Journal of Asynchronous Learning Networks*, 6(1), 21-40.
- Piskurich, G. M. (1993). *Self-directed learning: A practical guide to design, development, and implementation*. San Francisco: Jossey-Bass.
- Prammanee, N. (2005). Understanding participation in online courses: A case study of online interaction. *Dissertation Abstracts International*, 66(04), 1267. (UMI No. 3173595)
- Ravenscroft, A., & McAlister, S. (2006). Designing interaction as a dialogue game: Linking social and conceptual dimensions of the learning process. In C. Juwah (Ed.), *Interactions in online education: Implications for theory and practice* (pp. 75-90). New York: Routledge.
- Restauri, S. L. (2006). Faculty-student interaction components in online education: What are the effects on student satisfaction and academic outcomes? *Dissertation Abstracts International*, 67(01), 602. (UMI No. 3206695)
- Rhode, J. F. (2006). Anatomy of a socially-constructed self-paced learning environment. Retrieved August 20, 2007, from <http://www.idolresources.com/?p=416>
- Richardson, J. C., & Newby, T. (2006). The role of students' cognitive engagement in online learning. *American Journal of Distance Education*, 20(1), 23-37.
- 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.
- Roberts, B. (2002). Interaction, reflection and learning at a distance. *Open Learning*, 17(1), 39-55.

- Roblyer, M. D., & Wiencke, W. R. (2003). Design and use of a rubric to assess and encourage interactive qualities in distance courses. *American Journal of Distance Education, 17*(2), 77-99.
- Roblyer, M. D., & Wiencke, W. R. (2004). Exploring the interaction equation: Validating a rubric to assess and encourage interaction in distance courses. *Journal of Asynchronous Learning Networks, 8*(4).
- Rogers, C. R. (1969). *Freedom to learn*. Columbus, OH: Charles E. Merrill.
- Rourke, L., & Anderson, T. (2002a). Exploring social interaction in computer conferencing. *Journal of Interactive Learning Research, 13*(3), 257-273.
- Rourke, L., & Anderson, T. (2002b). Using peer teams to lead online discussion. *Journal of Interactive Media in Education*(1).
- Rourke, L., Anderson, T., Garrison, D. R., & Archer, W. (1999). Assessing social presence in text-based computer conferencing. *Journal of Distance Education, 14*(3), 51-70.
- Rovai, A. P. (2002). Building a sense of community at a distance. *International Review of Research in Open and Distance Learning, 3*(1).
- 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). Retrieved March 17, 2007, from <http://cade.athabascau.ca/vol18.1/rovai.pdf>
- Russell, T. L. (2001). *The no significant difference phenomenon* (5th ed.): The International Distance Education Certification Center.
- Russell, T. L. (2005). No significant difference phenomenon. Retrieved December 5, 2005, from <http://www.nosignificantdifference.org>
- Russo, T. C., & Benson, S. (2005). Learning with invisible others: Perceptions of online presence and their relationship to cognitive and affective learning. *Educational Technology & Society, 8*(1), 54-62.
- Russo, T. C., & Campbell, S. W. (2004). Perceptions of mediated presence in an asynchronous online course: Interplay of communication behaviors and medium. *Distance Education, 25*(2), 215-232.

- Saba, F. (2000). Research in distance education: A status report. *The International Review of Research in Open and Distance Learning*, 1 (1), 1-9. Retrieved November 21, 2006, from <http://www.irrodl.org/index.php/irrodl/article/view/4>
- Saba, F., & Shearer, R. L. (1994). Verifying key theoretical concepts in a dynamic model of distance education. *The American Journal of Distance Education*, 8(1), 36-57.
- Salmon, G. (2003). *E-moderating: The key to teaching and learning online*. London: RoutledgeFalmer.
- Schmidt, J. (2007). Blogging practices: An analytical framework. *Journal of Computer-Mediated Communication*, 112(4), 1409-1427.
- Schwartz, L., Clark, S., Cassarin, M., & Rudolph, J. (2004). Educational wikis: Features and selection criteria. *International Review of Research in Open and Distance Learning*, 5 (1). Retrieved August 19, 2007, from <http://www.irrodl.org/index.php/irrodl/article/view/163/692>
- Sechrest, L., & Sidana, S. (1995). Quantitative and qualitative methods: Is there an alternative? *Evaluation and Program Planning*, 18, 77-87.
- Selwyn, N., Gorard, S., & Furlong, J. (2006). Adults' use of computers and the Internet for self-education. *Studies in the Education of Adults*, 38(2), 141-159.
- Shea, P. J., Li, C., Swan, K., & Pickett, A. (2005). Developing learning community in online asynchronous college courses: The role of teaching presence. *Journal of Asynchronous Learning Networks*, 9(4), 59-82.
- Sher, A. (2004). Assessing the relationships of student-instructor and student-student interaction with student learning and satisfaction in Web-based distance learning programs. *Dissertation Abstracts International*, 65(03), 903. (UMI No. 3126415)
- Sherry, L. (1996). Issues in distance learning. *International Journal of Educational Telecommunications*, 1 (4), 337-365. Retrieved July 3, 2007, from <http://carbon.cudenver.edu/~lsherry/pubs/issues.html>
- Siemens, G. (2004). Connectivism: A learning theory for the digital age. Retrieved November 11, 2006, from <http://www.elearnspace.org/Articles/connectivism.htm>
- Sims, R. (1999). Interactivity on stage: Strategies for learner-designer communication. *Australian Journal of Educational Technology*, 15 (3), 257-272. Retrieved July 8, 2006, from <http://www.ascilite.org.au/ajet/ajet15/sims.html>

- Sims, R. (2000). An interactive conundrum: Constructs of interactivity and learning theory. *Australian Journal of Educational Technology*, 16 (1), 45-57. Retrieved December 2, 2006, from <http://www.ascilite.org.au/ajet/ajet16/sims.html>
- Sims, R. (2003). Promises of interactivity: Aligning learner perceptions and expectations with strategies for flexible and online learning. *Distance Education*, 24(1), 87-103.
- Sims, R., & Bovard, B. 2004. Interacting with online learners: How new elaborations of online presence can foster critical thinking and reflection. In R. Atkinson, C. McBeath, D. Jonas-Dwyer, & R. Phillips (Eds), *Beyond the comfort zone: Proceedings of the 21st ASCILITE Conference* (pp. 841-850). Perth, 5-8 December. <http://www.ascilite.org.au/conferences/perth04/procs/sims.html>
- Sims, R., & Salter, D. (2006). Blogging for learning: Integrating social networks for staff development. In L. Markauskaite, P. Goodyear & P. Reimann (Eds.), *Proceedings of the 23rd annual conference of the Australasian Society for Computers in Learning in Tertiary Education* (pp. 775-778). Sydney, Australia: Sydney University Press.
- Sims, R., & Stork, E. (2007). Design for contextual learning: Web-based environments that engage diverse learners. In J. Richardson & A. Ellis (Eds.), *Proceedings of AusWeb07*. Lismore, NSW: Southern Cross University.
- Smith, M. K. (2005). 'Andragogy', the encyclopaedia of information education. Retrieved April 20, 2006, from <http://www.infed.org/lifelonglearning/b-andra.htm>
- Song, L., & Hill, J. R. (2007). A conceptual model for understanding self-directed learning in online environments. *Journal of Online Interactive Learning*, 6(1), 27-37.
- Stein, D. S., Wanstreet, C. E., Calvin, J., Overtom, C., & Wheaton, J. E. (2005). Bridging the transactional distance gap in online learning environments. *The American Journal of Distance Education*, 19(2), 105-118.
- Strachota, E. M. (2003). Student satisfaction in online courses: An analysis of the impact of learner-content, learner-instructor, learner-learner and learner-teacher interaction. *Dissertation Abstracts International*, 64(08), 2746. (UMI No. 3100902)
- Su, B. (2006). Experiences of and preferences for interactive instructional activities in online learning environment. *Dissertation Abstracts International*, 67(04), (UMI No. 3215221)

- Su, B., Bonk, C. J., Magjuka, R. J., Liu, X., & Lee, S.-h. (2005). The importance of interaction in web-based education: A program-level case study of online MBA courses. *Journal of Interactive Learning Research*, 4(1), 1-19.
- Sutton, L. A. (2000). Vicarious interaction in a course enhanced through the use of computer-mediated communication. *Dissertation Abstracts International*, 61(06), 2272. (UMI No. 9976346)
- Swan, K. (2002). Building learning communities in online courses: The importance of interaction. *Education, Communication & Leadership*, 2(1), 23-49.
- Swan, K., & Shih, L.-F. (2005). On the nature and development of social presence in online course discussions. *Journal of Asynchronous Learning Networks*, 9(3), 115-136.
- Sweller, J. (2003). Evolution of human cognitive architecture. In B. Ross (Ed.), *The psychology of learning and motivation* (Vol. 43, pp. 215-266). San Diego, CA: Academic Press.
- Tan, S. H. S. (2006). Social networks in online learning environments. *Dissertation Abstracts International*, 67(05), (UMI No. 3216179)
- Tashakkori, A., & Creswell, J. W. (2008). Editorial: Mixed methodology across disciplines. *Journal of Mixed Methods Research*, 2(1), 3-6.
- Tashakkori, A., & Teddlie, C. (1998). *Mixed methodology: Combining qualitative and quantitative approaches*. Thousand Oaks, CA: Sage.
- Tashakkori, A., & Teddlie, C. (Eds.). (2003). *Handbook of mixed methods in social and behavioral research*. Thousand Oaks, CA: Sage.
- Taylor, J. C. (2001, April). *Fifth generation distance education*. Keynote presentation at the 20th ICDE World Conference, Düsseldorf, Germany.
- Teddlie, C., & Tashakkori, A. (2003). Major issues and controversies in the use of mixed methods in the social and behavioral sciences. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research* (pp. 3-50). Thousand Oaks, CA: Sage.
- Topper, A. (2005). Facilitating student interactions through discursive moves: An instructor's experience teaching online graduate courses in educational technology. *The Quarterly Review of Distance Education*, 6(1), 55-67.

- Tosh, D., & Werdmuller, B. (2004). Creation of a learning landscape: Weblogging and social networking in the context of e-portfolios. Retrieved August 2, 2006, from [http://www.eraac.org/papers/Learning\\_landscape.pdf](http://www.eraac.org/papers/Learning_landscape.pdf)
- Tough, A. M. (1979). *The adult's learning projects: A fresh approach to theory and practice in adult learning* (2nd ed.). Austin, TX: Learning Concepts.
- Tu, C.-H. (2005). From presentation to interaction: New goals for online learning technologies. *Educational Media International*, 42(3), 189-206.
- Tu, C.-H., & Corry, M. (2003). Designs, management tactics, and strategies in asynchronous learning discussions. *The Quarterly Review of Distance Education*, 4(3), 303-315.
- Tu, C.-H., & McIsaac, M. S. (2002). The relationship of social presence and interaction in online classes. *The American Journal of Distance Education*, 16(3), 131-150.
- Tusting, K. (2003). *A review of theories of informal learning*. Lancaster Literacy Research Centre working paper no 2. Unpublished manuscript.
- Twigg, C. A. (2003). Improving Learning and reducing costs: New models for online learning. *Educause Review*, 38(5), 28-38.
- Varvel, V. E. (2007). Master online teacher competencies. *Online Journal of Distance Learning Administration*, 10 (1). Retrieved June 21, 2007, from <http://www.westga.edu/~distance/ojdl/spring101/varvel101.htm>
- Vonderwell, S., & Zachariah, S. (2005). Factors that influence participation in online learning. *Journal of Research on Technology in Education*, 38(2), 213-230.
- Vrasidas, C. (2000). Constructivism versus objectivism: Implications for interaction, course design, and evaluation in distance education. *International Journal of Educational Telecommunications*, 6(4), 339-362.
- Wagner, E. D. (1994). In support of a functional definition of interaction. *The American Journal of Distance Education*, 8(2), 6-29.
- Wagner, E. D. (1997). Interactivity: From agents to outcomes. *New Directions for Teaching and Learning*, 71, 19-26.
- Waits, T., & Lewis, L. (2003) Distance education at degree-granting postsecondary institutions: 2000-2001. [Electronic version]. Retrieved June 5, 2005, from <http://nces.ed.gov/pubs2003/2003017.pdf>

- Wallace, R. M. (2003). Online learning in higher education: A review of research on interactions among teachers and students. *Education, Communication and Information*, 3(2), 241-280.
- Wang, H., Gould, L., & Fulton, D. (2007). Bridge the virtual gap: Using new technology to enhance interaction in distance learning. *International Journal of Instructional Technology and Distance Learning*, 4 (3). Retrieved April 21, 2007, from [http://www.itdl.org/Journal/Mar\\_07/article05.htm](http://www.itdl.org/Journal/Mar_07/article05.htm)
- Wang, M. (2004). Correlational analysis of student visibility and performance in online learning. *Journal of Asynchronous Learning Networks*, 8(4), 71-82.
- Wanstreet, C. E. (2006). Interaction in online learning environments. *Quarterly Review of Distance Education*, 7(4), 399-411.
- Watson, J. B. (1930). *Behaviorism*. Chicago: University of Chicago Press.
- Wedemeyer, C. A. (1971). Independent study. In R. Deighton (Ed.), *Encyclopedia of Education IV* (pp. 548-557). New York: McMillan.
- Wegerif, R. (1998). The social dimension of asynchronous learning networks. *Journal of Asynchronous Learning Networks*, 2(1), 34-49.
- West, R. E., Waddoups, G. L., Kennedy, M. M., & Graham, C. R. (2007). Evaluating the impact on users from implementing a course management system. *International Journal of Instructional Technology and Distance Learning*, 4 (2). Retrieved April 6, 2007, from [http://itdl.org/Journal/Feb\\_07/article01.htm](http://itdl.org/Journal/Feb_07/article01.htm)
- West, R. E., Wright, G., Gabbitas, B., & Graham, C. R. (2006). Reflections from the introduction of blogs and RSS feeds into a preservice instructional technology course. *TechTrends*, 50(4), 54-60.
- Whipp, J. L., & Chiarelli, S. (2004). Self-regulation in a web-based course: A case study. *Educational Technology Research & Development*, 52(4), 5-22.
- Wiley, D. (2006). Scalability and sociability in online learning environments. In H. F. O'Neil & R. S. Perez (Eds.), *Web-based learning: Theory, research, and practice* (pp. 295-306). Mahwah, NJ: Lawrence Erlbaum Associates.
- Willging, P. A., & Johnson, S. D. (2004). Factors that influence students' decision to dropout of online courses. *Journal of Asynchronous Learning Networks*, 8(4), 105-118.

- Williams, M. F., III. (2003). A comparative study on transforming an education graduate degree program from traditional classroom instruction to online-based instruction. *Dissertation Abstracts International*, 64(07), 2409. (UMI No. 3099282)
- Williams, P. E., & Hellman, C. M. (2004). Differences in self-regulation for online learning between first- and second-generation college students *Research in Higher Education*, 45(1), 71-82.
- Wilson, S., Liber, O., Beauvoir, P., Milligan, C., Johnson, M., & Sharples, P. (2006). Personal learning environments: Challenging the dominant design of educational systems. Retrieved October 31, 2006, from <http://hdl.handle.net/1820/727>
- Yang, Y., & Cornelious, L. F. (2005). Preparing instructors for quality online instruction. *Online Journal of Distance Learning Administration*, 8 (1). Retrieved October 13, 2005, from <http://www.westga.edu/%7Edistance/ojdla/spring81/yang81.htm>
- Zimmerman, B. J. (1989). A social cognitive view of self-regulated academic learning. *Journal of Educational Psychology*, 81(3), 329-339.

## APPENDIX A: INTERVIEW QUESTIONS

### Welcome Statement

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Thanks \_\_\_\_\_ for being willing to participate in my research study by sharing your recent online learning experiences with CMUO. The purpose of this study is to gather first-hand experiences from adult learners regarding of the types of interaction that occur in self-paced online learning environments and in particular what interactions learners like yourself prefer most.

I'm recording our discussion for data analysis purposes. Please feel free to respond openly and candidly as the information that you supply will be confidentially stored in a secure location and reported in aggregate form only. Keep in mind that your responses will in no way be linked, either directly or indirectly, back to you. Your responses have no bearing on the grade that you receive for the course but will be very valuable in efforts to continue to improve the quality of the online learning experience offered through CMUO. Your name will not be used in either the data analysis or results to ensure that your identity is protected.

### Participant Demographics

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First, I'd like to ask just a few basic demographic questions:

Q1. Gender? \_\_\_\_ Male      \_\_\_\_ Female

Q2. Into which of the following ranges does your age fall into. Please just say "stop" when I mention the range that includes your age.

18-25

26-35

36-45

46-55

56-65

66-75

76-85

86+

Q3. Is this course the first CMUO course you have completed?

Q4. How many CMUO courses have you completed thus far?

Q5. How many CMUO courses are you taking right now?

## Value of Course Elements

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Next, I'd like to ask you to rate the importance of various elements of the online course. On a **scale of 1-5 with 5 being most important and 1 being least important**, please rate importance of each of the following in the self-paced online course you have just recently completed:

Q6-1. Instructional Presentations

1      2      3      4      5

Q6-2. Supplementary Instructional Media (ie: videos)

1      2      3      4      5

Q6-3. Course Podcast

1      2      3      4      5

Q6-4. Course Discussion Board (Threaded Discussion)

1      2      3      4      5

Q6-5. Comments from the Instructor to Discussion Board Postings

1      2      3      4      5

Q6-6. Comments from Other Learners to Discussion Board Postings

1      2      3      4      5

Q6-7. Posting Comments to Other Learners' Discussion Board Postings

1      2      3      4      5

Q6-8. Course Textbook Readings

1      2      3      4      5

Q6-9. Course Community (CMUOnet)

1      2      3      4      5

Q6-10. Course Blog

1      2      3      4      5

Q6-11. Your Personal Blog

1      2      3      4      5

Q6-12. Other Learners' Blogs

1      2      3      4      5

Q6-13. Comments from the Instructor to Your Personal Blog Postings

1      2      3      4      5

Q6-14. Comments from Other Learners to Your Personal Blog Postings

1      2      3      4      5

Q6-15. Posting Comments to Other Learners' Blog Postings

1      2      3      4      5

Q6-16. Course Bookmarks (tagged with course tag in del.icio.us)

1      2      3      4      5

Q6-17. Bookmarks of Other Learners

1      2      3      4      5

Q6-18. Instructor's Bookmarks (tagged with course tag in del.icio.us)

1      2      3      4      5

Q6-19. Communications from the course instructor

1      2      3      4      5

Q6-20. Communications from fellow learners in the course

1      2      3      4      5

Q6-21. Communications from other learners NOT currently enrolled in your course section

1      2      3      4      5

Q6-22. Links to external resources (those that are outside of the courseroom)

1      2      3      4      5

Q6-23. Application assignments

1      2      3      4      5

Q6-24. Reflection activities

1      2      3      4      5

Q6-25. Sending e-mail to the instructor

1      2      3      4      5

Q6-26. Receiving e-mail from the instructor

1      2      3      4      5

Q6-27. Sending e-mail to other learners

1      2      3      4      5

Q6-28. Receiving e-mail from other learners

1      2      3      4      5

Q6-29. Real-time chatting (e.g., instant messaging) with the course instructor

1      2      3      4      5

Q6-30. Real-time chatting (e.g., instant messaging) with other learners

1      2      3      4      5

### Course Experience

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These next questions now are in regards to your course experience. For all of these remaining questions, think of your experience completing the course.

Q7. What were the best aspects of the course?

Q8. What were the weakest aspects of the course?

Q9. What activities were most beneficial?

Q10. Did you use the course blogging community, CMUOnet? If no, why? If yes...did you find it to be helpful to your overall learning experience?

Q11. Did you make use of the course blog? If so, did you find it helpful? If not, why?

Q12. How does the course blog compare to the course discussion board in Blackboard? Do you prefer one over the other? Why? In your opinion, are both necessary for the course? Or, could one replace the other?

Q13. Did the activity of bookmarking relevant links add to the learning experience? If yes...how did you find bookmarking to be helpful to your overall learning experience?

#### Nature of Self-Paced Learning

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Q14. Tell me about your self-paced learning experience – the fact that you were able to proceed through the course materials and activities at your own pace? What were the best parts of the experience? Hardest/most difficult?

Q15. Did you find the self-paced nature of the course (ie: the ability to progress through the course at an individualized pace) to be a help or a hindrance? Why?

Q16. Did you feel as though you had the support of the instructor and other learners? What made you feel that way?

Q17. Did you ever feel isolated from the rest of your classmates or all alone? If yes, what caused that feeling?

Q18. If you had the choice between taking this course in its self-paced format as compared to a more instructor-paced format, in which certain deadlines had to be met completed by a specific dates, which format would you prefer? Why?

#### Interaction with Instructor (Formal)

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Q19. How involved was the instructor in the overall learning experience?

Q20. How important was his/her feedback?

Q21. Did you ever communicate with the instructor within Blackboard?

Q22. What types of interaction with the instructor is most beneficial?

Q23. What value did the instructors postings in the course environment have on your overall learning experience?

Q24. What value did the course announcements have on your overall learning experience?

### Interaction with Instructor (Informal)

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Q25. Did you ever communicate with the instructor outside of the course room?  
(example: via e-mail, phone, in person, CMUOnet)

Q26. Did this type of interaction vary from that which took place within the course room?  
How?

Q27. Did you ever read the instructor's blog? Did you ever comment on any of his  
postings?

Q28. What value did the instructor's blog have in your overall learning experience?

Q29. Did you ever access any of the instructors other shared resources, such as photos,  
bookmarks, or videos?

Q30. If yes, what value did these resources have in your overall learning experience?

Q31. Did you ever communicate with other CMUO instructors, or instructors or experts  
from outside VFCC who have expertise in the area you were studying?

Q32. If yes, how did they compare to your interactions with your course instructor? What  
value did those interactions have in your overall learning experience? Do you prefer one  
type of interaction over the other?

Q33. How do you prefer to have the instructor interact with you? (e.g., e-mail, discussion  
board, blog, announcements, etc.?)

Q34. How do you prefer to interact with other learners? (e.g., e-mail, discussion board,  
blog, IM/chat, etc.?)

### Interaction with Learners (Formal)

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Q35. How involved were other learners in the online discussion in Blackboard?

Q36. Did you read the "I Learned" reflection statements posted by other learners to the  
discussion board? If yes, did you generally read them before or after posting your own  
reflection statement?

Q37. How important is it to receive feedback from other learners?

Q38. How important is the size of the class to the overall learning experience? Can a self-paced course be too large or too small?

Q39. Did you respond to any of the other learners' postings in Blackboard? If yes, what prompted you to do so? If no, what prevented you from doing so?

Q40. How valuable were the interactions you have with other learners in the course room to your overall learning experience?

#### Interaction with Learners (Informal)

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Q41. Did you ever communicate with learners from the course outside of the course room? (example: via e-mail, phone, in person, CMUOnet). If yes, please describe.

Q42. Did you ever subscribe to and/or read the blogs of other learners in the course? If yes, how did these types of interactions compare to discussion that took place in the discussion board in Blackboard?

Q43. Did you ever comment on of the blog postings of other learners?

Q44. Did anyone comment on any of your blog postings?

Q45. Did this type of interaction vary from that which took place within the course room? How?

Q46. How did the conversations in the course blog compare to the discussion board?

Q47. Did you ever communicate with other CMUO learners but NOT those enrolled in your specific course section? For example, did you read the blogs of other CMUO learners who aren't currently in your course section? If yes, how did these interactions differ from your communications with learners in your course?

Q48. Did you ever subscribe to and/or read the blogs or access resources of other individuals outside of the course that have helped you better grasp the concepts of the course? If yes, please describe.

Q49. How did these information and resources external to the course compare to the course-provided resources? Do you prefer one type over the other?

#### Interaction with Content (Formal)

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Q50. Thinking of all the different types of instructional content in the course, which aspects of the course content or activities were most helpful?

Q51. How valuable were the instructional presentations to the overall learning experience?

Q52. How valuable were the unit introductions (e.g., podcast episodes) to the overall learning experience?

Q53. How valuable was the required textbook readings to your overall learning experience?

Q54. How valuable were the practical application assignments to your overall learning experience?

#### Interaction with Content (Informal)

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Q55. Did you find other resources, such as other texts, videos, tutorials, or other helpful Web sites? Please describe.

Q56. How valuable were these external resources to your overall learning experience?

Q57. Do you prefer the external resources to the instructional presentations and resources in the course? Why or why not?

#### Interaction Impact on the Learning Experience

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Q58. In what ways does the quality of the interaction in a self-paced online course like the one you have just recently completed impact the quality of the learning experience?

#### Learner Preferences for Interaction / Equivalency

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Q59. Thinking of all the different types of interaction you've mentioned, which do you think is most important to the overall success of a self-paced online course? Why?

Q60. Do you feel that the different types of interaction that we we've discussed within the online course(s) that you've completed are equal? Why/why not?

Q61. Is one type of interaction more important than others? Could that type of interaction be replaced by an increased level of others?

Q62. Thinking of all interactions that you had with the instructor...if they were to be diminished or even eliminated from the course, do you feel that an increase in other types of interaction would fill that void? If yes, what other types of interactions would compensate?

Q63. Thinking of interactions that you had with the other students in the course...if they were to be diminished or even eliminated from the course, do you feel that an increase in other types of interaction would fill that void? If yes, what other types of interactions would compensate?

Q64. Thinking of interaction that you had with the course content...if they were to be diminished or even eliminated from the course, do you feel that an increase in other types of interaction would fill that void. If yes, what other types of interactions would compensate?

#### Other Comments

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Any other comments you'd like to share concerning your recent online learning experience or other suggestions you have for improving the course you took or CMUO in general?