PERCEPTIONS OF MOTIVATION, ENJOYMENT, AND LEARNING FROM ONLINE DISCUSSIONS BY NORTH CAROLINA HIGH SCHOOL STUDENTS IN ONLINE, ADVANCED PLACEMENT PSYCHOLOGY COURSES

by
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ABSTRACT

BOBBY E. HOBGOOD, JR: Perceptions of Motivation, Enjoyment, and Learning from Online Discussions by North Carolina High School Students in Online, Advanced Placement Psychology Courses

(Under the direction of Professor Barbara D. Day)

The purpose of this research study was to explore the perceptions of high school students with respect to motivation, enjoyment, and learning from online discussions in an online course. A targeted sample of students was selected to share their perceptions through an anonymous online survey administered at the end of their Advanced Placement Psychology course. Study results are intended to inform the stakeholders in the K-12 online learning arena and include online instructors, guidance counselors, curriculum specialists, administrators and classroom teachers. Specifically, the findings are intended to contribute to a baseline of research for understanding the dynamics of online courses from the student's perspective. Findings were discussed according to the elements of an effective online course as described in Garrison et al.'s Community of Inquiry model (2000).

This research study discovered a strong relationship between student perceptions of motivation and enjoyment and student perceptions of learning from online discussions. Statistical analysis found no significant difference between the perceptions of males and

females in this study. Findings indicated that 77% of students agreed that online discussion was a great chance to share opinions among peers and their instructor. Likewise, more than 55% of students expressed an enjoyment of online discussions on four survey items related specifically to that construct. Reaction was mixed to questions related to motivation from online discussions. By contrast, more than 50% of students indicated that they learned from their involvement in online discussions, though responses suggested that they did not learn directly from peers. Findings indicated that 70% of students did not see online discussions as decreasing the quality of learning they experienced.

Though not included in statistical calculations, student comments suggested a need for increased instructor involvement and feedback in online discussions. Students also suggested the need for more discussion while paying attention to how discussions are used by the instructor and by peers. Comments reflected a disdain for participation requirements like number of postings or length of posting. Students shared an appreciation for the ability to engage in discussion in the absence of barriers that traditionally interfere with equitable participation in class discussions.

DEDICATION

To my past, current, and future teachers,

In name and by association,

Who helped me to see and understand the lesson in everything.

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CHAPTER ONE:

INTRODUCTION

Distance learning has experienced tremendous growth due largely to the ubiquitous access to the Internet. Not only has the Internet increased the number of individuals participating in distance learning, but it has at the same time raised the awareness and ability to collaborate on distance learning initiatives. The Internet has made it possible for one population of learners, high school students, to have access to courses not normally available in the traditional high school setting. For example, students living in rural areas of North Carolina have not traditionally taken Advanced Placement courses since the small size of the school systems precludes offering these courses.

In recent years, high schools have begun to include online courses as a part of their course catalogs to serve students who need advanced courses not typically offered by their school. Financially, online courses are cost-effective curriculum additions since they do not require the hiring of additional staff to make them available as a part of a school's course catalog. The current model of implementation involves the purchase of seats in online courses from external providers like the Florida Virtual High School (http://www.flvs.net/). Depending on the school's agreement with the course provider, students may be scheduled to work on their online course during a regular period of the day, usually in the presence of a site facilitator who monitors student time on task. In some cases, courses are designed as

synchronous experiences. This format requires that students meet at a scheduled time, in a scheduled teleconference facility, with their classmates and instructor who are physically located elsewhere. The class interacts via two-way video/audio. Just like the traditional classroom, students can see and hear one another as the class unfolds.

Most recently, asynchronous courses have become a popular format for online course delivery. Schools and school systems find the flexibility of this format more appealing since students can log on or attend class at any time during the day, on any Internet-connected computer, located anywhere on school grounds. Asynchronous learning is not constrained by the requirements of real-time interaction.

From this perspective, online courses appear to be a "win-win" situation for many school systems across the country. School administrators in particular are intrigued by evaluation studies which conclude that student achievement online equals or surpasses achievement seen in traditional settings (Mills & Roblyer, 2003). However, the addition of online courses to a school curriculum requires a change in thinking about how student schedules are organized, how grades are reported, and how schools collaborate with outside providers to increase their course offerings. Perhaps the most essential and most ignored consideration of online courses for high school students is the change that students experience as they adjust to learning in a new way, in a new environment. Indeed, several studies provide empirical evidence revealing the negative experiences of online learners like the feelings of isolation most commonly attributed to this medium (Barab, Thomas, & Merrill, 2001; Sherry, 2000; Wegerif, 1998). In the online classroom, there are temporal, geographic, and psychological distances which distinguish the online classroom from the "on

ground" classroom. Certainly, these features of online courses have a unique impact on student performance (Bibeau, 2001).

While there is literature to support the economic advantages and issues of equity afforded by online courses, there is an unequal amount of empirical evidence of its effectiveness, impact on student motivation and performance, and benefits for learning (Hannafin, Hill, Oliver, Glazer, & Sharma, 2003). This is not surprising given that the Internet has been widely available to the general public for less than 20 years. The existing research base concentrates on post-secondary education where the technology and money have been available far longer than in the K-12 arena. It should be noted that existing research which looks at student perceptions, motivations, learner characteristics, and other affective aspects of online learning is limited. This can be explained by the relatively short amount of time the Internet has been a part of K-12 education, approximately 10 years. Schools in rural areas have had Internet access for less time than that, with connection speeds far slower than those of their counterparts in urban and suburban areas. The slow pace of Internet integration in these schools helps to explain why access to asynchronous courses has been a recent occurrence for many schools.

Now that all schools in North Carolina have some level of Internet access, there is fervor to enroll high school students in rural areas in online courses, not to be excluded from the same opportunities afforded to high school students in urban and suburban areas. Before online courses become as prevalent at the high school level as they are in post-secondary education, perhaps there is a need to not only take a look at the limited research available, but to begin to conduct similar research for this new population of online learners. Such research might focus on student perceptions and understandings about this different learning

environment, learner characteristics, pedagogical strategies, and how students in online courses are motivated to learn (Cereijo, Young, & Wilhelm, 1999; Hartley & Bendixen, 2001). How do online courses address the challenges students and teachers encounter in the face-to-face classroom?

Problem Statement

In the fall of 2002, LEARN NC, a K-12 outreach program of the School of Education at the University of North Carolina at Chapel Hill, began to offer online, Advanced Placement courses for the first time to students in 13 rural, low-wealth counties in North Carolina. Funded by a grant from the North Carolina Department of Public Instruction, LEARN North Carolina identified and prepared certified Advanced Placement teachers to become online instructors for the program, and served as the hosting institution for the courses. Among these, four teachers were identified and prepared to teach Advanced Placement Psychology, which was determined to be a course in high demand for high school students.

The North Carolina Department of Public Instruction served as the administrative agency for the program, publicizing, enrolling, and managing the budget of the entire program. Funding came from a federal grant, part of the *No Child Left Behind* act, targeting students in counties who would not otherwise have had the opportunity to take these courses either online or in a traditional classroom. At the time of this study, the initial grant-funded sites continued to receive federal funding while the state's Department of Public Instruction provided funding for all other North Carolina students. Funding for all students included the cost of the course, but did not include the required course texts which must be provided by the school system. At the time of this research, LEARN North Carolina was in the final year

of providing online courses for high school students as the North Carolina Virtual Public School prepared to open in fall 2007.

The primary function of LEARN NC's state-wide program was to assist schools in their attempts to increase course offerings, specifically Advanced Placement courses in rural areas (Mills & Roblyer, 2004). During the first year, sixty-eight students were enrolled in six courses. During its fifth year, the period when this study was conducted, the program offered 58 courses with approximately 2,350 students from North Carolina and a few students from other southern states. Participation in the program required a formal application through the North Carolina Department of Public Instruction which dictated that each participating school must provide the following:

- a scheduled class period for students taking an online course;
- dedicated, reliable, and daily Internet access with specific computer software and hardware configurations;
- a school facilitator who monitors students' work and assessments, troubleshoots technical issues, and serves as the official school liaison with the grantee (the North Carolina Department of Public Instruction) and the hosting institution, LEARN North Carolina.

The LEARN NC Online Courses program was similar to other online course providers in that it offered school districts the opportunity to increase their course offerings with a particular emphasis on Advanced Placement courses. Though teachers' and students' attitudes toward the program reflected positive feelings about student achievement and satisfaction, there had been no formal evaluations or studies involving students in this program which might support anecdotal findings with empirical data. Likewise, there were

little to no empirical data in general for high school students in online courses as reflected by the literature. This study was designed not only to inform the LEARN NC Online Courses program, but to contribute to a research base for understanding how high school students understand and perform in online courses.

Given the rate at which states were developing virtual high schools and the haste of individual schools to include online courses as a part of their course offerings, little attention had been given to the impact of this learning environment on the learner. At the expense of addressing federal mandates to increase achievement scores, little is known about how high school students perceive their online learning experience. Are they motivated to learn online? Do they enjoy it? Do they believe they are learning from it? Do online courses meet the needs of all students or only those of a few? The excitement and learning potential attributed to online courses appears to overshadow the need to understand how they should be designed and integrated to result in successful learning experiences for these students.

Purpose of the Study

Among the issues of research in online learning are those of student interaction and development of a learning community. The literature indicated that the interaction of the learning community is important for achieving a successful online experience and can also impact student achievement (Jiang & Ting, 2000). Some of this research was based on student perceptions of their interactions with one another and with the instructor and how their perceptions contribute to their success in the course.

Ongoing, collaborative online discussion is considered among the characteristics of a successful online learning community. Most Learning Management Systems (LMS), i.e., courseware platforms for development and delivery of online courses, include a tool for

facilitating online, asynchronous discussions called the *Discussion Board*. This feature of online courses, housed by the LMS, is where the majority of student and instructor interaction takes place.

Online discussions can be important tools for developing a learning community among learners who are geographically separated. The learning community is cultured through student and teacher interaction by course features like the *Discussion Board.* In order to better understand how high school students are affected by the use of online discussion, this study examined student perceptions of motivation, enjoyment, and learning as a result of participating in online discussion. The study explored the potential relationship between motivation, enjoyment, and learning to understand how they are related. While exploring this relationship, the study considered gender differences in online discussion, the impact of prior experience on online discussion, and the role of the instructor to motivate students through online discussion.

A theoretical model that represents instructional, communal, and cognitive indicators was used to frame this research study. It was chosen to provide a point of comparison between what is known about effective learning environments in traditional classrooms and in the online classroom, and to analyze the data from the study. The Community of Inquiry model, proposed by Garrison et al. (2004) is explained in greater detail in the *Review of the Literature.* It categorizes elements of an effective learning environment as representing the "teaching presence," the "social presence," and the "cognitive presence" of classroom interactions.

Research Questions

The following questions framed the development and implementation of this study. Statistical analyses were used in the analysis of the resulting data to discuss findings of the study related to the major research question and to other research questions which provided focus for the research.

Major Research Question

What are the relationships between student perceptions of motivation and enjoyment and student perceptions of learning from online discussions?

Research Questions

1. Is there a significant difference between students who have taken online courses and those who have not in terms of their perceptions of motivation and enjoyment from online discussions?

2. Is there a significant difference between students who have taken online courses and those who have not in terms of their perceptions of learning from online discussions?

3. Is there a significant difference between male and female students in perceptions of motivation and enjoyment from online discussions?

4. Is there a significant difference between male and female students in perceptions of learning from online discussions?

Definition of Terms

This section defines commonly used terms in the study of online learning as they are used in this study.

Advanced Placement or A.P. is a program offering high school students the opportunity to receive university credit for courses taken while enrolled in high school. The program is administered by the not-for-profit College Board which develops and maintains these courses in various subject areas. Student scores on the end-of-year AP Exam determine whether students can receive college credit for the course. In the context of this study, the site selection for the study sample is comprised of three sections of online Advanced Placement Psychology.

Asynchronous communication describes class interaction that does not occur in real time. It may involve the use of email, threaded online discussions, or listservs. Distance education and online learning make use of both asynchronous and synchronous modes of delivery. In this study, asynchronous communication refers to the interaction of students and instructor through the use of threaded online discussions in the discussion board.

Blackboard is a commonly used web-based software platform used to create and host online courses. Blackboard is widely used in both business and education for web-enhanced, hybrid, and fully online courses. It is an example of a *Learning Management System (LMS)* which provides tools and functionality for online course management, content management

and sharing, assessment management, online communication, and collaboration. Blackboard was the LMS used in this study.

Computer-mediated Communication refers to any form of communication between individuals interacting with one another via separate computers through the Internet, and using software designed to facilitate communication. CMC does not focus on the methods by which two or more computers communicate. Instead, the emphasis is on how communication occurs between individuals using computers. Computer-mediated Communication is a major area of research in distance education.

Discussions refer to an exchange of information that occurs electronically in the online environment. For example, discussions may occur via private email exchanges, through synchronous chats, or via a discussion board. In the context of this study, the term "discussion" referred to the conversations that occur in the *Discussion Board* of the courses.

Discussion Board is a feature of many online courses where discussion forums are housed. This feature is often accessed via a link in the main menu of the course.

Discussion Forum is a Web application within the Discussion Board feature which provides architecture for online discussion, usually in an asynchronous format. Historically, discussion forums or discussion boards followed the use of email newsgroups and bulletin boards as Web-based tools allowing discussion on a variety of topics by like-minded participants.

Distance education refers to education using interactive technologies to connect teacher(s), students, and resources across geographic and temporal distances.

Face-to-Face Classroom is a term used to distinguish between online courses and the traditional classroom in an educational setting. The term Face-to-Face Classroom is used to highlight the ability of students and instructors to interact with one another in real time, in the same physical space.

Learning Community refers to a group of learners brought together with a common interest whose collaborative activities drive the growth of the group and its members as learners. In online learning, the *learning community* is an essential component in successful courses.

Learning Management System (LMS) refers to the software or courseware through which learning content is delivered and managed. Blackboard is an example of a Learning Management System.

Online Learning is a form of distance education involving computer-mediated communication (CMC) via the Internet. In the context of this study, online learning refers to fully-online, asynchronous courses.

Threaded Discussion is a term that refers to the hierarchical representation of a discussion occurring in an asynchronous environment. Threaded discussions take place in discussion

forums where an initial posting or starter thread begins a conversation. The thread of the conversation is visually represented by indenting responses to represent the order of exchange of the conversation. Participants may either respond to a previous comment or launch a new conversation of their own. In the context of this study, the researcher examined students' perceptions based on the interaction which occurs in the threaded discussions.

World Wide Web, often referred to as the "Web," refers to the information made available via the Internet that can be accessed via software called a "browser." Organizations and individuals can publish information about themselves on "websites" or pages on the Web. In the context of this study, the online courses were accessed via the World Wide Web using the Internet Explorer browser.

Significance of the Study

The majority of research in online learning comes from studies conducted at the post-secondary level of education. By contrast, there is a paucity of research at the K-12 level. Though the results of some studies may be extended to the K-12 environment, careful consideration must be given to the fact that the body of current research is primarily concerned with adult learners, and therefore likely to be influenced by the expectations of adult learning theory. There is a need to understand the effects of online learning for adolescents since they will soon populate the online courses studied by researchers in higher education. The sample of students in this study have known the Internet for most of their lives and bring a different set of expectations and understanding of what online learning is and can be. Research is needed to inform the current development, deployment, and evaluation of online courses for K-12 education. This study examined how online

discussions function to motivate students and how they are sources of student learning within the course environment. At the time of this study, the researcher could not identify the existence of empirical studies which offer insight into issues in online learning at the K-12 level with the exception of national studies on the adoption and impact of online courses from a demographic perspective. Literature reviews and meta-analyses of online learning were all focused on online learning in higher education.

Summary of Introduction

This chapter has described the current status of online learning in the K-12 educational setting in North Carolina and makes an appeal for research studies like this one. The feverish adoption of Internet technologies, including online courses, had not been met with equal attention to understanding the cognitive, social, and pedagogical implications of online courses for high school students. The LEARN North Carolina program is a course provider offering online courses to high school students in North Carolina. This organization and others like it will benefit from greater insight into the dynamics of online courses for K-12 education. This study examined student perceptions of the discussions within the Discussion Board feature. Their responses to an online survey were an important source of data for understanding the value of online discussions. A Definitions section clarified key terms related to online learning used throughout the study.

The study was situated in a theoretical framework, the Community of Inquiry model (D. Randy Garrison, Anderson, & Archer, 2000) which brings together essential components of an effective online course. The locus of control for this framework is found in online discussions. The following chapter, *Review of the Literature*, presents select research related to the essential elements of this study and to the theoretical framework.

CHAPTER TWO:

REVIEW OF THE LITERATURE

Online learning has become the predominant format for conducting distance education in the 21st century. Far removed from the first model for distance education which occurred by mail in Europe during the 1700s (Sherry, 1996), online learning has developed as a continuum of alternative delivery modes for teaching and learning. At one extreme, instructors in traditional face-to-face courses use resources from the World Wide Web to supplement or enhance their classes (Web-enhanced). Somewhere in the middle, a hybrid mode occurs when classes meet occasionally in the face-to-face setting. The course materials, assignments, and discussions occur via the Internet. This approach is considered a transitional stage for instructors who are not yet ready to relinquish the face-to-face contact with their students. At the opposite end of the spectrum are courses where the entire curriculum of a class if offered via the World Wide Web. Students participate in the course regardless of their geographic location, and independent of time and place (Harasim, Hiltz, Teles, & Turoff, 1995). Interaction occurs asynchronously over the World Wide Web and students may never meet in a face-to-face setting in order to complete the course. This study was concerned with the asynchronous method of delivery.

The majority of research literature related to online courses comes from studies conducted at the post-secondary level. A few studies have been conducted at the secondary level (Collins, 2001; Roblyer, 1999; Roblyer & Marshall, 2002-2003), but many more are

needed to provide clarity and understanding of the circumstances under which high school students enroll in online courses. Nonetheless, post-secondary research does hold some relevance given that the demographics of online students continues to shift to younger learners (Roblyer, 1999). This *Review of the Literature* examines what is known about online learning while controlling for the age of the learner. In other words, this *Review* discusses aspects of online learning that are seemingly extensible to all learners. As such, general research about online learning, the phenomenon of the online environment, student perceptions of learning from online discussion, student motivation and enjoyment from online discussion, prior experience as an online learner, gender differences, and instructor role in online discussion are examined.

Research in Online Learning

Research in the K-12 arena has centered on implementation and policy issues. Despite the scarcity of literature on the effectiveness of online learning at the K-12 level, many states have forged ahead with the creation of their own virtual high schools, modeling their programs after the first study of the Concord Consortium's Virtual High School by SRI International and the subsequent book by two SRI staff, *The Virtual High School: Teaching Generation V (Yamashiro & Zucker, 1999; Zucker & Kozma, 2003)*. The frenetic growth of virtual high schools is apparent in organizations like the Florida Virtual High School and the Concord Consortium's Virtual High School.

The first national study of distance education courses for public elementary and secondary students was released in 2005 by the National Center for Educational Statistics (Setzer & Lewis, 2005). This report provided a baseline for measuring the proliferation of distance education courses, as well as estimated enrollment information for the 2002-2003

school year. According to the report, 8,200 public schools, or 9% of all public schools nationwide had students enrolled in distance education courses. Within these schools, approximately 45,300 students were enrolled in Advanced Placement or college-level distance education courses. Asynchronous courses were the primary delivery mode of computer-based instruction in medium and large districts. Superintendents in these districts reported that 92% of the students enrolled in distance education courses accessed them from school, with 60% accessing them from home, and 8% accessing the courses from other locations like a community center or public library. The primary reasons for offering distance education courses included offering courses not otherwise available at school (80% of districts), meeting the needs of specific groups of students (59%), and offering Advanced Placement or college-level courses (50%). And finally, on a policy level, there is the push to embrace online learning as a mechanism for preparing tomorrow's leaders to thrive in an information-based economy (Information Infrastructure Task Force, 1993; President's Committee of Advisors on Science and Technology, 1997).

The advantages of online learning are well documented in the research literature (Jiang & Ting, 2000; Rourke, Anderson, Garrison, & Anderson, 2001; Simonson, Smaldino, Albright, & Zvacek, 2000; Ward & Newlands, 1998). Among those, the convenience and flexibility afforded to the user are most cited. Studies often refer to the "anytime, anywhere" accessibility of online courses. This means that students can participate in their courses at any time of the day or week at any location where there is Internet access. Students who are unable to travel to a particular campus where the course might normally be held, and who need more flexibility in their schedules can still take a course or even complete a degree (Tricker, Rangecroft, Long, & Gilroy, 2001).

On a cognitive level, online learning makes it possible for the learner to take all the time necessary to process new information before engaging in discussion with classmates and the instructor (Berge, 1997; Harasim, 1990; Simonson et al., 2000) . Unlike the face-to-face classroom, the online classroom does not demand an immediate response to a question, placing the learner "on the spot." This affordance of the online classroom makes it possible for students to work at their own pace, a particular advantage for English language learners, shy students, students with disabilities, or students whose learning style is more conducive to a pace which they control (Navarro & Shoemaker, 1999; Simonson et al., 2000). Finally, the ability of the Web to conceal personal identities, to strip away those aspects of who we are, that can lead to prejudice or discrimination of any kind, means that all students can participate equally in online learning regardless of their race, sex, appearance, or any other personal attribute (Simonson et al., 2000).

As can be expected, there are disadvantages associated with online learning. Among these, one of the most prominently cited is limited interaction or lack of "teacher immediacy" behaviors (Arbaugh, 2001; Johnson, Aragon, Shaik, & Palma-Rivas, 2000; Vonderwell, 2003). Teacher immediacy behaviors are influenced by numerous variables like prior experience of the instructor in teaching online, instructor decisions of how to use the communication tools of the Learning Management System, personal philosophy of teaching, and instructor role in the online environment, to name a few.

From the student perspective, a limited or lack of understanding of the technology, a larger-than-expected workload, lack of technical support, and potential costs of equipment can be significant barriers to a successful online experience (Valenta, Therriault, Dieter, & Mrtek, 2001). Students either don't have the skills necessary to participate in the

environment, or they experience technical problems caused by the Learning Management System. In these instances, students spend an inordinate amount of time negotiating barriers of the environment with little time left to engage in the course material. Further, student performance is hindered when students falsely believe that their online course will be easier than a face-to-face course.

Most of the disadvantages to the student come from a lack of attention to the best practices research on learning design, deployment, and pedagogy (Elbaum, McIntyre, & Smith, 2002; Palloff & K., 1999; Sunal, Sunal, Odell, & Sundberg, 2003; Vonderwell, 2003). Instructors may have received little or no preparation to design and teach their online courses. The information provided to the student from the host institution may have been confusing. Unclear directions and awkward use of the course features on the part of the instructor can cause students to "check out" of the course in a relatively short amount of time.

Fortunately, there are an equal number of studies that identify best practices in online learning, citing key course elements and teaching strategies. Sunal et al. (2003) conducted a meta-analysis of best practices in asynchronous and synchronous online instruction in higher education. Among their findings, they observed that while the literature supports the idea that the medium, i.e., the Learning Management System, does not supplant effective practice in online learning, the medium alone is not responsible for student learning. Instead, their research supports Robert Kozma's (1994) belief that both media and methods are essential components in the effective instructional design of an online course.

Having discussed the advantages and disadvantages of online learning, the question of the efficacy of online courses must also be examined, particularly in light of the fervor to

embrace online learning in the K-12 arena and beyond. This question has been posed from the very beginning by many researchers, in particular those naysayers who caution against the widespread implementation of online courses. There is an increasing body of research, sprinkled with some program evaluation studies, indicating there is no significant difference in student achievement online versus achievement in traditional classrooms (Coates et al., 2000; Johnson et al., 2000; Ocker & Yaverbaum, 1999; Sunal et al., 2003). Studies indicate that students perform no worse in online courses, yet little empirical evidence has indicated that students achieve greater academic success in the online environment. No empirical evidence can be found indicating differences between student performance in required online courses versus those courses taken as electives or taken due to their convenience.

The Online Environment

There are several critical aspects of the online environment appearing throughout the research. Among those cited at the post-secondary level are communications between students and instructor, student time management, student expectations of the learning experiences, and quality of instruction (Chung, Winiecki, & Fenner, 1998; Cooper, 2000; Frew & Weber, 1995; Hogan, 1997; Saba, 2000). As with any innovation, there is the danger that the glamour and appeal of the online courses might cloud the reality of their direct impact on students. Once an online course has begun, there is the natural tendency of both student and instructor to map their understanding of teaching and learning in the traditional classroom onto the online classroom. This phenomenon causes students and teachers to ignore the "affordances" of the online environment in favor of their instinctual expectations and behaviors cultivated by experience in a more familiar medium, the traditional classroom. Gibson (1977) defines affordances as, "the properties that an object or environment offer to

the individual." Lack of awareness of the affordances of the medium may likely impede the potential success of both students and instructors.

The learning community is perhaps the most essential affordance of an online course (Hiltz, 1997; Palloff & K., 1999; Rovai, 2002; Swan, 2002; Wegerif, 1998). The interactions in the form of discussions that occur in the discussion forum and elsewhere in an online course are elements for building and sustaining a learning community. Not to be confused with a "community of learners," the learning community is the vibrant component which drives the learning experience in any successful online course. Because students and instructor are in different physical locations, and may never see one another, the instructor must nurture this learning community so that no individual student feels isolated or "lost in cyberspace." The theoretical framework of this study provides more details on the relevance of the learning community in online courses, with an emphasis on the "Community of Inquiry" which best defines a successful online course (D. Randy Garrison et al., 2000).

The body of research which considers how students feel about online learning is also increasing. Included among the research are studies which report that students value the ability to interact with peers in an environment where they experience greater flexibility in learning and personal control of their own learning (Collis & Moonen, 2002; Coomey & Stephenson, 2001). Additional research has identified that students value the ability to actively participate and share ideas, the presence of timely, constructive feedback, and the climate of learning-focused messaging (Laurillard, 1994; Salmon, 2000). It is clear that interactivity can contribute to the overall effectiveness of the online course. Unlike the traditional classroom, online students can not hide in the back of the room. Their presence

can be observed through learner-learner interaction, learner-instructor interaction, learner-content interaction, and learner-interface interaction (Zirkin & Sumler, 1995).

Student Perceptions of Learning from Online Discussion

With all of the attention given to the implementation of online courses, what is known about how students perceive their learning experiences online? Do they feel that the online course environment is effective toward achieving learning goals?

Numerous studies take a look at student perceptions of various components of the online course environment like course structure, learner autonomy, course interface, and interaction (Fulford & Zhang, 1993; Huang, 2002; Picciano, 2002; Wu & Hiltz, 2004). These studies indicate that students are impacted by the attention given to course design, pedagogy, and attempts to cultivate a learning community. A significant part of most online, asynchronous courses is the *Discussion Board* feature. Some describe the Discussion Board as a tool that contributes significantly to positive perceptions of learning. Such was the case with a mixed-methods study where students felt they had a better experience in courses emphasizing online discussion (Jiang & Ting, 2000). Swan's (2002) study of the course design factors that impact successful asynchronous courses revealed a strong preference for active discussions by students across 73 courses. Just prior to the widespread use of online discussion forums, Altaus (1997) found that students who participated in computer-mediated discussion reported they learned more and had higher grades than those students in the study control group in a study using an electronic mail configuration to simulate threaded discussions.

Online discussions offer the advantage of increased reflection time and opportunity to continue discussions beyond a certain date, hence the potential to more deeply explore a

topic and take the discussion to higher levels of thinking. Students are more careful about what they write and more thoughtful knowing that their classmates, in addition to their instructor, will read what they write (Chizmar & Walbert, 1999; Petrides, 2002; Vonderwell, 2003). Such is the case in studies that explore the role of the discussion forum and its relationship to higher-order thinking (Meyer, 2003). These studies indicate that students appreciate the opportunity to learn more as they collaborate and engage in critical thinking skills (Hiltz, 1994; McAteer, Tolmie, Duffy, & Corbett, 1997). Further, content analysis of student postings in several studies reveals that, although students may post few times to a discussion forum, their responses are lengthy, cognitively deep, and embedded with peer references (DR, Webb, & Cochrane, 1997; Hara, Bonk, & Angeli, 2000).

The Community of Inquiry model, the theoretical framework for this study, holds that student perceptions of learning are closely aligned with their perceptions of social presence through online discussions. Student and instructor interactions in the discussion board foster a greater sense of social presence. The literature indicates that student perceptions of learning are greater in those instances where students perceive a high level of social presence in areas like the discussion board (Richardson & Swan, 2003; Wu & Hiltz, 2004).

Student Motivation and Enjoyment from Online Discussion

The complexity of the instructor role is mirrored by the complexity of student perceptions of online discussions. As might be expected, every student brings their own level of intrinsic motivation to the learning experience which ultimately factors into their perceptions of success and enjoyment from the online experience (Song, Singleton, Hill, & Koh, 2004). Motivation for enrolling in online courses varies as learners grow older, with post-secondary students choosing to enroll because of convenience of participation or

program requirements that are conducive to a hectic lifestyle. In the case of K-12 students, the motivation for enrolling in an online course is more likely linked to the opportunity to access courses not available in their setting or to advance their academic standing, as is often the case when students enroll in Advanced Placement courses. The intrigue for this study was situated in the potential extrinsic motivation whose locus is situated in online discussions.

Because students must assume more responsibility for their own learning in online courses, motivation to learn and be successful are linked to student achievement (White, 1999). When students know that others will view their work and their "thoughts" in online discussions, they are more motivated to work diligently and to complete all assignments (Hiltz, 1997). In an earlier study, Hiltz (1994) found that students who make best use of various online tools like the discussion board have the most positive attitudes about the online learning experience. The mere integration of discussion board activities in an online course can motivate students who realize participation has been equalized since everyone has the same amount of time to contribute to a discussion (Procter, 2000). The absence of tools like the discussion board can isolate students from their peers, decreasing the likelihood of interaction, and consequently impacting students' motivation to excel and complete the course (Abrahamson, 1998).

Online discussions can motivate students and provide enjoyment when there are manifestations of both teacher and student immediacy behaviors (Robert LaRose & Pam Whitten, 2000). In online discussions, these behaviors may take the form of text or non-verbal utterances like images or emoticons, textual representations of emotion like a smiley face: :-). LaRose and Whitten note that immediacy behaviors in discussions can act as social

incentives. For example, responses that include expressions of approval or indications of interest in a particular student can originate from fellow students as well as the instructor of the course. When this happens, students come to see themselves as valued contributors, experts or discussion leaders. They come to value the online discussion as an integral part of the course. Shea et al. (2001) corroborate these findings in their major study of 3,800 students enrolled in 264 courses of the SUNY Learning Network (SLN) where they found a strong relationship between satisfaction, interaction, and performance as measured by grades. They concluded that when value is attributed to online discussion, i.e., graded, when the discussion is authentic and frequent, and when interactions are positive and enthusiastic, students are happier and learn more.

Prior Experience as an Online Learner

There is the general tendency to believe that teenagers of the 21st century, the "N-Geners,"(Tapscott, 1998) are well-equipped for participating in online courses. They have known technology in the form of the personal computer and the Internet for most of their lives. Consequently, there is the assumption that they will adapt more readily to online courses than adult learners. Though this may be the case, there will always be a time of adaptation and role adjustment for the learner who is new to online courses. Prior experience in online learning can provide a distinct advantage to the learner who begins a new online course. Students with prior experience already understand the way in which they must behave, i.e., how they must adjust their behavior and role as students to achieve success.

The experienced learner knows the environment of the online course. Only a few studies have indicated that a student's prior experience serves as a strong predictor of student satisfaction with the delivery medium (Arbaugh, 2001; Vrasidas & McIsaac, 1999) with no

others to contradict these findings. In the absence of a depth of research on the effects of prior experience in online courses, instructors must bear in mind how the usefulness and ease of use of an online course could influence the student's attitude toward online learning, thereby increasing the likelihood of the student enrolling in another online course (Arbaugh, 2000b). The same philosophy applies to face-to-face courses. As such, Yellen's (1998) work indicates that motivation, expectation, and experience are critical factors for success for students in both settings.

Gender Differences

Historical accounts of the use of technology in the face-to-face setting have indicated distinct differences in adoption, response to, and role of technology with respect to gender. Though thoroughly studied in the traditional classroom setting, how does gender impact behavior in the online classroom? In the online learning arena, the research is again limited to post-secondary courses; therefore, research on female motivation and lifestyle as it relates to gender differences in online learning in higher education can not be extended to the K-12 arena though it does provide some insight into this aspect of online learning.

Research into gender differences in online discussion in the 1990's shows a male dominance of online discussions (Kramarae & Taylor, 1993; Spender, 1995). This may be explained by the predominantly male Internet population at a time when online communication required more technical "gateways" to participate. As late as 1999, one study indicated that gender differences in online courses mirror those that occur in face-to-face settings in higher education (Blum, 1999). This study of students in both bachelor's and master's degree courses suggests that the communication patterns traditionally observed in face-to-face classrooms are similar to those in computer-mediated communication. Males

tended to exhibit separate, individual learning styles, while females were more connected in the way they learned. Unfortunately, this study also reported male domination of the discussion forum with disparaging remarks from male participants about the technical prowess of women.

As the number of female Internet users has increased, it is likely that the male voice will no longer dominate. With a now larger percentage of females online than males, perhaps online discussions are now more suitable to the learning styles of female students. For example, Richardson and Swan (2003) found that females perceived more social presence than males in a study of 97 students in online courses through Empire State College. However, caution should be taken in such observations given the potential for bias of survey instruments or small sample sizes.

Arbaugh found that there were no significant differences in learning between males and females (Arbaugh, 2000a). He did find that males indicated greater difficulty interacting with classmates throughout the course. When online communication is used primarily to disseminate information, males appear to be more satisfied. However, keeping in mind that a learning community requires interaction and collaboration, gender research indicates that females would more likely succeed, indicating their responsiveness and preference for a supportive, nurturing environment via online discussions. (Hipp, 1997; M Moore & Kearsley, 1996). Likewise, an Internet and Web design course favored women and older students who were more motivated, better at scheduling their learning, and adept at communicating online (McSporran & Young, 2001).

K-12 education in North Carolina began to see Internet connectivity at the classroom level in 1996. This means that K-12 students who are currently enrolled in online courses

have known the Internet for more than half of their life. They are among the first "Digital Natives" we have known. They turn to the Internet first as their source of information unlike the "Digital Immigrants" who, as adult learners, did not grow up with the need to understand digital literacies in order to function in the world (Presky, 2001). The gender differences currently reported in the literature do not account for the new population of students in online courses who will enter post-secondary education with prior experience in online learning.

Instructor Role in Online Discussion

Much has been written about the role of the instructor in online courses. In particular, research into best practices online describes the instructor as more of a facilitator than the traditional teacher (Berge, 1997; D. Randy Garrison et al., 2000; Harasim et al., 1995; Palloff & K., 1999; Simonson et al., 2000). The instructor can play an integral role in motivating students to participate and succeed through teacher immediacy behaviors (Robert LaRose & Pam Whitten, 2000).

Research on instructor role in online learning identifies numerous variables which impact student success. In the context of this study, this complexity was not examined. Instead, the study design considered only whether the instructor plays a critical role to motivate discussions among students.

Theoretical Framework

Many institutions are adopting the asynchronous format of online courses to address the changing needs of their students. Asynchronous courses offer a time-independent and place-independent schedule which conforms well to the lives of students at any educational

level. Secondary schools have embraced asynchronous courses since they can be easily incorporated into any school's existing daily schedule.

The learning community developed in an asynchronous online course, though ever-changing, is comprised of several key elements that are essential to a successful experience for students. Research models for framing what happens in the online environment are informed by researched models that prove successful in the traditional classroom. Caution must be taken to not overlook the apparent differences between the two as models are reinterpreted for the online environment. The National Research Council's Commission on Behavioral and Social Sciences and Education promotes a researched model of effective learning environments in the publication *How People Learn* (Bransford, Brown, Cocking, Donovan, & Pelligrino, 2000). Here, the authors present a framework of four components which describe an effective learning environment as learner centered, knowledge centered, assessment centered, and community centered. These components ask those involved in crafting a learning environment to consider the following:

1. *Knowledge centered* – The environment is designed to achieve learning outcomes.
2. *Learner centered* – The environment takes into consideration the "uniquities," strengths, and weaknesses of the learners and helps them to better understand how they learn. The environment bridges new learning with what is already known and capitalizes upon learners' interests to drive the learning experience.

3. *Assessment centered* – The environment offers numerous ways for learners to make their learning visible and to obtain ongoing feedback to assist in monitoring progress.
4. *Community centered* – The environment promotes collaborative learning in a safe environment where learners are encouraged to take risks. Learning is made relevant through connections to the outside world as learners become more self-directed in their learning.

The components of an effective learning environment, though not specifically designed to represent the online environment, do reinforce research on the essential components of online courses. These components can be seen in the *Community of Inquiry* model (D. Randy Garrison et al., 2000), Figure 1, which identifies the major elements necessary to achieve an effective learning community online.

As explained, the elements of Bransford's model do not map directly onto the *Community of Inquiry* model, but rather manifest themselves in different ways. The *Community of Inquiry* model draws upon the work of Matthew Lipman, who noted that children need to be engaged in collaborative activities, with assistance and encouragement, through dialogue in order to achieve a level of critical thinking (Lipman, 1988). Seen from this perspective, dialogue serves to establish an atmosphere of trust and respect for one another in a community which observes certain norms and common interests. Similar to what might be seen in the Bransford model, an online learning community requires that students and a teacher come together in one space for the purpose of learning something. Unlike the traditional classroom, the online classroom places an even greater emphasis on a student-centered, constructivist approach whereby the instructor's role is not diminished,

only reconceptualized (Carr-Chellman & Duchastel, 2000; Knowlton, 2000). In order to learn, students must engage in dialogue with one another and with their instructor as they collaborate to achieve learning outcomes (Anderson, 1998; Jonassen, Davidson, Collins, Campbell, & Haag, 1995; Kearsley & Shneiderman, 1998; Savery & Duffy, 1995). They must proactively engage their co-learners while processing the content of the course in different ways than they may have been accustomed to doing in the traditional classroom.

From this philosophical perspective, Garrison et al.*'s Community of Inquiry* model defines the three core constructs of any effective online course environment as follows:

1. *Cognitive Presence* is concerned with the exploration, construction, resolution, and confirmation of understanding through collaboration and reflection in a community of inquiry.
2. *Teaching Presence* concerns the selection, organization, and presentation of the content as well as the development of learning activities and assessment. Teaching presence moderates the behaviors coming from cognitive presence and social presence. Of note, the facilitation of learning associated with teaching presence may be performed by instructor or student.
3. *Social Presence* is the degree to which participants are able to project themselves affectively within the medium (D. Randy Garrison et al., 2000).

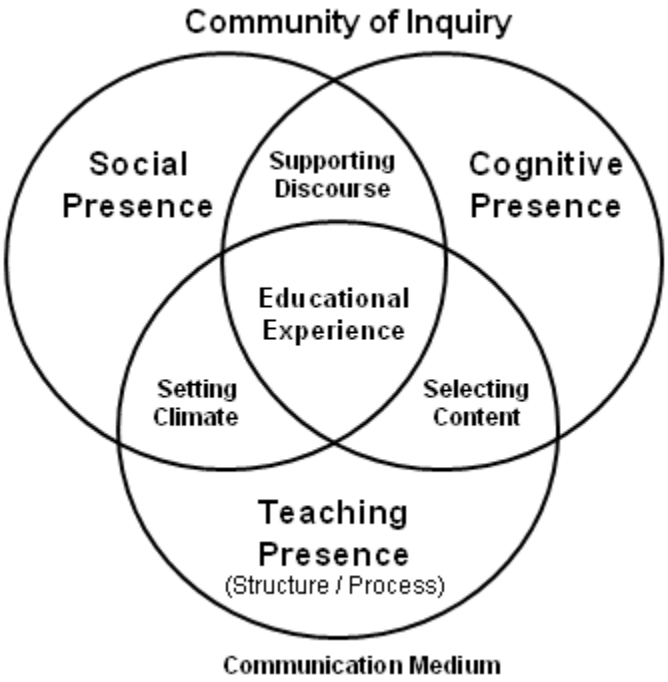


Figure 1 Community of Inquiry Model

When students engage in online discussion, the likelihood that a community of inquiry, a learning community, will be cultivated is increased. Student interaction through discussions can manifest the three constructs of cognitive, teaching, and social presence. The *Community of Inquiry* model lends theoretical support to the importance of online discussion in the development of a learning community, and ultimately the development of an effective online course.

Summary of the Literature

Online learning is becoming a viable alternative for delivering courses not normally available in the K-12 setting. The majority of research in online learning comes from studies conducted at the post-secondary level. Research in K-12 education is focused primarily on policy and economies of scale for implementation like the 2005 study "Distance Education

Courses for Public Elementary and Secondary School Students: 2002-2003" (Setzer & Lewis, 2005).

The literature is filled with studies documenting the advantages of online learning (Jiang & Ting, 2000; Rourke et al., 2001; Simonson et al., 2000; Ward & Newlands, 1998). Most prominent are those which address the ubiquitous access to the online environment, socio-cognitive advantages to the learner, and equality of educational opportunity. Disadvantages include potential isolation due to lack of physical contact, environmental and technological barriers, poor instructional design, and lack of instructor preparation. Meanwhile, substantial attention has been given to the identification of best practices in online pedagogy and instructional design (Sunal et al., 2003).

The theoretical framework of this study, the Community of Inquiry Model (D. Randy Garrison et al., 2000) provided a focus for the research literature while providing a structure for the design and analysis of this study.

Student perceptions of learning from online discussions give insight into the role of various course features and phenomena. Topics include course structure, learner autonomy, course interface and course interaction (Fulford & Zhang, 1993; Huang, 2002; Picciano, 2002; Wu & Hiltz, 2004). The learning potential afforded by online courses is discussed in studies that look at the development of a learning community through collaboration and activities that promote critical thinking skills (Hiltz, 1994; McAteer et al., 1997).

Student motivation and enjoyment in online courses is the subject of studies that focus on various course features like the discussion board (Hiltz, 1994; Hiltz, 1997; LaRose & Whitten, 2000; Procter, 2000). Student characteristics like prior experience in online courses (Arbaugh, 2001; Vrasidas & McIsaac, 1999) and gender have been studied in the

context of student perceptions and achievement (Blum, 1999; Kramarae & Taylor, 1993; Richardson & Swan, 2003; Spender 1995). The literature reflects a change in the role that gender plays in more recent studies (Arbaugh, 2000a).

The instructor role in online discussions and online courses is an area of increasing interest for researchers. The literature conceptualizes the instructor's role more as a facilitator than a knowledge-giver (Berge, 1997; D. Randy Garrison et al., 2000; Harasim et al., 1995; Palloff & K., 1999; Simonson et al., 2000). While not a major emphasis of this study, the role of the instructor in online discussions and online courses cannot be ignored.

It is not enough to know that online learning is an effective environment for teaching and learning. The research literature is moving in the direction of "why" it is so. The issues discussed in this review of the literature beg for more research in the area of K-12 online learning to provide a complement for the existing research which is primarily focused on post-secondary education. This research study provided initial insight into some of the issues already documented for adult learners.

CHAPTER THREE:

RESEARCH DESIGN

This chapter details the research methods and procedures, including purpose, rationale of design, role of the researcher, site selection and participants, and discussions of sample and sample size. The survey instrument is discussed according to the constructs examined during the study: Perceptions of Motivation and Enjoyment and Perceptions of Learning. A single item looks at the role of the instructor. The chapter concludes with details of procedures, data collection, and analysis.

Purpose

Online courses are fast becoming an integral part of the course offerings in high schools around the country. Since little is known about their impact on the students at the high school level, decisions to develop and implement online courses at this level are based upon the research conducted at the post-secondary and continuing education levels. An engaged, functioning learning community in an online course has been identified as a major factor in determining student success in online courses. The research indicates that the learning community is influenced by numerous variables; among these is the interaction that occurs in the course discussion board or forum. This study examined how students perceive the role of discussions in their online course. Do discussions motivate them? Do they enjoy participating in online discussions? Do discussions contribute to their learning? What role

does the instructor play in online discussions? Though discussions can occur via various online tools, this study considered only those discussions which take place in a well-known feature of many Learning Management Systems like Blackboard, the *Discussion Board*. Many instructors take advantage of this architecture to create an opportunity for students to engage in the content of the course, to reflect on their learning, to socialize, and to collaborate with their classmates on learning activities.

Research Questions

This study proposed the following questions for examination:

Major Research Question

What are the relationships between student perceptions of motivation and enjoyment and student perceptions of learning from online discussions?

Research Questions

1. Is there a significant difference between students who have taken online courses and those who have not in terms of their perceptions of motivation and enjoyment from online discussions?

2. Is there a significant difference between students who have taken online courses and those who have not in terms of their perceptions of learning from online discussions?

3. Is there a significant difference between male and female students in perceptions of motivation and enjoyment from online discussions?

4. Is there a significant difference between male and female students in perceptions of learning from online discussions?

Rationale for Design

This study used a non-experimental approach to correlate student perceptions of motivation and enjoyment with their perceptions of learning from online discussions in three Advanced Placement Psychology courses for high school students. Data were collected via an online survey instrument administered at the end of the course. Given the design of the study, it was essential to identify online courses that take advantage of the discussion forum feature. Further, to control for the effects of the course subject matter and variation in instruction, this study targeted participants from three sections of Advanced Placement Psychology. All three sections used the same course layout and design, and all three used the same discussion activities throughout the course. The courses had different instructors, with one course being taught by a husband and wife team. It is important to note, however, that the four instructors were all prepared to teach online for LEARN NC at the same time, using the same original course, and have collaborated in their use of the Discussion Board. It was necessary to use all three courses to achieve a greater sample size than would be possible with only one. The design takes advantage of convenience sampling since the researcher is employed by the host institution of the courses, and has easy access to the research subjects for conducting this study.

Role of the Researcher

The researcher in this study managed all aspects of this study. All communication with instructors, site facilitators, study participants, and the host institution, LEARN NC, were handled by the researcher. In this capacity, the researcher communicated with students using the *Messages* feature of Blackboard. Communication with course instructors and the Site Facilitators occurred via email. The researcher assisted in the work to place the survey online using Snap software. When all surveys had been submitted, the researcher collected all of the data and maintained the security of the data by ensuring that both the survey data housed on the server and on the researcher's personal laptop were always secure and not accessible to others. Finally, the researcher analyzed the data using Snap survey software (Snap, 2005), SPSS software (SPSS, 2005), and QDA Miner software (Provalis, 2004).

Site Selection and Participants

Access

The site for this study is unique in that it is not a physical location as normally expected in research studies. Instead, the site existed in the virtual world as a collection of online, asynchronous courses housed by the host institution, LEARN NC (www.learnnc.org), a program of the School of Education at UNC, but funded directly by the State of North Carolina (http://www.learnnc.org/students/9-12/courses/). All courses through LEARN NC were designed and taught asynchronously using Blackboard, a Learning Management System (LMS) that had become an industry standard for developing and teaching online courses.

Students participated in the course as if it were a traditional offering at their school site. Some of their classmates in the online course also attended the same school and were

logged into their online class during the same school period. Each school site provided a period during the day, Monday through Friday, when the student accessed the course. This daily time varied from one school to the next depending upon the school schedule, but did not impact the student's ability to take part in the course. Students were able to access the course beyond the end of the school day on any computer with Internet access.

A site facilitator was physically present while all students accessed their courses. The site facilitator monitored and supported student participation on a daily basis. This individual served as a liaison between the course instructor and the host institution, LEARN NC. The Site Facilitator performed numerous functions for the program like monitoring daily participation, proctoring online assessments, communicating grades from the instructor to the school, and troubleshooting technical issues.

The instructors of these courses, like their students, were geographically located around the state. The instructors were not on faculty at UNC, but functioned as contract employees through LEARN NC. All were employed as classroom teachers in North Carolina high schools. The instructors were certified as Advanced Placement teachers, had advanced teaching degrees, and had been teaching online for the same amount of time.

This site was chosen because of the ease of entry resultant from the researcher's employment by the host institution and peripheral involvement with the K-12 Online Courses Program at LEARN NC.

Steps to Acquire Participants/Sample Size

Since the researcher was employed by the host institution, both the Director of Online Learning, the Associate Director, and the Executive Director of LEARN NC were aware of the researcher's interest to select students from the K-12 Online Courses program. By way

of informal contact, the researcher had discussed the plan to survey students in this program with the aforementioned Directors of LEARN NC. Formal communication of the study to both the Executive Director and the Director of Online Learning was made via hard copy letter detailing the study's research design, research questions, procedures, and timeline. The researcher explained that results would be shared with LEARN NC and how these results would benefit the organization. The Director of Online Learning assisted the researcher in the identification of courses that satisfied the requirements of the study design. The Director of Online Learning served as a liaison to introduce the researcher to the online course instructors. The researcher communicated the study's research design, research questions, procedures, and timeline to those instructors via email. The same information was shared with the Site Facilitators via email at each of the school sites where students were participating in the study.

The researcher sent initial contact letters via the Site Facilitators to the parents of students in the participating courses. The letter contained the same information communicated to course instructors: the study's research design, research questions, procedures, and timeline. Following, assent was obtained from students participating in the study and parental consent was obtained from students who were considered minors. All forms were returned to the researcher via mail.

Population & Number of Participants/Population & Sample Size

The population targeted by this study was North Carolina high school students enrolled in online, asynchronous courses through LEARN NC. The study targeted 92 high school students from high schools across the state enrolled in one of the three online Advanced Placement Psychology courses. Students were not required to take this course for

graduation, but elected to do so for different reasons. The course lasted one year to accommodate the scheduling of the Advanced Placement examination held in the spring of each year. At the time of the study, the LEARN NC Online Courses Program had an enrollment of 1,600 students across 31 courses. All students had been participating in the course since the beginning of the 2005-2006 academic year.

The instructors were four licensed teachers who had Advanced Placement certification, advanced teaching degrees, and who had been prepared by LEARN NC to teach online. All instructors had from 8 to 25 years of teaching experience. All of the instructors were in their fourth year of teaching Advanced Placement Psychology online for LEARN NC, having begun teaching online in the 2002-2003 school year. These courses and their instructors had been chosen as previously stated because they all used the *Discussion Board* in the same way. As important, all three courses were sections of the same course, Advanced Placement Psychology, and all three had been designed from the same master course, using the same activities in the *Discussion Board* throughout the year. These factors were essential in course selection to control for differences in subject matter, course design, and use of the *Discussion Board* feature.

Rationale for Choice of Participants/Sample Size

Participant selection for this study was influenced by the need to control for the differences in subject matter, course design, instructor role, and use of a primary feature of the Blackboard environment, the *Discussion Board*. Previous studies of students in online courses have included samples that include participants across subject areas, educational level, and use of the Learning Management System as a Web-enhanced, a hybrid, or a fully-online course. Controlling for these variables required the identification of online courses

which were as similar as possible so as not to introduce any of the variables mentioned above which would interfere with isolation of study variables. Convenience sampling was used here given the researcher's ease of access to the students. The Advanced Placement Psychology courses were chosen since they collectively offered the largest sample size possible while controlling for the aforementioned variables (Gall, Borg, & Gall, 1996). The enrollment for these courses totaled 92 students. Since convenience sampling was used, a nonprobability sampling method, a potential limitation of the study was the extent to which the sample actually represented the entire population.

Instrumentation

Background

This study required students to complete an *Online Discussion Survey* at the end of the second semester, just prior to the final exam of the course (See Appendix A). Prior to the development of this study, the researcher conducted a literature review to identify possible instruments appropriate for examining student perceptions of online discussions. The result was the *Online Discussion Survey* which was used in this study. The survey was developed and used in an exploratory study with 116 undergraduate and graduate students at the New Jersey Institute of Technology to better understand their feelings on the role of the discussion feature in their hybrid courses (Wu & Hiltz, 2004) . The instrument consists of three parts: Part I for obtaining demographic information, Part II consisting of 20 Likert-scale questions, and Part III consisting of four open-ended questions. The survey was designed to explore the relationship between student enjoyment and motivation as a result of participation in online discussions, and the potential relationship between both enjoyment and motivation and student learning.

The research model for the current study posited that the online discussion forum should motivate students to engage in the content of the course, to think about major concepts through discussion with their peers. Further, if it is believed that discussions should be student-dominated rather than instructor-dominated, then students should enjoy their interaction with peers. Consequently, the research model that framed the development of the original survey was based on the concepts of *motivation* and *enjoyment* from online discussions. The instrument includes eight questions which together form an index of *student perceptions of motivation and enjoyment.* The original design of the instrument intended to measure these as separate constructs; however a confirmatory factor analysis indicated that all eight items comprise a single construct, not two. They were thus combined into a single index.

Eleven items in the survey were indexed to a single construct called the *Perceptions of Learning* variable. The original study posited that the intervening variables of motivation and enjoyment should explain the variations in students' perceptions of learning. Table 1 organizes the items according to the constructs they represent. And finally, one item was included to solicit students' perceptions of the instructor's role in online discussions. Whether viewing his role as central to discussions or otherwise, the instructor can play a role in the way students perceive online discussions.

The independent variables "gender" and "prior experience" in online courses were examined to provide further insight into student perceptions of motivation and enjoyment and learning. Given the research on differences in communication styles and gender bias perpetuated against females in the use of technology in schools, the developers of the instrument wanted to know what role gender might play in the use of online discussions.

Likewise, familiarity with the online environment and prior use of electronic discussion boards or forums might also have an impact on student perceptions of online discussions. As with any environmental setting, students should feel less anxiety and stress if they are already familiar with an essential component of the learning environment.

Table 1

Construct Representation by Survey Item

Construct	Item
Perceptions of Motivation and Enjoyment	5. Through participating in online discussion, I was motivated to learn more.
	7. I disliked online discussion.
	8. I enjoyed online discussion.
	9. Through discussing with my peers online, I became more interested in the subject.
	10. Online discussion wasted too much time.
	13. Through online discussion, I was motivated to do my best work.
	18. In the online discussion environment, my learning interest was frustrated.
	19. In the online discussion environment, I enjoyed sharing my prior experience with peers to improve my learning quality.
Perceptions of Learning	1. By participating in online discussion, I learned a great deal from peers.
	2. Through online discussion, my ability to integrate facts was greatly improved.
	3. Through online discussion, my ability to develop generalizations was improved.
	4. I think online discussion was useless to my learning.
	6. My learning quality was improved by online collaborative learning with peers.

Table 2 (Continued)

Construct Representation by Survey Item

Construct	Item
Perceptions of Learning	11. Through online discussion with my classmates and teacher(s), I developed the ability to communicate clearly about the subject
	12. I think online discussion provided useful social interaction.
	14. I think online discussion was a great chance to share opinions among peers and instructor.
	15. I think most of my peers' comments were not very valuable.
	16. Through online discussion, I broadened my knowledge about the subject.
	20. Overall, online discussion decreased my learning quality.
Instructor Role	17. In the online discussion environment, the instructor(s) played a critical role to motivate effective discussions.

The four open-ended questions were designed to provide students with the opportunity to elaborate on any of the issues presented in the Likert-scale questions, and to furnish additional information about the course. The open-ended questions are:

1. What do you like best about the online discussions in the Discussion Board?
2. What do you think would improve participation in online discussions?
3. Why do you like/dislike online discussion? Please elaborate and provide examples when necessary.
4. Do you have any other comments that you would add which have not been covered on this survey?

Validity and Reliability

The instrument was chosen because the two index variables, "perceived motivation and enjoyment from online discussions," and "perceived learning from online discussions," were found to be highly reliable as indexes for this study. A confirmatory factor analysis indicated that the perceived motivation and enjoyment variable yielded a Cronbach's Alpha of 0.9006. The perceived learning variable yielded a Cronbach's Alpha of 0.9049. When administered as a part of the original study, both were correlated using Pearson's R with a value of .477 at the 0.01 level (2-tailed). The instrument was based on questions from the research on the virtual classroom by Dr. Starr Roxanne Hiltz who served as an expert judge in the validation of the instrument.

Because the instrument was used in an environment that uses Blackboard, not WebBoard or WebCT, the researcher engaged in focusing the questions by removing references to WebBoard and WebCT from the original survey. This act in no way shifted the meaning of the questions nor jeopardized the validity and reliability of the instrument.

Procedures/Data Collection

Data for this study were collected in a single phase once all surveys had been submitted online. Based on Johnsen and Christensen (2000), a recommended return rate of 50% plus one was necessary to analyze the data. In this case, at least 47 students needed to respond in order to analyze the data. The researcher anticipated a higher return rate than this given the students' ability to use technology, the caliber of students who would take online Advanced Placement Psychology, and their ease of access for completing the survey.

Course instructors and site facilitators received notice of the study approximately two weeks prior to when the invitation to participate was sent to students. This notification

described the role of the site facilitators to distribute and later collect parental consent and assent forms from students. It also detailed the role of the instructors to publicize the study via an announcement on the front page of their courses.

At the end of March 2007, students received an invitation to participate in the study through the *Messages* system, an internal, private communication function similar to email housed within their online course. In cooperation with LEARN NC and the researcher, course instructors were asked to post an announcement written by the researcher to the *Announcements* page of the course alerting students of this communication. The site facilitators received the letter of assent and the parental consent forms for students under 18 via email. These forms were printed and given to the students to return to the site facilitator who mailed them to the researcher in a postage-paid envelope previously provided by the researcher.

One week beyond the deadline for receiving consent forms, students received a message from the researcher containing a restricted URL and an access code for the study survey via the *Messages* feature (Dillman, 2000). The researcher had access to the courses to send this message to the students. The survey was created using Snap survey software (http://www.snapsurveys.com/) and housed on a secure server belonging to LEARN NC. The instructor of the course did not have access to the survey and could not see the messages sent to students. Students were able to submit the survey without completing all items. The software did not allow the students to take the survey more than once. Input validation was not programmed into the design of the software as per Dillman's "Tailored Design Method" for creating and deploying Internet surveys (Dillman, 2000). As such, students were able to skip a question if they did not feel comfortable answering it.

Students were allowed time to complete the survey on the day of deployment as per an agreement with LEARN NC, the course instructors, and the site facilitators. The researcher coordinated the optimal date of survey deployment with the course instructor to avoid conflicts with assessments or other critical class assignments. The survey required 5-12 minutes to complete. Average completion time according to the Snap Survey software was 7 minutes, though it should be noted that this figure may not accurately portray the actual amount of time spent on taking the survey, only the time measured from the initial login until the "submit" button had been clicked.

Data Analysis

In order to minimize variables that could affect study results, careful consideration was given to the identification of courses for this study. Three psychology courses were chosen to achieve an adequate sample size of N=92. Given that participants in this study accessed the Internet daily for their course, and were thereby accustomed to using technology to complete online assessments/surveys, a response rate at or near 100% was anticipated. Further, the caliber of student who enrolled in Advanced Placement courses would presumably be more likely to complete a survey which is described as improving the quality of the course.

Data from the survey were collected and compiled by the Snap survey software. Once all data had been collected, they were imported into SPSS software and QDA Miner software on the researcher's personal computer. Descriptive statistics were computed to report the basic findings while a correlation analysis was conducted to describe the underlying relationship among construct variables. Differences in perceptions based on gender and experience were analyzed using the Student's T-Test. Prominent themes found in

the open-ended questions were coded to determine frequency of occurrence. Reverse-coding was applied to the following items before calculating the construct variables:

4. I think online discussion was useless to my learning.
7. I disliked online discussion.
10. Online discussion wasted too much time.
15. I think most of my peers' comments were not very valuable.
18. In the online discussion environment, my learning interest was frustrated.
20. Overall, online discussion decreased my learning quality.

Quantitative Data

The following analyses were conducted on data from Part II of the survey, the 20-item Likert-scale questions:

1. Descriptive statistics were computed for the 20 Likert-scale questions: response rates, means, and standard deviations, per item.
2. Correlation Analysis (Pearson's R) was computed for the following variables at the 0.01 level (2-tailed):
    a. Perception of Learning from Online Discussion Index
    b. Perception of Motivation and Enjoyment Index
3. Student's T-test using the following grouping variables was computed:
    a. Gender
    b. Prior experience in online courses

Qualitative Data

The data from the 4 open-ended questions in Part III of the survey were analyzed to identify prominent themes in students' perceptions on the use of the discussion forum. These

data were used to further interpret the quantitative data and to suggest areas of future study. The qualitative software QDA Miner facilitated the development of code categories and codes for the creation of the codebook and the subsequent analysis of qualitative data.

Summary of Methodology

This chapter has described the procedures used in this study. The purpose of the study, research questions, rationale for design, role of the researcher, site selection, and participants were presented. The chapter continued with a discussion of the population and the rationale for choosing participants.

The survey instrument was described to understand its relevance to the study and a description of both the quantitative and qualitative analysis explained how they would be used in the examination of the data.

CHAPTER FOUR:

RESEARCH FINDINGS

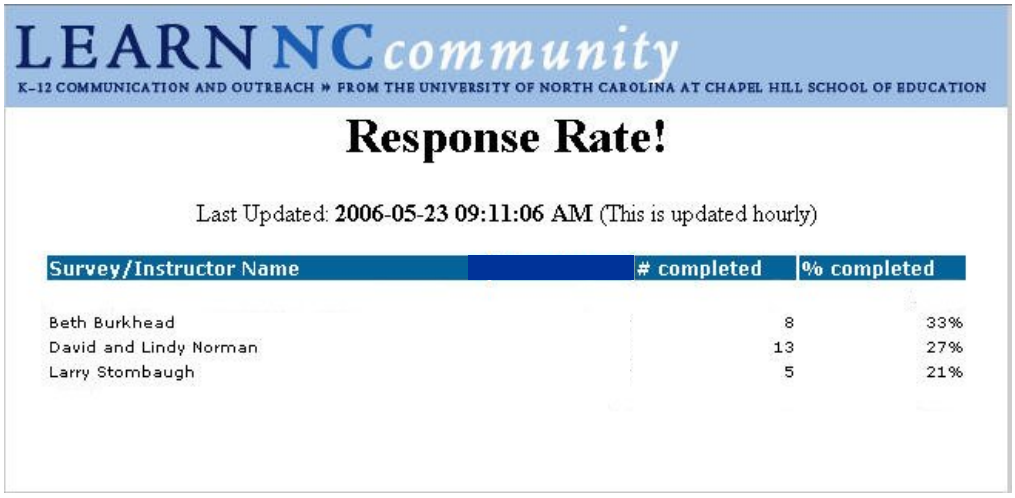
This chapter describes the results of the data analysis. The raw data were analyzed using SPSS statistical software and QDA Miner qualitative software. This chapter is organized into two major sections. The first section is a general reporting of the results, organized according to the three parts of the survey. General demographic data from Part I of the survey are reported first. Next, the results of the Part II Likert-scale questions and their associated statistical analysis as described in Chapter 3 are presented. Finally, the results of the qualitative analysis of the 4 open-ended questions from Part III are reported.

The second section of this chapter, *Data Analysis through the Community of Inquiry Model*, uses the conceptual framework of the study, the Community of Inquiry model, as a structure for organizing the findings presented in the first section. The findings of the quantitative and qualitative data are combined in an analysis that reinforces the roles of cognitive presence, social presence, and teaching presence. In addition, a fourth category, "Emotion," presents findings related to social presence which come directly from the survey questions on "motivation and enjoyment," but are not typically considered as a formal component of the Community of Inquiry model.

General Reporting of Results

Demographic Results

As described in Chapter 3, students in the three online sections of A.P. Psychology were invited to participate in the study by responding to the online survey. All students enrolled in one of the three Advanced Placement Psychology courses attended one of 26 North Carolina public schools. Data collection took place over a two-week period allowing students the opportunity to respond at a time that was most convenient and that would not interfere with their work. Following the invitation to participate and subsequent collection of consent and assent forms, 69 of the 92 students responded to the survey, yielding a survey response rate of 75%. Response rate was monitored daily during the deployment period to gauge the need for reminders to students to login to take the survey. Figure 2 illustrates a table that was automatically updated by the Snap software to display current response rates. This example shows the responses after Day 1 of survey deployment.


LEARN NC community

K-12 COMMUNICATION AND OUTREACH » FROM THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL SCHOOL OF EDUCATION

Response Rate!

Last Updated: **2006-05-23 09:11:06 AM** (This is updated hourly)

Survey/Instructor Name	# completed	% completed
Beth Burkhead	8	33%
David and Lindy Norman	13	27%
Larry Stombaugh	5	21%

Figure 2 Example Response Rate Report

The typical student completed the survey within the first week of deployment (72%). The average time spent taking the survey was seven minutes. There were no reports of technology glitches which may have interfered with successful completion of the survey. Every survey was completed with a 100% response rate for the demographic section (Part I) and a 100% response rate for the Likert-scale questions (Part II). Response rates for Part III varied according to question and are illustrated in Table 5.

Part I of the survey requested demographic information. Table 2 represents the characteristics of students who participated in this study. It includes survey items that were recorded as categorical data: nominal and ordinal data. The typical student participating in this research study was female (72%), white (54%), 18 years old (51%), and was enrolled in an online course for the first time (87%).

For the majority of these students, this course represented their first experience taking an online course. Specifically, 87% (n=60) had never taken an online course prior to this one, while 13% (n=9) had taken two or more courses including this one. This small subgroup impacted the ability to address the research questions related to experience which will be discussed in the section *Likert-scale Item Results.* Unfortunately, statistical analysis of the differences between students with prior experience in online courses and those who are enrolled in a course for the first time is not appropriate with the small subgroup of participants who have prior experience in online courses. A descriptive examination was possible and appears later in this chapter.

Table 2

Student Background Information

	Item Response		Statistics (Responses of students)		
Survey Item	n	Percentage	Response	n	Percentage
Age	69	100.00	15 years old	3	4.0
			16 years old	8	12.0
			17 years old	22	32.0
			18 years old	35	51.0
			19 years old	1	1.0
Ethnic Background	69	100.00	Black/African American	8	12.0
			Hispanic	5	7.0
			White	54	78.0
			Native American	0	0.0
			Asian/Asian American	2	3.0
Gender	69	100.00	Male	19	28.0
			Female	50	72.0
Courses taken including this one	69	100.00	One	60	87.0
			Two	7	10.0
			Three	2	3.0

Likert-scale Item Results

Part II of the survey included the 20-item Likert-scale questions. The questions represented the two constructs important to this study with one additional question related to the role of the instructor. Original questions appeared with a 5-point Likert scale ranging from "Strongly Disagree" to "Strongly Agree." Due to an oversight prior to the deployment of the survey, the survey was launched with the final two foils of the scale for each item

"Agree" and "Agree Strongly" appearing in reverse order. The order thus appeared to respondents as follows:

Disagree Strongly Disagree Don't Know Agree Strongly Agree

Once realized, it was too late to repost the survey to the online website since the survey had been launched with numerous surveys completed. Given that this order does not follow the traditional order of terms in a Likert scale, it can not be assumed that students noted the inconsistency. Therefore, the decision was made to collapse the scale from a 5-point scale to a 3-point scale at the end of the data collection. This procedure would account for differences in how students responded using this scale. In this way, a response marked as either "Agree Strongly" or "Agree" would impact the results of the survey in the same way and were collapsed into a response of "Agree." Similarly, responses marked with "Disagree Strongly" and "Disagree" were collapsed into a response of "Disagree." Those responses marked as "Don't Know" did not change their original designation. Neither the correlation statistic nor the data themselves were compromised as a result of this decision (McCall, 2001).

The data are reported here in two separate tables corresponding to the *Perceptions of Motivation and Enjoyment* construct and the *Perceptions of Learning* construct for ease of analysis and later discussion. The item related to the role of the instructor (Item 17) has been separated out since it was not used in either of the constructs. For all items, the response rate was 100% with n=69.

Table 3 displays the responses, frequencies, percentages, means, and standard deviations for the eight items which comprise the Perceptions of Motivation and Enjoyment construct. The majority of students were in agreement for five of the eight items.

Specifically, the majority indicated their enjoyment of online discussion with a strong disagreement for "I disliked online discussion," in item 7 (58%), and an agreement for "I enjoyed online discussion" in item 8 (57%). They disagreed that "Online discussion wasted too much time," in item 10 (65%). Their interest in learning was not "frustrated" as indicated in item 18 (57%), and they expressed enjoyment for sharing their ". . . prior experience[s] with peers to improve my learning quality," in item 19 (57%).

With respect to motivation, the results do not show as strong agreement as reported for items concerning enjoyment. Item 5 indicates 42% of students were ". . . motivated to learn more," while 35% disagreed, and 23% responded with "Don't Know." By contrast, 46% of students indicated that they were not ". . . motivated to do my best work" through online discussion (Item 13), while 38% indicated they were, and 16% responded with "Don't Know." They did, however, report in Item 9 an increased interest in subject matter through discussion with their peers with 48% in agreement, 33% who disagreed, and 19% who responded with "Don't Know."

Table 3

Perceptions of Motivation and Enjoyment

		Item Response		Statistics	
Survey Item	Response	n	Percentage	Mean	SD
5. Through participating in online discussion, I was motivated to learn more.	Disagree	24	34.8	2.07	.880
	Don't Know	16	23.2		
	Agree	29	42.0		
7. I disliked online discussion.	Disagree	40	58.0	1.70	.880
	Don't Know	10	14.5		
	Agree	19	27.5		

Table 3 (Continued)

Perceptions of Motivation and Enjoyment

		Item Response		Statistics	
Survey Item	Response	n	Percentage	Mean	SD
8. I enjoyed online discussion.	Disagree	19	27.5		
	Don't Know	11	15.9	2.29	.876
	Agree	39	56.5		
9. Through discussing with my peers online, I became more interested in the subject.	Disagree	23	33.3		
	Don't Know	13	18.8	2.14	.896
	Agree	33	47.8		
10. Online discussion wasted too much time.	Disagree	45	65.2		
	Don't Know	16	23.2	1.46	.698
	Agree	8	11.6		
13. Through online discussion, I was motivated to do my best work.	Disagree	32	46.4		
	Don't Know	11	15.9	1.91	.919
	Agree	26	37.7		
18. In the online discussion environment, my learning interest was frustrated.	Disagree	39	56.5		
	Don't Know	18	26.1	1.61	.771
	Agree	12	17.4		
19. In the online discussion environment, I enjoyed sharing my prior experience with peers to improve my learning quality.	Disagree	18	26.1		
	Don't Know	12	17.4	2.30	.863
	Agree	39	56.5		

Table 4 displays the responses, frequencies, percentages, means, and standard deviations for the 11 items which comprise the Perceptions of Learning construct. Similar to the results for the items comprising the Perceptions of Motivation and Enjoyment construct, the majority of students were in agreement for all of the items in the Perceptions of Learning construct with the exception of Item 1, ". . .learn[ing] a great deal from peers," (48% Agree, 10% Don't Know, and 42% Disagree), and item 6, improved learning quality by " . . .online collaborative learning with peers," (41% Agree, 17% Don't Know, and 42% Disagree).

Four items comprising the Perceptions of Learning construct dealt with how students engaged the content of the course. The majority responded that through online discussion, their ". . . ability to integrate facts was greatly improved" (52%) in item 2, their ". . . ability to develop generalizations was improved" (55%) in item 3, they ". . . developed the ability to communicate clearly about the subject" (55%) in item 11, and they ". . . broadened [their] knowledge about the subject" (62%) in item 16.

Two items from this construct targeted learning through the use of online discussion in the general sense. Here, students disagreed that ". . . online discussion was useless to my learning" (64%) in item 4, and they also disagreed that ". . . online discussion decreased my learning quality" (70%) in item 20.

The remaining three items that comprise this construct address interaction and sharing through online discussion. The majority of students agreed that ". . . online discussion provided useful social interaction" (55%) in item 12, and that ". . . online discussion was a great chance to share opinions among peers and instructor" (77%) in item 14, which reflects the strongest agreement among students on any particular item in this study. Students

disagreed with the statement that ". . . most of my peers' comments were not very valuable" (65%) in item 15.

Table 4

Perceptions of Learning

	Item Response			Statistics	
Survey Item	Response	n	Percentage	Mean	SD
1. By participating in online discussion, I learned a great deal from peers.	Disagree Don't Know Agree	29 7 33	42.0 10.1 47.8	2.06	.953
2. Through online discussion, my ability to integrate facts was greatly improved.	Disagree Don't Know Agree	20 13 36	29.0 18.8 52.2	2.23	.877
3. Through online discussion, my ability to develop generalizations was improved.	Disagree Don't Know Agree	14 17 38	20.3 24.6 55.1	2.35	.801
4. I think online discussion was useless to my learning.	Disagree Don't Know Agree	44 8 17	63.8 11.6 24.6	1.61	.861
6. My learning quality was improved by online collaborative learning with peers.	Disagree Don't Know Agree	29 12 28	42.0 17.4 40.6	1.99	.915
11. Through online discussion with my classmates and teacher(s), I developed the ability to communicate clearly about the subject.	Disagree Don't Know Agree	17 14 38	24.6 20.3 55.1	2.30	.845
12. I think online discussion provided useful social interaction.	Disagree Don't Know Agree	19 12 38	27.5 17.4 55.1	2.28	.873

Table 4 (Continued)

Perceptions of Learning

	Item Response			Statistics	
Survey Item	Response	n	Percentage	Mean	SD
14. I think online discussion was a great chance to share opinions among peers and instructor.	Disagree Don't Know Agree	7 9 53	10.1 13.0 76.8	2.67	.657
15. I think most of my peers' comments were not very valuable.	Disagree Don't Know Agree	45 13 11	65.2 18.8 15.9	1.51	.760
16. Through online discussion, I broadened my knowledge about the subject.	Disagree Don't Know Agree	16 10 43	23.2 14.5 62.3	2.39	.844
20. Overall, online discussion decreased my learning quality.	Disagree Don't Know Agree	48 10 11	69.6 14.5 15.9	1.46	.759

The original survey included a single item regarding the role of the instructor(s) ". . . to motivate effective discussions" (Item17). Though not a part of either of the two major constructs used in this study, the decision was made to retain this item for this study since it directly relates to the conceptual framework of the study (Teaching Presence) and because it might offer some basis for future study. The greatest number of students (48%) disagreed with the statement that ". . . [their] instructor(s) played a critical role to motivate effective discussions" while 38% agreed, and 15% indicated "Don't Know." The results of this question are displayed in Table 5.

Table 5

Role of the Instructor

	Item Response			Statistics	
Survey Item	Response	n	Percentage	Mean	SD
17. In the online discussion environment, the instructor(s) played a critical role to motivate effective discussions.	Disagree	33	47.8		
	Don't Know	10	14.5	1.90	.926
	Agree	26	37.7		

SPSS was used to compute a new variable based on the index of items forming the construct Perceptions of Motivation and Enjoyment (MotEnjoy) and a second variable based on the index of items forming the construct Perceptions of Learning (Learning). Each variable was computed as the mean of the items comprising that construct. A correlation analysis, Pearson's R, was computed on the two variables, yielding a highly significant correlation of $p = .804$ at the 0.01 level (2-tailed).

Given the small number of students who have prior experience in online courses in this study (n=9), statistical analysis of the data using a T-test was not appropriate for this subgroup. The findings can not be generalized to the greater population. A description of the findings is discussed here and in Chapter 5. The relevant research questions are:

1. Is there a significant difference between students who have taken online courses and those who have not in terms of their perceptions of motivation and enjoyment from online discussions?

2. Is there a significant difference between students who have taken online courses and those who have not in terms of their perceptions of learning from online discussions?

Though these findings could not be reported with statistical significance, a side-by-side comparison of the means did show a slightly higher mean for each construct for students with prior experience. The mean score on the Perceptions of Motivation and Enjoyment variable was 2.56 for experienced users versus 2.20 for novices. The mean score on the Perception of Learning variable was 2.49 for experienced users and 2.30 for novices. A T-test did not result in a significant difference between the two groups. A lower mean from the subgroup of experienced students may have warranted further study; however, statistical analysis would not be appropriate given this small sample size as stated. Further discussion of this limitation appears in Chapter 5.

Independent sample T-tests were also performed for each construct variable using gender in online courses as the grouping variable. There was no significant difference between males and females with respect to their Perceptions of Motivation and Enjoyment, with $t(49) = -1.708$, $p=.094$ at the 0.05 level (2-tailed). The mean score on the Perceptions of Motivation and Enjoyment variable was 2.09 for males and 2.31 for females yielding a mean difference of -.22. Similarly, there was no significant difference between males and females with respect to the Perceptions of Learning. The analysis resulted in $t(67) = .903$, $p = .370$ at the 0.05 level (2-tailed). The mean score on the Perceptions of Learning variable was 2.24 for males and 2.37 for females yielding a mean difference of -.13.

Open-ended Questions Results

Part III of the survey includes 4 open-ended questions. The data from these questions were analyzed using QDA Miner. The first three questions relate directly to topics surveyed in Part II, asking students to express their perspective on online discussions. The final question serves as a "catch-all" question, allowing students the opportunity to provide any additional information related to the course that they deemed important or useful. Students did take advantage of the opportunity to elaborate on their perceptions in this section as indicated in Table 6. Question 4 had a considerably lower response rate than all other questions with only 35% of the students (n=24) choosing to provide additional comments related to the survey. For this question, responses of "nothing" or "no" were not included in calculating the response rate.

Table 6

Response Rate to Open-ended Questions

	Item Response	
Survey Item	n	Percentage
1. What did you like best about online discussion in the Discussion Board?	68	99.0
2. What do you think would improve participation in online discussions?	65	94.0
3. Why do you like/dislike online discussion? Please elaborate and provide examples when necessary.	67	97.0
4. Do you have any other comments that you would add which have not been covered on this survey?	24	35.0

Development of the code book followed a conventional content analysis approach (Hsieh & Shannon, 2005). An initial review of the data collected from Part III was necessary to formulate the codes which later comprised the code book used in the qualitative analysis.

Codes were first identified based on repeated themes. Once all possible codes were identified, clear code categories emerged. These categories aligned with the conceptual framework of the study and were not generated to forcibly support it. Categories include Cognitive codes which identify references to cognitive presence in the learning community, Social codes for the identification of references to social presence of all participants, including the instructor, and Teaching codes to identify references to teaching presence in the discussions. Five cognitive codes identified student comments related to their learning via discussions. Four social codes were used for tagging comments related to student-to-student or student-to-teacher interactions. Three teaching codes identified comments on the instruction and participation of the instructor in discussions.

During the initial development of the codebook, a fourth category, Environment, was created, but later collapsed into the existing categories. The environment category consisted of only two codes: Technical issues and Comfort. The technical issues code was dropped since there were so few comments by students regarding problems with the use of technology. Moreover, those comments were about technical issues outside of the course environment and not directly related to online discussions. The comfort code was merged into the social code category since these comments were more strongly related to the quality of interactions within the course as opposed to physical aspects of the course environment. The initial review of the data also revealed a significant number of comments reflecting students' feelings about online discussions. Since these comments did not fit into any of the existing categories, a new category, Emotion, was created. The emotion category represents four codes used for coding examples of students' likes and dislikes about online discussion, primarily Question 1 and Question 3.

The data were then coded with the codebook during the second review of student responses. A third review was conducted to preclude overlapping of codes, sharpen coding procedure, and rectify improperly used coding. A fourth and final review of the data resulted in the codebook which appears in Table 7. Codes are organized in this table according to the code categories they represent.

Table 7

Study Codebook

Category	Code	Code Description
Cognitive	Clarifying Content	Refining understanding and providing insight into content
	New Ideas	Contributes to thinking about ideas and content in a new or different way
	Not Helpful	Does not contribute to comprehension
	Prompted Thinking	Thought-provoking
	Understanding	Contributes to understanding course content
Emotion	Dislike	Expression of disdain for some aspect of discussion
	Enjoyable	Expressions of enjoyment
	More Discussion	Desire for or need for more discussion
	Motivation	Expression of the role of motivation in online discussions
Social	Freedom	Ability to learn at your own pace and to participate at any time
	Interaction	Interaction among participants

Table 7 (Continued)

Study Codebook

Social	Comfort	Comfortable and safe sharing thoughts, opinions, and ideas without fear of embarrassment or ridicule
	Sharing Perspectives	Ability to share perspectives
Teaching	Feedback	Feedback from instructor and classmates
	Involvement	Instructor participation in discussions
	Requirement	Instructor requirements for participation and suggestions for requirements to improve participation in discussions

Using the codebook, 274 code occurrences were identified for Part III using the 16 codes from the codebook. An "occurrence" refers to a labeling of data using a particular code. Here, the occurrences of codes are reported versus the number of cases associated with each code to offer an overview of the frequency with which each code was used. The distribution of coding occurrences is as follows: 39% of occurrences came from Question 1 (n=107), 34% from Question 2 (n=93), 22% from Question 3 (n=61), and 5% from Question 4 (n=13). This distribution parallels the decreasing student response rate to these questions as seen in Table 6. An analysis of the frequency of code occurrences across categories reveals a predominance of social codes. The social code category represented 37% of code occurrence (n=100) across the four questions. The frequency of occurrence of remaining code categories was almost even with emotion codes accounting for 22% of code occurrence (n=61), cognitive codes at 21% of code occurrence (n=58), and teaching codes at 20% of

code occurrence (n=55). Social codes accounted for the largest number of occurrences in both Question 1 (54%, n=58) and Question 3 (39%, n=36). These questions target students' likes and dislikes of discussions, in particular what they liked best about discussions in the discussion board and why they liked or disliked online discussion. By contrast, teaching codes constituted the largest category for Question 2 (54%, n=33) and Question 4 (38%, n=5). Here, the similarities between the two questions do not appear to be as significant.

Sharing perspectives, a code from the social category, was coded most frequently in Part III with 52 occurrences of the code. More than half of the students (57%, n=39) made reference to the value of sharing of opinions and perspectives through online discussions. In terms of the most frequently used codes from the remaining categories, the code "Requirement" from the teaching category represented 35% (n=24) of student remarks about teaching presence; the code "Enjoyable" from the emotion category represented 29% (n=20) of student remarks pertaining to their enjoyment of discussion; and the code "Understanding" from the cognitive category represented 20% (n=14) of student remarks pertaining to comprehension.

Data analysis through the Community of Inquiry model

The data from the first section of this chapter are more easily understood when analyzed using the Community of Inquiry model as a guide. The basis for using this model as a tool for analysis comes from studies which indicate a sense of community is significantly associated with: motivation to participate (R LaRose & P Whitten, 2000; Wu & Hiltz, 2004), enjoyment (Gunawardena & Zittle, 1997; Jones, 1998) and perceived learning (Rovai, 2002; Shea, 2006), the essential constructs which comprise the study survey instrument. Further, student perceptions are important not only to the understanding of this

community, but on a macro level, to the dynamics of the teaching-learning exchange. Moore (1989) defines this exchange as learner-content interactions, learner-learner interactions, and learner-teacher interactions. These interactions are reflected in the Community of Inquiry model through cognitive presence, social presence, and teaching presence respectively, which frame the analysis of both quantitative and qualitative data.

Since some of the survey items elicit responses which cross categories within the Community of Inquiry model, those items will appear more than once as a part of the discussion, though with a different frame of reference each time. For example, Item 1, "By participating in online discussion, I learned a great deal from peers," includes elements of both cognitive presence and social presence, both of which support discourse within the model. Survey items which pertain to setting climate will appear in both discussions of social presence and teaching presence. Those items dealing with course content will likewise appear in discussions of teaching presence and cognitive presence. Twelve of the 20 survey items will be discussed in this section.

Cognitive Presence

Nine of the items from Part II of the survey furnish data related to the cognitive presence component of the conceptual framework. The data from these items and two additional items were used to calculate the Perception of Learning variable. A closer look shows that these items highlight the role of collaborative learning (Items 1, 6, 11, & 15), information processing (Items 2, 3, & 16), and understanding (Items 4 & 20). These categories reflect the essence of cognitive presence which is concerned with processing the information through collaboration to arrive at understanding of the content. Likewise, the cognitive codes representing major themes in Part III (clarifying content, new ideas, not

helpful, prompted thinking, and understanding) support the cycle of learning which constitutes cognitive presence: a triggering event, which leads to the exploration of information, followed by the integration of new ideas, and culminating in a resolution or application of new ideas (D. Randy Garrison et al., 2000). Cognitive codes were used 58 times to identify student remarks related to collaborating with their peers to learn the content of the course. They accounted for 21% of the total remarks coded. Eighty-five percent of the cognitive codes (n=58) used to identify comments related to cognitive presence were contributed by females. Though females represent 87% of this sample, it is interesting to note that males did not contribute more in this area.

Student responses to questions about learning through collaboration with their peers resulted in an almost equal division of opinion. In response to, "By participating in online discussion, I learned a great deal from peers," 48% agreed while 42% disagreed. Similarly, 41% agreed that, "My learning quality was improved by online collaborative learning with peers," while 42% disagreed. Several responses indicated a change in understanding like, ". . . sometimes I felt differently about a subject after seeing someone's alternate view of the topic," or a deepening of understanding as seen in the comment, ". . . .[they] gave me more insight on the subject." Those who felt differently offered perspectives like, "It spawned no insightful discussion among my peers and I feel that it was useless in gaining any knowledge on psychology." By contrast, 65% disagreed with the statement, "I think most of my peers' comments were not very valuable," offering responses like, "It helped me understand more" referring to the collaborative nature of the discussions. More than half of the students (55%) did agree that, "Through online discussions with my classmates and teacher(s), I developed the ability to communicate clearly about the subject." To that end, one student replied, "The

thing I liked best about online discussions were the replies of my peers. They helped improve my responses. . .”

Despite the mixed opinions about the role of their peers per se in helping them to learn, there was greater agreement on the ability of online discussions to help students process or integrate information. For example, 52% agreed that, “Through online discussion, my ability to integrate facts was greatly improved,” and 55% agreed that, “Through online discussion, my ability to develop generalizations was improved.” They offered comments like, “It sometimes could make difficult subjects more interesting and easier to understand” and, “. . . we were able to see different views and ideas on what we were studying and also gain what was to me valuable knowledge on the subject.” Along the same lines, 62% felt that, “Through online discussion, I broadened my knowledge about the subject.” Student remarks included, “. . . I was able to learn the subject better . . .,” and, “Sometimes I felt differently about a subject after seeing someone’s alternate view of the topic.”

The culmination of the cycle of learning that constitutes cognitive presence in any course is the understanding and use of knowledge acquired through collaboration. In this study, more than half of the students agreed that online discussion was useful to their learning. They disagreed with the items, “I think online discussion was useless to my learning,” where 64% disagreed, and “Overall, online discussion decreased my learning quality,” where 70% disagreed. Several students offered specific examples of the value of discussions in terms of using what they had learned with comments like, “I like online discussions because I got to learn more about the subject and made it more interesting as well as preparing me for the test.” They also recognized the value of discussions beyond the course with comments like:

> I beleive [*sic*] that online discussions gives you examples from other's experiences that when you are taking the exam or AP, it was easy to recall this [*sic*] examples that related to often a complex subject of psychology to understand. Online discussions gave me the opportunity to see just how other people my age reason.

From the perspective of cognitive presence, there is some indication that students do learn from online discussions. Though there is a mixed opinion about their peers' contributions to understanding the content, it is perhaps the engagement with peers and instructor through discussions that appears to be valuable in terms of processing information and understanding information. Ultimately, the value of online discussions to the individual comes through observations like this one: "I liked them because I was able to use my knowledge for something other than the test."

The survey items discussed here constitute 9 of the 11 items that make up the Perception of Learning construct. As noted earlier, there was no significant difference between males and females on their perceptions of learning according to the T-test comparing their scores for this variable. Interestingly, females contributed thirty-nine of the comments related to cognitive presence whereas males contributed six, although females do account for 72% of the sample. Since the issue of gender relates directly to two of the research questions, it will be treated in more detail in Chapter 5.

Social Presence

Online courses are great environments for both individual learning as well as group learning activities. The same is true for traditional face-to-face courses. The difference is that both types of learning are not as easily accomplished in the online environment. Online learners and instructors must use different methods of making their presence known to other

members of the class. Social presence is based upon social presence theory (Short, Williams, & Christie, 1976) which holds that the social effects of the medium, in this case the discussion forum, are caused by the degree of social presence afforded to its users. It is important to note, however, that social presence in the Community of Inquiry model is not limited to the effects of the medium, but rather is moderated by the effects of teaching presence as discussed later in this chapter.

To better understand the social effects from the discussion forum, this section discusses six of the survey items which have some bearing on social presence. The data from these items were also used in the calculation of the Perception of Learning variable. Among the items discussed in this section, four of them (Items 1, 6, 11 & 15) were also discussed with regards to cognitive presence. Here, these items are used to frame student comments relative to social presence. In the context of social presence, five items (Items 1, 6, 11, 12 & 15) frame the discussion of comments related to cohesion of the learning community. One additional item, Item 14, is also related to social presence and is discussed with respect to open communication in online discussions.

Students seem to have more to say about the social aspect of online discussions than any other aspect of online discussions. Social codes were created to identify major themes reflecting social presence: Sharing perspectives, Interaction, Comfort, and Freedom. In an optimal learning environment, students must feel comfortable participating in the discussion forum, sharing their thoughts and ideas freely without fear of reprimand or ridicule. Social codes used to identify student comments in Part III represented the largest percentage of code occurrences of all codes at 37% (n=100), almost twice that of each of the three other coding categories. By contrast, cognitive codes (21%, n=58), emotion codes (22%, n=61), and

teaching codes (20%, n=55) were used with a lower frequency for identifying important themes. Eighty percent (n=80) of the 100 social codes identified comments from female students which suggests a greater value on socialization in the learning process for females versus males in this study.

According to Garrison et al. (2000), group cohesion can be described as ". . .focused collaborative communication that builds participation and empathy." In order for critical inquiry or deep discourse to occur, participants must see themselves not only as individual learners, but as a part of a group. They must appreciate their individual responsibility to contribute to the discussion as well as the responsibility of their peers to contribute, thus sustaining a cohesive community. As indicated in the discussion on cognitive presence, students in this study were almost evenly divided in their views on learning through collaboration with their peers. Item 1, "By participating in online discussion, I learned a great deal from peers," and Item 6, "My learning quality was improved by online collaborative learning with peers," gave students the opportunity to comment on both their learning as a result of peer collaboration and the use of collaboration itself. Through the lens of social presence, the focus here is on the cohesion of the group achieved through interaction. This distinction becomes clear when examining student comments from Part III of the survey. Students realized their ability to share in the learning process as well as the potential of their peers to contribute to their own learning through sharing. Comments like "I liked being able to share my own thoughts about a subject as well as seeing how other people thought. Sometimes if I didn't understand the subject the online discussion would clear it up," represent an understanding of the value of participating in group discussions. Another student further validated the participation of everyone by saying "These discussions also

provide insight from everyone in the class, thus making it easier to comprehend the subject matter because of the varying points of view." Conversely, all students did not perceive the same benefit from group activities as indicated by:

> I liked this class but I do not feel like I learned as much as I would have if it had been in a normal classroom setting. I think there needs to be more interactive activities and more feedback from the teachers. I feel like I had to teach myself everything.

Additional evidence of group cohesion supports the majority of students who agreed with Item 11, "Through online discussion with my classmates and teacher(s), I developed the ability to communicate clearly about the subject," and with Item 15, "I think most of my peers' comments were not very valuable." Here again the value of sharing opinions and insights into subject matter was reinforced with comments like, "The online discussion gives us time to reflect easily on others' opinions, and generate our own the way we want it to come out." Comments like this one recognize peer contributions toward personal opinion-forming. They also draw attention to the nature of the discussion environment to do so without pressure to respond within a certain period of time. For students like this one, willingness to participate in the group might likely be facilitated by the structure of the discussion forum. How readily would this student participate in a face-to-face setting where responses to classmate's opinions require immediate action? Given the tendency of some adolescents to withhold their opinions from the group for fear of embarrassment, it is not often a student would say of the traditional classroom, "I like [online] discussions because it shows what I know and what other people know. This can be usefule [*sic*] so other

classmates can collaborate and help each other learn by correcting mistakes or misinterpretations about a particular subject."

The majority of students, 55%, agreed with Item 12, "I think online discussion provided useful social interaction," while 28% disagreed. Student comments drew attention to the fact that their classmates were geographically located around the state, so online discussion was necessary in order to "get together" as one student described it. Another student remarked, "Online discussions, when done, made for great opportunity to interact with my fellow classmates and really feel a part of a 'class'." That feeling or group cohesion was mentioned by other students who observed that, ". . . while discussions are supposed to help discuss learning topics, I think they should also be utilized more for students to get to know each other."

Open communication is another indicator of social presence in a community of inquiry. Item 14, "I think online discussion was a great chance to share opinions among peers and instructor," relates to this indicator by providing evidence of risk-free expression. This item demonstrated the greatest percentage of agreement of all 20 items in Part II with 77% (n=53) in agreement and only 10% (n=7) who disagreed. In addition to previous comments related to sharing in online discussions, several students commented not only on their willingness to share, but to do so in a non-threatening environment. For example, one student observed, ". . . students could express their own ideas and opinions on subject matter almost freely, something you can't usually do too often in the classroom." This relates strongly to the group cohesion aspect of social presences discussed earlier whereby the learning community is sustained through the open exchange of ideas and information. Students were explicit about the value of open communication as seen in statements like,

"You could say whatever you wanted and didn't feel imbarrassed [*sic*] about it because you had to say in front of a whole class," and, "I liked that i [*sic*] was able to voice my opinion in a non-threatening environment." Contributing to their willingness to share openly, some students also noted the ability of the online discussion to allow for communication in the absence of "seeing" physical traits which can sometimes impede or preclude open and unbiased communication. This perception is clearly seen in the comment, "We could not be biased about looks or race or social class. We could freely share our most introverted opinions without the fear of disapproving looks and isolation." Some students did indicate that the physical contact or presence of others was important to their learning, though one student suggested that this discomfort, ". . . was only weird for me because this was my first year, but after a year I guess I would get used to the discussion format."

Like the survey items discussed in the cognitive presence section, the two additional items discussed in this section were also used in the calculation of the Perceptions of Learning variable which will be discussed in Chapter 5.

Teaching Presence

The third component of the Community of Inquiry, Teaching Presence, moderates the dynamics between cognitive presence and social presence. It is responsible for not only setting the climate, a factor of social presence, but also for the selection, organization, and implementation of content and artifacts of cognitive presence. Though most often associated with the instructor, teaching presence can be cultivated through actions of any member of the learning community. This study reflects the predominant paradigm for teaching presence online where the instructor is for the most part responsible for this component of the Community of Inquiry. Without logging into the course, the data reflect that the instructors

actualization of three primary indicators in this course (D. Randy Garrison et al., 2000): instructional management of the course, i.e., instructional design, content selection, and use of the medium; direct instruction or teaching, where the instructor offers feedback and monitors student participation in the course to ensure the development of the learning community; and building understanding or facilitating group cohesion.

This section calls upon two previously discussed survey items: Item 11, "Through online discussions with my classmates and teacher(s), I developed the ability to communicate clearly about the subject," and Item 14, "I think online discussion was a great chance to share opinions among peers and instructor." Note that Item 11 has been used to discuss all three components of the Community of Inquiry given its relevance to all three. This section also includes Item 17, "In the online environment, the instructor(s) played a critical role to motivate effective discussions." This item was not used in the calculation of either the Perception of Learning variable nor the Perception of Motivation and Enjoyment variable. As mentioned earlier, it is included to provide some insight into the role of the instructor, not for the purposes of statistical analysis.

Both Item 11 and Item 14 allude to the instructor's role and the students' role in the instructional management of online discussions. Some remarks focused on student requirements for participation. One student noted, "I think make [*sic*] us reply to each others comments was a good idea." The same perception was not shared by others who thought that required postings were not necessary with comments like, "I think the number of responses should not be required. I think as long as you have at least one quality response then it should be sufficient." Another student elaborated here by saying, "Many times I felt our discussions were simply disagreeing with each other – I did not find that very helpful." A

few students offered suggestions to make better use of discussions with comments like, "I think that the further we learn into the course, the more our opinions may change, which I think would do us good if we went back to comment again on our previous mindsets."

Numerous comments reflected the instructor's role in the direct instruction indicator of teaching presence. Students observed that the instructor's feedback and participation in online discussions was valuable to learning. According to one student, "It [allowed] me to see how my teacher responded to my post and opinion." The instructor's ability to validate understanding through feedback in online discussions is evidenced by the comment, "I like the online discussion because of the interaction with the instructor. Whenever an instructor would reply to my original posts or responses I really feel like I learned the most."

Not to be forgotten, students also play a role in direct instruction. Peer learners have the capacity to contribute their perspectives in a manner akin to that of the instructor. One student recognized this through the comment, "I like that online discussions allowed you to get feedback on your thoughts from both people your age and those who have a little more knowledge in your subject area." More pointedly, students benefited from special student forums designed to make it easier for students to teach one another using "peer talk," the conversational style and ability shared by peers to make content comprehensible also found in the traditional classroom setting. A clear example can be seen in the comment, ". . . [our instructor] had set up a 'Student Questions' forum where we could post questions we had and get quicker feedback from fellow peers that may have the answers, but we also got answers in there from [our instructor] as well."

Only one survey item solicited student perceptions specifically related to the instructor(s). Almost half of the students, 48% (n=33), agreed with Item 17, "In the online

environment, the instructor(s) played a critical role to motivate effective discussions," while 38% (n=26) did not agree with this statement. It is important to remember that this item was not included in the statistical calculations of either the Perceptions of Learning variable or the Perceptions of Motivation and Enjoyment variable. Bearing in mind that students had different instructors, including these results in the calculation of either variable would not be statistically valid. Though using the same course design, with the same discussion questions and same amount of teacher preparation both in teaching online and offline, it is possible that different instructors would significantly bias student responses to this question. This might also explain the mixed results for this question.

Responses relative to this question illustrate how the instructor builds understanding in online courses. This activity is different than the cognitive code "understanding" which relates more toward student understanding and knowledge construction. With respect to teaching presence, "building understanding" applies to the instructor's actions to moderate discussions and to be "present" for students. Student comments included marks of praise for their instructors like, "The teacher was the best. He took care of everything in a timely fashion and answered every minute question with promptness and thoroughness. He kept the students in mind as individuals and gave great feedback on assignments." In contrast, one student said, "I feel that the instructor(s) did not play a big role in the discussion. They merely asked a question or gave us a discussion to take on and the students took it from there."

To improve the quality of discussions, students suggested the need for more involvement from the instructor(s). Echoing the earlier remarks of another student who felt challenged to participate in this new environment, one student suggested, "I think teachers

should be more involved with discussions so that it is more similar to a classroom environment." In addition to instructor comments in the discussion board, one student offered suggestions for more instructor involvement, ". . . such as more help and an instant messaging program, rather than the e-mail method."

Data Analysis through Perceptions of Motivation and Enjoyment

Emotion in online discussions plays a major role in this study. Though not a formal component of the Community of Inquiry model, Garrison et al. (2000) discuss emotional expression as an indicator of social presence. They note that, "Emotions are inseparably linked to task motivation and persistence, and therefore, to critical inquiry." Further, socio-emotional interactions have been shown to be important to achievement in online courses (D.R. Garrison, 1997; Gunawardena & Zittle, 1997). The major research question of this study looks at the relationships between motivation and enjoyment and learning with high school students in this environment. The data analysis of survey items that comprise the construct of Perceptions of Motivation and Enjoyment are thus described in this section in juxtaposition to the previous discussion of survey items that comprise the construct of Perceptions of Learning as seen through the theoretical framework of the study.

Eight items from Part II (Items 5, 7, 8, 9, 10, 13, 18, & 19) of the study were used to compute the Perceptions of Motivation and Enjoyment variable and are discussed in this section. Four of these items relate to students' motivation as a result of participating in online discussion (Items 5,9,13, and 18) and the other four relate to students' enjoyment from participating in online discussions (Items 7,8, 10, & 19). A T-test found no significant difference between male and female students with respect to this variable. Further discussion of this finding appears in Chapter 5. Twenty-two percent of all codes used to identify major

themes (n=61) came from the Emotion category of codes. These codes reflect recurring themes from the date and include dislike, enjoyable, more discussion, and motivation. Reponses to questions about motivation offered mixed results as compared to those about enjoyment. According to one student, "I think that most kids need to be motivated more to do them." Item 18, "In the online discussion environment, my learning interest was frustrated," was the only one of these four survey items resulting in a majority agreement, with 57% (n=39) who disagreed with the statement and 17% (n=12) who agreed. Comments like, ". . . it was hard to understand what some people were trying to say without physical contact," may offer some insight into the majority response result here. A smaller percentage of students (48%, n=33) agreed with Item 9, "Through discussing with my peers online, I became more interested in the subject," while 33% (n=23) disagreed. Perhaps an increase in interest in the subject can be explained by comments like, "Knowing that everyone else will be reading what I post motivates me to do my absolute best in the discussions."

The remaining two items pertaining to motivation resulted in response differences of only five and six students between those who agreed and those who disagreed with the statement. Item 5, "Through participating in online discussion, I was motivated to learn more," and Item 13, "Through online discussion I was motivated to do my best work," resulted in a 42% (n=29) and a 46% (n=32) of students who agreed with each statement respectively. In this case, responses like, "I think we should be motivated to participate in these more often," allude to the need for more discussion. Is it possible that a limited amount of discussion overall in the online courses contributed to the mixed understandings about the ability of discussions to motivate students to participate and learn? Indeed, a major theme that surfaced from the data in Part III of the survey was the need for more discussion.

Several students mentioned the need for more online discussion as either a requirement or as a way of increasing social interaction. This statement indicates several issues pertaining to the need for more online discussion: ". . . doing more online discussion because it was a lot of fun as well as informative. In my class, we did not discuss very often, and though I learned a lot from the class, I think I could have gained more from more interactions with my classmates."

Two major themes emerged from Part III of the survey to support student responses related to enjoyment from online discussion: student displeasure (dislike) with online discussion and student comments expressing enjoyment (enjoyment) of online discussions. The majority of students were in agreement on all four of the questions related to enjoyment: Items 7, 8, 10, and 19. Items 7 and 8 were simply the converse of one another and resulted in almost identical responses. Item 7, "I disliked online discussion," had 58% (n=40) agreement among students and Item 8, "I enjoyed online discussion," had 56.5% (n=39) agreement among students. Both items resulted in the same number of students (28%, n=19) who responded to indicate they did not like online discussions. Data revealed that students not only found discussions informative, but also fun as in the comments, "It's a great source of learning and fun to the online course students," and "I liked reading some of the insane responses people would come up with. It was highly entertaining to read some of the more outrageous responses."

On the other hand, not everyone found online discussion as enjoyable. Comments reflect students' frustration with instructor requirements for posting to the discussion board, as mentioned earlier, and student dissatisfaction with fellow classmates who didn't take online discussions as seriously as they should. Examples of such include comments like, ". . .

some of my classmates would post stupid things that I got tired of looking at so I quit going to the online discussion board," and, "I disliked online discussion it wasted much of my time as most of us simply wrote things to satisfy the word count."

Despite comments like these, other students did see value in online discussions beyond satisfying instructor requirements. More than half of the students, 57% (n=39), agreed and 26% (n=18) disagreed with Item 19: "In the online discussion environment, I enjoyed sharing my prior experience with peers to improve my learning quality." Students' comments conveyed an appreciation for sharing personal experiences with one another as they worked together to learn the content. One student wrote, "I liked that we were able to share past experiences and relate that to a topic in psychology." For students like these, discussions were not a waste of time, hence the 65% (n=45) who disagreed and 12% (n=8) who agreed with Item 10, "Online discussion wasted too much time."

Summary of Research Findings

This chapter presented the results and analysis of the data from the 69 participants in this study. The response rates for Part I of the survey and for Part II were 100% each. Response rates for the first three questions in Part III, the open-ended questions, were greater than 94% for each item. The final item was an opportunity for students to share any additional thoughts and yielded a response rate of 35%. Survey data were reported in the first part of the chapter followed by an analysis of the data using the theoretical framework for this study, the Community of Inquiry model (D. Randy Garrison et al., 2000). Descriptive statistics including the responses, frequencies, percentage, means, and standard deviations were used to present data from Part II of the survey. These data were organized according to the major constructs of the survey: Perceptions of Motivation and Enjoyment

and Perceptions of Learning, with a separate section devoted to the single item specifically related to the instructor. Variables representing each construct were computed from the means of the Part II Likert-scale items associated with each construct. A Pearson correlation of these construct variables resulted in a strong correlation $p = .804$ at the 0.01 level (2-tailed) between student Perceptions of Motivation and Enjoyment and student perceptions of learning, supporting the major research question.

Statistical analysis was not appropriate for the exploration of differences in perception between students with prior online experience and those enrolled in their first online course due to the small size of the subgroup of students with prior experience. A descriptive analysis was used to report these findings. Statistical analyses of significance were performed to confirm no significant difference between perceptions of motivation and enjoyment and perceptions of learning by male and female students.

A conventional content analysis approach (Hsieh & Shannon, 2005) was used to create a coding scheme for the open-ended questions of Part III. Code categories developed in alignment with the theoretical framework and included cognitive codes, social codes, teaching codes, and emotion codes. The coding scheme came from the data, not the theoretical framework. The resulting codebook made it easy to better understand the major themes from the data and to use qualitative data to support the quantitative data from Part II.

Student responses indicated that they enjoyed the interactions in online discussions with their peers and their instructor. Findings indicated that 77% of students agree that online discussion is a great chance to share opinions among peers and instructor. Their reactions to questions about the ability of discussions to motivate them did not show as strong agreement. With respect to learning in online discussions, the majority of students indicated value in the

ability of online discussion to facilitate their learning; however, there was no strong agreement regarding the potential to learn from their peers in online discussions. Findings indicated that 70% of students did not see online discussions as decreasing the quality of learning they experienced. Among their responses, the majority agreed that not only did online discussions provide useful social interaction, online discussions are also ". . . a great chance to share opinions among peers and instructor."

Student reactions were mixed regarding the role of the instructor to motivate effective discussions. Data from the open-ended questions offered insight into their reactions with suggestions for more instructor involvement and feedback as well as more discussions, but with the caution that they be thoughtfully crafted and monitored by the instructor.

The following chapter, Discussion, interprets the results presented here and offers suggestions for future research and future practice. The chapter returns to the original research questions as a point of focus for discussing the ramifications of this study with respect to the research literature. The implications of the study for both researchers and practitioners include suggestions for broadening the understanding of online discussions in K-12 education.

CHAPTER FIVE:

DISCUSSION

This chapter interprets the results and discusses implications for this descriptive, non-experimental study (Gall et al., 1996). The discussion returns to the research questions. The section is organized by the topics of prior experience, gender, and the relationship between motivation and enjoyment and learning. For each question, conclusions are drawn based on study results. Though the data from questions related to the instructor role were not used for any statistical analysis, a discussion of the instructor role is included. Outcomes of the study are related back to relevant past research. Relevant limitations of this study are then discussed in the context of the results. The chapter concludes with implications for future research and implications for future practice.

Individual perceptions inform future perceptions and behaviors of the learner in any educational setting. The fervor to implement online learning into the K-12 environment is not matched by commensurate research supporting the educational outcomes of our financial and human investments in this area. This study drew upon the perceptions of 69 North Carolina high school students enrolled in one of three online, Advanced Placement Psychology courses. The data represent a snapshot of their perceptions about learning online, specifically their perceptions of motivation and enjoyment and learning from one feature of online courses: online discussions. It is the hope of the researcher that these

results and discussion will be used by K-12 curriculum specialists, administrators, online instructors, and course developers who are considering or are already in the planning stages of course or program implementations of online courses in their setting. The Community of Inquiry model (D. Randy Garrison et al., 2000), which serves as the theoretical framework of the study, framed the analysis of the data. It reminds the educator that while similar in some ways, the online classroom and traditional classroom are quite different. As such, the perceptions of students in this study, through the lens of the Community of Inquiry model, illustrate the similarities, differences, and affordances of this relatively new learning environment. The resulting analysis is now discussed with respect to the research questions.

Study Conclusions

Prior Experience in Online Discussions

The sample of 69 students included only nine students who had previously taken online courses. This small number is likely explained by two factors: 1) A small sample size and, 2) the relative infancy of online courses in K-12 education. Of these nine students, seven students had previously taken two courses, including this one. The remaining two students from this subgroup had taken three courses, including this one. As stated in Chapter 4, statistical analysis using this subgroup would not be appropriate given the small size of the subgroup. Discussion here focuses on description of the results and relationship to related literature. The relevant research questions are:

> Research Question 1**:** Is there a significant difference between students who have taken online courses and those who have not in terms of their perceptions of motivation and enjoyment from online discussions?

Research Question 2*:* Is there a significant difference between students who have taken online courses and those who have not in terms of their perceptions of learning from online discussions*?*

Comparison of the two means for both the Perception of Motivation and Enjoyment variable and Perception of Learning variable does show a slightly higher mean for students with prior experience in online courses. Returning to the research literature on this topic, while an analysis of the data involving students with prior experience was not statistically appropriate, a descriptive review of the data does support the earlier studies by Arbaugh (2001) and Vrasidas and McIsaac (1999) which indicated prior experience has some bearing on student satisfaction with online courses. The slight difference seen here should be viewed with caution given the increase in enrollments of K-12 students in online courses and the increased use of online learning in the K-12 environment. The numbers of students with prior experience will certainly increase as online courses become more prevalent in K-12 education with expansion into the middle school and elementary school levels. The concern with the role of prior experience with respect to satisfaction and learning will not disappear; it will be reshaped as more students have the opportunity to take more than one online course. The current assumption is that prior experience is a positive contributor to satisfaction and learning. The shift will mirror a phenomenon known to the traditional classroom: a poor experience or experiences in previous courses will make it more challenging for this student to thrive in a different online course where performance expectations, course design, and pedagogy may be markedly different. This phenomenon points toward the extremely vital role of the instructor, to be discussed later in this chapter.

Gender in Online Discussions

This study included 19 high school males and 50 high school females. Research has indicated that there has been an increase in the number of adolescent females who use both computers and the Internet relative to adolescent males. In the report, "Computer and Internet Use by Students in 2003," an analysis of census data from that year resulted in an equal number of K-12 males and females who reported using the Internet on a regular basis (DeBell & Chapman, 2006). The data from that report did not reference online courses specifically. More recently, one of the oldest providers of online, asynchronous courses in the United States, the Virtual High School based in Maynard, Massachusetts, lists as current enrollment 57% females and 43% males across 30 sites ("VHS Member Profile," 2007). Increased use of computers, of the Internet, and increasing enrollments in online courses by adolescent females represents a shift away from what began as a male-dominated frontier. Not surprisingly, the male dominance of discussion forums in computer-mediated communication, as mentioned in Review of the Literature, does not appear to apply to this study (Kramarae & Taylor, 1993; Spender, 1995). The relevant research questions are:

> Research Question 3: Is there a significant difference between male and female students in perceptions of motivation and enjoyment from online discussions?
>
> Research Question 4: Is there a significant difference between male and female students in perceptions of learning from online discussions?

These findings represent some of the first data reported about high school students in online courses. Unlike the other studies and reports on high school students in online courses,

the data from this sample zoom into the course discussion area providing a more focused view of the dynamics and experiences of the learners. The data do not support the belief that females would indicate more enjoyment and learning than their male counterparts from text-based communication like online discussion. Previous studies like Blum's (1999) characterize adolescent females as more likely to keep journals or diaries, more interested in sharing their opinions and feelings, and as deriving more enjoyment from social interaction with their classmates. Characterizations of female learners like this one serve to fuel the "women's ways of knowing" paradigm which suggests special attention be given to how females use technology (Zuga, 1999). These ideas are no longer supported by the behaviors of digital natives in online environments. The participants in this study included male students who, like their female peers, are a part of a culture that commonly shares their thoughts and opinions through social software like blogs. Blogs or "Weblogs" are online, electronic journals that make it easy for anyone to freely and easily share their thoughts with the entire world. Knowing the popularity of such software, it was interesting to find a predominance of female comments (80%) related to social interaction as stated in Chapter 4. This finding supports Richardson and Swan's (2003) study where females perceived more social presence than males, but it does not mean that female students perceive more enjoyment and motivation than their male counterparts.

As noted in the Review of the Literature, Presky (2001) would describe the students in this study as Digital Natives. As learners, they communicate regularly through text-messaging, synchronous online chatting, and cell phones – males and females alike. The technology involved in online discussions is neither a novelty nor innovation for motivating them. There was little mention in Part III of the survey of any technical issues which might

interfere with their participation. From the student perspective, the medium is not the message. Consequently, it can not be assumed that technology alone explains the responses of students in this study with respect to motivation, enjoyment, and learning. As mentioned in the Review of the Literature (Kramarae & Taylor, 1993; Spender, 1995), studies from the 1990's spoke of male dominated online discussions and male dominance in the general use of technology. Those studies were about digital immigrants, not digital natives. Those studies were about adult learners, not adolescents.

With respect to the construct of motivation and enjoyment, the finding of no significant difference between the perceptions of males and females mirrors studies like Arbaugh's (2000a) which found that male and female students feel they can participate equally. The majority of students in this study enjoyed online discussions and was motivated by participating in them. Both their ability to enjoy the experience and their motivation as such were enhanced by the absence of those individual traits like gender which can interfere with the experience as noted in the literature by Simonson et al (2000). This phenomenon manifested itself through student comments about their ability to speak freely without threat of embarrassment as in the example, "We could not be biased about looks or race or social class." This implication points to the capacity of online discussions to foster an optimal learning experience. Students in this study were unfettered by the typical concerns of the face-to-face classroom. They were able to interact with one another, to be as involved with the class as they so desired. This climate is what Csikszentmihalyi describes as "Flow" (Csikszentmihalyi, 1991). According to Flow theory, students feel in control of their fate, and by extension, a sense of enjoyment. He defines enjoyment as a "sense of accomplishment." The strong correlation between motivation and enjoyment and learning in

this study would suggest that students feel they have achieved something while enjoying the experience. Imagine reading the responses of students in this study minus any references to the class as being online. Are the student perceptions from this course representative of a typical classroom?

The finding of no significant difference between males and females with respect to perceptions of learning is not so surprising in light of the discussion of the same finding for perceptions of motivation and enjoyment. This finding is consistent with Arbaugh's study (2000a) from the literature which found no significant difference in learning between males and females. It is important to note again that Arbaugh's work and that of others studied adult learners, not adolescents. Nonetheless, the finding of no significant difference in this study is consistent with findings from the literature. Seen here, online discussions are a feature of online courses which facilitate student learning without fostering gender-bias. Since the majority of students (77 %) felt comfortable sharing as indicated by the survey item, "I think online discussion was a great chance to share opinions among peers and instructors," and since the learner's physical characteristics that might normally be barriers to learning are not visible as indicated earlier, the range and depth of contributions by classmates is likely greater than that of a traditional classroom. As such, the opportunity to engage the content of the course, to see various perspectives, is heightened. These perspectives include both those of males and females. And while the data indicated that students did not necessarily learn a great deal from their peers, it was concluded that the act of engagement with peers through online discussion contributes to their perceptions of learning.

The Relationship between Motivation and Enjoyment and Learning

The major focus of this study is the relationship between student perceptions of motivation and enjoyment and their perceptions of learning from online discussions. The correlation analysis between the two constructs resulted in a strong correlation of $p = .804$ at the 0.01 level (2-tailed). This finding provides empirical data to support the major research question, "What are the relationships between student perceptions of motivation and enjoyment and student perceptions of learning from online discussions?" It is consistent with the research literature by Shea et al. (2001) and Barab et al. (2001), who discovered a strong relationship between satisfaction, interaction and performance. Student comments like, "Knowing that everyone else will be reading what I post motivates me to do my absolute best," also support the research by Hiltz (1997), who found that students are more motivated to participate and complete assignments if they know others will be reading their work. Remembering that correlation does not imply causation, care should be taken in the interpretation of this finding to avoid the mistake of believing perceptions of learning from online discussions are "caused by" perceptions of motivation and enjoyment. The strong relationship between these two constructs makes a statement about the importance of the online discussion board feature. It does not mean that perceptions of motivation and enjoyment from online discussions alone can explain student success in an online course. In a setting where social presence is not so easily achieved, and where the instructor's role to moderate both social presence and cognitive presence is so critical, effective use of online discussions becomes an essential strategy for promoting student success. Knowing that these two constructs can be cultivated through online discussions, course instructors can more effectively manage the learning process through careful attention to the use of this course

feature. The absence of online discussions or the lack of attention to them can not only isolate students from their peers, but it can also significantly decrease the potential for interaction overall. Students in this study validated the importance of interaction with their peers in online discussions as seen in the predominance of social codes versus codes from other categories. One of the most compelling findings of the study was the strong agreement (77%) with the survey statement, "I think online discussions was [*sic*] a great chance to share opinions among peers and instructor." As Abrahamson noted (1998), the absence of discussion impacts students' drive to excel and to complete the course. Unlike adult learners who may be more self-directed in their learning, the adolescent learners in this study did not possess a wealth of life experiences to help them build understanding. They needed online discussions perhaps more than adults. The constructivist nature of the interaction through online discussions offered them two key elements essential to learning: the incentive through motivation and enjoyment, and the scaffolding through social, cognitive, and teaching.

It would be easy to believe that the students in this study came to the course with a high level of motivation to learn by looking at the demographic data from Part I of the survey. One might assume that these students were most likely juniors and seniors by looking at their age; college-bound, given their choice of Advanced Placement Psychology; and independent learners, given that they are taking the course online, and in some cases, as the only student in their school. Caution should be exercised on this point since the survey did not ask "why" they were taking the course. It is possible that they enrolled because it was an online course and they were intrigued by the ability to learn online. They may have enrolled because the course would be a nice addition to their college applications. It is also possible that they enrolled in the course because a teacher or guidance counselor made the

decision for them. Whatever their motivation for enrollment, it can not be assumed that their demographics alone would explain the strong relationship between perceptions of motivation and enjoyment and perceptions of learning in online discussions. Excluding the role of demographics from this discussion, and reading student comments from Part III of the survey, online discussion offered something for everyone. The value of online discussion can be heard through comments that range from those which speak to the enjoyment and social aspects of online discussions to those which speak of the learning potential from online discussions

Instructor Role

Student motivation and learning are significantly impacted by teacher immediacy behaviors in online discussions. The instructor's role was not formally considered in the research questions of this study. A discussion of the instructor role is included here because the Community of Inquiry model can not be adequately discussed without it. In this study, student reactions to their ". . . instructor(s) role to motivate discussions" were mixed with 48% (n=33) who agreed with this statement. Their responses in Part III resulted in the identification of three themes related to teaching presence and the instructor: feedback, involvement, and requirement. It is important to note that these themes reflect student perceptions of the instructor's role. Students acknowledged the value of instructor feedback and involvement in discussions. They also made mention of their dislike of certain instructor requirements for participating in discussions. Student perceptions also suggest more involvement in online discussions is needed from the instructor. Their comments align with the research in teacher immediacy behaviors online. They support research like Burge

(1994) who realized early in the history of online learning that discussion management and contribution are necessary instructor behaviors in effective online discussions.

Limitations of the Study

This study is limited by the lack of research in online learning at the K-12 level. Consequently, research from post-secondary education is used with caution so as not to generalize findings in adult settings (andragogy) to the K-12 setting (pedagogy). The limited number of students with prior experience in this study is commensurate with the four years that LEARN NC has offered online courses in North Carolina. In its first year of existence, the program served 68 students with six courses. At the time of this study, there were 1,600 students enrolled in 31 courses. According to the Director of Online Learning for LEARN NC, most students enrolled in online courses as juniors and seniors. In this study, most students were 17 years old (32%, n=22) or 18 years old (51%, n=35) with one student who was 19 years old. These numbers would indicate their status as high school juniors or seniors since grade-level status was not solicited via the survey. Using these numbers, 84% of the students in this study waited until their junior or senior year to take an online course. The small subgroup of students in this study with prior experience was partially explained by the current model of online course implementation in North Carolina K-12 education.

The demographics of the study, level of course difficulty as advanced placement, and the course topic made for a homogeneous study sample. Participants were most likely among the highest achievers in their schools. As such, the sample represented a limited perspective of student perceptions in the online environment. The voice of the average or low-performing student was not represented here. The results thus reflected the experiences

of students who most likely self-selected to take the course and do not necessarily reflect the range of perceptions available from high school students.

Sample size was also impacted by timing of survey deployment. The survey was launched after the Advanced Placement exam was administered for this course, but before the end of the semester for all students. In addition to the survey used in this study, an additional research-sponsored survey was deployed only two weeks prior to the deployment of the survey for this study. The researcher learned of this additional survey after it had been deployed. The proximity of the two surveys was confusing for instructors, site facilitators, and especially for students who believed they were participating in only one survey.

Concurrent with the study survey, an announcement appeared on the entry page of the courses reminding students to complete the end-of-course evaluation. This event created even more confusion among students who were faced with completing three different surveys. Special communications between all stakeholders occurred to alleviate confusion among students, correcting any misunderstandings about the number of surveys and carefully identifying this one.

The issues related to timing of survey deployment reduced the potential of a larger sample size and the potential of a larger subgroup of students with prior experience. As a result, the statistical analysis planned for evaluating significant differences between students with prior experience online and those who were taking the course for the first time was not appropriate as stated in Chapter 4. Overall, a larger sample size would have increased the power of the results toward the ability to generalize findings.

Implications for Future Research

To improve the power of future studies, a larger sample population is recommended. The ability to do so will require adjustments and subsequent validation of the current survey to render it appropriate for sampling across content area courses. The current study design was conceived to control for the variables of subject matter, instructor, and course design. Administration of this survey across subject matter courses would require an intensive exploration of course design and pedagogy to verify an appropriate sample.

The sampling method used in this study attempted to reach all members of the population who were Advanced Placement Psychology students in three online courses, offered by a single course provider. Future research could investigate the student perceptions of the study constructs using a random sample across a larger population thereby increasing the power of the study. This too would require a careful controlling of variables, but would increase the potential of the survey to more closely examine subgroups like prior experience, age, grade-level, and ethnicity.

Random sampling could also increase the potential for obtaining a more heterogeneous sample of students with respect to achievement levels or students who are struggling academically. As described earlier, this study sample did not offer the range of perspectives possible since it targeted students enrolled in a higher-level course typically taken by college-bound juniors and seniors. Future research could include students who were not necessarily college-bound and high achievers. Future studies could examine students in course recovery programs who are struggling to complete gateway courses like Algebra I and Freshman English. Studies might also sample students enrolled in a required course like Civics where there is likely to be a broader range of achievement levels and motivation.

Future research might also attempt a triangulation of data, using a mixed-methods design. The data from the current survey instrument would be enhanced by data from the actual transcripts of student discussions in the discussion forum. Instructor interviews and student interviews would also compliment the study and offer greater insight into themes that emerged during analysis of Part III questions. Such data would make it possible to discuss themes like instructor involvement and requirements as related to online discussions.

Instructors would benefit from insight into how different activity structures within online discussion forums impact issues like student achievement and perceptions based on gender. For example, future research might explore how activities that are more collaborative in nature, such as team projects, impact achievement versus those where the individual student reacts to the opinions of classmates. Researchers might compare the effect of different activity structures used during an online course and their ability to motivate students toward learning goals. Attention could be given to the effects of different structures on gender, race, or other student variables.

Insight into the importance of online discussions would be enhanced by a study to examine student perceptions of motivation and enjoyment and perceptions of learning in online discussions relative to other features of the online environment. The current survey might be adjusted to include questions which focused on student perceptions of motivation and enjoyment and learning through the Gradebook, a feature of online courses which allows students to see their current grades at any time. A comparison of student perceptions of these two features or of any two features impacting student performance would further highlight the value of a given feature toward student behavior and achievement.

Implications for Future Practice

This study contributes to the growing body of research on teaching and learning in online courses. The strong correlation of perceptions of motivation and enjoyment and perceptions of learning from online discussions found in this study goes beyond reinforcing best practices in online learning. This finding also offers an interesting perspective for the classroom teacher in a brick-and-mortar classroom.

The correlation of motivation and enjoyment with learning in online discussions from this study informs online instructors of the affordance of the discussion board feature in online courses. Not simply a feature for sharing ideas and opinions, this feature of online courses affords the instructor the opportunity to cultivate motivation and enjoyment for learning. Students need a venue for interaction, an opportunity for making their understandings of the content known to the learning community. Otherwise, the sole mechanism for demonstrating comprehension rests solely in formative assessments and assignments seen only by the instructor. The absence or neglect of online discussions reduces the impact of the Community of Inquiry model to achieve an optimal learning experience. Such neglect severely limits the instructor's capacity for making decisions about instruction and assessment.

Instructor involvement through teacher immediacy behaviors bolsters the Community of Inquiry in effective online courses. In this study, students indicated a need for more instructor involvement as witnessed in the themes identified in the qualitative data and their mixed reactions to the single questions related to the instructor role to motivate discussions. Student responses demonstrate an understanding of the value of instructor participation and feedback in the online discussions. Student contributions to discussions were validated when

the instructor acknowledged their participation. While students valued the ability to see the comments of their peers and to interact with them, they did not indicate significant learning from their peers. Consequently, the instructor is thus the only individual in the learning community whose responsibility is to provide the scaffolding and expert knowledge not offered by students. Future instructors cannot rely on the students alone to provide the interactions necessary toward the achievement of construction of knowledge.

Increased instructor interaction, following best practices in online pedagogy, could only increase the level of teaching presence, thereby impacting the growth of the learning community in a Community of Inquiry. Ongoing involvement would also provide formative feedback to both students and instructor: the students would be able to better gauge their understanding of course content while the instructor would have additional information for monitoring student performance. The absence of instructor involvement in online discussions would limit the amount of feedback the instructor receives to inform modifications in instruction.

Future instructors need to pay attention to student expectations of online discussions as indicated by this study. Student responses to the survey indicated a value for the use of online discussions, but with some qualifications. Student comments revealed dissatisfaction with certain requirements imposed upon participation in discussions like the number or length of responses they must post in a given conversation. These requirements can limit the ability of online discussions to engage learners in the content of the course. Students want discussions to mean something more than an activity to receive a grade. The engagement of their peers was important to them even though there was no strong indication that they learned a great deal from their peers. Their preference for active, meaningful discussions

throughout the course is supported by the research literature with adult learners as well (Swan, 2002).

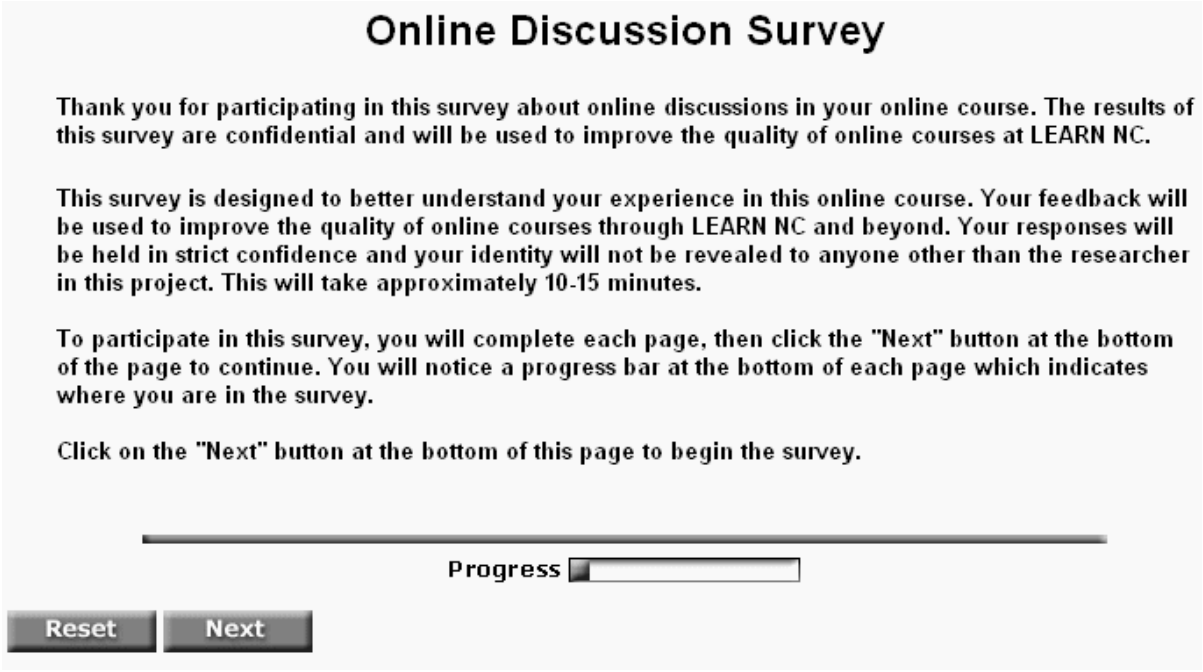
This study and those to come have implications for practice in the face-to-face classroom. Teachers in the face-to-face classroom could take advantage of the finding of no significant difference between perceptions of males and females in this study. Student responses in this study highlight the capacity of the online discussion forum to create a more equitable atmosphere for student discussion, interaction, and contribution to the learning community. Classroom teachers could readily create online discussion boards or discussion groups with free online tools to emulate the environment seen in this study. Incorporating such web-based tools bridges the two worlds of the online and the on-ground classroom, creating a web-enhanced classroom. An online discussion tool could be used as a mediator for conducting classroom discussions. The classroom teachers could require students to post their contributions to the discussion at their own pace and with the time they need to organize their thoughts. The online discussion forum as a mediator for classroom discussions can impact student self-esteem as learners are able to more freely contribute to the conversation. Students would be able to participate in classroom discussions beyond the end of the school day, creating discussions that were more in-depth and ongoing. The time constraints of the traditional school schedule would no longer interfere with students' ability to contribute equitably to discussions. These discussions could include a broader range of perspectives unlike discussions held in face-to-face settings. Both students and teacher could benefit from this broader range of individual contributions as well as the contributions of the learning community. Together, the contributions of both students and teacher in a discussion, whether

online or on-ground, inform knowledge construction for students, and student evaluation for teachers.

APPENDIX A:

LEARN NC Online Discussion Survey

The survey instrument is presented here as it appeared for participants upon authenticating into the restricted site.



Part I: Background Information

For each of the questions in this section, please respond by clicking the circle adjacent to the appropriate answer.

1. Age

- ○ 13
- ○ 14
- ○ 15
- ○ 16
- ○ 17
- ○ 18
- ○ 19

2. Course

- ○ A.P. Psychology - Stombaugh
- ○ A.P. Psychology - Burkhead
- ○ A.P. Psychology - Normans

3. Ethnic background

- ○ Black/African American
- ○ Hispanic
- ○ White/Causian
- ○ Native American
- ○ Asian/Asian American

Other (Please specify) _____

4. Gender

- ○ Male
- ○ Female

5. How many online courses have you taken including this one?

- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5
- ○ 6 or more

Progress

Back Reset Next

Online Discussion Survey

Part II: Online Discussion Questions

In answering the questions below, please think about the discussions in the Discussion Board for this course. For each of the following, please indicate the response which best describes your experience in this course by clicking on the appropriate answer.

1. By participating in online discussion, I learned a great deal from peers.

Strongly Disagree	Disagree	Don't Know	Agree Strongly	Agree
○	○	○	○	○

2. Through online discussion, my ability to integrate facts was greatly improved.

Strongly Disagree	Disagree	Don't Know	Agree Strongly	Agree
○	○	○	○	○

3. Through online discussion, my ability to develop generalizations was improved.

Strongly Disagree	Disagree	Don't Know	Agree Strongly	Agree
○	○	○	○	○

4. I think online discussion was useless to my learning.

Strongly Disagree	Disagree	Don't Know	Agree Strongly	Agree
○	○	○	○	○

Progress

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Online Discussion Survey

		Strongly Disagree	Disagree	Don't Know	Agree Strongly	Agree
5.	**Through participating in online discussion, I was motivated to learn more.**	○	○	○	○	○
6.	**My learning quality was improved by online collaborative learning with peers.**	○	○	○	○	○
7.	**I disliked online discussion.**	○	○	○	○	○
8.	**I enjoyed online discussion.**	○	○	○	○	○

Progress

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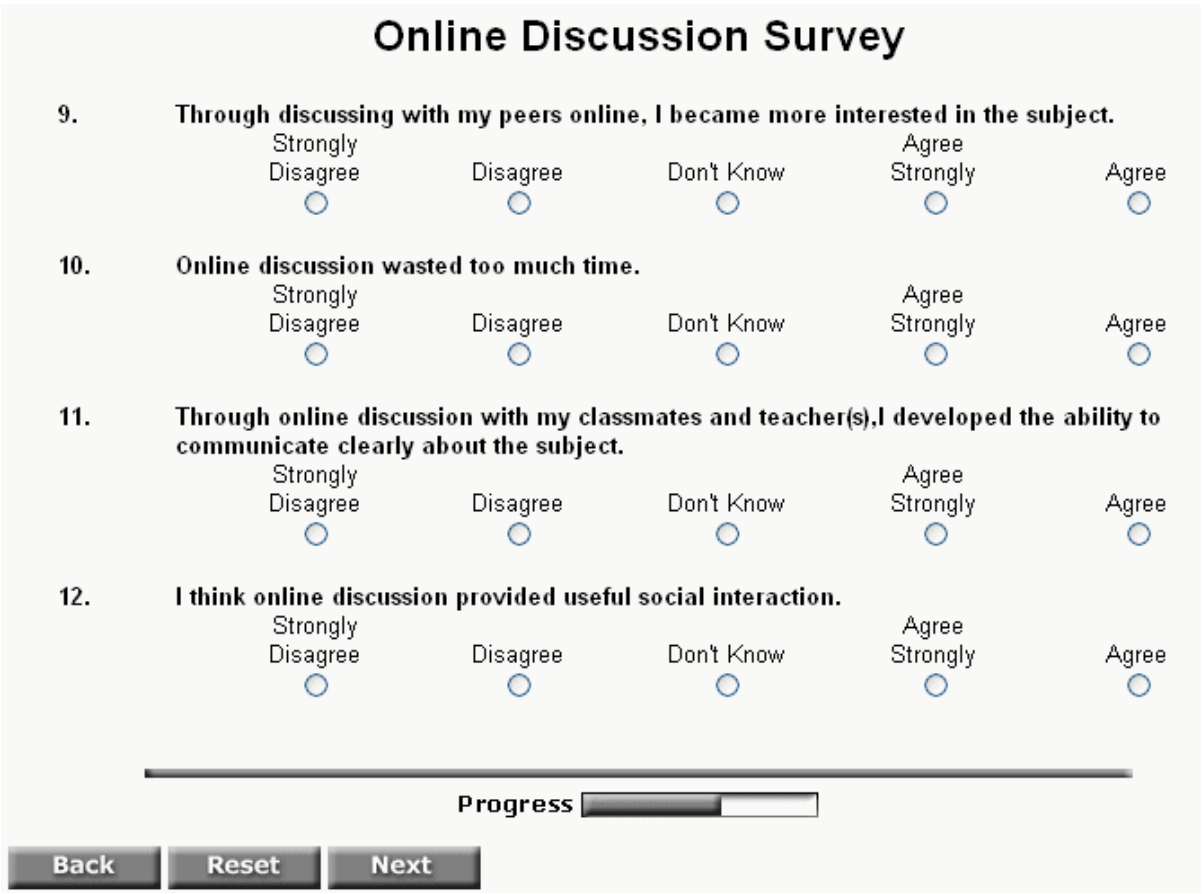
Online Discussion Survey
9. Through discussing with my peers online, I became more interested in the subject.
Strongly Disagree
Disagree
Don't Know
Agree Strongly
Agree
10. Online discussion wasted too much time.
Strongly Disagree
Disagree
Don't Know
Agree Strongly
Agree
11. Through online discussion with my classmates and teacher(s),I developed the ability to communicate clearly about the subject.
Strongly Disagree
Disagree
Don't Know
Agree Strongly
Agree
12. I think online discussion provided useful social interaction.
Strongly Disagree
Disagree
Don't Know
Agree Strongly
Agree
Progress
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Online Discussion Survey

17. **In the online discussion environment, the instructor(s) played a critical role to motivate effective discussions.**

Strongly Disagree	Disagree	Don't Know	Agree Strongly	Agree
○	○	○	○	○

18. **In the online discussion environment, my learning interest was frustrated.**

Strongly Disagree	Disagree	Don't Know	Agree Strongly	Agree
○	○	○	○	○

19. **In the online discussion environment, I enjoyed sharing my prior experience with peers to improve my learning quality.**

Strongly Disagree	Disagree	Don't Know	Agree Strongly	Agree
○	○	○	○	○

20. **Overall, online discussion decreased my learning quality.**

Strongly Disagree	Disagree	Don't Know	Agree Strongly	Agree
○	○	○	○	○

Progress

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Online Discussion Survey

Part III: Open-ended Questions
Please indicate your answers clearly in the following open-ended questions.

1. **What did you like best about the online discussion?**

2. **What do you think should be improved for this online discussion process?**

Progress

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Online Discussion Survey

3. **Why do you like/dislike online discussion? Please elaborate and provides examples when necessary.**

4. **Do you have any other comments that you would add which have not been covered on this survey?**

Thank you for participating in the survey.
Please click the "Submit" button to finish your survey.
Thank you for sharing your thoughts about online discussions.

Progress

Back Reset Submit

LEARN NC community
K-12 COMMUNICATION AND OUTREACH » FROM THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL SCHOOL OF EDUCATION

Thank You!

Thank you for participating in this survey about online discussions in your online course. The results of this survey are confidential and will be used to improve the quality of online courses at LEARN NC.

Go back to Blackboard (http://classroom.learnnc.org)

APPENDIX B:

Academic Affairs Institutional Review Board Approval

TO: Bobby Hobgood
Education
CB# 7216 140 Friday Ctr Dr

FROM: Behavioral IRB

APPROVAL DATE: 5/16/2006

EXPIRATION DATE OF APPROVAL: 5/15/2007

RE: Notice of IRB Approval by Expedited Review
Submission Type: Initial
Expedited Category: 7.Survey/group chars
Study #: 06-0163
Study Title: Perceptions of Motivation, Enjoyment, and Learning from Online Discussions by North Carolina High School Students in Online, Advance Placement Psychology Courses

Description:
Purpose: To investigate the perceptions of motivation, enjoyment, and learning from online discussions by North Carolina high school students in online, Advance Placement Psychology courses.
Procedures: Administer end-of-course survey to students.
Participants: 95 NC high school students, ages 15-19 who are enrolled in an online Advance Placement course hosted by LEARN NC, a program of the School of Education at UNC-CH.

The following Federal regulation is applicable to this research study:
45 CFR 46.404 - The IRB finds that no greater than minimal risk to children is presented, and that adequate provisions have been made for soliciting the assent of the children and the permission of their parents or guardians, as set forth at 45 CFR 46.408.

This submission has been approved by the above IRB for the period indicated. If you have any questions or concerns about your study's approval, please contact the Behavioral IRB Office at 962-7761 or e-mail the office at aa-irb-chair@unc.edu.

Federal regulations require that all research be reviewed at least annually. It is the Principal Investigator's responsibility to submit for renewal and obtain approval before the expiration date. You may not continue any research activity beyond the expiration date without IRB approval. Failure to receive approval for continuation before the expiration date will result in automatic termination of the approval for this study on the expiration date.

CC: Barbara Day, School Of Education, CB# 3500 307d Peabody Hall, Faculty Advisor
Shannon Jackson, School Of Education, CB# 3500 107b Peabody Hall, Local Reviewer

APPENDIX C:
Institutional Review Board Application

OFFICE OF HUMAN RESEARCH ETHICS
Institutional Review Board

APPLICATION FOR IRB APPROVAL OF HUMAN SUBJECTS RESEARCH
Version 28-Sep-2005

For IRB Use
Behav Bio Dent Nurs PH
IRB Study #_____
Rec'd_____
Full Expedited Exempt

Part A.1. Contact Information, Agreements, and Signatures

Title of Study: Perceptions of Motivation, Enjoyment, and Learning from Online Discussions by North Carolina High School Students in Online, Advance Placement Psychology Courses

Date: January 5, 2006

Name and degrees of Principal Investigator: Bobby Hobgood (MAT-French, AB Education)
Department: Education Mailing address/CB #: 7219
UNC-CH PID: 700941425 Pager:
Phone #: 962-8944 Fax #: 962-8940 Email Address: bhobgood@learnnc.org

For trainee-led projects: __ undergraduate _X_ graduate __ postdoc __ resident __ other
Name of faculty advisor: Dr. Barbara Day
Department: Education Mailing address/CB #: 307d Peabody Hall, CB#3500
Phone #: 962-7739 Fax #: Email Address: bday1@email.unc.edu

Name, phone number, email address of project manager or coordinator, if any:

List **all other project personnel** including co-investigators, and anyone else who has contact with subjects or identifiable data from subjects:

Name of funding source or sponsor:
_X_ not funded __ Federal __ State __ industry __ foundation __ UNC-CH
__ other (specify): **Sponsor or award number**:

Include following items with your submission, where applicable. Check the items below and **include in order listed**.

X This application. One copy must have original PI signatures.
X Consent and assent forms, fact or information sheets; include phone and verbal consent scripts
□ HIPAA authorization addendum to consent form
X All recruitment materials including scripts, flyers and advertising, letters, emails
X Questionnaires, scripts used to guide phone or in-person interviews, etc.
□ Focus group guides
□ Data use agreements (may be required for use of existing data from third parties)

- □ Addendum for Multi-Site Studies where UNC-CH is the Lead Coordinating Center
- □ Documentation of reviews from any other committees (e.g., GCRC, Oncology)
- X Documentation of training in human research ethics for all study personnel
- □ Investigator Brochure if a drug study
- □ Protocol, grant application or proposal supporting this submission; (e.g., extramural grant application to NIH or foundation, industry protocol, student proposal)

Principal Investigator: I will personally conduct or supervise this research study. I will ensure that this study is performed in compliance with all applicable laws, regulations and University policies regarding human subjects research. I will obtain IRB approval before making any changes or additions to the project. I will notify the IRB of any other changes in the information provided in this application. I will provide progress reports to the IRB at least annually, or as requested. I will report promptly to the IRB all unanticipated problems or serious adverse events involving risk to human subjects. I will follow the IRB approved consent process for all subjects. I will ensure that all collaborators, students and employees assisting in this research study are informed about these obligations. All information given in this form is accurate and complete.

_____ _____

Signature of Principal Investigator Date

Faculty Advisor if PI is a Student or Trainee Investigator: I accept ultimate responsibility for ensuring that this study complies with all the obligations listed above for the PI.

_____ _____

Signature of Faculty Advisor Date

Department or Division Chair, Center Director (or counterpart) of PI: (or Vice-Chair or Chair's designee if Chair is investigator or otherwise unable to review): I certify that this research is appropriate for this Principal Investigator, that the investigators are qualified to conduct the research, and that there are adequate resources (including financial, support and facilities) available. I support this application, and hereby submit it for further review.

_____ _____

Signature of Department Chair or designee Date

_____ _____

Print Name of Department Chair or designee Department

Part A.2. Summary Checklist

Are the following involved?	Yes	No
A.2.1. Existing data, research records, patient records, and/or human biological specimens?	__	X
A.2.2. Surveys, questionnaires, interviews, or focus groups with subjects?	X	__
A.2.3. Videotaping, audiotaping, filming of subjects?	__	X
A.2.4. Do you plan to enroll subjects from these vulnerable or select populations:		
a. UNC-CH students or UNC-CH staff?	__	X
b. Non-English-speaking?	__	X
c. Decisionally impaired?	__	X
d. Patients?	__	X
e. Prisoners, parolees and other convicted offenders?	__	X
f. Pregnant women?	__	X
g. Minors (less than 18 years)? **If yes**, give age range: 15 to 17 years	X	__
A.2.5. a. Is this a multi-site study (i.e., involves organization(s) outside UNC-CH)?	X	__
b. Will any of these sites be outside the United States?	__	X
If yes, provide contact information for the foreign IRB.		
c. Is UNC-CH the sponsor or lead coordinating center?	__	X
If yes, include the ***Addendum for Multi-site Studies where UNC-CH is the Lead Coordinating Center***.		
A.2.6. Will there be a data and safety monitoring committee (DSMB or DSMC)?	__	X
A.2.7. a. Are you collecting sensitive information such as sexual behavior, HIV status, recreational drug use, illegal behaviors, child/physical abuse, immigration status, etc?	__	X
b. Do you plan to obtain a federal Certificate of Confidentiality for this study?	__	X
A.2.8. a. Investigational drugs? (provide **IND #**)	__	X
b. Approved drugs for "non-FDA-approved" conditions?	__	X
All studies testing substances in humans must provide a letter of acknowledgement from the UNC Health Care Investigational Drug Service (IDS).		
A.2.9. Placebo(s)?	__	X
A.2.10. Investigational devices, instruments, machines, software? (provide **IDE #**)	__	X
A.2.11. Fetal tissue?	__	X
A.2.12. Genetic studies on subjects' specimens?	__	X
A.2.13. Storage of subjects' specimens for future research? ***If yes***, *see instructions within the form* ***Consent for Stored Samples***.	__	X
A.2.14. Diagnostic or therapeutic ionizing radiation, or radioactive isotopes, which subjects would not receive otherwise? ***If yes***, *approval by the* ***UNC-CH Radiation Safety*** ***Committee*** *is required.*	__	X
A.2.15. Recombinant DNA or gene transfer to human subjects? ***If yes***, *approval by the* ***UNC-CH Institutional Biosafety*** ***Committee*** *is required.*	__	X
A.2.16. Does this study involve UNC-CH cancer patients? ***If yes***, *submit this application directly to the* ***Oncology Protocol Review Committee***.	__	X
A.2.17. Will subjects be studied in the General Clinical Research Center (GCRC)? ***If yes***, *obtain the* ***GCRC Addendum*** *from the GCRC and submit complete application (IRB application and Addendum) to the GCRC.*	__	X

Part A.3. Conflict of Interest Questions and Certification

The following questions apply to **all investigators and study staff** engaged in the design, conduct, or reporting results of this project **and/or their immediate family members.** For these purposes, "family" includes the individual's spouse and dependent children. "Spouse" includes a person with whom one lives together in the same residence and with whom one shares responsibility for each other's welfare and shares financial obligations.

A.3.1. Currently or during the term of this research study, does any member of the research team or his/her family member have or expect to have:		
(a) A personal financial interest in or personal financial relationship (including gifts of cash or in-kind) with the sponsor of this study?	__ yes	X no
(b) A personal financial interest in or personal financial relationship (including gifts of cash or in-kind) with an entity that owns or has the right to commercialize a product, process or technology studied in this project?	__ yes	X no
(c) A board membership of any kind or an executive position (paid or unpaid) with the sponsor of this study or with an entity that owns or has the right to commercialize a product, process or technology studied in this project?	__ yes	X no
A.3.2. Has the University or has a University-related foundation received a cash or in-kind gift from the Sponsor of this study for the use or benefit of any member of the research team?	__ yes	X no
A.3.3. Has the University or has a University-related foundation received a cash or in-kind gift for the use or benefit of any member of the research team from an entity that owns or has the right to commercialize a product, process or technology studied in this project?	__ yes	X no

If the answer to ANY of the questions above is *yes*, the affected research team member(s) must complete and submit to the Office of the University Counsel the form accessible at http://coi.unc.edu. List name(s) of all research team members for whom any answer to the questions above is *yes*:

Certification by Principal Investigator: By submitting this IRB application, I (the PI) certify that the information provided above is true and accurate regarding my own circumstances, that I have inquired of every UNC-Chapel Hill employee or trainee who will be engaged in the design, conduct or reporting of results of this project as to the questions set out above, and that I have instructed any such person who has answered "yes" to any of these questions to complete and submit for approval a Conflict of Interest Evaluation Form. I understand that as Principal Investigator I am obligated to ensure that any potential conflicts of interest that exist in relation to my study are reported as required by University policy.

Signature of Principal Investigator _____ Date _____

<u>Faculty Advisor if PI is a Student or Trainee Investigator</u>: I accept ultimate responsibility for ensuring that the PI complies with the University's conflict of interest policies and procedures.

Signature of Faculty Advisor _____ Date _____

Part A.4. Questions Common to All Studies

For all questions, if the study involves only secondary data analysis, focus on your proposed design, methods and procedures, and not those of the original study that produced the data you plan to use.

A.4.1. **Brief Summary**. Provide a *brief* non-technical description of the study, which will be used for internal and external communications regarding this research. Include purpose, methods, and participants. Typical summaries are 50-100 words.

The purpose of this study is to investigate the perceptions of motivation, enjoyment, and learning from online discussions by North Carolina High School students in online, Advance Placement Psychology courses. Approximately 95 students will be involved in this non-experimental study that requires the completion of an end-of-course survey by the student. No additional data will be collected during this study.

A.4.2. **Purpose and Rationale**. Provide a summary of the background information, state the research question(s), and tell why the study is needed. If a complete rationale and literature review are in an accompanying grant application or other type of proposal, only provide a brief summary here. If there is no proposal, provide a more extensive rationale and literature review.

The ubiquitous presence of the Internet in today's schools has facilitated access to a broader range of educational resources and opportunities for teachers and students in all levels of education. Consequently, distance education via the Internet has become an attractive option for providing access to courses not otherwise available to various populations of learners. Though relatively new, there is a growing body of research on Internet-based distance education at the post-secondary level and beyond. By contrast, the research at the secondary level has scarcely begun though the enthusiasm for engaging in distance education online has exploded as indicated by several national studies.

Among the issues of research in the study of distance education online are those of student interaction and development of a learning community. Research literature on web-based learning indicates that interaction is important for achieving a successful online experience. A significant amount of this research is based on student perceptions of their interactions with one another and with the instructor and how their perceptions contribute to their success in the course.

This study will consider these issues for high school students since there is relatively little research for this population of online learners. Given the rate at which states are developing virtual high schools and the individual schools are including online courses as a part of their course offerings, little attention has been given to the impact of this learning environment on the learner. At the expense of addressing federal mandates to increase achievement scores, little is known about how high school students perceive their online learning experience. Are they motivated to learn

online? Do they enjoy it? Do they believe they are learning from it? The excitement and hope attributed to online courses appears to overshadow the need to understand how they should be designed and integrated to result in successful learning experiences for these students. While research indicates that the cultivation of a learning community is essential to the success of an online course, there remains the question of how students react to strategies for the development of this community.

Among the essential components of a successful online learning community is the discussion forum. Most Learning Management Systems (LMS), i.e., courseware platforms for development and delivery of online courses, include a tool for facilitating online, asynchronous discussions. This aspect of online learning is where the majority of student and instructor interaction takes place. When course instructors decide to incorporate online discussion forums as major tools for facilitating discussions and thereby learning, how are students impacted with respect to their motivation and enjoyment to learn? Does the discussion forum contribute to their learning?

The major research question is thus: What are the relationships between student perceptions of motivation and enjoyment and student perceptions of learning from online discussions?

The research questions are:

1. Is there a significant difference between students who have taken online courses and those who have not in terms of their perceptions of motivation and enjoyment from online discussions?

2. Is there a significant difference between students who have taken online courses and those who have not in terms of their perceptions of learning from online discussions?

3. Is there a significant difference between male and female students in perceptions of motivation and enjoyment from online discussions?

4. Is there a significant difference between male and female students in perceptions of learning from online discussions?

A.4.3. **Full description of the study design, methods and procedures.** Describe the research study. Discuss the study design; study procedures; sequential description of what subjects will be asked to do; assignment of subjects to various arms of the study if applicable; doses; frequency and route of administration of medication and other medical treatment if applicable; how data are to be collected (questionnaire, interview, focus group or specific procedure such as physical examination, venipuncture, etc.). Include information on who will collect data, who will conduct procedures or measurements. Indicate the number and duration of contacts with each subject; outcome measurements; and follow-up procedures. If the study involves medical treatment, distinguish standard care procedures from those that are research. If the study is a clinical trial involving patients as subjects and use of placebo control is involved, provide justification for the use of placebo controls.

Study Design

This study uses a non-experimental approach to correlate student perceptions of motivation and enjoyment with their perceptions of learning from online discussions. Data will be collected via an online survey instrument to be administered at the end of the course. Given the design of the study, it is important to identify online courses that take advantage of the discussion forum feature. Further, to control for the effects of the course subject matter and variation in instruction, this study will draw participants from three sections of Advance Placement Psychology. All three sections use the same course layout and design, and all three use the same discussion activities throughout the course. The courses do have different instructors, however all three have collaborated in their role in the use of the discussion board. It is necessary to use all three courses to achieve a greater sample size than would be possible with only one. The design takes advantage of convenience sampling since the researcher is employed by the host institution of the courses and has easy access to the research subjects for conducting this study.

The sample will include approximately 95 North Carolina high school students who are enrolled in an online Advance Placement course hosted by LEARN NC (www.learnnc.org), a program of the School of Education at UNC, but funded directly by the State of North Carolina (http://www.learnnc.org/students/9-12/courses/). All courses through LEARN NC are asynchronously designed and taught using Blackboard, an industry standard for the development and teaching of online courses. Students participate in the course as if it were a traditional offering at their school site. Some of their classmates for the online course may also attend the same school and may be scheduled to "attend" their online class during the same school period. Each school site provides a period during the day, Monday through Friday, when the student accesses the course. This daily time varies from one school to the next depending upon the school schedule, but does not impact the student's ability to take part in the course. Students may also access the course outside of this period of the day on any computer where they have Internet access.

A Site Facilitator is present in the room each day as students access the course. This individual serves as a liaison between the course instructor and the host institution, LEARN NC. The Site Facilitator performs numerous functions for the program like monitoring online assessments, communicating grades from the instructor to the school, troubleshooting technical issues, etc.

The instructors of these courses, like their students, are geographically located around the state. The instructors are not on faculty at UNC, but function as contract employees through LEARN NC. All three instructors are certified as Advance Placement teachers in the area of Psychology.

All students have been participating in the course for the same amount of time since the beginning of the semester. The course is delivered with a Learning Management System called Blackboard which is commonly used throughout the United States as a platform for deploying online courses. The format of the course is asynchronous; students on different high school schedules can participate in the course at any time during the day. Students are from high schools across North Carolina and range in age from 15-19. The courses are funded by the North Carolina Department of Public Instruction and administered by LEARN NC.

Methods and Procedures

Course instructors and site facilitators will receive notice of the study approximately one week prior to the invitation to participate is sent to students. This notification will describe their role to distribute and later collect parental consent and assent forms from students. At the end of February, students will receive an invitation to participate in the study via their online course

through the *Messages* system, an internal, private communication function similar to email. In cooperation with LEARN NC and the researcher, course instructors will be asked to post an announcement written by the researcher to the *Announcements* page of the course alerting students of this message (See Attached). The Site Facilitator will receive via email the letter of assent and the parental consent forms for students under 18. These forms will be printed and given to the students to return to the Site Facilitator who will mail them to the researcher in a postage-paid envelope provided.

One week beyond the deadline for receiving consent forms, students will receive a message from the researcher (See attached) containing a restricted URL for the study survey via the *Messages* feature. The researcher will have access to send this message to the students. The survey will be created using Snap survey software (http://www.snapsurveys.com/) and housed on a secure server belonging to LEARN NC. The instructor of the course will not have access to the survey and can not see the messages sent to students. Students may submit the survey without completing all items. The software does not allow the respondent to take the survey more than once.

Students will be allowed time to complete the survey on the day of its deployment as per an agreement with LEARN NC, the course instructors, and the Site Facilitators. The researcher will coordinate with the course instructor the best date for the survey to avoid conflicts with assessments or other critical class assignments. The survey will require 10-15 minutes time to complete.

Once all surveys have been completed, the data will be compiled by the software. The researcher will export the data in a secure file to a personal laptop where the data will be housed and used for calculating study statistics with SPSS software.

A.4.4. **Benefits to subjects and/or society.** Describe any potential for direct benefit to individual subjects, as well as the benefit to society based on scientific knowledge to be gained; these should be clearly distinguished. Consider the nature, magnitude, and likelihood of any direct benefit to subjects. If there is no direct benefit to the individual subject, say so here and in the consent form (if there is a consent form). Do not list monetary payment or other compensation as a benefit.

Because the data will be collected and analyzed at the end of the semester, information that will serve to inform the quality of instruction and course design will not be available to the course instructor for enhancements or improvements to the course. Consequently, students will not see immediate benefits to the course. The results will be used later to inform the K-12 Online Courses program at LEARN NC for the future administration and development of these and other courses. Given the history of LEARN NC's K-12 program, it is possible that some of the study participants will enroll in future online courses offered by LEARN NC and will experience potential enhancements to the quality of course design and instruction as influenced by the results of this study.

A.4.5. **Full description of risks and measures to minimize risks.** Include risk of psychosocial harm (e.g., emotional distress, embarrassment, breach of confidentiality), economic harm (e.g., loss of employment or insurability, loss of professional standing or reputation, loss of standing within the community) and legal jeopardy (e.g., disclosure of illegal activity or negligence), as well as known side effects of study medication, if applicable, and risk of pain and physical injury. Describe what will be done to minimize these risks. Describe procedures for follow-up, when necessary, such as when subjects are found to be in need of medical or psychological referral. If there is no direct interaction with subjects, and risk is limited to breach of confidentiality (e.g., for existing data), state this.

The study design does not require direct interaction with students and poses no risk of any kind to participants, nor potential breach of confidentiality. The nature of information provided by the student poses no psychosocial harm to students, instructors, nor the host institution LEARN NC. There is also no risk of economic harm to neither the instructor nor the host institution LEARN NC as a result of the nature of student responses to the survey. The results of the study will be shared with course instructor and the host organization, LEARN NC, as a tool for providing feedback on the students' experience for this course.

A.4.6. **Data analysis.** Tell how the qualitative and/or quantitative data will be analyzed. Explain how the sample size is sufficient to achieve the study aims. This might include a formal power calculation or explanation of why a small sample is sufficient (e.g., qualitative research, pilot studies).

In order to minimize variables that could affect study results, careful consideration was given to the identification of courses for this study. Three psychology courses were chosen to achieve an adequate sample size of N=95. The Power calculation has been computed at 80% for an n=95, with a population correlation of .25. Given that participants in this study access the Internet daily for their course, and are thereby accustomed to using technology to complete online assessments/surveys, it is highly likely that the response rate will be at or near 100%. Further, the caliber of student who enrolls in Advance Placement courses would presumably be more likely to complete a survey which is described as improving the quality of the course.

Date from the survey will be compiled by the Snap survey software and exported to SPSS software on the researcher's personal computer. Descriptive statistics will be used to report the basic findings while a correlation analysis will be used to describe the underlying relationships among variables.

The survey instrument is organized into 3 sections: 1) Background information (age, sex, etc.), 2) 20 Likert-scale questions, and 3) 4 open-ended questions. The instrument will capture both quantitative and qualitative data.

Quantitative Data

1. Descriptive statistics will be calculated for the 20 Likert-scale questions: response rates, means, and standard deviations, per item.

2. Correlation Analysis (Pearson's R) for the following variables at the 0.05 level (2-tailed):
    a. Perception of Learning from Online Discussion Index

b. Perception of Motivation and Enjoyment Index

3. Student's T-test
    a. Gender
    b. Number of online courses taken

Qualitative Data
The data from the 4 open-ended questions will be analyzed to identify recurring themes in students' perceptions on the use of the discussion forum. This data will be used to support findings from the quantitative data and to suggest future areas of study.

A.4.7. **Will you collect or receive any of the following identifiers as part of the study data?** Does not apply to consent forms.

X No __ Yes *If yes, check all that apply*:

a. __ Names
b. __ Telephone numbers
c. __ Any elements of dates (other than year) for dates directly related to an individual, including birth date, admission date, discharge date, date of death. For ages over 89: all elements of dates (including year) indicative of such age, except that such ages and elements may be aggregated into a single category of age 90 and older
d. __ Any geographic subdivisions smaller than a State, including street address, city, county, precinct, zip code and their equivalent geocodes, except for the initial three digits of a zip code
e. __ Fax numbers
f. __ Electronic mail addresses
g. __ Social security numbers
h. __ Medical record numbers
i. __ Health plan beneficiary numbers
j. __ Account numbers
k. __ Certificate/license numbers
l. __ Vehicle identifiers and serial numbers (VIN), including license plate numbers
m. __ Device identifiers and serial numbers (e.g., implanted medical device)
n. __ Web universal resource locators (URLs)
o. __ Internet protocol (IP) address numbers
p. __ Biometric identifiers, including finger and voice prints
q. __ Full face photographic images and any comparable images
r. __ Any other unique identifying number, characteristic or code, other than dummy identifiers that are not derived from actual identifiers and for which the re-identification key is maintained by the health care provider and not disclosed to the resear

A.4.8. **Data sharing.** With whom will *identifiable* (contains any of the 18 identifiers listed in question 7 above) data be shared outside the immediate research team? For each, explain confidentiality measures. Include data use agreements, if any.

X No one
__ Coordinating Center**:**
__ Statisticians**:**
__ Consultants**:**
__ Other researchers**:**
__ Registries**:**
__ Sponsors:
__ External labs for additional testing:
__ Journals:
__ Publicly available dataset:
__ Other:

A.4.9. **Confidentiality of the data**. Describe procedures for maintaining confidentiality of the data you will collect or will receive. Describe how you will protect the data from access by those not authorized. How will data be transmitted among research personnel? Where relevant, discuss the potential for deductive disclosure (i.e., directly identifying subjects from a combination of indirect IDs). Describe your plan to destroy identifiers. When will identifiers be destroyed?

Data from the electronic survey will be collected on the secure server where the survey is housed. The researcher will have access to this data via a personal password-protected account. This data is also accessible by the Director of Technology at LEARN NC who assisted in the creation of the survey on the server. Once created, the researcher will change the password access to the data from this survey such that the Director of Technology will no longer have access. The data will be backed-up by the researcher in a personal, locked (i.e., password protected) folder on a secure server belonging to LEARN NC, the host institution of the online course.

Once all surveys have been submitted, and the data compiled by the Snap software, the researcher will export the data via a secure network to his personal computer. This computer is biometrically protected, used only by the researcher, and in the possession of the researcher at all times. The data will be backed-up by the researcher in a personal, locked (i.e., password protected) folder on a secure server belonging to LEARN NC, the host institution of the online courses.

There is no danger of deductive disclosure since the survey does not ask students to provide any of the identifiers mentioned in Section A4.7. Access codes to take the survey will be randomly generated and assigned to students to preclude the potential for outside access to the survey. Once an access code has been used by the student, that student may no longer access the survey. The researcher will not maintain records the assignment of access codes.

A.4.10. **Data security for storage and transmission**. Please check all that apply.

For electronic data:
X Secure network X Password access X Encryption

__ Other (describe):
X Portable storage (e.g., laptop computer, flash drive)
Describe how data will be protected for any portable device:
The laptop computer which will house data from this study is used only by the researcher, is biometrically protected, and in the possession of the researcher at all times.

For hardcopy data (including human biological specimens, CDs, tapes, etc.):
__ Data de-identified by research team (stripped of the 18 identifiers listed in question 7 above)
__ Locked suite or office
__ Locked cabinet
__ Data coded by research team with a master list secured and kept separately
__ Other (describe):

Part A.5. The Consent Process and Consent Documentation (including Waivers)

The standard consent process is for all subjects to sign a document containing all the elements of informed consent, as specified in the federal regulations. Some or all of the elements of consent, including signatures, may be altered or waived under certain circumstances.

- If you will obtain consent in any manner, complete **section A.5.1**.
- If you are obtaining consent, but requesting a waiver of the requirement for a signed consent document, complete **section A.5.2**.
- If you are requesting a waiver of any or all of the elements of consent, complete **section A.5.3**.

You may need to complete more than one section. For example, if you are conducting a phone survey with verbal consent, complete sections A.5.1, A.5.2, and possibly A.5.3.

A.5.1. **Describe the process of obtaining informed consent from subjects**. If children will be enrolled as subjects, describe the provisions for obtaining parental permission and assent of the child. If decisionally impaired adults are to be enrolled, describe the provision for obtaining surrogate consent from a legally authorized representative (LAR). If non-English speaking people will be enrolled, explain how consent in the native language will be obtained. Address both written translation of the consent and the availability of oral interpretation. *After you have completed this part A.5.1, if you are not requesting a waiver of any type, you are done with Part A.5.; proceed to Part B.*

The forms for informed consent will be emailed directly to the school site facilitator where each student is logging on to participate in the online course. This individual is present every day in the room where the student accesses the online course, Monday through Friday, and serves as a liaison between the course instructor and the host institution, LEARN NC. The school site facilitator will print the consent form to give to the student during the class period scheduled for the online course that he or she is taking. This email communication will also include the parental consent form for those students under age 18. All students will inform the site facilitator of their intent to participate in the study by completing the necessary form(s) and returning them to the site facilitator. The site facilitator will also collect the parental consent forms required of those participants under 18. The site facilitator will mail all of the documents to the researcher in a postage-paid envelope that will be sent to the site facilitator concurrent with the email communication.

A.5.2. **Justification for a waiver of *written* (i.e., signed) consent**. *The default is for subjects to sign a written document that contains all the elements of informed consent.* Under limited circumstances, the requirement for a signed consent form may be waived by the IRB if either of the following is true:

a. The only record linking the subject and the research would be the consent document and the principal risk would be potential harm resulting from a breach of confidentiality (e.g., study involves sensitive data that could be damaging if disclosed). X yes __ no
Explain.

b. The research presents no more than minimal risk of harm to subjects and involves no procedures for which written consent is normally required outside of the research context (e.g., phone survey). X yes __ no
Explain.

If you checked "yes" to either, will consent be oral? Will you give out a fact sheet? Use an online consent form, or include information as part of the survey itself, etc?

A.5.3. **Justification for a full or partial waiver of consent.** *The default is for subjects to sign a written document that contains all the elements of informed consent.* A waiver might be requested for research involving only existing data or human biological specimens (see also Part C). More rarely, it might be requested when the research design requires withholding some study details at the outset (e.g., behavioral research involving deception). In limited circumstances, parental permission may be waived. This section should also be completed for a waiver of HIPAA authorization if research involves Protected Health Information (PHI) subject to HIPAA regulation, such as patient records.

__ Requesting **waiver of some elements** (specify; see SOP 28 on the IRB web site):
__ Requesting **waiver of consent entirely**
If you check either of the boxes above, answer items a-f.. To justify a full waiver of the requirement for informed consent, you must be able to answer "yes" (or "not applicable" for question c) to items a-f. **Insert brief explanations that support your answers.**

a. Will the research involve <u>no greater than minimal risk</u> to subjects or to their privacy? X yes __ no
Explain.

b. Is it true that the waiver will *not* adversely affect the rights and welfare of subjects? *(Consider the right of privacy and possible risk of breach of confidentiality in light of the information you wish to gather.)* X yes __ no
Explain.

c. When applicable to your study, do you have plans to provide subjects with pertinent information after their participation is over? *(e.g., Will you provide details withheld during consent, or tell subjects if you found information with direct clinical relevance? This may be an uncommon scenario.)* __ yes __ not applicable

Explain.

d. Would the research be impracticable without the waiver? *(If you checked "yes," explain how the requirement to obtain consent would make the research impracticable, e.g., are most of the subjects lost to follow-up or deceased?).* __ yes __ no
Explain.

e. Is the risk to privacy reasonable in relation to benefits to be gained or the importance of the knowledge to be gained? X yes __ no
Explain.

If you are accessing patient records for this research, you must also be able to answer "yes" to item f to justify a waiver of HIPAA authorization from the subjects.

f. Would the research be impracticable if you could not record (or use) Protected Health Information (PHI)? *(If you checked "yes," explain how* not *recording or using PHI would make the research impracticable).* __ yes __ no
Explain.

APPENDIX D:

Assent Letter

University of North Carolina-Chapel Hill
Assent to Participate in a Research Study
Adolescent Participants age 15-17
Social Behavioral Form

IRB Study #_____
Assent Form Version Date: _____

Title of Study: Perceptions of Motivation and Enjoyment, and Learning by North Carolina High School Students in Online, Advance Placement Psychology Courses

Principal Investigator: Bobby Hobgood
UNC-Chapel Hill Department: Education
UNC-Chapel Hill Phone number: 919 962-8944
Email Address: bhobgood@learnnc.org
Co-Investigators:
Faculty Advisor: Dr. Barbara Day
Funding Source: None

Study Contact telephone number:
Study Contact email:

What are some general things you should know about research studies?
You are being asked to take part in a research study. Your parent, or guardian, needs to give permission for you to be in this study. You do not have to be in this study if you don't want to, even if your parent has already given permission. To join the study is voluntary. You may refuse to join, or you may withdraw your consent to be in the study, for any reason, without penalty.

Research studies are designed to obtain new knowledge. This new information may help people in the future. You may not receive any direct benefit from being in the research study. There also may be risks to being in research studies.

Details about this study are discussed below. It is important that you understand this information so that you can make an informed choice about being in this research study. You will be given a copy of this consent form. You should ask the researchers named above, or staff members who may assist them, any questions you have about this study at any time.

What is the purpose of this study?

The purpose of this research study is to learn about student perceptions of the motivation and enjoyment as they relate to their perceptions of learning from online discussions between their classmates and instructor in online, Advance Placement Psychology courses.

You are being asked to be in the study because you are among a small number of high school students in North Carolina who are enrolled in an online course as a part of your program of study. Because so little is known about the experience of high school students in online courses, your feedback is important to improve the quality of online courses in our state and beyond.

How many people will take part in this study?
If you decide to be in this study, you will be one of approximately 95 people in this research study. You and all of your classmates in this course have been invited to participate.

How long will your part in this study last?
Your involvement in this study will requires very little time on your part, approximately 10-15 minutes or less to complete an online survey.

What will happen if you take part in the study?
If you choose to take part in this study, you will have the opportunity to assist in the improvement of quality of online courses not only for LEARN NC but potentially for other online courses as well.

The survey will ask you to respond to questions about your experience in this course related to the **Discussion Board**. You may choose not to answer any of the questions for any reason. You will be notified via an announcement on the front page to check your *Messages* section for a message with and access code and the URL for this survey. This will occur near the end of the semester. The access code that you will be issued is unique to you. It was randomly generated and randomly issued. This means that no one, including the researcher, can identify your answers from this code.

You will use your access code to login to the survey. This code prevents others from accessing the survey who have not been invited to participate. You will click on the link which will take you to the survey located on a different server. Your responses and comments will be known only to the researcher. Your instructor will have no way of knowing your responses.

What are the possible benefits from being in this study?

Research is designed to benefit society by gaining new knowledge. You may not benefit personally from being in this research study unless you take another online course from LEARN NC next year. The information from this study will be used to inform LEARN NC

of the type of interactions that occur in the course.

What are the possible risks or discomforts involved from being in this study?

There are no risks whatsoever involved with participating in this study. The study has been designed to protect your privacy. Further, the questions in this survey are all based on your perceptions and do not require responses that would reveal any sensitive information about you.

How will your privacy be protected?

Your privacy and confidentiality is of the utmost concern in this study. The survey is completely anonymous, and does not require that you give your name nor any other identifying information that would allow anyone to associate your answers with you. Neither your course instructor nor Site Facilitator will know your responses to the survey. The researcher is the only person who will know your responses. The data from the survey will be kept on a password protected computer used only by the researcher.

You *will not* be identified in any report or publication about this study. Although every effort will be made to keep research records private, there may be times when federal or state law requires the disclosure of such records, including personal information. This is very unlikely, but if disclosure is ever required, UNC-Chapel Hill will take steps allowable by law to protect the privacy of personal information. In some cases, your information in this research study could be reviewed by representatives of the University, research sponsors, or government agencies for purposes such as quality control or safety.

Will you receive anything for being in this study?

You will not receive anything for taking part in this study.

What if you have questions about this study?

You have the right to ask, and have answered, any questions you may have about this research. If you have questions, or concerns, you should contact the researcher listed on the first page of this form.

What if you have questions about your rights as a research participant?

All research on human volunteers is reviewed by a committee that works to protect your rights and welfare. If you have questions or concerns about your rights as a research subject you may contact, anonymously if you wish, the Institutional Review Board at 919-966-3113 or by email to IRB_subjects@unc.edu.

- -

Participant's Agreement:

I have read the information provided above. I have asked all the questions I have at this time. I voluntarily agree to participate in this research study.

_____ _____

Your signature if you agree to be in the study Date

_____

Printed name if you agree to be in the study

APPENDIX E:

Parental Consent Letter

University of North Carolina-Chapel Hill
Parental Permission for a Minor Child to Participate in a Research Study
Social Behavioral Form

IRB Study #_____
Consent Form Version Date: _____

Title of Study: Perceptions of Motivation and Enjoyment, and Learning by North Carolina High School Students in Online, Advance Placement Psychology Courses

Principal Investigator: Bobby Hobgood
UNC-Chapel Hill Department: Education
UNC-Chapel Hill Phone number: 919 962-8944
Email Address: bhobgood@learnnc.org
Faculty Advisor: Dr. Barbara Day
Funding Source: None

Study Contact telephone number:
Study Contact email:

What are some general things you should know about research studies?

You are being asked to allow your child to take part in a research study. To join the study is voluntary. You may refuse to give permission, or you may withdraw your permission for your child to be in the study, for any reason. Even if you give your permission, your child can decide not to be in the study or to leave the study early.

Research studies are designed to obtain new knowledge. This new information may help people in the future. Your child may not receive any direct benefit from being in the research study. There also may be risks to being in research studies.

Details about this study are discussed below. It is important that you understand this information so that you and your child can make an informed choice about being in this research study.
You will be given a copy of this permission form. You and your child should ask the researchers named above, or staff members who may assist them, any questions you have about this study at any time.

What is the purpose of this study?

The purpose of this research study is to learn about student perceptions of the motivation and enjoyment as they relate to their perceptions of learning from online discussions involving their classmates and instructor in online, Advance Placement Psychology courses.

Your child is being asked to be in the study because he/she has the ability to offer important feedback to influence the quality of online courses for high school students in our state and beyond.

How many people will take part in this study?
If your child is in this study, your child will be one of approximately 95 students in this research study.

How long will your child's part in this study last?
Your child's involvement in this study will require very little time, approximately 10-15 minutes or less to complete an online survey. The timing of the survey has been carefully coordinated with the course instructor and LEARN NC to ensure that it will not interfere with the course schedule in any way.

What will happen if your child takes part in the study?
If your child takes part in this study, he/she will have the opportunity to assist in the improvement of quality of online courses not only for LEARN NC, but potentially for other online courses as well.

- The survey will ask students to respond to questions about their experience in their course related to the **Discussion Board**, a place in the course where they discuss class assignments and learn from one another. They may choose not to answer any of the questions for any reason.

- They will be notified via an announcement on the front page of the course to check their *Messages* section for a message which explains how they will access the survey. Each student will be issued a unique access code and the URL for this survey. This will occur near the end of the semester. The access code was randomly generated and randomly issued. This means that no one, including the researcher, can identify individual student responses.

- Students will use their unique access code to login to the survey. This code prevents others from accessing the survey who have not been invited to participate. They will click on the link which will take them to the survey located on a different server. Their responses and comments will be known only to the researcher. The course instructor will have no way of identifying individual student responses.

What are the possible benefits from being in this study?
Research is designed to benefit society by gaining new knowledge. You may also expect your child to benefit by being in this study if he or she enrolls in future online courses through LEARN NC or another institution. The results of the research will become a part of

the research base for improving online learning.

What are the possible risks or discomforts involved from being in this study?
There are no risks involved in participating in this study.

How will your child's privacy be protected?
Participants *will not* be identified in any report or publication about this study. Although every effort will be made to keep research records private, there may be times when federal or state law requires the disclosure of such records, including personal information. This is very unlikely, but if disclosure is ever required, UNC-Chapel Hill will take steps allowable by law to protect the privacy of personal information. In some cases, your information in this research study could be reviewed by representatives of the University, research sponsors, or government agencies for purposes such as quality control or safety.

Data from the electronic survey will be collected on the secure server where the survey is housed. The researcher will have access to this data via a personal password-protected account. This data is also accessible by the Director of Technology at LEARN NC who assisted in the creation of the survey on the server. Once created, the researcher will change the password access to the data from this survey such that the Director of Technology will no longer have access. The data will be backed-up by the researcher in a personal, locked (i.e., password protected) folder on a secure server belonging to LEARN NC, the host institution of the online course.

Once all surveys have been submitted, and the data compiled by the Snap software, the researcher will export the data via a secure network to his personal computer. This computer is biometrically protected, used only by the researcher, and in the possession of the researcher at all times. The data will be backed-up by the researcher in a personal, locked (i.e., password protected) folder on a secure server belonging to LEARN NC, the host institution of the online courses.

There is no danger of deductive disclosure since the survey does not ask students to provide any of the identifiers mentioned in Section A4.7. Access codes to take the survey will be randomly generated and assigned to students to preclude the potential for outside access to the survey. Once an access code has been used by the student, that student may no longer access the survey. The researcher will not maintain records the assignment of access codes.

Will your child receive anything for being in this study?
Your child will not receive anything for taking part in this study.

Will it cost you anything for your child to be in this study?
There will be no costs for being in the study

What if you or your child has questions about this study?
You and your child have the right to ask, and have answered, any questions you may have about this research. If you have questions, or concerns, you should contact the researcher listed on the first page of this form.

What if you or your child has questions about your child's rights as a research participant?

All research on human volunteers is reviewed by a committee that works to protect your child's rights and welfare. If you or your child has questions or concerns about your child's rights as a research subject you may contact, anonymously if you wish, the Institutional Review Board at 919-966-3113 or by email to IRB_subjects@unc.edu.

- -

Parent's Agreement:

I have read the information provided above. I have asked all the questions I have at this time. I voluntarily give permission to allow my child to participate in this research study.

____
Printed Name of Research Participant (Child)

______________________________________ ________________
Signature of Parent Date

____
Printed Name of Parent

APPENDIX F:

Completion Record Course in The Protection of Human Research Subjects

CITI Course in The Protection of Human Research Subjects

CITI Course Completion Record
for Bobby Hobgood

To whom it may concern:

On *1/13/2006*, *Bobby Hobgood* (username=bhobgood) completed all *CITI Program* requirements for the *Basic CITI* Course in The Protection of Human Research Subjects.

Learner Institution: *University of North Carolina at Chapel Hill*

Learner Group: *Group 2*

Learner Group Description: ***Social and Behavioral Research:*** *Studies on sociological, psychological, anthropological or educational phenomena that typically involve direct contact with subjects. Does not include drug or device studies.*

Contact Information:

Gender: Male
UNC Affiliation: Affiliated
UNC PID: 700941425
Department: Education
Which course do you plan to take?: Social & Behavioral Investigator Course Only
Role in human subjects research: Student Researcher
Email: bhobgood@learnnc.org
Office Phone: 919 962-8944

The Required Modules for *Group 2* are:	**Date completed**
Introduction	01/13/06
History and Ethical Principles - SBR	01/13/06

Defining Research with Human Subjects - SBR	01/13/06
The Regulations and The Social and Behavioral Sciences - SBR	01/13/06
Assessing Risk in Social and Behavioral Sciences - SBR	01/13/06
Informed Consent - SBR	01/13/06
Privacy and Confidentiality - SBR	01/13/06
Records-Based Research	01/13/06
Research With Protected Populations - Vulnerable Subjects: An Overview	01/13/06
Group Harms: Research With Culturally or Medically Vulnerable Groups	01/13/06
Workers as Research Subjects-A Vulnerable Population	01/13/06
Conflicts of Interest in Research Involving Human Subjects	01/13/06
HIPAA and Research at UNC- Chapel Hill	01/13/06
Additional optional modules completed:	**Date completed**
Research in Public Elementary and Secondary Schools - SBR	01/13/06
Internet Research - SBR	01/13/06

For this Completion Report to be valid, the learner listed above must be affiliated with a CITI participating institution. Falsified information and unauthorized use of the CITI course site is unethical, and may be considered scientific misconduct by your institution.

Paul Braunschweiger Ph.D.
Professor, University of Miami
Director Office of Research Education
CITI Course Coordinator

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