

Blended Learning and the Classroom Environment: A Comparative Analysis of Students'
Perception of the Classroom Environment across Community College Courses Taught in
Traditional Face-to-face, Online and Blended Methods

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Abstract of Dissertation

Blended Learning and the Classroom Environment: A Comparative Analysis of Students' Perception of the Classroom Environment across Community College Courses Taught in Traditional Face-to-face, Online and Blended Methods

This study examined how students' perception of the classroom environment differs across traditional face-to-face, online, and blended courses. The study compared feedback from students enrolled in courses taught in each format to determine if the blended learning environment produces higher levels of participation (Cathetic Learning Climate/CLC), a stronger sense of connection to the instructor (Professorial Concern/PC), a more positive feeling about the cooperative nature of the classroom environment (Inimical Ambiance/IA), a stronger perception that the course is intellectually challenging (Academic Rigor/AR), a better feeling that the instructor is supportive and student-centered (Affiliation/AF), and a more positive sense that the evaluation criteria and course content have been clearly articulated (Structure/ST).

The College Classroom Environment Scales (CCES) were used to gather information about students' perceptions of the classroom environment (Winston, Vahala, Nichols, & Gillis, 1989). Study participants consisted of 368 students enrolled in courses taught at a community college. A stratified random sample was taken during the Fall 2007 semester. Descriptive statistics, MANOVA, univariate ANOVAs and Games-Howell planned comparison tests were used in the analysis. The analysis revealed significant differences on all six dependent variables.

The findings suggest that blended classes provide an atmosphere that is as good as or better than both face-to-face and online classes in producing higher levels of student participation (CLC) and a stronger sense of being connected to the instructor (PC). That

both face-to-face and blended students perceive that their instructor is more supportive and student-centered (AF) and have more positive feelings about the cooperative nature of the classroom environment (IA) than do online students. But, classes taught online seem to foster a stronger perception that the course is intellectually challenging (AR) and that the evaluation criteria and course content have been clearly articulated (ST) than both face-to-face and blended classes.

Overall, the results seem to suggest that by combining elements of both face-to-face and online courses, blended courses can create a positive learning environment while providing some of the convenience of an online course without eliminating the face-to-face contact that many students desire.

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CHAPTER I

The Problem and its Setting

Overview

Over the past two decades American higher education has undergone a dramatic transformation as technology has moved into every element of the institution. Colleges and universities are shifting from traditional pedagogical constructs based largely on face-to-face instruction to educational paradigms that increasingly incorporate online courses and Web-based instructional activities. A recent study by the Sloan Foundation found that a vast majority of colleges and universities are now offering online courses. The percentage of public colleges and universities offering online courses is over 90 percent (Allen & Seaman, 2004). Online learning is the fastest growing segment in the educational marketplace (Conhaim, 2003; Waits & Lewis, 2003). A recent study showed that online enrollments grew 12.9% in one year. This growth rate far exceeded the 1.2% growth rate of the overall higher education student population during the same period (Allen & Seaman, 2008). According to a recent national survey, over 3.9 million people took at least one online course during the fall 2007 term and over twenty percent of all U.S. higher education students were taking at least one online course during the same period (Allen & Seaman, 2008). This shift has occurred in part because faculty and academic leaders are not only more comfortable with this new instructional delivery method, but are increasingly accepting it as a quality alternative to traditional face-to-face instruction (Conhaim, 2003; Sloan, 2003). In a national survey of chief academic officers

Allen & Seaman (2004) found that 52.6 percent of them viewed online learning as critical to their institutions strategic success.

America's 1,195 community colleges have been in the forefront of adopting this new instructional format (Muse, 2003). Of the 3,077,000 enrollments in all distance education courses during the 2001 academic year, 48 percent or 1,472,000 of them came from two-year public institutions and community colleges had a half million more distance education enrollments than public four-year institutions (Waits & Lewis, 2003). A recent comprehensive survey found that this number has continued to grow so now community college students make up over one-half of all online students in the United States (Allen & Seaman, 2008). That community colleges have been quick to adopt online education should not come as a surprise. Community colleges have a long history of expanding access and providing educational opportunities for students who may not otherwise be able to attend college (Cross, 1974, Parnell, 1985). Alternatives like online courses are particularly important in a community college setting where the average age of the 11.5 million students is 29 years old and the majority of students are women (AACC, 2005). As a recent U.S. Department of Education report found, older women with families and jobs are more drawn to undergraduate distance education courses than members of any other demographic group (Sikora, 2002). The author of the report, Anna Sikora, speculated that working adults who have work and family responsibilities gravitate toward distance-education courses because of the flexibility they provide (Carnevale, 2003). As a result, most community colleges offer online courses and, increasingly, online degree programs (Green, 2003).

While research over the past several years seems to indicate that students can be as successful in learning in an online environment as in a traditional setting (Barry & Runyan, 1995; Cole, 2000; Gagne & Shepherd, 2001; Hiltz, Zhang & Turoff, 2002; Russell, 1999; Schulman and Sims, 1995; Swann, 2003, 2004) colleges and universities recognize that there are advantages and disadvantages of offering courses in traditional face-to-face formats and in online formats. In his review of the literature, Jasper (1995) found that while cognitive outcomes were virtually the same between distance learning students and face-to-face student in a wide range of studies, researchers have found significantly lower degrees of student-teacher interaction and student satisfaction with the overall course, the course structure, and the physical learning environment among distance learning students than traditional face-to-face students. “Comfort and convenience were cited repeatedly as positive elements” of distance learning (Spooner, Jordan, Algozzine, & Spooner, 1999, p.3). However, even though students like the convenience of online courses, Simonson’s (1997) research suggests that if it wasn’t for challenges related to time and space many undergraduate students would “prefer sitting in a classroom, laboratory, or conference room with other learners and the instructor because they value the interactions as a part of the total learning experience” (p. 104). Some contend that this lack of face-to-face physical interaction is one of the major limitations of distance education (Kirby, 1999; Kruger, 2000). The differences have led some educators to conclude that instructional methods should be chosen based on their relative advantages and disadvantages (Edward & Fritz, 1997).

In an attempt to take advantage of the strengths of both traditional face-to-face courses and online course, some colleges have begun offering blended or hybrid courses.

A blended course is one that is taught by combining traditional face-to-face instructional elements with online learning components and online course management tools. Blended courses and blended degree programs promise, in the words of Jeffrey Young (2002), “the best of both worlds” (p. 33), offering some of the convenience of an all-online course without the complete loss of face-to-face contact (Colis & Moonen, 2001; Graham, 2005; Osguthorpe & Graham, 2003; Twigg, 2003; Young, 2002). Through this blended approach some believe that a faculty member can create a learning experience more effective than either approach on its own (Graham, 2005; Graham, Allen & Ure, 2003; Osguthorpe & Graham, 2003). In fact, John Bourne, the editor of the *Journal of Asynchronous Learning Networks*, predicts that, “somewhere in the 80 – 90 percent range of classes could sometime become hybrid” (Young, 2002, p. 33).

Attracted by the allure of an instructional format that promises both expanded access through convenience while maintaining a high level of face-to-face interaction, many community colleges have begun developing and offering more blended courses.

Problem Statement

Based on a growing body of research which seems to indicate that students can be as successful in learning in an online environment as in a traditional face-to-face setting (Barry & Runyan, 1995; Cole, 2000; Gagne & Shepherd, 2001; Hiltz, Zhang, & Turoff, 2002; Russell, 1999; Schulman & Sims, 1995; Swann, 2003, 2004) researchers have begun to suggest that it is time for moving beyond studies which compare the outcomes of distance learning classes in order to better understand the distance learning environment and its impact on students’ learning and satisfaction (Arbaugh, 2000; Clark,

1994; Phipps & Merisotis, 1999; Russell, 1999; Surry & Ensminger, 2001). As Saba (1999) advised potential researchers, the “proper question is not whether distance education is comparable to a hypothetical ‘traditional,’ or face-to-face, instruction, but if there is enough interaction between the learner and the instructor for the learner to find meaning and develop new knowledge” (p. 2).

As explored in greater depth in Chapter II, a number of authors and theorists have built on the work of Dewey (1938) to advance the concept that interaction among students and interactions between students and teachers is a key factor in student learning and is a critical element in creating effective learning experiences. Dewey theorized that learning emerged from meaningful experiences, where students join together in a social context, such as a classroom, to manipulate materials and ideas. Dewey (1938) believed that learning is a “social enterprise” (p. 116) and stressed that the interactions between student and teacher were critical to the learning process.

In responding to this issue, colleges and universities have begun developing a variety of new instructional models that utilize online learning components while retaining the face-to-face interactions among students and instructors found in more traditional instructional settings (Green, 2003; Osguthorpe & Graham, 2003; Twigg, 2003). While all of these new models help address the need for colleges and universities to respond to student demand for flexibility and access, the blended or hybrid model seems to have attracted the most interest among the nation’s community colleges (Twigg, 2003). This model replaces, rather than supplements, some face-to-face classroom time with online, interactive learning activities (Twigg, 2003). Courses taught using this model reduce the time spent in the classroom while retaining some of the interactivity (Bruffee,

1993; Jasper, 1995) and sense of community that seems to be preferred by students in a traditional face-to-face class (Crabtree, 2000; Hiltz, 1998).

While theorists suggest that the blended format may result in greater student satisfaction (Colis & Moonen, 2001; Osguthorpe & Graham, 2003; Twigg, 2003; Young, 2002), a review of the literature finds no empirical evidence to support this notion. Thus, the problem addressed in this dissertation project is that although the literature seems to indicate that courses taught in a blended format should produce higher levels of student satisfaction with the learning environment than courses taught in an online format, after an exhaustive search using a variety of sources, no definitive studies can be found to support this claim. This project will begin to fill this gap by comparing feedback about satisfaction with the classroom environment from students enrolled in blended courses with students enrolled in traditional face-to-face and online courses

Purpose of the Study

The purpose of this study is to examine how students' perception of the classroom environment differs across traditional face-to-face, fully online, and blended courses. In doing so, the study seeks to determine if blended courses offer the "best of both worlds" (Young, 2002, p. 33) by offering some of the convenience of an all-online course without the complete loss of face-to-face contact. Specifically, the study compares feedback from community college students enrolled in blended courses with community college students enrolled in face-to-face and online courses to determine if the blended learning environment produces higher levels of participation, a stronger sense of connection to the instructor, a more positive feeling about the course structure, a

stronger perception that the course is intellectually challenging, a more positive perception that the instructor is supportive and student-centered, and a more positive sense that the evaluation criteria and course content have been clearly articulated.

Significance of the Study

This study will make contributions in three areas. First, while the literature suggests that the blended format may result in greater student satisfaction (Colis & Moonen, 2001; Osguthorpe & Graham, 2003; Twigg, 2003; Young, 2002) by offering some of the convenience of a fully-online course without the complete loss of face-to-face contact there has been little research to determine if this is indeed the case. A comparison of how the classroom environment is perceived by students enrolled in traditional face-to-face, online, and blended courses will be helpful in determining the merits of this assertion. Demographic comparisons will also be useful in determining if there are any demographic differences in these perceptions among student enrolled in each format.

Second, while blended formats are rapidly being adopted by community colleges (Green, 2003) as a way to address access issues of adult students (Sikora, 2002) while still retaining some face-to-face contact (Sloan, 2005), there has been no empirical research examining how students' perception of the blended classroom environment compares to the perceptions of students taking classes in traditional or online classroom environments at community colleges. The findings from the present study will be useful in helping decisions makers determine the need for the continued development and expansion of the blended instructional methodology in community college settings.

Third, by contributing knowledge about how the classroom environment is perceived by students enrolled in courses taught in these three instructional methods, this study may have implications for future research in this area. Future studies of community colleges in other geographic locations could determine if the results can be generalized throughout the country and future studies at four-year colleges and universities could also help determine if the results could be extended to the four-year setting as well. A recent study of e-learning in higher education showed that 80% of all colleges and universities and 93% of doctoral institutions offer blended learning courses (Arabasz, Boggs, & Baker, 2003). So information about how student perceive the blended learning environment could be of critical importance as four-year college and universities consider future course development.

Theoretical Framework

A number of authors and theorists have advanced the idea that interaction among students and interactions between students and teachers is a key factor in student learning and is a critical element in creating effective learning experiences (Astin, 1975, 1977, 1993; Berge, 1999; Hammer 2001; Kearsley, 2000; Moore, 1989; Pascarella, 1980, 1985; Pascarella & Terenzini, 1977; Spady, 1971; Sutton, 2001; Terenzini & Pascarella, 1971, 1980; Tinto, 1975, 1982, 1987, 1988, 1993, 1997; Wagner, 1994). This concept is grounded in the educational philosophy of Dewey (1938). Dewey theorized that learning emerged from meaningful experiences, where students join together in a social context, such as a classroom, to manipulate materials and ideas. Dewey (1938) believed that learning is a “social enterprise” (p. 116) and stressed that the interactions between student

and teacher were critical to the learning process. He wrote that education needed to focus on the process of inquiry rather than just relaying information from teacher to student.

Recently, authors have built on Dewey's theories by asserting that not only are interaction between students and teachers important to the learning process, but interactions among students are just as important to learning. Moore (1989) considered interactions among students and interactions between students and teachers so important that he referred them as "a defining characteristic of education" (p. 2). Shale and Garrison (1990) considered interaction so fundamental to the educational process that they believed education itself could be defined as "an interaction among instructor, student and subject content" (p. 1).

Several definitions of interaction exist, but one of the clearest definitions was provided by Wagner (1994). She wrote that interaction could be defined as:

reciprocal events that require at least two objects and two actions. Interactions occur when these objects and events mutually influence one another. An instructional interaction is an event that takes place between a learner and the learner's environment. Its purpose is to respond to the learner in a way intended to change his or her behavior toward an educational goal. Instructional interactions have two purposes: to change learners and to move them toward achieving their goals (p.8).

In writing about interaction, Michael Moore (1989) developed an important theoretical framework which can help us better understand the role interaction plays in the learning environment. Moore's interaction paradigm described three specific types of interactions that occur in an educational setting: i) learner-content interaction, ii) learner-

instructor interaction, and iii) learner-learner interaction (Figure 1-1). A fourth type of interaction was later added by Hillman, Willis and Gunawardena (1994) called learner-interface interaction.

- i. Learner-content interaction. The method by which students obtain information from the course material. It is the “process of intellectually interacting with content that results in changes in the learner’s understanding, the learner’s perspective, or the cognitive structures of the learner’s mind” (Moore, 1989, p. 1). Learner-content interaction result in learners achieving intellectual growth and is seen by Moore as the defining characteristic of education.
- ii. Learner-instructor interaction. This interaction is what many think of as classroom teaching. It can take the form of an instructor delivering information, encouraging the learner, or providing feedback. It can also take the form of the learner asking questions of the instructor or communicating with the instructor regarding course activities. This type of interaction provides motivation, feedback, and student-instructor dialogue. This concept is supported by earlier research by Bloom (1981) who believed that “Interaction between teachers and students in the classroom is the major factor in accounting for the cognitive learning of students, their interest in school subjects and learning, and their confidence in their own learning capabilities (p. vi).
- iii. Learner-learner interaction. This interaction is characterized by the exchange of information and ideas that occurs in a course among students with or without the presence of the instructor. Learner-learner interaction can foster learning through student collaboration and knowledge sharing.

- iv. Learner-interface interaction. Learner-interface interaction is most commonly thought of as the interaction that occurs when a student uses a computer program to learn a particular topic or subject. By definition, this only occurs when the computer provides feedback to the student concerning their progress or knowledge (Hillman et al., 1994).

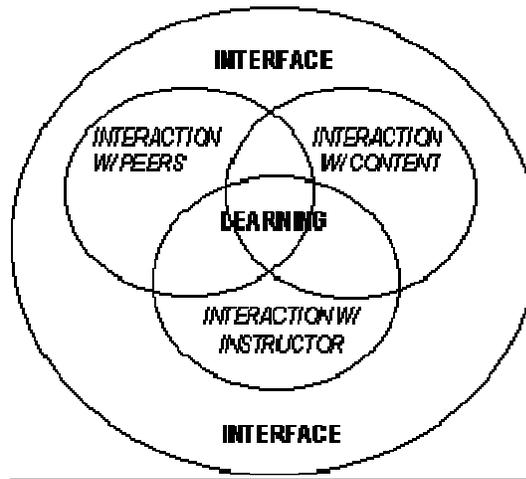


Figure 1-1: Moore's Interaction Paradigm Conceptualized (Swan, 2003)

Overall, the literature demonstrates that interaction in the learning context is a key element to student learning and satisfaction in both traditional face-to-face classes and online learning. Each of these interactions is a critical component of the learning environment. The importance of these components was emphasized by Palloff and Pratt (1999) who stated that the “keys to the learning process are the interactions among student themselves, the interaction between faculty and students, and the collaboration in learning that results from these interactions” (p. 5).

Given that result of many studies show no significant difference in learning outcomes between students taking online and traditional courses (Barry & Runyan, 1995; Cole, 2000; Gagne & Shepherd, 2001; Hiltz, Zhang, & Turoff, 2002; Russell, 1999; Schulman & Sims, 1995; Swan, 2003, 2004) several researchers have called for moving beyond studies which compare the outcomes of distance learning classes in order to better understand the distance learning environment and its impact on students' learning and satisfaction (Arbaugh, 2000; Clark, 1994; Phipps & Merisotis, 1999; Russell, 1999; Surry & Ensminger, 2001).

Classroom environment research evolved from theories proposed by Lewin (1935), who referred to the environment as "life space," which contains the "person and the psychological environment that exists for him" (p. xi). The properties that make up a classroom environment include interpersonal relationships among students, relationships between students and their teachers, relationships between students and both the subject being studied and the method of learning, and the students' perception of the structure of the class (Anderson, 1970, p. 135).

Theories on the impact of the environment on learning have been researched since the 1930's (Groh & Fraser, 1998). These theories explore the nature of various teaching and classroom environments on students and their learning. In writing about learning environments in the college setting, Strange and Banning (2001) said that at their core these theories are based on the concept that, "Variations in the differing aspects of students' environments yields a constructed milieu that, in turn, further influences students' attraction, satisfaction, and stability within the environment" (p. 2). Applying learning environment theories to the college classroom springs from clear findings that

students report higher levels of perceived learning and satisfaction in classrooms with a supportive environment (Fraser, 1994, 1998).

One of the earliest theorists to describe the classroom learning environment was Withall (1949). He described the student-student and student-teacher interactions as the “social emotional climate” (p. 348). He defined this as:

a general emotional factor which appears to be present in interactions occurring between individuals in face to face groups. It seems to have some relationship to the degree of acceptance expressed by members of a group regarding each other's needs or goals. Operationally defined, it is considered to influence: 1) the inner private world of each individual; 2) the esprit de corps of a group; 3) the sense of meaningfulness of group and individual goals and activities; 4) the objectivity with which a problem is attacked; and 5) the kind and extent of interpersonal interaction in a group (pp. 348 – 349).

Building on work of Withall (1949) and others (Bovard, 1951; Pace & Stern, 1959), Anderson (1970) offered a slightly different take on the classroom learning environment when he asserted that the climate in the learning environment is contingent upon student and faculty relationships. He wrote:

These climate properties include interpersonal relationships among pupils, relationships between pupils and their teachers, relationships between pupils and both the subject studied and the method of learning, and finally, pupils' perceptions of the structured characteristics of the class (p. 135).

Moos (1976) asserted that these learning environments have ‘personalities’ much like people do and that differing environments affect those in them in differing ways

(Sempsey & Johnston, 2004). Moos (1994) stressed that, “each setting has a unique ‘personality’ that gives it unity and coherence.” Understanding these environmental factors can help researchers understand the overall behavior of groups, particularly as they relate to outcomes on both the aggregate and the individual level (Sempsey & Johnston, 2004).

This study brings together student interaction theories (Astin, 1975, 1977, 1993; Hammer 2001; Kearsley, 2000; Moore, 1989; Pascarella, 1980, 1985; Pascarella & Terenzini, 1977; Spady, 1971; Sutton, 2001; Terenzini & Pascarella, 1971, 1980; Tinto, 1975, 1982, 1987, 1988, 1993, 1997; Wagner, 1994) and the learning environment theories (Fraser, 1994, 1998; Groh & Fraser, 1998; Moos, 1976, 1979) to examine students’ perception of the classroom environment across community college courses taught in traditional face-to-face, online, and blended methods. The intersection of these theories, best described by Moore’s Interaction Paradigm (Moore, 1989; Swan, 2003), forms the conceptual framework from which to examine how student’s perception of the classroom environment differs across traditional face-to-face, online and blended courses.

Research Questions

The study addresses the overarching question: Do students’ perception of the classroom environment differ across traditional face-to-face, fully online, and blended courses? This primary question will be addressed through the use of the College Classroom Environment Scales (CCES) instrument designed by Winston, Vahala, Nichols, and Gillis (1989) to explore student perceptions of the social and psychological aspects of the learning environment. The CCES was chosen for this study since, unlike

other available instruments, it was specifically developed for use with undergraduate students at American colleges and universities, it addresses several of the factors both student interaction research and learning environment theorists have shown are associated with positive perceptions of the classroom experience, it has strong validity and reliability, and it has been tested and analyzed in a wide variety of both two-year and four-year undergraduate settings (Winston, Vahala, Nichols, Gillis, Wintrow, & Rome, 1994). The College Classroom Environment Scales are comprised of 62 statements to which students can respond using a five-point Likert-type scale (see Appendix A). The statements are grouped into six scales (CLC, PC, IA, AR, AF and ST) that have been found to be related to classroom environment and that can be used independently. A full presentation of the survey instrument and the research underlying the scales will be presented in Chapter II, Review of the Literature Review and Chapter III, Research Design and Methodology. This survey instrument will be used to answer the following research questions:

1. To what extent do classroom environments differ across traditional face-to-face, fully online, and blended courses in relation to cathectic learning climate (CLC) as measured by the College Classroom Environment Scales (CCES)?
2. To what extent do classroom environments differ across traditional face-to-face, fully online, and blended courses in relation to professorial concern (PC) as measured by the College Classroom Environment Scales (CCES)?
3. To what extent do classroom environments differ across traditional face-to-face, fully online, and blended courses in relation to inimical ambiance (IA) as measured by the College Classroom Environment Scales (CCES)?

4. To what extent do classroom environments differ across traditional face-to-face, fully online, and blended courses in relation to academic rigor (AR) as measured by the College Classroom Environment Scales (CCES)?
5. To what extent do classroom environments differ across traditional face-to-face, fully online, and blended courses in relation to affiliation (AF) as measured by the College Classroom Environment Scales (CCES)?
6. To what extent do classroom environments differ across traditional face-to-face, fully online, and blended courses in relation to structure (ST) as measured by the College Classroom Environment Scales (CCES)?

Research Hypotheses

The rationale underlying the research hypotheses in this study is based on the literature review presented in Chapter II which leads us to posit that by combining the best elements of traditional and online instructional methodologies professors and course designers can create a learning environment that provides more opportunities for students to interact with each other and with their instructors. In doing so, the blended environment should result in higher levels of student participation (CLC), a stronger sense of connection to the instructor (PC), a more positive feeling about the classroom atmosphere and structure (IA), a stronger perception that the course is intellectually challenging (AR), a better feeling that the instructor is supportive and student-centered (AF), and a more positive sense that the evaluation criteria and course content have been clearly articulated (ST).

Hypotheses

H_A1: Students enrolled in blended classes will have significantly higher cathectic learning climate (CLC) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

H_O1: Students enrolled in blended classes will not have significantly higher cathectic learning climate (CLC) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

H_A2: Students enrolled in blended classes will have significantly higher professorial concern (PC) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

H_O2: Students enrolled in blended classes will not have significantly higher professorial concern (PC) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

H_A3: Students enrolled in blended classes will have significantly higher inimical ambiance (IA) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

H_O3: Students enrolled in blended classes will not have significantly higher inimical ambiance (IA) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

H_A4: Students enrolled in blended classes will have significantly higher academic rigor (AR) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

H_{O4}: Students enrolled in blended classes will not have significantly higher academic rigor (AR) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

H_{A5}: Students enrolled in blended classes will have significantly higher affiliation (AF) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

H_{O5}: Students enrolled in blended classes will not have significantly higher affiliation (AF) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

H_{A6}: Students enrolled in blended classes will have significantly higher structure (ST) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

H_{O6}: Students enrolled in blended classes will not have significantly higher structure (ST) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

Definition of Key Terms

Throughout this study certain key terms are used. While many of these key terms are used consistently throughout higher education literature, some need clarification and definition to understand how they are applied to this study.

Academic Rigor (AR): High scores on this scale are indicative of an environment that is intellectually challenging and demanding (Winston, et al., 1989).

Affiliation (AF): High scores on this scale describe a class environment that students see as promoting informal interaction and as being highly supportive, friendly, and student-centered (Winston, et al., 1989).

Blended Course. A blended, or hybrid, course is one that is taught by combining traditional face-to-face instructional elements with online learning components and online course management tools (Osguthorpe & Graham, 2003). One of the basic concepts underlying this definition is that, “Those who use blended learning environments are trying to maximize the benefits of both face-to-face and online methods – using the Web for what it does best and using class time for what it does best” (Osguthorpe & Graham, 2003, p. 227).

Cathectic Learning Climate (CLC): High scores on this scale indicate a charged academic atmosphere that stimulates students to be active participants in the class and to seek classmates’ opinions and reactions (Winston, et al., 1989).

Classroom Environment: Classroom environment research evolved from theories proposed by Lewin (1935), who referred to the environment as “life space,” which contains the “person and the psychological environment that exists for him” (p. xi). The properties that make up a classroom environment include interpersonal relationships among students, relationships between students and their teachers, relationships between students and both the subject being studied and the method of learning, and the students’ perception of the structure of the class (Anderson, 1970, p. 135).

Distance Education/Distance Learning: Distance education has a long history in American higher education. Its roots can be traced back to correspondence courses in the early 1900’s (Morabito, 1997). From this early beginning, educators have searched for

ways to use new tools and technologies to break down time and space barriers that limit student access to higher education. These have included not only courses by mail, but also by radio, television, telephone, and video teleconferencing (Farahani, 2003). Today distance learning is most commonly associated with online courses. It can generally be defined as, “planned learning that occurs in a different place from teaching and as a result requires special techniques or course design, special instructional techniques, special methods of communication by electronic and other technology, as well as special organizational and administrative arrangements” (Moore & Kearsley, 1996, p.2).

Inimical Ambiance (IA): High scores on this scale characterize an environment that students see as being hostile, highly competitive, and rigidly structured (Winston, Vahala, Nichols, & Gillis, 1989).

Interaction: “Interaction is defined as reciprocal events that require at least two objects and two actions ... An instructional interaction is an event that takes place between a learner and the learner’s environment” (Wagner, 1994, p. 8).

Mid-Size Maryland Community College. The state of Maryland has 16 community colleges. For reporting purposes the schools are grouped by size. The state has four mid-size colleges. Mid-size schools have an FTE (full-time equivalent) student enrollment between 1,000 and 2,000.

Online Courses. Online learning is defined as using Internet technology to deliver courses content. Online courses can be either “asynchronous” (interacting at different times) or “synchronous” (interacting at the same time) and usually do not require any face-to-face time in the classroom (Farahani, 2003). In a fully online course all learning

material and course communication are delivered using the Internet (Berge, Collins, & Dougherty, 2000).

Professorial Concern (PC): High scores on this scale describe an academic environment in which students perceive the instructor as being personally concerned about them as individuals and as striving to foster their educational and personal achievements (Winston, Vahala, Nichols, & Gillis, 1989).

Student Satisfaction: Student satisfaction and affective learning are both used in the literature to describe a student's attitude toward their educational experience. Fraser (1982) defined this as the extent of enjoyment a student got from their class work (p.5). "In other words, did the student feel the course was valuable, would the student enroll in a similar course, and did the student find the experience to be beneficial" (Sher, p. 10).

Structure (ST): High scores on this scale describe an environment that students perceive as having evaluation criteria and course content clearly articulated (Winston, Vahala, Nichols, & Gillis, 1989).

Traditional Face-to-face Courses: Face-to-face courses refer to those courses in which the student and the teacher meet in a traditional classroom setting for instructional activities. Face-to-face courses may add some technology-based or out-of-class activities, but the primary mode of instructional delivery between teacher and student is face-to-face in a classroom.

Assumptions of the Study

The following assumptions apply to this study:

1. The perceptions of lower division, undergraduate students at a mid-size community college in Maryland are an accurate measure of the classroom environment.
2. Students participating in the survey could read and comprehend the survey questions and answered them as honestly and accurately as possible.
3. The students in both the fully online and blended courses had the skills needed to utilize the technologies used in the course.

Delimitations of the Study

“Delimitations describe the population to which the study specifically applies and for which generalizations can be made” (McDade, 1999, p.21). This study examines the topic through the lens of one select population and has the following delimitations:

1. Because of classroom and student data access issues, the study was limited to one mid-size, multi-campus Maryland community college.
2. The study was limited to intact groups of students enrolled in classes taught utilizing traditional face-to-face, online, and blended instructional methodologies.

Limitations of the Study

Limitations for this study include the number of colleges in the study, the number of students and classes in the study, the experience of the class instructors with each format, the background of the researcher, and instructional issues and student success issues. Each of these issues is further explained below:

1. While this mid-size, multi-campus Maryland community college participating in this study is similar in many respects to other comprehensive community colleges, the ability to generalize the findings to other colleges is limited.
2. Since blended learning is still an emerging instructional methodology, many classes are not taught in all three formats. So, while the study did control for academic discipline of the courses surveyed (e.g. only courses in disciplines that offered classes in all three formats were surveyed), it was not possible to survey the same courses offered across all three formats (e.g. a similar group of courses in each discipline were included in each group but not the same courses).
3. The researcher involved in this study has an extensive background in development and deployment of online and blended courses and, as a result, approached the development of the study with a positive perspective on the use of online and blended courses in the community college setting.
4. The study did not control for instructor experience or training in teaching in each instructional format. While most instructors have significant experience in teaching in a face-to-face setting, fewer have extensive experience in teaching online or in the relatively new blended format.
5. Students involved in the study varied in prior knowledge, skills, and attitudes and in their experience with online and blended courses. They varied in level of education, life experience, motivation, and socioeconomic status.

Overview of the Dissertation

This study is organized around five chapters. Chapter I provides an introduction to the literature, a rationale for the study, and presents the research questions and definitions used in the study. Chapter II presents a review of the literature related to this topic emphasizing prior research on interactions in different learning environments. Chapter III outlines the research design and methodology used to investigate the research questions and further discusses the College Classroom Environment Scales (CCES) instrument designed by Winston, Vahala, Nichols, & Gillis (1989). Chapter IV presents the results of the data analysis and findings. Chapter V discusses implications, limitations, recommendations for future research, and concludes with a summary of the dissertation.

Summary

Attracted by the allure of an instructional format that promises both expanded access through convenience while maintaining a high level of student-teacher and student-student interaction, many community colleges have begun developing and offering more blended courses. A blended course is one that is taught by combining traditional face-to-face instructional elements with online learning components and online course management tools. Blended courses promise “the best of both worlds” (Young, 2002, p. 33), offering some of the convenience of an all-online course without the complete loss of face-to-face contact (Colis & Moonen, 2001; Graham, 2005; Osguthorpe & Graham, 2003; Twigg, 2003; Young, 2002). Through this approach some believe that a faculty member can address student learning issues and persistence

problems connected with online classes and create a learning experience more effective than either approach on its own (Graham, 2005; Osguthorpe & Graham, 2003). However, little research has been conducted to examine how this old notion of combining elements of distance learning and traditional face-to-face instruction is being received by students in today's Web-based society. While literature suggests that the blended format may result in greater student satisfaction (Colis & Moonen, 2001; Osguthorpe & Graham, 2003; Twigg, 2003; Young, 2002), there is little evidence to support this notion. As blended courses gain popularity, especially on community college campuses, it is important to explore this question.

This study examines how students' perception of the classroom environment differs across traditional face-to-face, fully online, and blended courses. In doing so, the study contributes to answering the question "do blended courses really offer the best of both worlds?" Specifically, the study compares feedback from students enrolled in blended courses with students enrolled in face-to-face and online courses to determine if the blended learning environment produces higher levels of participation, a stronger sense of connection to the instructor, a more positive feeling about the classroom atmosphere and structure, a stronger perception that the course is intellectually challenging, a better feeling that the instructor is supportive and student-centered, and a more positive sense that the evaluation criteria and course content have been clearly articulated.

CHAPTER II

Review of the Literature

Overview

Attracted by the allure of an instructional format that promises both expanded access through convenience while maintaining a high level of student-teacher and student-student interaction, many community colleges have begun developing and offering more blended courses. Blended courses promise the best of both worlds, offering some of the convenience of an all-online course without the complete loss of face-to-face contact (Colis & Moonen, 2001; Graham, 2005; Osguthorpe & Graham, 2003; Twigg, 2003; Young, 2002). Through this approach some believe that a faculty member can address student learning issues and persistence problems connected with online classes and create a learning experience more effective than either approach on its own (Graham, 2005; Osguthorpe & Graham, 2003). This study's overall purpose was to examine how students' perception of the classroom environment differs across traditional face-to-face, fully online, and blended courses. In doing so, the study contributes to answering the question "do blended courses really offer the best of both worlds?" Specifically, the study compared feedback from students enrolled in blended courses with students enrolled in face-to-face and online courses to determine if the blended learning environment produces higher levels of participation, a stronger sense of connection to the instructor, a more positive feeling about the classroom atmosphere and structure, a stronger perception that the course is intellectually challenging, a better feeling that the instructor is supportive and student-centered, and a more positive sense that the evaluation criteria and course content have been clearly articulated.

This purpose of this literature review is to provide a context for the examination of blended courses in the community college setting and review research on student-student and student-teacher interactions in the learning environment. The review is organized into six sections. First, an overview of American community colleges is given. Second, a summary of the development and growth of distance learning in higher education is presented. Third, a description of the development and growth of the blended learning instructional method is provided. Fourth, a discussion of the role student interaction and student satisfaction plays in learning is presented. Fifth, learning environment research and its implications for student satisfaction is reviewed. Sixth, an overview of the College Classroom Environment Scales is presented. A summary that synthesizes the literature and provides inferences for the present study concludes the chapter.

Overview of American Community Colleges

American community colleges were born in the 1890's as part of a new model of higher education that emerged from the formation of the University of Chicago (Rudolph, 1990). This new model was the work of the first president of the University of Chicago, William Rainey Harper. In his model, Harper saw the traditional four years of education divided into two parts, the first to be known as the junior college and the second to be known as the senior college (Rudolph, 1990). The junior college was envisioned as a school which primarily focused on collegiate preparation and study. During the early 1900's Harper implemented this design by creating the associate's degree and establishing the first public junior college (Witt, Wattenbarger, Gollattschedk, &

Suppinger, 1994). By the mid-1900's junior colleges had begun to spread across the mid-west and were taking a foothold on the east and west coasts (Witt et. al, 1994).

In the years following World War II the number of junior colleges, some beginning to be known as community colleges, in America expanded dramatically. Buoyed first by the influx of veterans returning to school after World War II and Korea on the GI Bill and then by the arrival of the baby boomers in the 1960's, the number of junior colleges and community colleges rose from fewer than 100 in the early 1940's to more than 600 by the mid-1960's (Kane & Rouse, 1999; Weiger, 1999). Today, 1,195 community colleges have been established across America to respond to the diverse needs, academic skill levels, and interests of students (AACC, 2005).

Community colleges have been called "open door colleges" or "democracy colleges" because they provide access to higher education for students who because of life circumstances, financial means, or academic preparedness might otherwise not be able to pursue higher education (Griffith & Connor, 1994). By offering remedial education, skills training, general education courses, technical and vocational education, non-credit courses, and scores of other opportunities, community colleges attempt to take each student from where they are to where they want to be (Two-year colleges, 1984). In writing about American higher education, Dale Parnell (1985) said, "One of the pressing dilemmas of educators is how to meet the great range of individual differences among students while seeking the best in all people." This in essence is the mission of American community colleges. The proportion of traditionally disadvantaged and under prepared students enrolled in community colleges reflect a commitment to this mission. While community colleges enroll fewer than half of all U.S. undergraduates, they enroll 46% of

all African-American students, 55% of all Hispanic students, 46% of all Asian/Pacific islanders and 55% of all Native American students (AACC, 2005). The typical community college student, if you look at statistical averages, is a 29 year old working woman, attending part-time, who is seeking to improve job skills and better her quality of life (AACC, 2005; Kane & Rouse, 1999; Palinchak, 1998). About half of all community college students report that work is their primary activity, compared to approximately a fourth of students at four year colleges or universities and most would probably not have attended a four year school (Grubb, 1998; Rouse, 1995, 1998). The open admissions policies, lower tuition, and convenient locations of community college campuses provide greater access for these students and others who might not otherwise be able to pursue higher education.

In examining this commitment to access, one can identify five overarching characteristics common to all two-year schools (Two-year colleges, 1984). First, they are democratic, providing low cost, open admissions, and access. Second, they provide a comprehensive curriculum that fits the needs of a diverse group of students. Third, they are community centered and respond to the needs of the local community in developing academic and continuing education programs. Fourth, they promote life-long learning for participants with a wide-range of ages and educational levels. Fifth, they adapt by responding to ever changing community needs, demographic shifts, and student differences.

One way community colleges have responded to student needs for greater access and flexibility is through the use of alternative delivery methods for instruction (Kane & Rouse, 1999). First through telecourses, and then through Web-based tools, American

community colleges have been among the early adopters of distance education technologies (Muse, 2003). Alternatives like online courses are particularly important in a community college setting where the average age of the 11.5 million students is 29 years old (AACC, 2005). Distance education expands access by giving working adults, single parents, and other potential students new alternatives to fit classes into their busy lives. Online courses provide students with the flexibility and convenience they need to take classes and complete their degrees. As a result, most community colleges offer online courses and, increasingly, online degree programs (Green, 2003, 2004).

Distance Learning Overview

Distance learning has a long history in American higher education. Its roots can be traced back to correspondence courses in the early 1900's (Morabito, 1997). From this early beginning, educators have searched for ways to use new tools and technologies to break down time and space barriers that limit student access to higher education. These have included not only courses by mail, but also by radio, television, telephone, and video conferencing (Farahani, 2003). In its broadest context, distance learning can be described as any learning environment or educational system characterized by the physical separation of the teacher and the student (Holmberg, 1995; Keegan, 1990; Moore and Kearsley, 1996; Verduin & Clark, 1991). Today distance learning is most commonly associated with online learning.

Online learning is defined as using Internet technology to deliver course content. Online courses can be either “asynchronous” (interacting at different times) or “synchronous” (interacting at the same time) and usually do not require any face-to-face

time in the classroom (Farahani, 2003). Salmon (2001) wrote that, “The term ‘online’ came from the days of the telegraph, when messages could be tapped directly onto the line rather than prepared ‘offline’ on perforated taped, for sending when the machine was connected later to the telephone line.” As personal computers have become more affordable and ubiquitous over the past two decades, more and more colleges and universities have begun to develop and offer online courses and degrees.

Online learning accounts for the fastest growing segment of the educational marketplace (Conhaim, 2003; Waits & Lewis, 2003). Last year online enrollment grew by 12.9% - a rate that far exceeded the 1.2% growth rate for overall higher education student enrollment (Allen & Seaman, 2008). A recent study by the Sloan Foundation found that a vast majority of colleges and universities are now offering online courses. The percentage of public colleges and universities offering online courses is over 90 percent (Allen & Seaman, 2004). According to a recent national survey, over 3.9 million people took at least one online course during the fall 2007 term and over twenty percent of all U.S. higher education students were taking at least one online course during the same period (Allen & Seaman, 2008).

The growth in online education has resulted from two main factors – students like the flexibility and access online classes provide (Marquand, 1998; Green, 2003; Sutton, 2003) and faculty and academic leaders are becoming more comfortable with this new instructional delivery method (Conhaim, 2003; Sloan, 2003). This shift has occurred in part because faculty and academic leaders are not only more comfortable with this new instructional delivery method, but are increasingly accepting it as a quality alternative to traditional face-to-face instruction (Conhaim, 2003; Sloan, 2003). In a national survey of

chief academic officers Allen & Seaman (2004) found that 52.6 percent of them viewed online learning as critical to their institutions strategic success.

America's 1,195 community colleges have been in the forefront of adapting this new instructional format (Muse, 2003). Of the 3,077,000 enrollments in all distance education courses during the 2001 academic year, 48 percent or 1,472,000 of them came from two-year public institutions and community colleges had a half million more distance education enrollments than public four-year institutions (Waits & Lewis, 2003). A recent comprehensive survey found that this number has continued to grow so now community college students make up over one-half of all online students in the United States (Allen & Seaman, 2008). That community colleges have been quick to adapt online education should not come as a surprise. Community colleges have a long history of expanding access and providing educational opportunities for students who may not otherwise be able to attend college (Cross, 1974; Parnell, 1985). Alternatives like online courses are particularly important in a community college setting where the average age of the 11.5 million students is 29 years old (AACC, 2005). Distance education expands this access by giving working adults, single parents, and other students with hectic lives new alternatives that fit classes into their busy schedules.

Online courses provide access to higher education for nontraditional students like those who attend community colleges. In 1995, fifty-eight percent of public two-year colleges offered distance education courses to more than 400,000 students, which was about seven percent of their total enrollment (Kane & Rouse, 1999). By 2001, ninety percent of public two-year institutions offered distance learning according to the U.S. Department of Education Report, *Distance Education at Degree-Granting Postsecondary*

Institutions: 2000-2001 (2003). The study also showed that there were 520 degree-programs and nearly 56,000 courses using distance education offered by these colleges. An estimated 1.47 million community college students enrolled in at least one distance education course.

Like typical community college students, students taking online classes tend to be predominantly women and returning adult students with families and jobs. A recent U.S. Department of Education study (2002) shows that among undergraduate students, 8.5 percent of women who took college courses did so through distance education, compared to 6.5 percent of men. The difference in ages is even larger. The study shows that 9.9 percent of students age 24 and older took distance education courses compared to 6 percent of those under 24 (Carnevale, 2002).

Over the past decade, numerous comparative studies have been conducted that indicate students can be as successful in learning in an online environment as in a traditional setting (Barry & Runyan, 1995; Cole, 2000; Gagne & Shepherd, 2001; Hiltz, Zhang & Turoff, 2002; Russell, 1999; Schulman & Sims, 1995). In fact, an extensive review of recent research findings led Karen Swan of the Sloan Consortium to conclude that, “there is no significant difference on gross measures of learning between students taking online courses and students taking traditional courses” (Swan, 2004). Even with such finding, colleges and universities recognize that there are advantages and disadvantages of offering courses in traditional face-to-face formats and in online formats. For example, while distance learning, especially asynchronous formats, offers more flexibility as it relates to time and space, it involves less human interaction than a face-to-face course (Kirby, 1999). These differences have led some educators to conclude

that even though no significant differences in learning outcomes have been found, instructional methods should be chosen based on their relative advantages and disadvantages (Edward & Fritz, 1997).

In his review of the literature, Jasper (1995) found that while cognitive outcomes were virtually the same between distance learning students and face-to-face students, researchers have found significantly lower degrees of student-teacher interaction and student satisfaction with the overall course, the course structure, and the learning environment among distance learning students than traditional face-to-face students. Some literature suggests that this may be linked to lower student retention rates for online classes than those of traditional face-to-face classes (Kerka, 1996). While no comprehensive national statistics on the completion rates of online courses or programs exist, campus-based research shows a much lower course completion rate for undergraduate students enrolled in online courses (Carr, 2000; Crabtree, 2000; Dexter, 1995; Sutton, 2003) and some studies have found completion rates for online undergraduate courses to be lower than 50% (Carr, 2000). Some contend that the lack of face-to-face physical interaction is one of the major limitations of distance education and may contribute to this problem (Kirby, 1999; Kruger, 2000).

This concern led Saba (1999), a leading theorist in the distance learning field to advise potential researchers that the “proper question is not whether distance education is comparable to a hypothetical ‘traditional,’ or face-to-face, instruction, but if there is enough interaction between the learner and the instructor for the learner to find meaning and develop new knowledge.” (p. 2).

Blended Learning

In recent years, the term online learning has begun to blur. Literature includes references to online courses, completely online courses, Web-based courses, Web-supplemented courses, hybrid or blended courses and a variety of other variations on instructional methods that incorporate the Web (Leh, 2002). While some consider these terms to be synonymous, a distinction between them has begun to emerge in the literature (Graham, Allen, & Ure, 2003; Leh, 2002; Muse, 2003, Osguthorpe & Graham, 2003; Willett, 2002; Young, 2002). Online courses are beginning to be defined as those courses in which instructors meet with students solely over the Web and blended courses are defined as those in which instructors combine face-to-face instruction with online learning components and online course management tools (Lamb, 2001; Mortera-Guierrez, 2004; Osguthorpe & Graham, 2003; Smith, 2001).

In an attempt to take advantage of the strengths of both traditional face-to-face courses and online courses, many colleges have begun to develop and offer blended courses. One recent study reported that almost 55% of all institutions offer at least one blended course (Allen, I.E., Seaman, J., & Garrett, R., 2007). In another study this number was reported to be as high as 80% among all institutions and 95% among doctoral institutions (Arabasz, Boggs, & Baker, 2003).

Some believe that blended courses and blended degree programs offer the best of both worlds, offering some of the convenience of an all-online course without the complete loss of face-to-face contact (Colis & Moonen, 2001; Graham, 2005; Osguthorpe & Graham, 2003; Twigg, 2003; Young, 2002). Through this approach it is thought that a faculty member can address student learning issues and persistence problems connected

with online classes and create a learning experience more effective than either approach on its own (Graham, 2005; Osguthorpe & Graham, 2003). In his recent overview of blended learning, Vaughan captured this sentiment when he wrote, “The goal of these hybrid courses is to join the best features of in-class teaching with the best features of online learning to promote active, self-directed learning opportunities with added flexibility” (Vaughan, 2007, p. 82).

The structure and delivery of blended learning courses and programs in higher education settings is still evolving. While there are some common elements and themes among blended courses, a review of the literature suggest that there is still disagreement over the definition of blended learning and how a course should be blended (Brown, 2001; Graham, Allen, & Ure, 2003; Hearn, 2002; Marsh, 2001; Mortera-Gutierrez, 2004; Osguthorpe & Graham, 2003; Young, 2002; Zenger, 2001). Early literature suggested referring to this instructional delivery method as “hybrid” (Brown, 2001; Young, 2002). But recently, the term “blended” has emerged as the preferred term (Fox, 2002; Graham, Allen, & Ure, 2003; Osguthorpe & Graham, 2003; Valiathan, 2002). Where hybrid alludes to joining two things together, the term blended is thought by theorists to be a broader term and one that “focuses on the mingling together of face-to-face and technology in ways that lead to a well-balanced combination” (Osguthorpe & Graham, 2003). One apt definition that captures this distinction was put forward by Fox (2002) when he wrote that blended learning, “combine(s) elements of classroom training, live and self-paced e-learning, and advanced supportive learning services in a manner that provides ... tailored learning” (p. 26).

Osguthorpe and Graham (2003) have written extensively about the blended learning environment and a review of their work provides a helpful overview of blended learning. In their writing they emphasize that each course or class may be blended in a different manner as an instructor seeks the right balance or mix of online and face-to-face components. Osguthorpe and Graham (2003) wrote:

Those who use blended approaches base their pedagogy on the assumption that there are inherent benefits in face-to-face interaction (both among learners and between learner and instructor) as well as the understanding that there are some inherent advantages to using online methods in their teaching. Thus the aim of those using blended learning approaches is to find a harmonious balance between online access to knowledge and face-to-face human interaction (p. 228).

The important consideration in creating a blended class is to ensure that the “blend involves the strengths of each type of learning environment and none of the weaknesses” (p. 228). The ultimate goal of which is to develop a blend of instructional strategies tailored specifically to improve student learning.

Figure 2-1 shows the various ways a class could be blended. Blend 1 emphasizes face-to-face learning components, while Blend 2 utilizes more online learning element. In either case they try to utilize the strengths of each instructional method in creating the right blend for the course. Blend 3 illustrates an example of an undesirable blend that emphasizes some of the weaknesses of each of the instructional methods. As Osguthorpe and Graham (2003) speculate about Blend 3 that, “Perhaps the face-to-face contact features a poorly-delivered lecture with no student participation, and the online portion of the course includes tedious, over-prompted forms of practice” (p. 228).

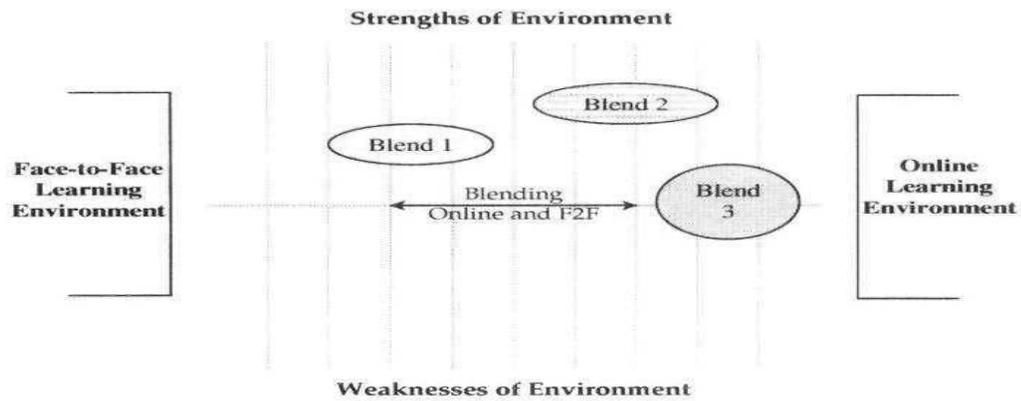


Figure 2-1: Blending the Strengths of Online and Face-to-Face Learning Environments
(Osguthorpe & Graham, 2003)

Osguthorpe and Graham (2003) suggest that there are at least three elements that one might want to consider mixing together in a blended course: 1) online and face-to-face learning activities, 2) online and face-to-face students, and 3) online and face-to-face instructors. Figure 2-2 provides a visual model of these three types of blends. By choosing which elements to blend and how to blend them, instructors can adapt a class to meet the needs of different settings, students and content.

Osguthorpe and Graham (2003) have also identified six goals that educators should consider as they design blended learning environments: 1) pedagogical richness, 2) access to knowledge, 3) social interaction, 4) personal agency, 5) cost effectiveness, and 6) ease of revision.

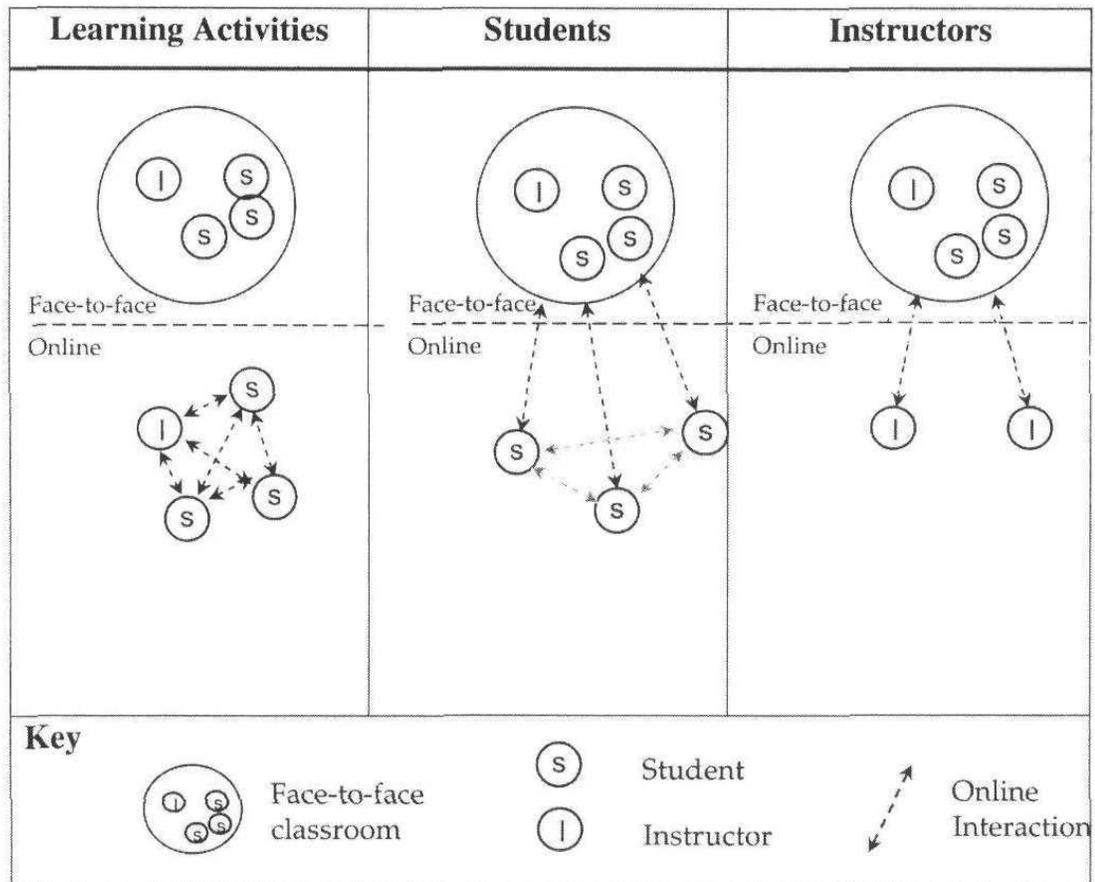


Figure 2-2: Common Types of Blended Environments (Osguthorpe & Graham, 2003)

Student Interaction and Satisfaction

A number of authors and theorists have advanced the idea that interaction among students and interactions between students and teachers is an important factor in student learning and is a critical element in creating effective learning experiences (Astin, 1975, 1977, 1993; Bean, 1980, 1982, 1983, 1985; Bean & Metzner, 1985; Berge, 1999; Hammer 2001; Kearsley, 2000; Moore, 1989; Pascarella, 1980, 1985; Pascarella & Terenzini, 1977; Spady, 1971; Sutton, 2001; Terenzini & Pascarella, 1971, 1980; Tinto, 1975, 1982, 1987, 1988, 1993, 1997; Wagner, 1994). This concept is grounded in the

educational philosophy of Dewey (1938). Dewey theorized that learning emerged from meaningful experiences, where students join together in a social context, such as a classroom, to manipulate materials and ideas. Dewey (1938) believed that learning is a “social enterprise” (p. 116) and stressed that the interactions between student and teacher were critical to the learning process. He wrote that education needed to focus on the process of inquiry rather than just relaying information from teacher to student.

Recently, authors have built on Dewey’s theories by asserting that not only are interaction between students and teachers important to the learning process, but interactions among students are just as important to learning. Moore (1989) considered interactions among students and interactions between students and teachers so important that he referred them as “a defining characteristic of education” (p. 2). Shale and Garrison (1990) considered interaction so fundamental to the educational process that they believed education itself could be defined as “an interaction among instructor, student and subject content” (p. 1).

Several definitions of interaction exist, but one of the clearest definitions was provided by Wagner (1994). She wrote that interaction could be defined as:

reciprocal events that require at least two objects and two actions. Interactions occur when these objects and events mutually influence one another. An instructional interaction is an event that takes place between a learner and the learner’s environment. Its purpose is to respond to the learner in a way intended to change his or her behavior toward an educational goal. Instructional interactions have two purposes: to change learners and to move them toward achieving their goals (p.8).

In writing about interaction, Michael Moore (1989) developed an important theoretical framework which can help us better understand the role interaction plays in the learning environment. Moore's interaction paradigm described three specific types of interactions that occur in an educational setting: i) learner-content interaction, ii) learner-instructor interaction, and iii) learner-learner interaction. A fourth type of interaction was later added by Hillman, Willis, and Gunawardena (1994) called learner-interface interaction.

- v. Learner-content interaction. The method by which students obtain information from the course material. It is the "process of intellectually interacting with content that results in changes in the learner's understanding, the learner's perspective, or the cognitive structures of the learner's mind (Moore, 1989, p. 1). Learner-content interaction result in learners achieving intellectual growth and is seen by Moore as the defining characteristic of education.
- vi. Learner-instructor interaction. This interaction is what many think of as classroom teaching. It can take the form of an instructor delivering information, encouraging the learner, or providing feedback. It can also take the form of the learner asking questions of the instructor or communicating with the instructor regarding course activities. This type of interaction provides motivation, feedback, and student-instructor dialogue. This concept is supported by earlier research by Bloom (1981) who believed that "Interaction between teachers and students in the classroom is the major factor in accounting for the cognitive learning of students, their interest in school subjects and learning, and their confidence in their own learning capabilities (p. vi).

- vii. Learner-learner interaction. This interaction is characterized by the exchange of information and ideas that occurs in a course among students with or without the presence of the instructor. Learner-learner interaction can foster learning through student collaboration and knowledge sharing.
- viii. Learner-interface interaction. Learner-interface interaction is most commonly thought of as the interaction that occurs when a student uses a computer program to learn a particular topic or subject. By definition, this only occurs when the computer provides feedback to the student concerning their progress or knowledge (Hillman et al., 1994).

The literature clearly demonstrates that interaction in the learning context is a key element to student learning and satisfaction in both traditional face-to-face classes and online learning. Each of these interactions are critical components of the learning environment. The importance of these components was emphasized by Palloff and Pratt (1999) who stated that the “keys to the learning process are the interactions among student themselves, the interaction between faculty and students, and the collaboration in learning that results from these interactions” (p. 5).

Given that results of many studies show no significant difference in learning outcomes between students taking online and traditional courses (Barry & Runyan, 1995; Cole, 2000; Gagne & Shepherd, 2001; Hiltz, Zhang & Turoff, 2002; Russell, 1999; Schulman and Sims, 1995; Swan, 2004) several researchers have called for moving beyond studies which compare the outcomes of distance learning classes in order to better understand the distance learning environment and its impact on students’ learning

and satisfaction (Arbaugh, 2000; Clark, 1994; Phipps & Merisotis, 1999; Russell, 1999; Surry & Ensminger, 2001).

Learning Environment

Theories on the impact of the environment on learning have been researched since the 1930's (Groh & Fraser, 1998). These theories explore the nature of various teaching and classroom environments on students and their learning. In writing about learning environments in the college setting, Strange and Banning (2001) said that at their core these theories are based on the concept that, "Variations in the differing aspects of students' environments yields a constructed milieu that, in turn, further influences students' attraction, satisfaction, and stability within the environment." Applying learning environment theories to the college classroom springs from clear findings that students report higher levels of perceived learning and satisfaction in classrooms with a supportive environment (Fraser, 1994, 1998).

One of the earliest theorists to describe the classroom learning environment was Withall (1949). He described the student-student and student-teacher interactions as the "social emotional climate" (p. 348). He defined this as:

a general emotional factor which appears to be present in interactions occurring between individuals in face to face groups. It seems to have some relationship to the degree of acceptance expressed by members of a group regarding each other's needs or goals. Operationally defined, it is considered to influence: 1) the inner private world of each individual; 2) the esprit de corps of a group; 3) the sense of meaningfulness of group and individual goals and activities; 4) the objectivity

with which a problem is attacked; and 5) the kind and extent of interpersonal interaction in a group (pp. 348 – 349).

Building on work of Withall (1949) and others (Bovard, 1951; Pace & Stern, 1959), Anderson (1970) offered a slightly different take on the classroom learning environment when he asserted that the climate in the learning environment is contingent upon student and faculty relationships. He wrote:

These climate properties include interpersonal relationships among pupils, relationships between pupils and their teachers, relationships between pupils and both the subject studied and the method of learning, and finally, pupils' perceptions of the structured characteristics of the class (p. 135).

Moos (1976) asserted that these learning environments have 'personalities' much like people do and that differing environments affect those in them in differing ways (Sempsey & Johnston, 2004). Moos (1994) stressed that, "each setting has a unique 'personality' that gives it unity and coherence." Understanding these environmental factors can help researchers understand the overall behavior of groups, particularly as they relate to outcomes on both the aggregate and the individual level (Sempsey & Johnston, 2004). In describing the learning environment, Moos (1979) developed three basic dimensions that are present in all social environments:

- 1) Relationship dimensions reflecting.... "the extent to which people are involved in the setting ... support and help one another, and ... express themselves freely and openly" (Moos, 1979, p14),

- 2) Personal growth and development dimensions that measure the “basic goals of the setting ... areas in which personal development and self-enhancement tend to occur” (Moos, 1979, p 16), and
- 3) System maintenance and system change dimensions which assesses “the extent to which the environment is orderly and clear in its expectations, maintains control, and responds to change” (Moos, 1979, p 16).

While extensive research has been done on the assessment and investigation of learning environments in the primary and secondary school setting, Fraser (1986, 1994, 1998) found that little work had been done at the higher education level. Building on the work of Moos and others, Fraser (1986, 1994, 1998) developed a new instrument, the College and University Classroom Environment Inventory (CUCEI) to research the importance of student and teacher perceptions of the social and psychological aspects of the learning environment in the college and university setting. Fraser and his colleagues chose to develop a survey instrument (Fraser, Treagust, & Dennis, 1986) instead of observational methodologies because they felt that measuring student perceptions was a superior approach to observational techniques in assessing classroom environment (Winston, 1994). This conclusion was based on their belief that:

- 1) Quantitative measurement of perceptions does not require training observers making it more economical,
- 2) Perceptual techniques are based on experiences over time, whereas observational data is restricted to relatively short time spans,
- 3) Perceptual data allows one to pool students’ reports or judgments,

- 4) In many, if not most cases, students' perceptions are more important determinants of their behavior than is the competing objective reality, and
- 5) Perceptual measures have frequently accounted for more variance in student learning outcomes than have interaction variables identified through observation (Winston, 1994).

Fraser, Treagust, Williamson, and Tobin (1987) found that their study of the college environment in Australia resulted in similar results as prior studies completed in secondary and primary schools in both Australia and the United States. They found that both students and instructors preferred a more positive environment and that student achievement and attitudes were both influenced by their perceptions of the environment (Walberg, Fraser & Welch, 1986).

College Classroom Environment Scales

The research of Moos and Fraser laid the groundwork for the development of the College Classroom Environment Scales (CCES) by Winston, Vahala, Nichols, & Gillis (1989). The development of the CCES grew out of the authors' desire to develop an instrument similar to Fraser's CUCEI (Fraser, Treagust & Dennis, 1986), but one that was developed based on the American higher education system. The authors (Winston, Vahala, Nichols, & Gillis, 1988) began developing the instrument by writing items that described their experiences in collegiate classrooms as teachers and students. These items were extensively tested and analyzed in a wide variety of undergraduate settings (Winston, Vahala, Nichols, Gillis, Wintrow, & Rome, 1994). The result was the development of the CCES.

The College Classroom Environment Scales is comprised of 62 statements to which students can respond using a five-point Likert-type scale: A = never or almost never true, B = seldom true, C = occasionally true, D = often true and E = always or almost always true (Winston, Vahala, Nichols, & Gillis, 1989). The statements are grouped into six factors that have been found to be related to classroom environment.

Cathectic Learning Climate (CLC): High scores on this scale indicate a charged academic atmosphere that stimulates students to be active participants in the class and to seek classmates' opinions and reactions.

Professorial Concern (PC): High scores on this scale describe an academic environment in which students perceive the instructor as being personally concerned about them as individuals and as striving to foster their educational and personal achievements.

Inimical Ambiance (IA): High scores on this scale characterize an environment that students see as being hostile, highly competitive, and rigidly structured.

Academic Rigor (AR): High scores on this scale are indicative of an environment that is intellectually challenging and demanding.

Affiliation (AF): High scores on this scale describe a class environment that students see as promoting informal interaction and as being highly supportive, friendly, and student-centered.

Structure (ST): High scores on this scale describe an environment that students perceive as having evaluation criteria and course content clearly articulated.

The instrument has been administered in a variety of college and university settings. They have found significant differences in classroom environments between

two-year and four-year schools, between liberal arts colleges and large universities, and among various disciplines as well (Vahala & Winston, 1994). While no general conclusions can be drawn from their work about the impact of any one type of environment on the learning process, they have clearly shown that the classroom environment does make a difference. As the researchers put it, “If the goal of instruction is to encourage or facilitate student learning, then it seems clear that instructors should carefully examine the kind of social climate that is created in their classrooms and whether that climate is likely to promote or detract from learning (Vahala & Winston, 1994).

Summary

Recent reports such as The Power of the Internet for Learning by the federal Web-based Education Commission (2000), document the infusion of the internet into every facet of education in the United States. Nowhere can this be seen as dramatically as in higher education. As the Sloan Foundation research documents, over 90 percent of higher education institutions now offer at least one fully online or blended course (Allen & Seaman, 2008). In fact, as Green’s (2004) annual Campus Computing Project survey shows, integrating the internet and other forms of information technology into the instructional process has consistently been a top issue on college campuses throughout this decade.

The expanded use of the internet and the development of online courses is in large part a response to student demand. Each year more and more students arrive on campus with extensive computer experience and an expectation of using the Web as part of the

learning process (Green, 2003; Sutton, 2003). At the same time, we see an increasing desire among students for flexible learning formats and course offerings that fit their busy lives. This is especially true for working adult students which comprise approximately 40 percent of all undergraduates (U.S. Department of Education, 2000). The convergence of these demands has, in part, spurred a tremendous surge in online enrollment. Online learning is now the fastest growing segment in the educational marketplace (Conhaim, 2003; Waits & Lewis, 2003). According to recent nation-wide study, over 3.9 million people took at least one online course during the fall 2007 semester and over twenty percent of all U.S. higher education students were taking at least one online course during that semester (Allen & Seaman, 2008).

As online enrollments have grown and online course offerings have expanded over the past decade, so have attempts to understand the impact of this new instructional methodology on student persistence and satisfaction. Given that results of many studies show no significant difference in learning outcomes between students taking online and traditional courses (Barry & Runyan, 1995; Cole, 2000; Gagne & Shepherd, 2001; Hiltz, Zhang & Turoff, 2002; Russell, 1999; Schulman and Sims, 1995; Swan, 2004) several researchers have called for moving beyond studies which compare the outcomes of distance learning classes in order to better understand the distance learning environment and its impact on students' learning and satisfaction (Arbaugh, 2000; Clark, 1994; Phipps & Merisotis, 1999; Russell, 1999; Surry Ensminger, 2001). Recent studies have explored issues regarding student satisfaction with online classes (Johnson, 1999), the relationship between attitudes toward computers and the desire to take online classes (Robertston & Stanforth, 1999), the nonacademic needs of online students (Bayless, 2001), the impact of

demographic differences on performance and retention in online and face-to-face courses (Crabtree, 2000), motivation and perceived educational needs between distance learners and traditional students (Yellen, 1998), and student persistence in Web-enhanced courses (Sutton, 2003). In response to these studies, and feedback from students on their own campuses, many in the higher education community have begun to realize that fully online classes are not necessarily the best fit for all students or for all subject matters (Twigg, 2003).

One indication of this is the high drop out rate seen in online courses. While national statistics are not available, campus-based research shows a much lower course completion rate for students enrolled in online courses (Carr, 2000; Crabtree, 2000; Dexter, 1995; Sutton, 2003) and less satisfaction with an online course than with comparable face-to-face courses (Sorg, 2000).

So, while online courses do meet the desire among students for flexible learning formats and course offerings, they clearly do not offer a 'one-size-fits-all' solution for everyone. In responding to this issue, colleges and universities have begun developing new instructional formats that utilize online learning components while retaining some of the elements of traditional face-to-face instruction (Twigg, 2003). While all of these new models help address the need for schools to respond to student demand for flexibility and access, the blended method seems to have emerged in the literature as the one attracting the most attention of researchers and practitioners (Leh, 2002; Graham, Allen, & Ure, 2003; Muse, 2003, Osguthorpe & Graham, 2003; Willett, 2002; Young, 2002). Blended courses promise the best of both worlds, offering some of the convenience of an all-online course without the complete loss of face-to-face contact (Colis & Moonen, 2001;

Graham, 2005; Osguthorpe & Graham, 2003; Twigg, 2003; Young, 2002). Some believe courses taught using the blended format fit better into the live of busy adult students, like those typically enrolled at a community college, while retaining the interactivity (Bruffee, 1993) and sense of community that seems to be preferred by students in a traditional face-to-face classroom (Crabtree, 2000; Hiltz, 1998) and creating a learning experience more effective than either approach on its own (Colis & Moonen, 2001; Graham, 2005; Graham, Allen, & Ure, 2003; Osguthorpe & Graham, 2003; Twigg, 2003; Young, 2002).

While blended courses are gaining more and more popularity in higher education, little research has been conducted to examine how this old notion of combining elements of distance learning and traditional face-to-face instruction is being received by students in today's Web-based society. The literature review identified that student-student and student-teacher interaction are critical components contributing to student satisfaction with face-to-face and distance learning environments. While researchers have conducted studies to explore the effects of interaction on student satisfaction and learning, few have examined differences in the learning environments across traditional face-to-face, fully online, and blended learning classes. Given that blended learning classes are being developed, in part, to increase interaction and improve satisfaction the need for further research in this area is clear.

CHAPTER III

Research Design and Methodology

Overview

The purpose of this study was to examine how students' perception of the classroom environment differs across traditional face-to-face, fully online, and blended courses. In doing so, the study sought to determine if blended courses really do offer the "best of both worlds" (Young, 2002, p. 33). Specifically, the study compared feedback from students enrolled in blended courses with students enrolled in traditional face-to-face and online courses to determine if the blended learning environment produces higher levels of participation, a stronger sense of connection to the instructor, a more positive feeling about the course structure, a stronger perception that the course is intellectually challenging, a better feeling that the instructor is supportive and student-centered, and a more positive sense that the evaluation criteria and course content have been clearly articulated. This chapter presents a discussion of the paradigm of inquiry and the theoretical constructs, describes the research questions and hypothesis, research design and the methodology for selection of subjects, the instrument, the research variables, and concludes with an examination of the data collection procedures and design issues.

Paradigm of Inquiry

This study uses a correlational design based on a post-positivistic research paradigm. A post-positivist research paradigm attempts to support a hypothesis by analyzing quantitative data using inferential statistical procedures. This research is

conducted by obtaining data in a form that can be represented by numbers, so that quantities and magnitudes can be measured, assessed, and interpreted with the use of statistical manipulation (Alreck & Settle, 1995). Through deductive logic, such quantitative research tests theories and hypotheses to determine whether, and to what degree, a relationship exists between two or more variables (Creswell, 1994; Gay & Diehl, 1992). In this study, students' perceptions of the classroom learning environment, as measured by the College Classroom Environment Scales (Winston, Vahala, Nichols, & Gillis, 1989), are compared across community college classes taught in traditional face-to-face, online, and blended methods.

Theoretical Framework

A number of authors and theorists have advanced the idea that interaction among students and interactions between students and teachers is a key factor in student learning and is a critical element in creating effective learning experiences (Astin, 1975, 1977, 1993; Moore, 1989; Pascarella, 1980, 1985; Pascarella & Terenzini, 1977; Spady, 1971; Terenzini & Pascarella, 1971, 1980; Tinto, 1975, 1982, 1987, 1988, 1993, 1997; Wagner, 1994). This concept is grounded in the educational philosophy of Dewey (1938). Dewey theorized that learning emerged from meaningful experiences, where students join together in a social context, such as a classroom, to manipulate materials and ideas. Dewey (1938) believed that learning is a "social enterprise" (p. 116) and stressed that the interactions between student and teacher were critical to the learning process. He wrote that education needed to focus on the process of inquiry rather than just relaying information from teacher to student.

Recently, authors have built on Dewey's theories by asserting that not only are interaction between students and teachers important to the learning process, but interactions among students are just as important to learning. Moore (1989) considered interactions among students and interactions between students and teachers so important that he referred them as "a defining characteristic of education" (p. 2). Shale and Garrison (1990) considered interaction so fundamental to the educational process that they believed education itself could be defined as "an interaction among instructor, student and subject content" (p. 1).

Several definitions of interaction exist, but one of the clearest definitions was provided by Wagner (1994). She wrote that interaction could be defined as:

reciprocal events that require at least two objects and two actions. Interactions occur when these objects and events mutually influence one another. An instructional interaction is an event that takes place between a learner and the learner's environment. Its purpose is to respond to the learner in a way intended to change his or her behavior toward an educational goal. Instructional interactions have two purposes: to change learners and to move them toward achieving their goals (p.8).

In writing about interaction, Michael Moore (1989) developed an important theoretical framework which can help us better understand the role interaction plays in the learning environment. Moore's interaction paradigm described three specific types of interactions that occur in an educational setting: i) learner-content interaction, ii) learner-instructor interaction, and iii) learner-learner interaction (Figure 3-1). A fourth type of

interaction was later added by Hillman, Willis and Gunawardena (1994) called learner-interface interaction.

- ix. Learner-content interaction. The method by which students obtain information from the course material. It is the “process of intellectually interacting with content that results in changes in the learner’s understanding, the learner’s perspective, or the cognitive structures of the learner’s mind (Moore, 1989, p. 1). Learner-content interaction result in learners achieving intellectual growth and is seen by Moore as the defining characteristic of education.
- x. Learner-instructor interaction. This interaction is what many think of as classroom teaching. It can take the form of an instructor delivering information, encouraging the learner, or providing feedback. It can also take the form of the learner asking questions of the instructor or communicating with the instructor regarding course activities. This type of interaction provides motivation, feedback, and student-instructor dialogue. This concept is supported by earlier research by Bloom (1981) who believed that “Interaction between teachers and students in the classroom is the major factor in accounting for the cognitive learning of students, their interest in school subjects and learning, and their confidence in their own learning capabilities (p. vi).
- xi. Learner-learner interaction. This interaction is characterized by the exchange of information and ideas that occurs in a course among students with or without the presence of the instructor. Learner-learner interaction can foster learning through student collaboration and knowledge sharing.

- xii. Learner-interface interaction. Learner-interface interaction is most commonly thought of as the interaction that occurs when a student uses a computer program to learn a particular topic or subject. By definition, this only occurs when the computer provides feedback to the student concerning their progress or knowledge (Hillman et al., 1994).

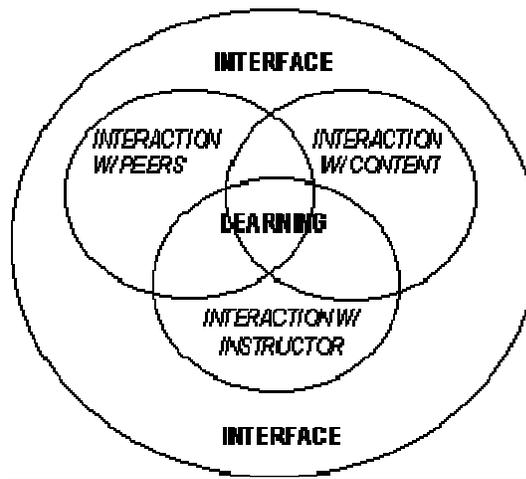


Figure 3-1: Moore's Interaction Paradigm Conceptualized (Swan, 2003)

Overall, the literature demonstrates that interaction in the learning context is a key element to student learning and satisfaction in both traditional face-to-face classes and online learning. Each of these interactions is a critical component of the learning environment. The importance of these components was emphasized by Palloff and Pratt (1999) who stated that the “keys to the learning process are the interactions among student themselves, the interaction between faculty and students, and the collaboration in learning that results from these interactions” (p. 5).

Given that result of many studies show no significant difference in learning outcomes between students taking online and traditional courses (Barry & Runyan, 1995; Cole, 2000; Gagne & Shepherd, 2001; Hiltz, Zhang & Turoff, 2002; Russell, 1999; Schulman and Sims, 1995; Swan, 2003, 2004) several researchers have called for moving beyond studies which compare the outcomes of distance learning classes in order to better understand the distance learning environment and its impact on students' learning and satisfaction (Arbaugh, 2000; Clark, 1994; Phipps & Merisotis, 1999; Russell, 1999; Surry & Ensminger, 2001).

Classroom environment research evolved from theories proposed by Lewin (1935), who referred to the environment as "life space," which contains the "person and the psychological environment that exists for him" (p. xi). The properties that make up a classroom environment include interpersonal relationships among students, relationships between students and their teachers, relationships between students and both the subject being studied and the method of learning, and the students' perception of the structure of the class (Anderson, 1970, p. 135).

Theories on the impact of the environment on learning have been researched since the 1930's (Groh & Fraser, 1998). These theories explore the nature of various teaching and classroom environments on students and their learning. In writing about learning environments in the college setting, Strange and Banning (2001) said that at their core these theories are based on the concept that, "Variations in the differing aspects of students' environments yields a constructed milieu that, in turn, further influences students' attraction, satisfaction, and stability within the environment" (p. 2). Applying learning environment theories to the college classroom springs from clear findings that

students report higher levels of perceived learning and satisfaction in classrooms with a supportive environment (Fraser, 1994, 1998).

One of the earliest theorists to describe the classroom learning environment was Withall (1949). He described the student-student and student-teacher interactions as the “social emotional climate” (p. 348). He defined this as:

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(Sempsey & Johnston, 2004). Moos (1994) stressed that, “each setting has a unique ‘personality’ that gives it unity and coherence.” Understanding these environmental factors can help researchers understand the overall behavior of groups, particularly as they relate to outcomes on both the aggregate and the individual level (Sempsey & Johnston, 2004).

This study brings together student interaction theories (Astin, 1975, 1977, 1993; Hammer 2001; Kearsley, 2000; Moore, 1989; Pascarella, 1980, 1985; Pascarella & Terenzini, 1977; Spady, 1971; Sutton, 2001; Terenzini & Pascarella, 1971, 1980; Tinto, 1975, 1982, 1987, 1988, 1993, 1997; Wagner, 1994) and the learning environment theories (Fraser, 1994, 1998; Groh & Fraser, 1998; Moos, 1976, 1979) to examine students’ perception of the classroom environment across community college courses taught in traditional face-to-face, online, and blended methods. The intersection of these theories forms the conceptual framework from which to examine how student’s perception of the classroom environment differs across traditional face-to-face, online and blended courses.

Research Questions

The study addresses the overarching question: Do students’ perception of the classroom environment differ across traditional face-to-face, fully online, and blended courses? This primary question will be addressed through the use of the College Classroom Environment Scales (CCES) instrument designed by Winston, Vahala, Nichols, and Gillis (1989) to explore student perceptions of the social and psychological

aspects of the learning environment. This survey instrument will be used to answer the following research questions:

1. To what extent do classroom environments differ across traditional face-to-face, fully online, and blended courses in relation to Cathectic Learning Climate (CLC) as measured by the College Classroom Environment Scales (CCES)?
2. To what extent do classroom environments differ across traditional face-to-face, fully online, and blended courses in relation to Professorial Concern (PC) as measured by the College Classroom Environment Scales (CCES)?
3. To what extent do classroom environments differ across traditional face-to-face, fully online, and blended courses in relation to Inimical Ambiance (IA) as measured by the College Classroom Environment Scales (CCES)?
4. To what extent do classroom environments differ across traditional face-to-face, fully online, and blended courses in relation to Academic Rigor (AR) as measured by the College Classroom Environment Scales (CCES)?
5. To what extent do classroom environments differ across traditional face-to-face, fully online, and blended courses in relation to Affiliation (AF) as measured by the College Classroom Environment Scales (CCES)?
6. To what extent do classroom environments differ across traditional face-to-face, fully online, and blended courses in relation to Structure (ST) as measured by the College Classroom Environment Scales (CCES)?

Research Hypotheses

The rationale underlying the research hypotheses in this study is based on the literature review presented in Chapter II which leads us to posit that by combining the best elements of traditional and online instructional methodologies professors and course designers can create a learning environment that provides more opportunities for students to interact with each other and with their instructors. In doing so, the blended environment should result in higher levels of student participation (CLC – cathectic learning climate), a stronger sense of connection to the instructor (PC – professorial concern), a more positive feeling about the classroom atmosphere and structure (IA – inimical ambiance), a stronger perception that the course is intellectually challenging (AR – academic rigor), a better feeling that the instructor is supportive and student-centered (AF - affiliation), and a more positive sense that the evaluation criteria and course content have been clearly articulated (ST - structure).

Hypotheses

H_A1: Students enrolled in blended classes will have significantly higher cathectic learning climate (CLC) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

H_O1: Students enrolled in blended classes will not have significantly higher cathectic learning climate (CLC) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

H_A2: Students enrolled in blended classes will have significantly higher professorial concern (PC) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

H_O2: Students enrolled in blended classes will not have significantly higher professorial concern (PC) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

H_A3: Students enrolled in blended classes will have significantly higher inimical ambiance (IA) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

H_O3: Students enrolled in blended classes will not have significantly higher inimical ambiance (IA) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

H_A4: Students enrolled in blended classes will have significantly higher academic rigor (AR) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

H_O4: Students enrolled in blended classes will not have significantly higher academic rigor (AR) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

H_A5: Students enrolled in blended classes will have significantly higher affiliation (AF) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

H_O5: Students enrolled in blended classes will not have significantly higher affiliation (AF) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

H_{A6}: Students enrolled in blended classes will have significantly higher structure (ST) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

H_{O6}: Students enrolled in blended classes will not have significantly higher structure (ST) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

Research Design

This study uses a correlational design based on a post-positivist research paradigm. A post-positivist research paradigm attempts to support the hypotheses by analyzing quantitative data using inferential statistical procedures. Through deductive logic, quantitative research tests theories and hypotheses to determine whether, and to what degree, a relationship exists between two or more variables (Creswell, 1994; Gay & Diehl, 1992). Inferential statistics allows the generalization of findings from a random sample on a survey instrument to the population being studied. The study used survey research data gathered from intact groups taking the College Classroom Environment Scales (Winston, Vahala, Nichols, & Gillis, 1989) to examine differences in population means on five dependent variables: cathetic learning climate (CLC), inimical ambiance (IA), academic rigor (AR), affiliation (AF), and structure (ST) and to collect data regarding the characteristics of the students. The subjects participating in the study were students enrolled in lower division courses at a mid-size Maryland community college.

Population and Sample

The state of Maryland has sixteen community colleges. These colleges range in size from less than a two thousand students to more than 30,000 and are located in rural, urban and suburban areas around the state. This study was conducted at a mid-size Maryland community college located in an area of the state that has recently transformed from rural to suburban in nature. In the fall of 2006, the college had an enrollment of just under 1,900 FTE (full-time equivalent enrollment) and a headcount of approximately 7,000 students. Students' ages range from 15 to 76 years old, with a mean average age of 27. The majority work full-time and live in the local service area. Seventy-one percent of the student body is white, twenty percent is African-American and three percent is Hispanic. Women make up fully two-thirds of the student body.

This community college was an early adopter of online education and has offered blended courses for the past five years. While the college teaches classes using traditional face-to-face, online, and blended formats, very few courses are offered in all three instructional methods and fewer still are taught by the same instructor in all three methods. However, there are a substantial number of course sections taught using each instructional method. In addition to hundreds of sections offered face-to-face, the college offers 107 online sections with a potential enrollment of 2,568 students and 76 blended sections with a potential enrollment of 1,824 students. Since the college offers courses in all three instructional methods and there are a large number of students enrolled in courses taught utilizing each method, it was determined that surveying students at this college would provide an adequate sample size for this study.

Both fully online courses and blended courses utilize WebCT software. WebCT is a proprietary course management software system that is utilized by thousands of colleges and universities world-wide. It provides students and instructors with a Web-shell that houses course content and provides online tools such as e-mail and bulletin boards for a course. A typical online course at the college consists of fifteen weekly modules. Students are usually required to read and respond to course content associated with each module and to post assignments or comments to the course Web-shell. The courses are asynchronous in nature so students can access course material and information 24 hours a day, 7 days a week from any computer location. In fully online courses student-to-instructor and student-to-student interaction is primarily through e-mail and online course discussion forums. Blended courses at the college typically meet face-to-face in the classroom about half of the time traditional face-to-face courses meet. College policy dictates that in order to be classified as a blended course, the class must meet in the classroom fifty percent of the time a traditional class would meet in the classroom. The remainder of course contact hours and learning objectives are fulfilled asynchronously utilizing the online learning tools associated with WebCT.

Sample Size

Alreck and Settle (1995) identify four factors to consider in determining sample size. The factors include: level of significance, power of the test, variance and effect size. In determining the sample size for this study an alpha of .05 level of probability was chosen and, in order to adequately control for Type I error, the power was set at .80. In order to determine effect size (d), the average effect size for three studies conducted by Winston, Vahala, Nichols, and Gillis (1989) was determined by taking the highest and the

lowest mean scores and standard deviations for each scale used in the studies and then calculated using the following formula:

$$\frac{hm - lm}{\frac{(n-1) s^2 + (n-1) s^2}{n + n - 2}}$$

These studies yielded an average effect size of .40 for the instrument or an average "f" ($f = d/2$) of .20. Using sample size tables found in Cohen (1988), one can determine that an "f" of .20 with an alpha of .05 and a power of .80 results in a sample size of $n = 80$ for each of the three groups (e.g. face-to-face, online, and blended).

A high response rate (80 – 100 percent) was expected for the surveys administered in the classroom to those students in the face-to-face and blended samples. However, since the online sample was surveyed by using a combination of mail and Web survey delivery, a lower response rate was expected from this group. A recent review of survey research literature revealed response rates for Web surveys ranging from 7 to 44 percent and 6 to 68 percent for E-mail surveys (Schonlau, Fricker & Elliot, 2001). However, Dillman (2000) found that these rates could be substantially improved if non-respondents were contacted using a different mode. Schonlau et al (2001) reported that studies, like the current study, offering participants both mail and Web response options had an average response rate of approximately 50 percent (response rates ranged from 33 to 80 percent).

While most classes have a capacity of 24 students, the average class size for face-to-face, online and blended classes at the college is approximately 20 students. However, given student attrition throughout the semester and routine absences one would expect no more than 80 percent of the students (an average of 16 students) to be present in any

given class by mid-semester. As a result, it was determined that in order for this study to reach a sample size of $n = 80$ for each of the formats, 10 class sections offered in each format would need to be surveyed to yield the desired sample (10 sections x 16 students per section = 160 students x .50 response rate = 80).

Sample

Since fewer blended courses are offered at the college than face-to-face or online courses it was necessary for this study to rely on a stratified random sampling strategy. Stratified sampling divides a population into two or more segments, or strata, and samples a different portion of each (Alreck & Settle, 1995). This sampling strategy is necessary when drawing a much larger or smaller portion of strata for a survey than the portion drawn from another group. The stratified sample was taken from students enrolled at the community college in the Fall 2007 semester. Ten class sections offered in each instructional method were surveyed. While the same courses were not surveyed across instructional methods, the courses surveyed were limited to disciplines taught using all three methods. Since fewer blended courses are offered than face-to-face or online courses, only those disciplines offering blended courses were surveyed. Ten class sections taught in each method were randomly selected, using the *N*th name sampling technique (Alreck & Settle, 1995) from those taught in the following common disciplines: Accounting (ACC), Business Administration (BAD), Criminal Justice (CJS), Communications (COM), Economics (ECN), Education (EDU), English (ENG), Information Technology (ITS), Language (LAN), Math (MYH), Psychology (PSY), Student Success Skills (STU), and Wellness (WFS). Each section in these thirteen disciplines was first divided into three lists by instructional method (e.g. traditional face-

to-face, online and blended). The number of sections on each of the three lists was then divided by 10. The resulting number became the *N*th sampling calculation for that list. A random section was chosen on each list and then every *N*th section following that randomly chosen section was selected for the sample population. If the instructor for any identified section refused to cooperate with the study, or if the instructor was also teaching another section already included in any of the sample sections, then the next section following that *N*th section was selected until 10 sections utilizing that instructional method were identified. In addition to controlling for the same instructors teaching multiple sections being surveyed, the study also attempted to control for the same student being surveyed more than once. The first survey question asked if the student had previously taken the survey. If the student answered yes, then the student was instructed not to complete the survey.

Through this sampling approach the study sampled approximately 480 students (10 sections x 16 students per section x 3 instructional methods) in order to obtain the minimum required sample of 240 (10 sections x 16 students per section x 3 instructional methods = 480 students x .50 response rate = 240 students or $n = 80 \times 3$).

Instrumentation

A review of the literature reveals that very few instruments have been developed which specifically examine classroom environment at the college level. The two instruments most cited in the literature are the College and University Classroom Environment Inventory (CUCEI) developed in Australia by Fraser, Treagust, and Dennis (1986) and the College Classroom Environment Scales (CCES) by Winston, Vahala,

Nichols, and Gillis (1989). The development of the CCES grew out of the authors' desire to develop an instrument similar to the CUCEI (Fraser, Treagust & Dennis, 1986), but one that was developed based not on the Australian educational system but on American colleges and universities. After reviewing both instruments, the CCES was chosen for this study since it was specifically developed for an American audience, it addressed the research question, it has strong validity and reliability, and it appeared to take less time to administer than the CUCEI – an important factor when persuading faculty members to administer a survey instrument in their class.

The authors, Winston, Vahala, Nichols, and Gillis (1989) began developing the instrument by writing items that described their experiences in collegiate classrooms as teachers and students. These items were extensively tested and analyzed in a wide variety of undergraduate settings (Winston, Vahala, Nichols, Gillis, Wintrow, & Rome, 1994). The result was the development of the CCES. The College Classroom Environment Scales is comprised of 62 statements to which students can respond using a five-point Likert-type scale: A = never or almost never true, B = seldom true, C = occasionally true, D = often true and E = always or almost always true (see Appendix A). These statements are grouped into six scales that have been found to be related to classroom environment and that can be used independently:

Cathectic Learning Climate (CLC): High scores on this scale indicate a charged academic atmosphere that stimulates students to be active participants in the class and to seek classmates' opinions and reactions.

Professorial Concern (PC): High scores on this scale describe an academic environment in which students perceive the instructor as being personally concerned

about them as individuals and as striving to foster their educational and personal achievements.

Inimical Ambiance (IA): High scores on this scale characterize an environment that students see as being hostile, highly competitive, and rigidly structured.

Academic Rigor (AR): High scores on this scale are indicative of an environment that is intellectually challenging and demanding.

Affiliation (AF): High scores on this scale describe a class environment that students see as promoting informal interaction and as being highly supportive, friendly, and student-centered.

Structure (ST): High scores on this scale describe an environment that students perceive as having evaluation criteria and course content clearly articulated.

The instrument has been administered in a variety of college and university settings. A review of the literature did not reveal any studies that have used the instrument in either an online or blended classroom environment. However, researchers have found that the survey has identified significant differences in classroom environments between two-year and four-year schools, between liberal arts colleges and large universities, and among various discipline (Vahala & Winston, 1994). Permission to use the instrument was granted by the authors (see Appendix B).

Reliability

Reliability refers to the degree to which the results obtained from a survey are consistent measures of what the survey is intended to evaluate (Fraenkel & Wallen, 2000). Cronbach's alpha, a statistical measure that examines the reliability of a test, observation, experiment or measurement by estimating the extent to which they provide

the same results on repeated trials was examined. Cronbach's alpha is a value between 0 and 1. Values close to 0 indicate low reliability and values close to 1 indicate high reliability. A value of .70 or higher is an acceptable reliability coefficient for this measurement (Cronbach, 1951; Fraenkel & Wallen, 2000). The reliability of the CCES was tested using the coefficient alpha procedure to estimate internal consistency of the scales and test-retest procedures to estimate their temporal stability (Winston, Valhala, Nichols, Gillis, Wintrow & Rome, 1994). The authors of the instrument calculated coefficient alphas using data from three studies. The averages of the three studies are: Cathectic Learning Climate .91 (.92, .90 and .91), Professorial Concern .89 (.90, .87 and .89), Inimical Ambiance .73 (.80, .61 and .79), Academic Rigor .74 (.75, .71 and .76), Affiliation .73 (.76, .69 and .75), and Structure .77 (.80, .70 and .82). The authors report that the internal consistency measures of the scales appeared to be stable across the samples at the $p < .01$ level and overall statistical analyses suggest that the CCES is a stable instrument for administration to groups (Winston, et al, 1994).

Validity

Construct validity is the degree a survey measures the hypothetical construct it is intended to measure (Fraenkel & Wallen, 2000). Winston, Vahala, Nichols, and Gillis (1988, 1989) conducted several studies to determine construct validity. In their first study, a factor analysis was conducted using 143 items that were administered to a total of 47 classes. Coefficient alphas were calculated for each of the six factors. The authors eliminated items that duplicated other factors, had a negative correlation, loaded less than .30 on any factor, or loaded within .05 of other factors than the one it was most heavily loaded. In their second study, the authors administered the remaining 91 items to 1,112

students enrolled in 81 classes. Based on their factor analysis of this study, 29 items were eliminated. The final result was the 62-item inventory used in this study (Winston, Vahala, Nichols, & Gillis, 1989).

The authors of the CCES also tested the instrument in order to examine congruent validity. The authors compared the responses on the CCES to responses on the Learning Styles Inventory (LSI) (Kolb, 1985). The researchers found no statistical correlations between the students' perception of the learning environment and their learning styles. They concluded that the students' perceptions of the learning environment were, "independent of their preferred learning styles and are not just an expression of their personalities" (Winston et al., 1994, p. 14).

Data Collection

The data collection and survey design process for this study was based on those described by Alreck and Settle (1995). The design process outlined by Alreck and Settle proscribe practical, effective, and well-tested survey planning, data collection and data processing strategies. This section describes the process used in this study.

Faculty Survey Briefing

Each faculty member teaching a section identified as part of this study was individually contacted and provided with an overview of the study and an explanation about their role in the data collection process. Faculty members were sent a letter during the Fall 2007 semester (see Appendix C) and received a follow up phone call or personal visit to confirm receipt of the letter and to respond to any questions they had about the study. In order to keep faculty informed and interested in the project, they also were

given e-mail notification prior to the distribution of student notification letters and received a copy of the notification letter.

Notification Letters

Alreck and Settle (1995) and other survey researchers (Dillman, 2000) emphasized the use of notification letters and other tools to increase survey response rates. While it was expected that the surveys administered in-class to the face-to-face and blended groups would result in a high response rate, the response rate of surveys administered to the online group was a concern. In an effort to increase the survey response rate of this group, notification letters were distributed to students enrolled in the online courses being surveyed. A notification letter was mailed first class to each student enrolled in one of the online classes included in the study (see Appendix D) during October, 2007. The notification letter was written in 12-point Times New Roman font and reproduced on stationary from the college involved in the study. The letter described the purpose of the study, its potential use for the college, their rights, and the importance of the student's role in a successful survey.

Survey Packet

The survey packets were distributed during November, 2007. The survey packet consisted of: a cover letter that explained the purpose of the survey, the student's rights, and the importance of the student's role in the survey (see Appendix E and F); the research consent/information sheet (see Appendix G); the combined CCES instrument and answer sheet, reproduced on double-sided white paper (see Appendix A); and a self-addressed, postage-paid 9 1/2 x 4 3/8 first class return envelope for the survey distributed to the fully online classes. To help ensure that respondents remain anonymous, while

being able to track the responses received from students in each instructional format, a coding system was employed. A code was placed in the upper right hand corner of each survey. The code for classed taught face-to-face was a F. The code for online classes was an O. The code for blended classes was a B. In addition, a question was added to the demographic section of the survey which asked the participant to identify the instructional method of the course section associated with the survey.

Survey Packet Distribution – Face-to-Face and Blended Classes

During November, 2007, survey packets were hand-delivered to instructors teaching face-to-face or blended courses chosen as part of the sample for this study. Along with the appropriate number of packets for the class, written instructions were provided to the instructor outlining how to administer the surveys and where to return the survey (see Appendix H), along with a pre-addressed inter-campus mail envelopes. Each instructor was asked to distribute and collect the survey packets in his/her class. Students were asked to record their answers on the survey form and to return the completed survey instrument to their instructor or to the person their instructor designated. The completed survey instruments were returned in the inter-campus envelope to the researcher.

Survey Packet Distribution – Online Classes

During the November, 2007, survey packets were mailed to students enrolled in online classes chosen as part of the sample for this study. The packets were place in a first-class business envelope from the college in which the students were taking the class. All papers in the packet were folded together prior to placing them in the envelope to help ensure that the student would examine the entire packet. The cover letter instructed students to record their answers on the survey form and to return the completed survey

instrument in the enclosed self-addressed postage-paid 9 1/2 by 4 3/8 envelope (see Appendix F).

In addition to the paper version of the survey, the online students were also offered the option of completing an online version of the survey. The online version of the survey was constructed using SurveyMonkey software (www.SurveyMonkey.com) and replicated the questions on the paper version. In order to ensure confidentiality, the survey responses were submitted directly to SurveyMonkey by the students and only the aggregated results were shared with the researcher.

Follow-up

A follow-up phone call was made to each face-to-face and blended instructor one week after the packets were distributed. The phone call served two purposes, first, to thank the instructors for their cooperation and participation in the survey and second, to remind any instructors that had not distributed the survey to their class of the importance of their cooperation to the study. A follow-up e-mail was sent to all participating students enrolled in online classes to thank them for their participation and to offer them the option to take the survey on line if they had not already returned the paper version of the survey (see Appendix I).

Preliminary Data Handling

An Excel spreadsheet was created to record survey instruments that were distributed and received. The surveys were reviewed and screened as they were received. Each survey was examined for completeness and accuracy (e.g. sight-editing). Unanswered questions were highlighted and reviewed. Unless the answer could be

readily inferred, unanswered questions were assigned an appropriate missing data code and excluded from analysis. Ambiguous answers, overlapping circles, were examined. If the intended answer could not be determined by looking at the marks on the form, the answer was randomly assigned to one of the nearest answer.

Based on the coded survey questions a data entry table was developed using the Statistical Package for Social Sciences (SPSS). Using an assigned survey number, each survey was assigned a row and each survey question answer was assigned a column. A numerical value was assigned to each possible alpha survey answer. An answer of “A” on the survey was coded as a “1” in SPSS, a “B” as a “2” and so on. Survey data was entered into SPSS by having a research assistant call out the entry and having the researcher enter the value in the table. After each value was entered, it was checked for accuracy by both individuals. Any discrepancies were examined and resolved. Once all data was entered and cross checked for entry errors, some simple frequency distribution calculations were made with SPSS to identify any possible erroneous entries or outliers (e.g. computer data editing). Errors were examined and corrections were made if possible. Online survey results compiled by SurveyMonkey were then incorporated into the SPSS table to produce a final data table.

Data Analysis

Inferential and descriptive statistics were used to analyze the survey data and to address the research hypotheses. In essence of the purpose of this study was to compare the responses from three groups of students: those taking face-to-face classes, those taking online classes and those taking blended classes. The study used the Statistical

Package for Social Sciences (SPSS) to perform statistical measurements that lend themselves to such a comparative analysis.

The data analysis began by producing simple frequency measures and descriptive statistics to build a composite picture of the demographics of the survey respondents and how they responded to each of the questions. These measures in and of themselves may produce some interesting insights into how courses taught through each instructional method are perceived by students.

A preliminary analysis was conducted to examine the data for reliability, validity, outliers, distribution of scores, and any violations to the assumptions of MANOVA. The multivariate analysis of variance (MANOVA) procedure was chosen since the study involved a categorical independent variable (instructional method) and multiple dependent variables. The survey results were analyzed to determine if any significant differences were found between the how students taking face-to-face, online and blended (instructional methods) classes responded on the five CCES scales (dependent variables): cathetic learning climate (CLC), inimical ambiance (IA), academic rigor (AR), affiliation (AF), and structure (ST). The criterion for the rejection of the null hypothesis was a determination of an alpha at $p < .05$ level of probability.

Detailed results from the CCES survey, statistical analysis and discussion are presented in Chapters IV and V. The goal of this analysis was to test each null hypothesis (fail to reject or reject) in order to determine if students enrolled in blended classes have significantly higher scores on the CCES scales than those enrolled in face-to-face or blended classes. Higher scores would indicate a correlation between the blended environment and higher levels of student participation (CLC), a stronger sense of

connection to the instructor (PC), a more positive feeling about the classroom atmosphere and structure (IA), a stronger perception that the course is intellectually challenging (AR), a better feeling that the instructor is supportive and student-centered (AF), and a more positive sense that the evaluation criteria and course content have been clearly articulated (ST).

Consideration of Human Subjects

By nature this study relies on human subjects and as such requires careful consideration of ethical issues including informed consent and confidentiality. The design of this study has been developed with these considerations in the forefront. The data was collected in a manner which insured the confidentiality of the students involved. While surveys can be linked to the instructional method of a class, the surveys can not be linked to any individual student, or even class section— thus guaranteeing confidentiality for subjects and providing some measure of confidentiality to instructors teaching course sections. The study did not collect name, student ID number, social security number, e-mail address or any other identifier tied to a particular student. The study did collect gender, class standing, age, and race/ethnic background. However, since the data was aggregated over multiple class sections, these identifiers could not be linked to any particular student or instructor. Since only aggregate tabulations for instructional methods were reported, no individual class data was shared with the institution or reported in the results.

All paper records containing were maintained and stored in a locked file cabinet only accessible to the researcher. Any signed consent/information sheets that are returned

were stored separately. In order to insure confidentiality, the online survey responses were submitted directly to SurveyMonkey.com by the students and only aggregated results were shared by SurveyMonkey with the researcher. At the conclusion of the study, all original survey responses were destroyed and the data sets deleted.

The study included a review by The George Washington University Office of Human Research.

Summary

This chapter has presented a discussion of the paradigm of inquiry and the theoretical constructs, described the research questions and hypothesis, research design and the methodology for selection of subjects, the instrument, the research variables, and briefly outlined the data collection procedures and design issues. Detailed results and discussion will be presented in Chapters IV and V.

CHAPTER IV

The Results

Overview

The purpose of this study was to examine how students' perception of the classroom environment differs across traditional face-to-face, fully online, and blended courses. Specifically, the study compared feedback from students enrolled in blended courses with students enrolled in traditional face-to-face and online courses to determine if the blended learning environment produces higher levels of participation (Cathetic Learning Climate), a stronger sense of connection to the instructor (Professorial Concern), a more positive feeling about the cooperative nature of the classroom environment (Inimical Ambiance), a stronger perception that the course is intellectually challenging (Academic Rigor), a better feeling that the instructor is supportive and student-centered (Affiliation), and a more positive sense that the evaluation criteria and course content have been clearly articulated (Structure). This chapter is organized into four sections. The first section presents a summary of the preliminary exploration of data and procedures used to screen data prior to analysis. The second section provides a descriptive profile of the participants and demographic information. The third section reviews the multiple regression analysis (MANOVA) performed. The final section evaluates the hypothesis against the supporting analysis.

Preliminary Exploration and Preparation of Data

Preliminary Sample

Ten class sections offered in each instructional method were surveyed. While the same courses were not surveyed across instructional methods, the courses surveyed were limited to disciplines taught using all three methods. Since fewer blended courses are offered than face-to-face or online courses, only those disciplines offering blended courses were surveyed. Ten class sections taught in each method were randomly selected, using the *N*th name sampling technique (Alreck & Settle, 1995) from those taught in the following common disciplines: Accounting (ACC), Business Administration (BAD), Criminal Justice (CJS), Communications (COM), Economics (ECN), Education (EDU), English (ENG), Information Technology (ITS), Language (LAN), Math (MYH), Psychology (PSY), Student Success Skills (STU), and Wellness (WFS). Each section in these thirteen disciplines was first divided into three lists by instructional method (e.g. traditional face-to-face, online and blended). There were 492 face-to-face, 108 web and 61 blended class sections taught in these disciplines. The number of sections taught in each method was divided by 10. The resulting number became the *N*th sampling calculation for that list. A random section was chosen on each list to be the first section surveyed and then every forty-ninth face-to-face section (492 sections divided by 10), every tenth web section (108 sections divided by 10) and sixth blended section (61 sections divided by 10) following that section was selected to be surveyed. If the instructor for the section identified chose not to participate in the study, or if that instructor taught another class that was already participating in the study, then the next section on the list was chosen. Through this sampling approach the study sampled

approximately 480 students (10 sections x 16 students per section x 3 instructional methods).

Three hundred and sixty-eight students responded to the survey. This preliminary sample included 151 students taking a face-to-face course, 89 students enrolled in an online course, and 127 students in a blended course. Overall approximately 77% of those who could have participated in the survey responded. However, due to the nature of the way the survey was distributed it is not possible to calculate a response rate for any of the groups. Surveys were distributed in-person to students by the instructors teaching face-to-face and blended courses and were distributed through the web to students taking online courses. The number of students in class on any given day varies by course section and instructors were not required to record the number of surveys they distributed.

Preparation of the Data

In the preliminary exploration of the data, each case ($N = 368$) was examined for missing values. Fifty-three ($n = 53$) subjects had missing data. Participants who had skipped 10 percent or more of the questions were eliminated from the study ($n = 10$). Of these ten students ($n = 10$), eight were enrolled in online sections ($n = 8$) and one was enrolled in a face-to-face section ($n = 1$) and one was enrolled in a blended section ($n = 1$). The remaining forty-three ($n = 43$) subjects had between 1 to 4 missing values with most missing one value. These missing values were replaced by inserting the group mean value for those enrolled in a similar instructional format. While this method is not as conservative as eliminating these subjects from the analysis it is a widely accepted method for imputing missing data (Tabachnik & Fidell, 1996).

The remaining sample ($n = 358$) was then examined for outliers. An outlier is a case where a subject has responded with such an extreme value on one variable (a univariate outlier) or such a strange combination of scores on two or more variables (multivariate outlier) that it distorts statistics (Tabachnik & Fidell, 1996). A series of box plots were produced using SPSS to explore outliers. In order to be conservative in the data analysis, responses that were deemed to be outliers were eliminated from the sample.

This resulted in a final group of three hundred and twenty-nine subjects ($n = 329$), or 89% of the sample, in the final study (face-to-face = 142, online = 67, blended = 120). This was a smaller number of online students than hoped. But, according to protocols established by Tabachnik and Fidell (1996), this sample was deemed large enough for our analysis since the commonly used guideline in regression models is that there should be at least five cases, and ideally 20 cases, for each independent variable. This sample exceeds these benchmarks.

Normality, Reliability and Consistency of Data

The data was then screened for normality using graphical methods in SPSS. Two components of normality are skewness and kurtosis. According to Tabachnik and Fidell (1996), "Skewness has to do with the symmetry of the distribution: a skewed variable is a variable whose mean is not in the center of the distribution. Kurtosis has to do with the peakedness of the distribution (p.79)." Skewness for the sample was within the acceptable range of -2.0 to +2.0 and kurtosis was under .1, which is in the acceptable range of -5.0 to +5.0 (Kendall & Stuart, 1958).

Correlation and regression analysis requires that data be normally distributed. So, items that make up each scale (dependent variables) were examined for reliability. Scale

reliability means that consistency is high among the items contained within each construct. Cronbach's alpha was used to test the internal consistency of the results across items within a scale. Alpha values of 0.70 are acceptable indicators of internal consistency (Nunnally, 1978). Cronbach's alpha values were calculated for each scale. As shown in Table 4-1, the alpha values are above 0.70 on four scales (CLC, PC, AF and ST) indicating the scales are reliable. However, the alpha values on two of the scales (IA and AR) were slightly below 0.70. As a result, findings from these subscales should be interpreted with caution.

Table 4-1
Reliability of Construct

Scale	Number of Items	Cronbach's alpha coefficient
CLC	19	.891
PC	12	.878
IA	9	.660
AR	8	.676
AF	6	.759
ST	8	.800

A Principal Component Analysis using Varimax rotation with Kaiser Normalization was also performed using SPSS. The results showed that scores associated with Cathectic Learning Climate (CLC), Professorial Concern (PC), Inimical Ambiance (IA), Academic Rigor (AF) and Affiliation (AF) grouped closely together in this analysis.

Scores associated with Structure (ST) did not load together in a consistent manner. This may indicate some problem with internal consistency, reliability and validity of this scale.

Description of Sample

Three hundred twenty-nine individuals ($n = 329$) were included in the study. The first section of the College Classroom Environment Scales (CCES) survey requested that respondents provide certain demographic information. The information collected included: gender, class standing, age, and race or ethnic background. In addition, respondents were asked to report if they had previously taken an online or web-based course and if they had previously taken a blended or web-hybrid course.

The descriptive statistics for the participants' demographic and education items are listed in Tables 4-2 and 4-3 respectively. The demographic make-up of the sample closely reflects that of the population being sampled in both gender (sample population equals 65.8% female and 34.2% male and the target population equals 65.8% female and 34.2% male) and race (sample population equals 64.3% Caucasian and 20.9% African American and the target population equals 64.0% Caucasian and 19.6% African American). The sample was slightly younger than the target population (72.7% of the sample population is between 18 – 29 years of age versus 66.6% of the target population). One hundred ninety-one (58.6%) of the students were Freshmen, and 135 (41.4%) were Sophomore or above. This is a slight under representation of Freshmen. In the target population Freshmen make up 67.8% of the student body and the remainder are Sophomore or above.

Table 4-2

Descriptive Statistics for the Participants' Demographics

Variable	<i>n</i>	%
Gender		
Female	214	65.8
Male	111	34.2
Age		
17 and younger	32	9.8
18 – 21	183	56.1
22 – 29	54	16.6
30 – 39	33	10.1
40 – 59	22	6.7
60 and older	2	0.6
Ethnicity		
Caucasian	209	64.3
African American	68	20.9
Asian	12	3.7
American Indian	8	2.5
Hispanic	7	2.2
Other	21	6.5

One hundred forty-two (43.2%) individuals were enrolled in a traditional face-to-face course, 120 (36.5%) in an online course and 67 (20.4%) in a blended course. A

large majority of the participants had no previous experience with a blended course (261, 80.1%) or an online course (203, 62.3%).

Table 4-3

Descriptive Statistics for the Participants' Education Items

Variable	<i>n</i>	%
Course Format		
Face-to-Face	142	43.2
Online	67	20.4
Blended	120	36.5
Previous Online Courses		
Yes	123	37.7
No	203	62.3
Previous Blended Courses		
Yes	65	19.9
No	261	80.1
Class Standing		
Freshman	191	58.6
Sophomore or Above	135	41.4

Statistical Analysis

This study used a correlational design based on a post-positivist research paradigm. A post-positivist research paradigm attempts to support the hypotheses by

analyzing quantitative data using inferential statistical procedures. Through deductive logic, quantitative research tests theories and hypotheses to determine whether, and to what degree, a relationship exists between two or more variables (Creswell, 1994; Gay & Diehl, 1992). Inferential statistics allows the generalization of findings from a random sample on a survey instrument to the population being studied.

A one-way MANOVA was conducted to determine if there were significant differences on Cathectic Learning Climate, Professorial Concern, Inimical Ambiance, Academic Rigor, Affiliation and Structure by course format (traditional face-to-face vs. online vs. blended). The means and standard deviations of each dependent variable by course format are listed in Table 4-4.

Table 4-4

Means and Standard Deviations of Subscales by Course Format

Dependent Variable	Group	<i>M</i>	<i>SD</i>	<i>n</i>
Cathectic Learning Climate	Face-to-Face	3.04	0.70	142
	Online	3.07	0.61	67
	Blended	3.42	0.60	120
	Total	3.18	0.67	329
Professorial Concern	Face-to-Face	3.75	0.74	142
	Online	3.66	0.67	67
	Blended	4.06	0.60	120
	Total	3.84	0.70	329
Inimical Ambiance	Face-to-Face	2.07	0.57	142
	Online	1.74	0.43	67

	Blended	1.97	0.54	120
	Total	1.97	0.55	329
Academic Rigor	Face-to-Face	3.54	0.62	142
	Online	3.92	0.50	67
	Blended	3.67	0.58	120
	Total	3.66	0.60	329
Affiliation	Face-to-Face	3.32	0.69	142
	Online	2.61	0.79	67
	Blended	3.44	0.70	120
	Total	3.22	0.78	329
Structure	Face-to-Face	4.02	0.60	142
	Online	4.46	0.30	67
	Blended	4.06	0.55	120
	Total	4.13	0.56	329

Box's test was significant, suggesting that the covariance matrices of the dependent variables were unequal across the groups. Levene's test (Table 4-5) was significant for Inimical Ambience and Structure, suggesting the groups had unequal error variances on these variables. However, MANOVA is robust to violations of the homogeneity of error variances and covariance matrices assumptions (Tabachnick & Fidell, 2007).

Table 4-5

Levene's Test for the Equality of Error Variances

Variable	<i>F</i>	Hypothesis <i>df</i>	Error <i>df</i>	Sig.
Cathectic Learning Climate	1.75	2	326	.175
Professorial Concern	2.20	2	326	.113
Inimical Ambiance	3.83	2	326	.023
Academic Rigor	2.07	2	326	.128
Affiliation	.81	2	326	.446
Structure	14.40	2	326	.000

The MANOVA using Pillai's Trace (Table 4-6) revealed a significant multivariate difference on the dependent variables by course format, $F(12, 644) = 15.72, p < .01$ ($\eta^2 = .23$, power = 1.00). Pillai's Trace was used in the analysis as it is recommended when examining unequal n 's (Tabachnick & Fidell, 2007). Univariate ANOVAs (Table 4-7) were conducted to further examine the multivariate significance. The tests revealed significant univariate differences on the all six dependent variables.

Table 4-6

MANOVA on Subscales by Course Format using Pillai's Trace (alpha .05)

Effect	<i>F</i>	Hypothesis <i>df</i>	Error <i>df</i>	Sig.	η^2	Power
Course Format	15.72	12	644	.000	.23	1.00

Table 4-7

Univariate ANOVAs on Subscales by Course Format

Dependent Variable	<i>F</i>	Sig.	η^2	Power
Cathectic Learning Climate	12.70 (0.42)	.000	.07	1.00
Professorial Concern	9.71 (0.46)	.000	.06	.98
Inimical Ambience	8.63 (0.28)	.000	.05	.97
Academic Rigor	10.12 (0.34)	.000	.06	.99
Afilliation	31.84 (0.51)	.000	.16	1.00
Structure	17.10 (0.29)	.000	.10	1.00

Note. Numbers in parentheses represents the mean square error for the corresponding term.

Games-Howell planned comparison tests (Table 4-8) were then conducted on the dependent variables to assess the significance of pairwise differences. In several instances these comparisons produces very large effect sizes (Cohen, 1988). These large effect sizes should be interpreted with caution in light of the potential effect of some skewness in the sample.

Table 4-8

Games-Howell Tests (alpha .05)

Dependent Variable	(I) Group	(J) Group	Mean	SE	Sig.	<i>d</i>
Cathectic Learning Climate	Face-to-Face	Online	-0.03	0.09	.941	.04
		Blended	-0.38	0.08	.000	.58
	Online	Face-to-Face	0.03	0.09	.941	.04
		Blended	-0.35	0.09	.001	.58
	Blended	Face-to-Face	0.38	0.08	.000	.58
		Online	0.35	0.09	.001	.58
Professorial Concern	Face-to-Face	Online	0.10	0.10	.623	.13
		Blended	-0.30	0.08	.001	.46
	Online	Face-to-Face	-0.10	0.10	.623	.13
		Blended	-0.40	0.10	.000	.62
	Blended	Face-to-Face	0.30	0.08	.001	.46
		Online	0.40	0.10	.000	.62
Inimical Ambiance	Face-to-Face	Online	0.33	0.07	.000	.62
		Blended	0.10	0.07	.339	.18
	Online	Face-to-Face	-0.33	0.07	.000	.62
		Blended	-0.23	0.07	.004	.46
	Blended	Face-to-Face	-0.10	0.07	.339	.18
		Online	0.23	0.07	.004	.46
Academic Rigor	Face-to-Face	Online	-0.39	0.08	.000	.66
		Blended	-0.13	0.07	.180	.22
	Online	Face-to-Face	0.39	0.08	.000	.66
		Blended	0.26	0.08	.005	.45

Affiliation	Blended	Face-to-Face	0.13	0.07	.180	.22
		Online	-0.26	0.08	.005	.45
	Face-to-Face	Online	0.72	0.11	.000	.99
		Blended	-0.12	0.09	.355	.17
	Online	Face-to-Face	-0.72	0.11	.000	.99
		Blended	-0.84	0.12	.000	1.14
Structure	Blended	Face-to-Face	0.12	0.09	.355	.17
		Online	0.84	0.12	.000	1.14
	Face-to-Face	Online	-0.44	0.06	.000	.85
		Blended	-0.03	0.07	.877	.07
	Online	Face-to-Face	0.44	0.06	.000	.85
		Blended	0.41	0.06	.000	.83
Blended	Face-to-Face	0.03	0.07	.877	.07	
	Online	-0.41	0.06	.000	.83	

Analysis of Hypotheses

H_A1: Students enrolled in blended classes will have significantly higher cathectic learning climate (CLC) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

H_O1: Students enrolled in blended classes will not have significantly higher cathectic learning climate (CLC) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

High scores on the Cathectic Learning Climate (CLC) scales indicate a charged academic atmosphere that stimulates students to be active participants in the class and to seek classmates' opinions and reactions (Winston et al., 1994). The blended students (*M*

= 3.42, $SD = 0.60$) scored significantly higher than the traditional face-to-face ($M = 3.04$, $SD = 0.70$) and the online ($M = 3.07$, $SD = 0.61$) students on Cathectic Learning Climate (Table 4-9). Further analysis showed that comparisons between both the blended group and the face-to-face group and the online group had a medium effect size ($d = .58$) (Cohen, 1988). Therefore this study rejected the null hypothesis and supported the alternative hypothesis that students enrolled in blended classes will have significantly higher Cathectic Learning Climate (CLC) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

Table 4-9
Games-Howell Tests ($\alpha .05$)

Dependent Variable	(I) Group	(J) Group	Mean	SE	Sig.	<i>d</i>
Difference (I-J)						
Cathectic Learning Climate	Face-to-Face	Online	-0.03	0.09	.941	.04
		Blended	-0.38	0.08	.000	.58
	Online	Face-to-Face	0.03	0.09	.941	.04
		Blended	-0.35	0.09	.001	.58
	Blended	Face-to-Face	0.38	0.08	.000	.58
		Online	0.35	0.09	.001	.58

H_{A2}: Students enrolled in blended classes will have significantly higher professorial concern (PC) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

H₀₂: Students enrolled in blended classes will not have significantly higher professorial concern (PC) scores, as measured by the CCES, than those enrolled in

traditional face-to-face or online classes.

High scores on the professorial concern scale describe an academic environment in which students perceive the instructor as being personally concerned about them as individuals and as striving to foster their educational and personal achievements (Winston et al., 1994). The blended students ($M = 4.06$, $SD = 0.60$) scored significantly higher than the traditional face-to-face ($M = 3.75$, $SD = 0.74$) and the online ($M = 3.66$, $SD = 0.67$) students on Professorial Concern (Table 4-10). An exploration of effect size showed that effect size of the comparison between blended and face-to-face sections had a medium effect size ($d = .46$) as did the comparison between blended and online students ($d = .62$) (Cohen, 1988). Therefore this study rejected the null hypothesis and supported the alternative hypothesis that students enrolled in blended classes will have significantly higher Professorial Concern (PC) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

Table 4-10
Games-Howell Tests (alpha .05)

Dependent Variable	(I) Group	(J) Group	Mean	SE	Sig.	<i>d</i>
Professorial Concern	Face-to-Face	Online	0.10	0.10	.623	.13
		Blended	-0.30	0.08	.001	.46
	Online	Face-to-Face	-0.10	0.10	.623	.13
		Blended	-0.40	0.10	.000	.62
	Blended	Face-to-Face	0.30	0.08	.001	.46
		Online	0.40	0.10	.000	.62

H_{A3}: Students enrolled in blended classes will have significantly higher inimical ambiance (IA) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

H₀₃: Students enrolled in blended classes will not have significantly higher inimical ambiance (IA) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

High scores on this scale characterize an environment that students see as being hostile, highly competitive, and rigidly structured. In addition, students are generally uninvolved in classroom activities, see few viable opportunities to influence the classroom process, and are uncomfortable asking questions or giving opinions (Winston et al., 1994). The blended students ($M = 1.97, SD = 0.54$) and traditional students ($M = 2.07, SD = 0.57$) scored significantly higher than the online students ($M = 1.74, SD = 0.43$) on Inimical Ambiance (Table 4-11).

Table 4-11
Games-Howell Tests (alpha .05)

Dependent Variable	(I) Group	(J) Group	Mean	SE	Sig.	<i>d</i>
Inimical Ambiance	Face-to-Face	Online	0.33	0.07	.000	.62
		Blended	0.10	0.07	.339	.18
	Online	Face-to-Face	-0.33	0.07	.000	.62
		Blended	-0.23	0.07	.004	.46
	Blended	Face-to-Face	-0.10	0.07	.339	.18
		Online	0.23	0.07	.004	.46

An exploration of effect size showed that effect size of the comparison between blended and online sections had a medium effect size ($d = .46$) and the comparison between traditional face-to-face and online students also had a medium effect size ($d = .62$) (Cohen, 1988). In sum, the online classes had lower scores than blended and face-to-face classes. Therefore this study partially rejected the null hypothesis and partially supported the alternative hypothesis since students enrolled in blended classes have significantly higher Inimical Ambiance (IA) scores than online students but not traditional face-to-face students.

H_A4: Students enrolled in blended classes will have significantly higher academic rigor (AR) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

H_O4: Students enrolled in blended classes will not have significantly higher academic rigor (AR) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

High scores on this scale are indicative of an environment that is intellectually challenging and demanding (Winston et al., 1994). In this study, the online students ($M = 3.92$, $SD = 0.50$) scored significantly higher than the blended ($M = 3.67$, $SD = 0.58$) and traditional face-to-face students ($M = 3.54$, $SD = 0.62$) on Academic Rigor (Table 4-12). There were no significant differences between blended and face-to-face classes. There was a medium effect size ($d = .45$) for the comparison between online and blended students and a medium effect size for the comparison between online and traditional face-to-face students ($d = .66$) (Cohen, 1988). Therefore, the study failed to reject the null hypothesis that students enrolled in blended classes will not have significantly higher

Academic Rigor (AR) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes. In fact, the study showed that students in blended courses have significantly lower scores on Academic Rigor than students in online courses.

Table 4-12

Games-Howell Tests (alpha .05)

Dependent Variable	(I) Group	(J) Group	Mean	SE	Sig.	d
Difference (I-J)						
Academic Rigor	Face-to-Face	Online	-0.39	0.08	.000	.66
		Blended	-0.13	0.07	.180	.22
	Online	Face-to-Face	0.39	0.08	.000	.66
		Blended	0.26	0.08	.005	.45
	Blended	Face-to-Face	0.13	0.07	.180	.22
		Online	-0.26	0.08	.005	.45

H_{A5}: Students enrolled in blended classes will have significantly higher affiliation (AF) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

H₀₅: Students enrolled in blended classes will not have significantly higher affiliation (AF) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

High scores on this scale describe a class environment that students see as promoting informal interaction and as being highly supportive, friendly, and student-centered (Winston et al., 1994). The results of this study showed that blended students ($M = 3.44$, $SD = 0.70$) scored significantly higher than online students ($M = 2.61$, $SD = 0.79$)

but not significantly higher than traditional face-to-face ($M = 3.32$, $SD = 0.69$) students on Affiliation. The results also showed that traditional face-to-face students ($M = 3.32$, $SD = 0.69$) scored significantly higher than online students ($M = 2.61$, $SD = 0.79$) (Table 4-13). The comparison between the blended students and the online students had a large effect size ($d = 1.14$) as did the comparison between the face-to-face and online students ($d = .99$) (Cohen, 1988). Therefore this study partially rejected the null hypothesis and partially supported the alternative hypothesis since students enrolled in blended classes have significantly higher Affiliation (AF) scores, as measured by the CCES, than online students but not traditional face-to-face students.

Table 4-13

Games-Howell Tests (alpha .05)

Dependent Variable	(I) Group	(J) Group	Mean	SE	Sig.	d
Affiliation	Face-to-Face	Online	0.72	0.11	.000	.99
		Blended	-0.12	0.09	.355	.17
	Online	Face-to-Face	-0.72	0.11	.000	.99
		Blended	-0.84	0.12	.000	1.14
	Blended	Face-to-Face	0.12	0.09	.355	.17
		Online	0.84	0.12	.000	1.14

H_{A6}: Students enrolled in blended classes will have significantly higher structure (ST) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

H₀6: Students enrolled in blended classes will not have significantly higher structure (ST) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

High scores on this scale describe an environment that students perceive as having evaluation criteria and course content clearly articulated. In addition, there is little or no ambiguity about assignments or expectations; the pre-established plan of study is closely followed (Winston et al., 1994). The results showed that blended students ($M = 4.06$, $SD = 0.55$) scored significantly lower than online students ($M = 4.46$, $SD = 0.30$) on Structure (ST) but not significantly higher or lower than the traditional face-to-face students ($M = 4.02$, $SD = 0.60$) as measured by the CCES. In a similar fashion, face-to-face student ($M = 4.02$, $SD = 0.60$) also scored significantly lower than online students ($M = 4.46$, $SD = 0.30$) on Structure (ST) (Table 4-14).

Table 4-14
Games-Howell Test (alpha .05)

Dependent Variable	(I) Group	(J) Group	Mean	SE	Sig.	<i>d</i>
Structure	Face-to-Face	Online	-0.44	0.06	.000	.85
		Blended	-0.03	0.07	.877	.07
	Online	Face-to-Face	0.44	0.06	.000	.85
		Blended	0.41	0.06	.000	.83
	Blended	Face-to-Face	0.03	0.07	.877	.07
		Online	-0.41	0.06	.000	.83

The comparison between the blended students and the online students had a large effect size ($d = .83$) as did the comparison between the face-to-face and online students (d

= .85) (Cohen, 1988). Therefore, the study partially rejected the null hypothesis that students enrolled in blended classes will not have significantly higher structure (ST) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

Summary

This chapter presented a summary of the preliminary exploration of data and procedures used to screen data prior to analysis, provided a descriptive profile of the participants and demographic information, reviewed the multiple regression analysis (MANOVA) performed, and evaluated the hypothesis against the supporting analysis. Chapter V will provide a summary of the study, discuss the significance of the findings, and explore recommendations for future research.

CHAPTER V

Interpretations, Conclusions and Recommendations

Overview

This chapter summarizes the study and discusses the findings in an effort to discover how students' perception of the classroom environment differs across traditional face-to-face, online, and blended courses. The chapter is divided into five sections. The first section provides a summary of the study. The second section discusses the findings of the study according to each research question. The third section explores the study's implications for practice. The last two sections of the chapter include a discussion of recommendations for future research and conclusions from the study.

Summary of the Study

The purpose of this study was to examine how students' perception of the classroom environment differs across traditional face-to-face, fully online, and blended courses. The study used survey research data gathered from intact groups at a community college taking the College Classroom Environment Scales (CCES) (Winston, Vahala, Nichols, & Gillis, 1989) during the Fall 2007 semester to examine differences in population means on five dependent variables. Specifically, the study compared feedback from community college students enrolled in blended courses with community college students enrolled in traditional face-to-face and online courses to determine if the blended learning environment produces higher levels of participation (Cathetic Learning Climate/CLC), a stronger sense of connection to the instructor (Professorial Concern/PC),

a more positive feeling about the cooperative nature of the classroom environment (Inimical Ambiance/IA), a stronger perception that the course is intellectually challenging (Academic Rigor/AR), a better feeling that the instructor is supportive and student-centered (Affiliation/AF), and a more positive sense that the evaluation criteria and course content have been clearly articulated (Structure/ST).

Ten class sections offered in each instructional method were surveyed (N = 30 class sections). While the same courses were not surveyed across instructional methods, the courses surveyed were limited to disciplines taught using all three methods. These included: Accounting (ACC), Business Administration (BAD), Criminal Justice (CJS), Communications (COM), Economics (ECN), Education (EDU), English (ENG), Information Technology (ITS), Language (LAN), Math (MTH), Psychology (PSY), Student Success Skills (STU), and Wellness (WFS). Three hundred and sixty-eight students (N=368) responded to the survey.

Inferential and descriptive statistics were used to analyze the survey data and to address the research hypotheses. A one-way MANOVA was conducted to determine if there were significant differences on Cathectic Learning Climate, Professional Concern, Inimical Ambiance, Academic Rigor, Affiliation and Structure by course format (traditional face-to-face vs. online vs. blended). A preliminary analysis was conducted to examine the data for reliability, validity, outliers, distribution of scores, and any violations to the assumptions of MANOVA. The multivariate analysis of variance (MANOVA) procedure was chosen since the study involved a categorical independent variable (instructional method) and multiple dependent variables. The survey results were analyzed to determine if any significant differences were found between how

students taking face-to-face, online and blended (instructional methods) classes responded on the five CCES scales (dependent variables). The criterion for the rejection of the null hypothesis was a determination of an alpha at $p < .05$ level of probability. Detailed results from the CCES survey, statistical analysis and discussion were presented in Chapter IV.

Discussion of Findings

The results of the statistical analysis, discussed in Chapter IV, yielded significant differences between the independent variable (instructional method) on each of the CCES scales (dependent variables): Cathectic Learning Climate, Professorial Concern, Inimical Ambiance, Academic Rigor, Affiliation, and Structure. A summary of how these results related to the research hypotheses is as follows:

Cathectic Learning Climate

High scores on the Cathectic Learning Climate (CLC) scales indicate a charged academic atmosphere that stimulates students to be active participants in the class and to seek classmates' opinions and reactions (Winston et al., 1994). The blended students scored significantly higher than the traditional face-to-face and the online students on Cathectic Learning Climate. Further analysis showed that comparisons between both the blended group and the face-to-face group and the online group had a medium effect size (Cohen, 1988). Therefore this study rejected the first null hypothesis and supported the alternative hypothesis that students enrolled in blended classes will have significantly higher Cathectic Learning Climate (CLC) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

These results suggest that the blended courses surveyed as part of this study may, in part, be living up to the goal described by many authors of developing classes that combine the best elements of face-to-face instruction and online instruction to create a learning environment more effective than either approach on its own (Colis & Moonen, 2001; Graham, 2005; Osguthorpe & Graham, 2003; Twigg, 2003; Young 2002). Reflecting on the elements in Moore's (1989) interaction paradigm, one could speculate that these findings may result from the fact that the blended format offers students an opportunity to interact with the course content, their instructor, and fellow students in a manner that might better fit their personality or learning style than strictly face-to-face or an online formats on their own. Writing about the effect this variety in learner-content, learner-instructor, and learner-learner interactions produce, Reynard (2007) asserted that, "the main benefit to hybrid from a teaching and learning viewpoint is that it provides an opportunity for the learning process to become much more engaging for students, and for student to drive the learning process more directly" (p. 2).

The results of this study suggest that well designed blended classes can stimulate students to be active participants in the class and may help to create a learning environment, at least in regard to student engagement, which is more effective than either face-to-face or online approaches on their own. These results are consistent with other research on the impact of blended courses on student engagement (Picciano & Dziuban, 2007; Story & DiElsi, 2003; Stein, 2004; Twigg, 2003; Vaughan, 2007) which have found that blended courses improve interactivity, foster peer collaboration across different learning modalities and establish a sense of community.

Professorial Concern

High scores on the Professorial Concern (PC) scale describe an academic environment in which students perceive the instructor as being personally concerned about them as individuals and as striving to foster their educational and personal achievements (Winston et al., 1994). The blended students scored significantly higher than the traditional face-to-face and the online students on Professorial Concern. The effect size showed that effect size of the comparison between blended and face-to-face sections was a medium effect size as did the comparison between blended and online students (Cohen, 1988). Therefore this study rejected the second null hypothesis and supported the alternative hypothesis that students enrolled in blended classes will have significantly higher Professorial Concern (PC) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

As described by Moore (1989), learner-instructor interactions can take the form of an instructor delivering information, encouraging the learner or providing feedback. It can also take the form of the learner asking questions of the instructor or communicating with the instructor regarding course activities. Moore's interaction paradigm asserts that this type of interaction provides motivation, feedback, and dialogue (Moore, 1989; Swann, 2003). This is a key element in creating an effective learning environment. In fact, Bloom (1981) asserted that "Interaction between teachers and students in the classroom is the major factor in accounting for the cognitive learning of students, their interest in school subjects and learning, and their confidence in their own learning capabilities" (p. vi).

The findings indicate that, of the students participating in this study, blended students perceive their instructor as being more personally concerned about them as individuals and as striving to foster their educational and personal achievements to a greater degree than students participating in either face-to-face or online classes. This may be a result of the multiple communication channels available to facilitate learner-instructor interactions in the blended format. Not only can students ask questions and interact with their instructor in the classroom portion of a blended course, but they also have the ability to communicate with their instructor through e-mail, chat and threaded discussions as part of the online component of the course. These findings are consistent with those found recently by other researchers (Benbunan-Fich & Hiltz, 2003; Picciano & Dziuban, 2007; Story & DiElsi, 2003; Stein, 2004; Twigg, 2003; Vaughan, 2007) who have found that blended courses create enhanced opportunities for teacher-student interactions, increase student engagement in learning and add flexibility in the teaching and learning environment.

Inimical Ambiance

High scores on the Inimical Ambiance (IA) scale characterize an environment that students see as being hostile, highly competitive, and rigidly structured. In addition, students are generally uninvolved in classroom activities, see few viable opportunities to influence the classroom process, and are uncomfortable asking questions or giving opinions (Winston et al., 1994). The blended students and traditional students scored significantly higher than the online students on Inimical Ambiance. The effect size of the comparison between blended and online sections had a medium effect size and the comparison between traditional face-to-face and online students also had a medium effect

size (Cohen, 1988). Therefore this study partially rejected the third null hypothesis and partially supported the alternative hypothesis since students enrolled in blended classes have significantly higher Inimical Ambiance (IA) scores than online students but not traditional face-to-face students.

The study's Inimical Ambiance (IA) scale results are interesting and somewhat counterintuitive. High scores on this scale are indicative of a negative learning climate. It indicates a classroom environment that students view as being hostile, highly competitive, and rigid. In addition, high scores here also generally indicate that students are uninvolved in classroom activities, see few viable opportunities to influence the classroom process, and are uncomfortable asking questions or giving opinions. Given this description, one would expect that since blended courses score significantly higher than face-to-face and online courses on both the Cathectic Learning Climate and Professorial Concern scales – scales indicative of a highly productive and engaging learning environment – one could expect blended courses to produce either no significant differences or perhaps lower scores on this scale than those produced by face-to-face or online courses. However, blended courses scored significantly higher on this scale than online courses.

As stated earlier, most recent research on blended courses has found that they seem to improve interactivity, foster peer collaboration across different learning modalities and establish a sense of community (Benbunan-Fich & Hiltz, 2003; Picciano & Dziuban, 2007; Story & DiElsi, 2003; Stein, 2004; Twigg, 2003; Vaughan, 2007). In fact, the Benbunan-Fich and Hiltz study (2003), one of the few studies that has compared student's perceptions of courses taught across all three instructional methods, showed that

students in blended courses had significantly higher perceptions of group collaboration, a characteristic related to Inimical Ambiance, than either face-to-face or online students.

So, what can explain the results on this scale? Revisiting the literature regarding online instruction does reveal a number of articles and studies concerning the development of “sense of community” and of “learning communities” in online classes (Benbunan-Fich & Hiltz, 2003; Grunawardena, 1995; Haythornthwaite et al., 2000; Huang, 2002; Lai, 2003, Wall, 1999). These studies imply that not only can students in online classes develop a strong, vibrant sense of community (SOC) but that this is an important element in creating a successful online learning environment. The Lai (2003) study concluded that, “when an instructor had adequate involvement in and facilitation of the ongoing discussions, students SOC was highly developed and the students themselves were highly motivated” (p. 121). The results of the current study may reflect the development of such a strong sense of community among the majority of those participating in the online class sections surveyed. In addition to this possibility, one recent study on blended learning offers another potential insight into this unexpected result. Dziuban, Moskal, and Hartman’s (2005) research explored the effect of generational markers on learner’s satisfaction with blended learning. Generations that they described as Matures, Baby Boomers, Generation X, and Millennials were included in the study. Their results indicated that Millennials, people born after 1985, responded least positively to their blended learning experience on the dimensions of engagement and interaction. This is interesting since the majority of the students (65.9%) participating in the current study can be classified as Millennials. Viewing the findings concerning Inimical Ambiance in light of Dziuban, Moskal, and Hartman’s (2005) research, one

possible interpretation could be that today's traditional-aged college students are more comfortable working in an online environment than in a face-to-face learning environment. Future research should be done to further explore the results on this scale.

Academic Rigor

High scores on the Academic Rigor (AR) scale are indicative of an environment that is intellectually challenging and demanding (Winston et al., 1994). In this study, the online students scored significantly higher than the blended and traditional face-to-face students on Academic Rigor. There was a medium effect size for the comparison between online and blended students and a medium effect size for the comparison between online and traditional face-to-face students (Cohen, 1988). Therefore, the study failed to reject the fourth null hypothesis that students enrolled in blended classes will not have significantly higher Academic Rigor (AR) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes. In fact, the study showed that students in blended courses have significantly lower scores on Academic Rigor than students in online courses.

These findings indicate that, of the students participating in this study, online students ranked their classes as being more intellectually challenging and demanding than did students taking face-to-face or blended courses. These findings are consistent with the literature. As discussed in Chapter II, researchers over the past decade have found that online course formats can provide a quality learning experience that is comparable to traditional face-to-face instruction (Barry & Runyan, 1995; Cole, 2000; Gagne & Shepherd, 2001; Hiltz, Zhang & Turoff, 2002; Russell, 1999; Schulman and Sims, 1995; Swann, 2003, 2004). In fact, research shows that most students report that online course

work is more demanding than in face-to-face courses (Navarro & Shoemaker, 2000; Snell & Mekies; Redding & Rotzler, 2001; Wyatt, 2005). Research indicates that student's perception that online courses are more challenging and demanding could be related to a students' initial expectations about the rigor of an online course, a students' motivation for taking an online course, the tendency of some students to procrastinate in completing online course work, and/or the ability for a student to stay on task without face-to-face prompting by an instructor or peers (Snell & Mekies, 1999).

This study speculated that by requiring students to complete both in-class and online learning activities students might perceive a blended course as having twice the work as either a face-to-face or an online course on its own and thus be more demanding. However, this does not seem to be the case. The results of this study seem to suggest that by blending face-to-face components with online components, blended courses are perceived to be less intellectually challenging and demanding than courses that present the same material fully online.

Affiliation

High scores on the Affiliation (AF) scale describe a class environment that students see as promoting informal interaction and as being highly supportive, friendly, and student-centered (Winston et al., 1994). The results of this study showed that blended students scored significantly higher than online students but not significantly higher than traditional face-to-face students on Affiliation. The results also showed that traditional face-to-face students scored significantly higher than online students. The comparison between the blended students and the online students had a large effect size as did the comparison between the face-to-face and online students (Cohen, 1988). Therefore this

study partially rejected the fifth null hypothesis and partially supported the alternative hypothesis since students enrolled in blended classes have significantly higher Affiliation (AF) scores, as measured by the CCES, than online students but not traditional face-to-face students.

This scale spans two critical components in Moore's (1989) interaction paradigm – learner-instructor interaction and learner-learner interaction. The importance of these components was emphasized by Palloff and Pratt (1999) who stated that the “keys to the learning process are the interactions among students themselves, the interaction between faculty and students, and the collaboration in learning that results from these interactions” (p. 5). This concept is grounded in research as far back as Dewey's (1939). Dewey theorized that learning emerged from meaningful experiences, where students join together in a social context, such as a classroom to manipulate materials and ideas. High levels of Affiliation is critical in creating the type of effective learning environment Dewey and others have written about (Astin, 1975, 1977, 1993; Bean, 1980, 1982, 1983, 1985; Bean & Metzner, 1985; Berge, 1999; Hammer 2001; Kearsley, 2000; Moore, 1989; Pascarella, 1980, 1985; Pascarella & Terenzini, 1977; Spady, 1971; Sutton, 2001; Terenzini & Pascarella, 1971, 1980; Tinto, 1975, 1982, 1987, 1988, 1993, 1997; Wagner, 1994).

The results of this study suggest that well designed blended classes can preserve the supportive, friendly, and student-centered atmosphere found in face-to-face classes while only meeting face-to-face half the time. These results are consistent with other research on the impact of blended courses on student engagement (Benbunan-Fich & Hiltz, 2003; Picciano & Dziuban, 2007; Story & DiElsi, 2003; Stein, 2004; Twigg, 2003;

Vaughan, 2007) which have found that blended courses improve interactivity, foster peer collaboration across different learning modalities and establish a sense of community.

Structure

High scores on the Structure (ST) scale describe an environment that students perceive as having evaluation criteria and course content clearly articulated. In addition, there is little or no ambiguity about assignments or expectations; the pre-established plan of study is closely followed (Winston et al., 1994). The results showed that blended students scored significantly lower than online students on Structure (ST) but not significantly higher or lower than the traditional face-to-face students as measured by the CCES. In a similar fashion, face-to-face student also scored significantly lower than online students on Structure (ST). The comparison between the blended students and the online students had a large effect size as did the comparison between the face-to-face and online students (Cohen, 1988). Therefore, the study partially rejected the sixth null hypothesis that students enrolled in blended classes will not have significantly higher Structure (ST) scores, as measured by the CCES, than those enrolled in traditional face-to-face or online classes.

The CCES Structure (ST) scale is related to Moore's (1989) learner-content interaction. As outlined by Moore, learner-content interactions describe the method by which student obtain information from the course material. It is the "process of intellectually interacting with content that results in changes in the learner's understanding, the learner's perspective, or the cognitive structure of the learner's mind" (Moore, 1989, p. 1). These findings indicate that, of the students participating in this

study, online students perceived their classes as having evaluation criteria and course content more clearly articulated than did students taking face-to-face or blended courses.

These findings are consistent with those of Huang (2002), a study also using Moore's theories to explore similar issues, who found that students enrolled in online courses not only reported that they provided "good organization with regards to objectives, assignments and grades" (p. 410) but also provided a structure that delivered content in a way that was flexible for learners to access and to learn.

One can speculate that these perceptions by online students may result from the nature and structure of most online classes. Online courses at the participating community college utilized a course management system, WebCT, which provides a highly structured, modularized and syllabus-linked presentation of course material and online grade books which can be viewed by students at anytime and anywhere during the semester. While a class taught in a face-to-face setting, like traditional and blended classes, may adjust what is being presented on any given day to accommodate changes in the classroom environment, it is unusual that an online class will deviate from the modularized syllabus presented at the beginning of the course. As a result these classes tend to be highly structured and provide students with very explicit evaluation criteria. While blended courses also utilize the WebCT platform, each instructor has the freedom to decide what tools they use in WebCT and what material and learning activities are offered in the classroom or online. As a result, different blended courses may yield different results on the Structure (ST) scale – as well as other scales depending on the blend. Future research should be conducted to see if varying what elements of a blended

course are offered face-to-face vs. online has an impact on students' perception of blended courses on this scale.

Summary of Significant Findings by Instructional Method

The findings suggest that blended classes provide an atmosphere that is as good as or better than both face-to-face and online classes in producing higher levels of student participation and intellectual stimulation (CLC) and a stronger sense in students that their professor is more personally concerned about them as individuals and does more to foster their educational and personal achievements (PC) (Table 5-1). The results also indicate that blended students are more likely to perceive that their classroom environment promotes and fosters informal interactions and is more student-friendly and student-centered (AF) than online students (Table 5-1). However, blended students are more likely to report more neutral or negative feelings about the cooperative nature of the classroom environment (IA) than online students. The results indicate that online students are significantly less likely to describe their classroom environment as being hostile, highly competitive, and rigid and are more likely to be involved in classroom activities than blended students (Table 5-1 and 5-3).

The findings also suggest that face-to-face students are more likely to perceive that their classroom environment promotes and fosters informal interactions and is more student-friendly and student-centered (AF) than online students (Table 5-2). However, face-to-face students, like blended students, are more likely to report more neutral or negative feelings about the cooperative nature of the classroom environment (IA) than online students (Table 5-2 and 5-3).

Table 5-1

*Significant Differences between Blended Classes and Face-to-Face and Online Classes
Games-Howell Test (alpha .05)*

Dependent Variable	(I) Group	(J) Group	Mean	SE	Sig.	<i>d</i>
Difference (I-J)						
Cathectic Learning Climate	Blended	Face-to-Face	0.38	0.08	.000	.58*
		Online	0.35	0.09	.001	.58*
Professorial Concern	Blended	Face-to-Face	0.30	0.08	.001	.46*
		Online	0.40	0.10	.000	.62*
Inimical Ambiance	Blended	Face-to-Face	-0.10	0.07	.339	.18
		Online	0.23	0.07	.004	.46*
Affiliation	Blended	Face-to-Face	0.12	0.09	.355	.17
		Online	0.84	0.12	.000	1.14*

Note. Bold highlighting indicates a significant relationship in the positive direction.

Table 5-2

*Significant Differences between Face-to-Face Classes and Online and Blended Classes
Games-Howell Test (alpha .05)*

Dependent Variable	(I) Group	(J) Group	Mean	SE	Sig.	<i>D</i>
Difference (I-J)						
Inimical Ambiance	Face-to-Face	Online	0.33	0.07	.000	.62*
		Blended	0.10	0.07	.339	.18
Affiliation	Face-to-Face	Online	0.72	0.11	.000	.99*
		Blended	-0.12	0.09	.355	.17

Note. Bold highlighting indicates a significant relationship in the positive direction.

The results suggests that classes taught online foster a stronger perception among students that the course is intellectually challenging and demanding (AR) and that the course content, expectations and evaluation criteria had been clearly articulated to the class (ST) than both face-to-face and blended classes. In addition, online students are less likely to report neutral or negative feelings about the cooperative nature of the classroom environment (IA) than either face-to-face or blended students. The results indicate that online students are significantly less likely to describe their classroom environment as being hostile, highly competitive, and rigid and are more likely to be involved in classroom activities than face-to-face or blended students (Table 5-3).

Table 5-3

Significant Differences between Online Classes and Face-to-Face and Blended Classes

Games-Howell Test (alpha .05)

Dependent Variable	(I) Group	(J) Group	Mean	SE	Sig.	D
Inimical Ambiance	Online	Face-to-Face	-0.33	0.07	.000	.62
		Blended	-0.23	0.07	.004	.46
Academic Rigor	Online	Face-to-Face	0.39	0.08	.000	.66*
		Blended	0.26	0.08	.005	.45*
Structure	Online	Face-to-Face	0.44	0.06	.000	.85*
		Blended	0.41	0.06	.000	.83*

Note. Bold highlighting indicates a significant relationship in the positive direction.

<i>Dependent Variable</i>	<i>Brief Description</i>
Cathectic Learning Climate (CLC)	High scores indicate a charged academic atmosphere that stimulates students to be active participants in the class and to seek classmates' opinions and reactions.
Professorial Concern (PC)	High scores describe an academic environment in which students perceive the instructor as being personally concerned about them as individuals and as striving to foster their educational and personal achievements.
Inimical Ambiance (IA)	High scores characterize an environment that students see as being hostile, highly competitive, and rigidly structured. In addition, students are generally uninvolved in classroom activities, see few viable opportunities to influence the classroom process, and are uncomfortable asking questions or giving opinions.
Academic Rigor (AR)	High scores are indicative of an environment that is intellectually challenging and demanding.
Affiliation (AF)	High scores describe a class environment that students see as promoting informal interaction and as being highly supportive, friendly, and student-centered.
Structure (ST)	High scores describe an environment that students perceive as having evaluation criteria and course content clearly articulated and where there is little or no ambiguity about assignments or expectations.

Figure 5-1: Description of the CCES Scales (Winston et al., 1994)

Implications of the Study

The results of this study suggest that in some respects, blended courses may live up to the assertion made by some authors that they offer “the best of both worlds”

(Young, 2002, p. 33), by providing some of the convenience of an online course without the complete loss of the face-to-face contact that appears to be important in creating an effective learning environment (Colis & Moonen, 2001; Graham, 2005; Osguthorpe & Graham, 2003; Twigg, 2003; Young, 2002). Overall, the results of this study seem to indicate that blended courses provide an atmosphere that is as good or better than both face-to-face and online classes in producing higher levels of student participation and fostering intellectual stimulation (CLC), a stronger sense by the student of being connected to the instructor (PC), and positive and productive student interactions (AF). In doing so, blended courses in this study seem to fulfill the goal described by Vaughan (2007) of joining, “the best features of in-class teaching with the best features of online learning to promote active, self-directed learning opportunities with added flexibility” (p. 82).

The findings of this study are consistent with Moore’s Interaction Paradigm (Moore, 1989; Swan, 2003) described in Chapter I (Figure 5-2). If designed well, blended courses can be richer in “learner-content interaction” (Moore, 2003) than either a face-to-face or an online course since they provide an opportunity for faculty to design multimodal activities that may better address the diverse learning styles of students and deliver instructional content through more communication channels than either method on its own (Osguthorpe and Graham, 2003; Piccianno, 2006). Blended courses may also be able to provide more “learner-instructor interaction” (Moore, 2003) opportunities since students can interact with their instructors through both face-to-face and online communication and information channels. So, students who might be shy about talking or

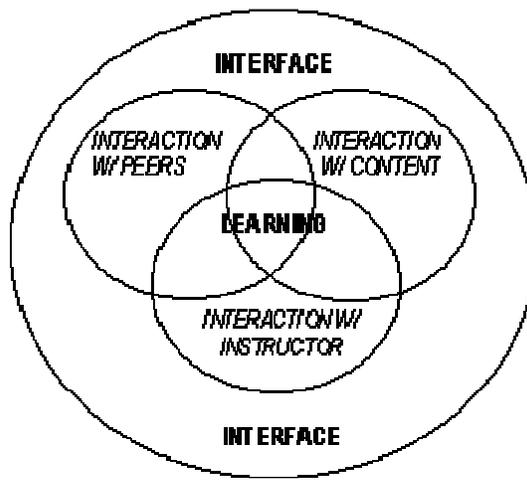


Figure 5-2: Moore's Interaction Paradigm Conceptualized (Swan, 2003)

asking a question in a face-to-face classroom setting can utilize online tools to interact with the instructor and students who rely on non-verbal communication cues to effectively communicate can get those through a blended class in ways they can not get in an online class. Finally, “learner-learner interaction” (Moore, 2003) in the blended setting is also more extensive than in either a face-to-face or an online class since these students can both interact and communicate in person in the classroom and anytime-anywhere through the Web. Each of these interactions is a critical component of the learning environment.

The importance of these components was emphasized by Palloff and Pratt (1999) who stated that the “keys to the learning process are the interactions among student themselves, the interaction between faculty and students, and the collaboration in learning that results from these interactions” (p. 5). This study provides support for the notion that by designing a course to taking advantage of the best features of face-to-face

classes and online classes an instructor can create a learning environment that is perceived as good as or better than either instructional method on its own in several areas – Cathectic Learning Climate, Professorial Concern, and Affiliation – that are key to fostering successful learning environments.

However, the results should be interpreted with caution. Each of these three instructional formats – traditional face-to-face, online, and blended – have advantages and disadvantages. The key to developing a successful learning environment in any of these formats is capitalizing on the strengths of the instructional format, while avoiding or adjusting for its limitations (Benbunan-Fich & Hiltz, 2003; Osguthorpe & Graham, 2003; Twigg, 2003). This is a critical concept when developing a blended course. While the results of this study indicated that the blended learning environment was perceived more positively by students on several important factors, this perception could be different in another study that involved courses with a different “blend”. Since each faculty member is free to choose which elements or learning activities are delivered in which method, each blended course can produce very different learning environments.

Osguthorpe and Graham have written extensively about the blended learning environment. In their writing they emphasize that each course or class may be blended in a different manner as an instructor seeks the right balance or mix of online and face-to-face components. Osguthorpe and Graham (2003) wrote:

Those who use blended approaches base their pedagogy on the assumption that there are inherent benefits in face-to-face interaction (both among learners and between learner and instructor) as well as the understanding that there are some inherent advantages to using online methods in their teaching. Thus the aim of

those using blended learning approaches is to find a harmonious balance between online access to knowledge and face-to-face human interaction (p. 228).

The important consideration in creating a blended class is to ensure that the “blend involves the strengths of each type of learning environment and none of the weaknesses” (p. 228). The ultimate goal of which is to develop a blend of instructional strategies tailored specifically to improve student learning.

So, while this study lends support to the assertion that blended courses may offer “the best of both worlds,” it is important to remember that in order to achieve the most effective learning environment the “mix matters.”

Recommendations for Future Research

The findings of this research have several implications for future studies. The following are recommendations for further research:

1. This study should be replicated at other community colleges to determine if similar results are found. There is no one unique model for developing and delivering blended courses. Since this study was conducted utilizing courses from one single college, future research should determine if the results can be replicated at other colleges – especially those that might have different methods of developing or delivering blended courses.
2. Similar studies should be conducted at four year colleges and universities to see if comparable results are found in the four-year setting. A recent study by the Sloan Consortium (Allen, Seaman, & Garrett, 2007) noted that while blended course offerings rose at community colleges from the period between

2003 and 2005, the number of courses offered in this format declined at four-year colleges and universities during this same period. Is this decline related to student feedback or other factors? Future research concerning the perception of blended courses by students at these institutions may provide valuable information to academic decision makers.

3. As more courses are offered at community colleges in all three instructional formats, and more instructors teach across all three formats, it may be possible to move from a field study approach to large scale quasi-experimental studies designed to control for many of the variables that could have influenced the results of this study.
4. Researchers should follow-up on the study's findings regarding Inimical Ambiance (IA). In some regards these findings are counterintuitive given other results in the study and raise several questions concerning why students taking blended and face-to-face courses viewed their class environment as being more hostile, competitive and rigid than students in online classes. Additional studies should be conducted to determine if these results can be replicated and, if so, what factors may contribute to this outcome.
5. Additional research should be conducted to explore how varying the delivery method of different elements in a blended course may produce different student perceptions of the course. Osguthorpe and Graham (2003) suggest that there are at least three elements that one might consider mixing together in a blended course: 1) online and face-to-face learning activities, 2) online and face-to-face student-student interactions, and 3) online and face-to-face

student-instructor interactions. In order to further investigate how the “mix matters,” studies should be conducted to determine which blends of these elements produce higher levels of student satisfaction.

6. Finally, follow-up studies should address why face-to-face courses fared so poorly in this study. With only one exception, both blended classes and online classes produced more positive feedback from students than face-to-face classes.

Additional research may help address some of these issues and provide researchers with more clearly defined methods and strategies to assess the effectiveness of courses taught in a blended format and how this instructional format can best be used to foster student learning.

Conclusion

The findings of this study provide support for the continued development and expansion of the blended course format at community colleges. The results lend support to the notion that blended courses can expanded access to higher education by allowing students to reduce the number of days and hours they spend in a traditional classroom while maintaining a high level of satisfaction with the student-teacher and student-student interactions that are critical components to learning.

These findings are especially important now during a time of economic uncertainty. As state and local governments across the country freeze or pair back community college budgets, college leaders are actively exploring ways to reduce operating costs and defer capital projects. Blended course offerings, if scheduled strategically, can recapture classroom space and significantly increase capacity at little or

no additional facility cost by pairing blended courses that meet half of the time in a traditional classroom with a similar blended course. So, expansion of blended course offerings presents the opportunity for an institution to not only provide students with a form of course delivery that may provide greater time flexibility and improved learning outcomes, but provide these courses in a way that better utilizes institutional resources in times of economic retrenchment.

This is good news for community colleges that have a long history of expanding access and providing educational opportunities for students who may not otherwise be able to attend college. As described by Parnell (1985), the goal of community colleges is to “open the door to higher education and, through their open admissions process, help each person who enters, regardless of skills or means, to become a fully competent, self-motivating, self-fulfilled member of our society” (p. 58). While there is no silver bullet to ensuring access to higher education, options like blended learning courses can play an important part in fulfilling this goal and continuing to help millions of Americans achieve their educational dreams.

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**COLLEGE
CLASSROOM
ENVIRONMENT
SCALES**

by

Roger B. Winston, Jr.

Mary Beth Vahala

Marianne Edwards

Edward C. Nichols

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FORM 8.89

Appendix B
Permission to Use the CCES Scales
(text from e-mail correspondences)

Sent: Monday, March 12, 2007 4:29 PM
To: Randy Swing
Subject: CCES

Dr Swing - I am trying to track down some information on the College Classroom Environment Scales (Winston, Vahala, Nichols, & Gillis, 1989). I would like to use the instrument for a research project. The information at the following link seems to indicate that one has permission to use the instrument, but I wanted to double check with the "owner." It was suggested by someone at the Policy Center that you might be able to shed some light on this for me or to give me contact information for Roger Winston.

<http://www.brevard.edu/fyc/CCES/cces.pdf>

I look forward to hearing from you.

Bill Comey

On 3/12/2007 at 4:51 PM, "Randy Swing" <swing@fyfoundations.org> wrote:

Bill,

This is an easy one. Roger Winston did give the Policy Center permission to share this instrument with others for non commercial use. You'll find that notice and the scoring rubric at the website below:

<http://www.brevard.edu/fyc/CCES/>

As long as you are using it for noncommercial use you should be clear to go. Roger has retired from the University of Georgia. It is my understanding that he still has the same email account but I'm not sure how often he checks that account.

Let me know if this website gets you what you need.

Randy

Randy L. Swing, Ph.D.
Co-Director and Senior Scholar
Policy Center on the First Year of College

Sent: Monday, March 12, 2007 5:09 PM
To: Randy Swing
Subject: RE: CCES

Randy - Thanks for your prompt response. I believe your e-mail will satisfy my IRB. Can I add one other wrinkle though? I am interested in using the survey in both traditional face-to-face classes and on-line classes. As such, it would be really nice to be able to provide the on-line students with an on-line version of the instrument. It would be my intent not to alter the survey's content in anyway but to merely make the instrument and answer sheet "web-enabled". The website you pointed me to (one which I have visited before) states:

"The CCES may be downloaded and printed locally. The survey should not be altered and should carry the title page with copyright notice. Users have permission to alter the directions to accommodate the answer sheet being used. Users may also alter or eliminate items in the "Background and Education" section; they may also add items. The survey document is located at:

<http://www.brevard.edu/fyc/CCES/cces.pdf>

Can you give me permission to administer the instrument in the manner I described above? I will make sure that I include the title page information and copyright notice on my online version. Since online forms were not as prevalent in the early 90's, I don't think this is something Dr. Winston anticipated but I think this approach should meet his intention for the form.

If you have any questions about this please let me know. Thanks - Bill

On 3/12/2007 at 6:05 PM, "Randy Swing" <swing@fyfoundations.org> wrote:

Bill,

I agree that what you suggest is within the spirit that Roger offered this survey for free, noncommercial use. I assume that you would be delivering the on-line survey to specific students and not posting it to an open access website. I guess this is the ultimate in "altering the survey instructions" to fit the answer sheet! I'm confident that he wanted to make this useable and available for researcher and people attempting to improve higher education and your request is in line with that purpose. Thanks for offering to include appropriate copyright and citation notice.

Randy

Randy L. Swing, Ph.D.
Co-Director and Senior Scholar
Policy Center on the First Year of College

Appendix C
Faculty Survey Briefing Letter

Dear CSM Faculty Member:

I am writing you to ask for your cooperation with a research study I am conducting to acquire much-needed information regarding blended, or hybrid, courses. For the past several years I have been researching the development of blended learning courses as part of my doctoral studies at the George Washington University. While blended, or hybrid, courses are gaining more and more popularity in higher education, little research has been conducted to examine how this old notion of combining elements of distance learning and traditional face-to-face instruction is being received by students. The purpose of this study is to examine how students' perception of the classroom environment differs across traditional face-to-face, fully online, and blended courses. The results of the research study should give you and other faculty members additional insights into how students perceive courses taught in each of these instructional methodologies.

Your (insert course and section number) course has been selected for the study either because it is taught as a hybrid course or it is in the same discipline as a hybrid course being included in the study. The study will use a 62-item Likert scale instrument that takes about 20 minutes to complete. I am asking for your cooperation in administering this survey during a class session during November. The results will be aggregated and no specific course section information will be compiled. In this way both your student's confidentiality and your confidentiality will be assured.

I realize your time is valuable and class time is particularly precious. However, I believe this study could provide you, and the college, with useful information as we consider how best to develop and offer courses in the future. I would greatly appreciate your help and cooperation with this study. I will be contacting you in person over the next few weeks to further discuss this project and to confirm your participation in the study. If you have any questions in the meantime, please contact me at 301-934-7509.

Sincerely,

Bill Comey

Appendix D
Student Notification Letter (Sent to online students a month before the survey)

Dear Student:

I am a doctoral student at the George Washington University. As part of my doctoral dissertation, I am conducting a survey of classroom environments at the College of Southern Maryland. This survey has been approved by your instructor and has been reviewed by the GW Office of Human Research Institutional Review Board (IRB).

The purpose of this study is to better understand students' perception of the classroom environment. The results of the research will provide the college, your teacher, and others with insights into how students perceive courses taught in a variety of instructional methods. This assessment is for research purposes only.

Your class has been selected to participate in this research project. In a few weeks, you will receive a copy of the survey in the mail. I realize your time is valuable, and there are a lot of questions to answer on a survey of this nature, but **your input is extremely valuable**. By completing and returning the survey, you will help provide much needed information.

Through the use of your honest input, we hope to gather data that can be used to improve the quality of classroom learning environments and help the college make decisions about how courses can be best delivered to students like you.

Thank you in advance for your time and participation!

Sincerely,

Bill Comey
Doctoral Candidate
The George Washington University

Appendix E
Survey Cover Letter (for blended and face-to-face classes)

Dear Student:

I am a doctoral student at the George Washington University. As part of my doctoral dissertation, I am conducting a survey of classroom environments at the College of Southern Maryland. This survey has been approved by your instructor and has been reviewed by the GW Office of Human Research Institutional Review Board (IRB).

The purpose of this study is to better understand students' perception of the classroom environment. The results of the research will provide the college and others with insights into how students perceive courses taught in a variety of instructional methods. This assessment is for research purposes only.

Attached is a 62-item survey that will take approximately 20 minutes to complete. Please remember:

- All of your information will remain confidential.
- Your individual responses will not be shown to your instructor.
- Your participation in this study is voluntary.
- Do not sign your name on this instrument.

I realize your time is valuable, and there are a lot of questions to answer, but **your input is extremely valuable**. By completing this survey, you will help provide much needed information. Through the use of your honest input, we hope to gather data that can be used to improve the quality of classroom learning environments and help the college make decisions about how courses can be best delivered to students like you.

Instructions:

1. Read the consent/information sheet.
2. Please answer all survey questions as honestly as possible. Try to answer each question.
3. Return the completed survey to your instructor or to the student who is helping to administer the survey. To ensure confidentiality, place your response in the Inter-Campus Envelope, which will be sealed once all the survey responses are collected.

Thank you for your time and participation!

Sincerely,

Bill Comey
Doctoral Candidate
The George Washington University

Appendix F
Survey Cover Letter (for online classes – mailed survey)

Dear Student:

I am a doctoral student at the George Washington University. As part of my doctoral dissertation, I am conducting a survey of classroom environments at the College of Southern Maryland. This survey has been approved by your instructor and has been reviewed by the GW Office of Human Research Internal Review Board (IRB).

The purpose of this study is to better understand students' perception of the classroom environment. The results of the research will provide the college and others with insights into how students perceive courses taught in a variety of instructional methods. This assessment is for research purposes only.

Attached is a 62-item survey that will take approximately 20 minutes to complete. Please remember:

- All of your information will remain confidential.
- Your individual responses will not be shown to your instructor.
- Your participation in this study is voluntary.
- Do not sign your name on this instrument.

I realize your time is valuable, and there are a lot of questions to answer, but **your input is extremely valuable**. By completing this survey, you will help provide much needed information. Through the use of your honest input, we hope to gather data that can be used to improve the quality of classroom learning environments and help the college make decisions about how courses can be best delivered to students like you.

Instructions:

1. Read the consent/information sheet.
2. Please answer all survey questions as honestly as possible. Try to answer each question.
3. Return the completed survey in the enclosed self-addressed stamped envelope.

Thank you for your time and participation!

Sincerely,

Bill Comey
Doctoral Candidate
The George Washington University

Appendix G
Consent/Information Sheet

Information about the Research Study
Blended Learning and the Classroom Environment
GWU IRB# 090716

You are invited to participate in a research study under the direction of Dr. Michael Corry of the Department of Educational Leadership, George Washington University (GWU). Taking part in this research is entirely voluntary. Your academic standing will not, in any way, be affected should you choose not to participate or if you decide to withdraw from the study at any time.

The purpose of this study is to better understand students' perception of the classroom environment. The results of the research will provide the college, your teacher, and others with insights into how students perceive courses taught in a variety of instructional methods. This assessment is for research purposes only.

The research will be conducted in various classes at the College of Southern Maryland. You will be one of approximately 480 participants to be asked to take part at the college. If you choose to take part in this study, you will be given a copy of a 62-item survey to fill out. The survey will take approximately 20 minutes to complete. We realize your time is valuable, and there are a lot of questions to answer on a survey of this nature, but your input is extremely important.

There are no physical risks associated with this study. There is, however, the possible risk of loss of confidentiality. Every effort will be made to keep your information confidential, however, this can not be guaranteed. Some of the questions we will ask you as part of this study may make you feel uncomfortable. You may refuse to answer any of the questions and you may take a break at any time during the study. You may stop your participation in this study at any time.

You will not benefit directly from your participation in the study. But, by completing and returning the survey, you will help provide much needed information.

You will not be paid for taking part in this study.

The investigator can decide to withdraw you from the study at any time. You could be taken off the study for reasons related solely to you (for example, not following study-related directions from the Investigator) or because the entire study is stopped.

If results of this research study are reported in journals or at scientific meetings, the people who participated in this study will not be named or identified. GWU will not release any information about your research involvement without your written permission, unless required by law.

The Office of Human Research of George Washington University, at telephone number (202) 994-2715, can provide further information about your rights as a research participant. If you think you have been harmed in this study, please report this to the Principal Investigator of this study or call the Office of Human Research immediately. Further information regarding this study may be obtained by contacting Bill Comey, the Research Coordinator, at telephone number (301) 934-7509.

To ensure anonymity, your signature is not required in this document unless you prefer to sign it. Your willingness to participate in this research study is implied if you proceed with completing the survey.

*Please keep a copy of this document in case you want to read it again.

Appendix H
Survey Administration Instructions (for blended and face-to-face classes)

**College Classroom Environment Scales
Survey Administration Instructions**

Before Class

Please take a few minutes to read over the survey instructions (located at the top of the second page of the survey) and look over the survey itself so that you will be able to answer any questions that students may have.

Prior to class, you'll need:

1. Enough surveys for each student in the class (please call 301-934-7509 to request additional surveys).
2. Pencils or pens if you think that the students will not be able to provide their own (please call 301-934-7509 to request pencils).

Survey Administration Instructions

1. **Distribute the cover letter, the consent/information sheet, and the survey to the students.** Ask them to not mark on the survey until you tell them to begin.
2. **Please go over the survey instructions (found at the top of the second page of the survey) with the students.** Read the instructions aloud to the students while they are following along.
3. Make sure that you share the following points:
 - **This is not a test.** There is no right or wrong answer. Their answers will not have an impact on their grades!
 - **The survey is voluntary.**
 - **The survey is private and confidential.** Explain that the answer sheets will be sealed in an envelope immediately after class and that you (the instructor) will never see the completed surveys. (Explaining this process generally helps reduce any anxiety about the confidentiality of the survey.)
4. **Explain how students are to turn in their surveys once they are finished.** If possible, place the large envelope that has been provided to you on a table or desk some distance from the other students and yourself. Instruct students to place their own survey in the envelope when they are finished.
5. **Instruct the students to begin the survey.**

After the Surveys are Completed and Collected

1. **Seal the envelope.** When all surveys have been submitted please seal the envelope while students are still in the classroom
2. **Return the envelopes.** As soon as possible, return the sealed envelope containing the surveys through inter-campus mail to the address on the envelope.

Appendix I

Survey Follow-up Letter (sent to online students about one week after mail survey)

Dear Student:

I am a doctoral student at the George Washington University. As part of my doctoral dissertation, I am conducting a survey of classroom environments at the College of Southern Maryland. This survey has been approved by your instructor and has been reviewed by the GW Office of Human Research Internal Review Board (IRB).

The purpose of this study is to better understand students' perception of the classroom environment. The results of the research will provide the college and others with insights into how students perceive courses taught in a variety of instructional methods. This assessment is for research purposes only.

A few days ago you were mailed a paper version this survey. You may have already filled out and returned the survey. If so, thank you! If not, you may be interested in taking the survey online. The link below will take you to an online version of the 62-item survey. It will take approximately 20 minutes to complete the survey. Please remember:

- All of your information will remain confidential.
- Your individual responses will not be shown to your instructor.
- Your participation in this study is voluntary.

I realize your time is valuable, and there are a lot of questions to answer, but **your input is extremely valuable**. So, please either complete and return the paper version of the survey or complete and submit the online version which can be found at **(insert Web address)**.

By completing this survey, you will help provide much needed information. Through the use of your honest input, we hope to gather data that can be used to improve the quality of classroom learning environments and help the college make decisions about how courses can be best delivered to students like you.

Thank you for your time and participation!

Sincerely,

Bill Comey
Doctoral Candidate
The George Washington University