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A comparison of face-to-face and online instructional delivery methods in large-group settings in a university undergraduate wellness course

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A COMPARISON OF FACE-TO-FACE AND ONLINE INSTRUCTIONAL DELIVERY METHODS IN LARGE-GROUP SETTINGS IN A UNIVERSITY UNDERGRADUATE WELLNESS COURSE

A Dissertation

Submitted

In Partial Fulfillment

Of the Requirements for the Degree

Doctor of Education

Approved:

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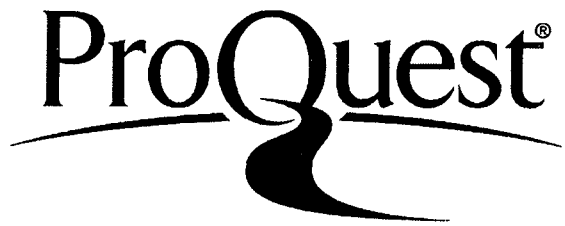

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DEDICATION

This work is dedicated to my family, especially Jerry, Marnie, Shawn, Shane, Chad, and Harper who have stood by me in my work and who I am so lucky to have in my life. A special thanks to all the supporters of the Personal Wellness course throughout the years. It has been a good battle worth fighting.

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ABSTRACT

Utilization of online delivery of the lecture component in an undergraduate wellness course is unique and undocumented in research. Wellness courses are traditionally taught with face-to-face lectures plus an activity component. This discipline is distinctive in terms of its activity components that are not conducted online.

The purpose of this study was to investigate two large group face-to-face and online courses to determine if the students enrolled were demographically equivalent and if there were differences in academic achievement in terms of final course grades and between subgroups of students. For the fall 2006 and spring 2007 semesters, 1,814 students were enrolled in the Personal Wellness course.

Chi-square test of independence and independent–samples *t*-tests results revealed there were demographic differences between the face-to-face and online delivery methods ($p < .05$). Significant differences were found for gender, ethnicity, major, ACT scores, and semester course load. Students' final course grades were examined using an independent-samples *t*-test to determine if students were academically more successful in the face-to-face or online delivery format. No significant differences were discovered in students' final course grades between the two delivery methods ($t(2) = .244$, $p > .05$). ANOVA and independent–samples *t*-test results revealed significant differences in final course grades among various student subgroups ($p < .05$). Differences were found based on gender, ethnicity, major, and year in school.

Based on these results, it was recommended that both face-to-face and online sections of Personal Wellness be offered and that different content be offered to best meet

the needs of the diverse students enrolled. A significant difference was found in student subgroups' and their final course grades based on their choice of face-to-face or online delivery. These conclusions should influence how the Personal Wellness course is taught in the future at this particular university. Future research should further examine these characteristics which may have educational impact for teachers, administrators, and students themselves.

CHAPTER I

INTRODUCTION

In the spring 2006 semester, the School of Health, Physical Education and Leisure Services (HPELS) at the University of Northern Iowa (UNI) offered its first experimental online Personal Wellness course. Personal Wellness is a required Liberal Arts Core (LAC) course. Each course within the LAC undergoes a review every five years. Based on its review in 2005, the LAC committee recommended a new option for students, an online version of Personal Wellness. An experimental online course was offered to explore this request from the LAC Committee. The course consisted of 50 students and utilized the same syllabus and textbook as the face-to-face sections. The lectures of a face-to-face section were video recorded and provided to the online sections so that those students could view them asynchronously.

The purpose of the experimental version was to prepare strategies for dealing with the possibility of larger section sizes in the future. A concern of the faculty involved with the course was if the students were as academically successful, as measured by students' final course grade, in the face-to-face sections as in the online section. Another concern was if various subgroups of students exhibited a difference in final course grades in regards to the delivery system. Based on this experimental version, the Personal Wellness course was expanded into large face-to-face and online sections.

The Context of the Personal Wellness Course

The University of Northern Iowa is located in Cedar Falls, Iowa, a city located in the Midwestern area of the United States. This state-supported university has

approximately 13,000 students enrolled. The Personal Wellness course is housed in the College of Education. The School of Health, Physical Education and Leisure Services (HPELS), as part of the College of Education, works cooperatively, devoting the efforts of two of its sub-professional areas, Health and Physical Education, to the education of students toward the pursuit of positive lifestyles.

The purpose of the Personal Wellness course was to develop students' knowledge in order to help them make sound decisions regarding their health. Students gain the knowledge to distinguish between healthy behaviors and risky behaviors (UNI Programs & Courses, 2008-10). This course raises an awareness of the resources and services available to facilitate the pursuit of a positive lifestyle. After this course students will be able to understand and appreciate wellness as a consciously chosen lifestyle.

Two components of the course structure were lectures and activity laboratory classes. Due to large enrollment every semester and demand for schedule flexibility, students were given a choice of delivery method for the lecture, either face-to-face or online. Each of the research semesters had five or six class sections plus one section for off campus non-traditional students. However, due to its unique format, the non-traditional section was not included in this study. The online sections were composed of on-campus and off-campus students. All the sections had the same instructors.

Online Instruction

Online instruction is often referred to as a delivery system of instruction that is streamed through the Internet. E-learning is another term that is closely related and is usually included within online instruction. Institutions of higher learning have expanded

programs offered to their students by the creation of online course. Fifty-six percent of all post-secondary institutions offered online courses at the beginning of the 21st century. This represented an increase of 12% in institutions that reported offering online education courses from the academic year of 1997–98 and a 23% increase over the 1994–95 year (Waits & Lewis, 2003). More than 4.6 million students took at least one online course in fall 2008, an increase of 17 % over the previous year (Allen & Seaman, 2009). The Sloan Consortium (2010) found that enrollment of online students rose by almost one million students, the largest ever year-to-year increase.

The number of online courses within university settings has risen dramatically in the past 30 years which increases flexibility for students. Students' time and geographic constraints during the pursuit of undergraduate degrees are key factors in the demand for the creation of online courses. With the new technologies and the resulting methodologies that have emerged, education administrators must re-examine whether schools are keeping pace with the needs of the current student population. Charp (2000) noted that students enroll in online courses because it offers a more convenient way to obtain a degree. Olsen (2002) and Phipps and Merisotis (1999) stated that some students are provided access to courses when they would not have been able to participate due to time constraints. Most campuses currently offer a flexible course schedule with online courses in conjunction with the customary face-to-face courses. Online courses offer great diversity in the structure, expectations, and availability of these courses.

With tight budget constraints in almost every state in the United States, schools and students alike are looking for course options to achieve graduation goals. The

flexibility of online courses would enable students to work part-time jobs while enrolled in school, and thus potentially alleviate individual financial concerns. However, administrators and teachers must ensure that students are receiving similar educational experiences in the online environment as they are in face-to-face classrooms.

Face-to-face courses are the traditional delivery system for instruction, but new delivery options such as online courses could provide educational success as well as financial efficiency for all involved. Institutions of higher learning are faced with decreasing budgets for their academic programs. According to The Delta Cost Project (2008), the average public research university received almost $8,350 per student from taxpayers in 2002, but by 2006 that amount had dropped below $7,100. The Delta Cost Project also noted that tuition increases are the primary source of new revenue for higher education. Tuition and fees at public four-year colleges and universities rose at an average annual rate of 4.9% per year beyond general inflation from 1999-2000 to 2009-10, more rapidly than in either of the previous two decades (College Board, 2009).

In terms of flexibility in time and location, online education has many advantages over the traditional face-to-face methods, but concerns arise as to the quality and equity of the educational experience. The traditional educational belief in the United States was to have small face-to-face courses which would provide the most effective and thoughtful learning experience for the students. With the rise in student demand for online courses comes uncertainty among some faculty, administrators, and government officials regarding the quality and equity of online education (Carnevale, 2003). Carnevale noted that at a United States House of Representatives subcommittee meeting in 2003, several

legislators called for "more federal supervision over online education programs" (p. 1). Levine (2000) stated his "fear is that we will provide personal, highly interactive campuses for those who can afford them, and the rest will be given virtual higher education" (p. 11). Allen and Seaman (2006) reported that 57% of senior academic leaders expressed beliefs that online academic achievement are "the same" or "superior" to traditional face-to-face learning outcomes, but in 2010 that number grew to 67%. They also noted that over 75% of academic leaders of public higher education institutions believe that online courses are "as good" or "better" than face-to-face courses.

As experimental online courses have experienced academic success based upon student academic test results (Neuhauser, 2002), more faculty have become engaged in online teaching. Some studies show that online education learners do as well academically as campus-based learners based on test scores (Derwin 2009; Dutton, Dutton & Perry 2002; Neuhauser 2002). Wray, Lowenthal, Bates and Stevens (2008), however, stated the majority of studies have concluded that there is "no significant difference" when comparing online learning to face-to-face learning.

Providing sufficient learning opportunities for a diverse student population is always a concern for teachers. Online courses also offer many opportunities for students who otherwise would not have the option of attending a four year institution for an undergraduate degree. Non-traditional students, students who work 20 to 30 hours a week, and students who do not have a school of higher education in close proximity are a couple of the student groups that are attracted to the online course option. Addressing concerns of international students is a critical factor in providing sufficient resources for

students in online courses. Many international students must overcome language barriers. Providing online video recorded lectures for international students gives them an opportunity to learn lecture content better by viewing lectures multiple times for comprehension. Online courses provide a flexible timeline for students who could be registered for large credit course loads as well.

Historically, administrators and teachers alike believed that small class sizes were more conducive to academic success in their courses (Jarvis, 2000). They believed that the small student/teacher ratio as found in face-to-face courses provided the most efficient and thoughtful learning experiences for the students. Koebler (2011) noted that U.S. News and World Report Ranking of Colleges and Universities has consistently rated schools with smaller course sizes higher than those that have larger ones. Minnesota State University Center for Excellence in Teaching and Learning (2009) concluded that

1. Course size has no effect on the recall and retention of facts and information as measured by student performance on objective questions or examinations.
2. Scores on standardized examinations two years after a course is over were virtually identical between students in large and small courses so that there was no discernible difference in the retention of academic information. (p. 1)

The Minnesota State University Center report noted, however, that students in smaller classes acquired more higher-order academic skills than students enrolled in large classes.

Success in large class settings depends on the student's age (Smith & Glass, 1980) and also in subject matter and discipline (McConnell & Sosin, 1984; Raimondo, Esposito, & Gershenberg, 1990). McConnell and Sosin also concluded that students tolerate larger

courses for Liberal Arts Core courses, elective courses, and prerequisite courses in disciplines other than their major.

Purpose

The purpose of this study was to investigate two alternative methods of instructional delivery in a wellness course at the undergraduate level in a university setting. The first method of instruction was characterized by large-group face-to-face delivery. In this context large-group instruction is defined by settings in which the ratio of students to instructors is at or greater than 100 students to one instructor. The second method is characterized by online instruction where students asynchronously and individually access instructional activities and course materials.

This study examined the degree to which students who enroll in face-to-face large-group instruction and students who enroll in online versions of the same course were demographically equivalent. This study also examined the difference in academic achievement as measured by final course grades between students who enroll in face-to-face large-group instruction and students who enroll in the online version of the same course. In addition, this study examined the academic achievement as measured by final course grades of subgroups as defined by student demographics, in both face-to-face large-group instructional settings and in the online version of the same course. Specifically this study address the following questions:

1. Are students who chose to enroll in face-to-face large-group sections and students who chose to enroll in an online version of the same course demographically

equivalent (gender, age, year in school, ethnicity, country of citizenship, ACT upon entering university, course load, and major)?

2. Are there differences in academic achievement as measured by final course grades between students who chose to enroll in face-to-face large-group sections and students who chose to enroll in an online version of the same course?
3. Are there differences in academic achievement as measured by final course grades between subgroups of these students (gender, year in school, ethnicity, and major) who chose to enroll in face-to-face sections and those who enrolled in online sections?

Definition of Terms

1. Academic Achievement: Composite grade at the conclusion of the semester.
2. Asynchronous learning: Learning when individuals are not online at the same time and interaction does not occur without a time delay, allowing learners to participate according to their schedules (WorldWideLearn.com).
3. E-Learning (electronic learning): Learning that is mediated by an electronic medium (Driscoll, 2002).
4. Liberal arts education: An education that exposes students to the broad areas of knowledge embodied in the whole of the environment and liberates students to further develop the knowledge, skills, and values necessary to live thoughtful, creative, and productive lives (University of Northern Iowa Programs and Courses Catalogue, 2008-2010).
5. Non-traditional student: As defined by age (especially being over the age of 24)

has been the defining characteristic for this population (U.S. Department of Education & National Center for Educational Statistics, 2010).

6. Online Education: Education that is delivered partially or entirely over the internet (U.S. Department of Education, 2009, p. 9).
7. Traditional student: General student population between ages 18-24 (U.S. Department of Education & National Center for Educational Statistics, 2010).
8. Wellness: The mind/body relationship in terms of the various dimensions of physical, emotional, intellectual, spiritual, interpersonal and social, and environmental (Teague, Mackenzie, & Rosenthal, 2009).

Significance of Study

Many research studies have investigated whether online course delivery is comparable to face-to-face delivery in terms of successful academic achievement of the students involved. The fields of business, mathematics, and computer sciences have been previously studied regarding this effectiveness. Utilization of online delivery of the lecture component in an undergraduate wellness course is unique and undocumented in research. Wellness courses are traditionally taught with face-to-face lectures plus an activity component. This discipline is distinctive in terms of its activity components which are not conducted online.

This study examined if there were differences in various students demographics such as age, gender, country of citizenship, ethnicity, course load of semester enrolled in Personal Wellness, ACT scores upon enrolling at the university, and major. The descriptive findings of the students' choice of enrollment in lecture section, online section

or face-to-face section; the final course grade; and any significant interactions amongst student subgroups will be informative for the instructors and administrators of similar type courses in developing effective instructional strategies. The results from this study should ultimately improve student learning because changes can be made in teacher strategies and methodologies.

Instructors' abilities to teach online are critical to the quality of online course offerings. Professional development for faculty of online courses needs to focus on learning outcomes and pedagogical skills to facilitate student learning (Kim & Bonk, 2006). Student advising can also be greatly affected. If the results determine that specific student subgroups have greater ease or difficulty with one delivery method, students can be advised during registration to enroll in a specific instructional format and therefore be given greater chance for academic success. The U.S. Department of Education in "Evaluation of Evidence-based Practices in Online Learning" (2009) stated that online and face-to-face students are comparably successful so all students should benefit by the following factors:

1. Increasing the availability of learning experiences for learners who cannot or choose not to attend traditional face-to-face offerings,
2. Assembling and disseminating information more cost efficiently,
3. Enabling instructors to handle more students while maintaining learning outcome quality that is equivalent to face-to-face instruction. (p. 1)

Limitations

Distinct challenges emerged during this study:

1. This is an historical study examining the Personal Wellness course over the years 2006 and 2007. Since the data is archival in nature, additional interactions cannot be conducted with students from the semesters examined. Since students are no longer enrolled in the class, the researcher cannot add extra qualitative or quantitative information through surveys and/or interviews to this historical data.
2. The students are grouped according to their choice of time and instructional delivery method and do not represent a random sampling.
3. The two semesters analyzed were the first two semesters the online delivery was fully implemented, so there was a steep learning curve on the part of the program administrator utilizing the new technology.
4. There may be a bias on the part of the principal investigator. The principal investigator had been involved with the Personal Wellness program for over 25 years as an instructor and program administrator.

CHAPTER II

LITERATURE REVIEW

Educational institutions are exploring and implementing alternative methods of delivering instruction to their students due to the ever increasing speed in the evolution of technology. With the focus on the effectiveness of instruction, there has been an increase in research comparing face-to-face and online instruction. The effectiveness, however, of teaching to different student subgroups requires further analysis to determine if one delivery system is more effective for different subgroups than another. The purpose of this study was to investigate two alternative methods of instructional delivery to determine if the students enrolled in these two different delivery methods were demographically equivalent, if there were differences in academic achievement in terms of final course grade between delivery types and if there were subgroup differences. A review of literature summarizes various components of the role of wellness education and large course settings. In addition, the literature review describes subgroups of students and online education.

Context of the Study: Wellness Education

"America's health care system is in crisis precisely because we systematically neglect wellness and prevention. We wait until people become obese, develop chronic diseases, or become disabled – and then we spend untold hundreds of billions annually to try to make them better" remarked U.S. Senator Tom Harkin to the American College of Preventative Medicine (2005, p. 1). This statement illustrates the nature of the health care

cycle that has encumbered our country. This problem has escalated dramatically in recent years.

Limitless amounts of statistics regarding the health disparities of the United States population are available for many populations. College-aged students have particularly distinctive challenges to their health for a variety of reasons. College life is typically the initial time of independent living when students must make personal decisions regarding nutrition and exercise, as well as encounter stresses they did not previously experience. These decisions will ultimately establish a pattern that will enhance or negatively impact the student's future health. Receiving vital information in the most effective manner is crucial to ensure students make health care choices that are right for them.

Health Statistics

The United States is being forced to find solutions to manage an ever-increasing unhealthy population. Businesses are searching for answers to keep their employees healthy so their health-care costs become more manageable. Insurance companies are focusing on adolescence and young adults now to reduce their medical expenses in the future. An estimated 27% of the increase in national per capita spending on health care between 1987 and 2001 was attributable to obesity-related problems (Barry, 2005). Barry (2005) also noted that if there is an overweight adolescent, there is a 70% chance that that individual will become an obese adult. But obesity is just one such problem. The number of persons with diabetes and heart disease were just as staggering. The leading cause of death among men and women in the United States is heart disease (Heron et al., 2006).

A major health epidemic and growing at an alarming rate is obesity. Unfortunately the knowledge of health benefits of physical activity has not offset the current obesity epidemic. In a research article entitled "Childhood Obesity: Future Directions and Research Priorities," James O. Hill and Fredrick L. Trowbridge (1998) concluded that this generation of 18 - 24 year olds will grow into the most obese generation of adults in U.S. history. Not surprisingly, Dennison, Strauss, Mellits, and Charney (1988) proclaimed that obese, low-fit individuals are less active than those who are neither obese nor low-fit. Since 1980 the number of overweight children has more than tripled in the U.S. While nearly 70% of 12-year olds reported engaging in vigorous physical activity on a regular basis, only 35% of 21-year olds maintained this level (Centers for Disease Control and Prevention [CDC], 2000). The American College Health Association (2005) reported that only 44.2% of college-aged students exercised vigorously for at least 20 to 30 minutes on at least three of the past seven days.

Young adults are susceptible to certain health risk factors. The 2009 Youth Risk Behavior Surveillance System indicated that 9.7 % of high school students had driven a motor vehicle under the influence of alcohol. This number more than doubles in college and researchers estimate that the percentage of college students who drive under the influence increased from 26.5% in 1998 to 31.4% in 2001 (Hingson, Heeren, Winter & Wechsler, 2005). An estimated 34.5% of college students had five or more drinks of alcohol on more than one occasion; 35.1% of college students were in a car with a driver who had been drinking alcohol; and 30.5% of the respondents reported they had been drinking while boating or swimming (CDC, 2009).

Reports also indicate college as a time when exploration and experimentation occur in high-risk sexual behavior (Brener & Gowda, 2001; Clemmens, Engler & Chinn, 2004). Only 29.6% of the 62.4% of college students having sexual intercourse used a condom during their last sexual encounter (CDC, 2009). Fewer students used condoms in 2005 than in 2000 (American College Health Association, 2005). 16% of college students had drunk alcohol or used drugs during their last sexual encounter, a factor affecting a student's ability to make healthy sexual choices (CDC, 1997). Students who use one substance are more likely to use others (Jones, Oeltmann, Wilson, Brener & Hill, 2001). These behaviors may explain why almost half of the approximately 19 million new sexually transmitted disease infections (STD) in the U.S. each year occur in 15 to 24 year olds. The high percentage of college age students with STDs is dramatic because this age group makes up only 25% of sexually active individuals (Weinstock, Berman & Cates, 2004).

Additionally, the U.S. population is continuing to engage in risky behaviors such as smoking and sexual promiscuity. More students in 2005 reported feelings of sadness, depression, and hopelessness and were more concerned about their weight than in 2000 (American College Health Association, 2005). College students:

> experience considerable stress and anxiety related to a range of underpinning economic, lifestyle, academic, environment and service-related factors, and therefore what emerges is a picture of students having a dearth of money, time, information and advice, eating and living generally unhealthy lifestyles (Dooris, 2001, p. 56).

College students report increased risky behaviors of higher rates of smoking and binge drinking (Clemmens et al., 2004). Rates of depression, diabetes, hypertension,

homicide, and suicide are on the increase (CDC, 2009). Poor self-image and alcohol abuse may increase one's vulnerability to eating disorders (Cooley & Toray, 2001). Hudd et al. (2000) reported that 52.1% of college students had relatively high levels of stress, 33% of these students reported that stress negatively affected their academic success, and 60.4% drank more alcohol than intended due to this stress. Educational interventions are necessary and can be effective in circumventing some of these risks. Kulinna, Warfield, Sonaitis, Dean and Corbin (2009) found that lifestyle modifications in youth can lead to the prevention or delay of coronary heart disease.

Elementary and secondary schools can be a major player in the battle fighting disease; but with state governments reducing school funding, there are reductions and eliminations of physical education classes. These reductions undermine the schools' ability to assist students in determining healthy life choices. The education students receive about these healthy life choices and wellness issues can eventually improve the quality of life of all involved. Unfortunately, it appears the information that students are being presented in typical wellness classes has not been reaching the students. Starkman and Rajani (2002) reported that many high school curricula do not provide a comprehensive sexual education program so many students enter college without adequate knowledge to make health decisions regarding their sexuality which is a contributing factor to the sexual health issues in college. Finding the most effective method in delivering wellness information, however, is yet to be determined.

History of Wellness Education

Most of the wellness movement impetus arose from church influence. The mental and spiritual connection was one of the original primary sources of physical health. The relationship between spirituality and health in the early nineteenth century was referred to as the mind-cure movement. Richardson (2006) stated that William James, Phineas Quimby and Mary Baker Eddy developed ideas regarding the spiritual nature of disease. These ideas and the power of the mind and spirit to influence the course of disease were common concepts. Horace Fletcher originated the idea of positive thinking and its impact on decreasing risk of disease. He believed that disease was the consequence of one's own actions and that positive thinking was crucial to maintaining well-being. John Kellogg developed a theory which evolved from Fletcher's. He took a literal translation of Scripture which stated that the body was a temple of the Holy Spirit and consequently placed his emphasis on diet and fitness. Kellogg developed a clinic where people learned to stay well. His chief message was that emphasis should be placed on health. This influenced the later development of the concept of wellness in the United States.

The term wellness originated with the work of Dr. Halbert Dunn. Dunn, who also wrote the Constitution of the World Health Organization, examined the long-term impact of disease on demographic changes. He also proposed the notion of "positive health" which was in principle identical with wellness. Dunn (1961) defined high-level wellness as:

> an integrated method of functioning which is oriented toward maximizing the potential of which the individual is capable. It requires that the individual maintain a continuum of balance and purposeful direction within the environment where he is functioning (p. 4-5).

Dunn was influenced by the social dimension of wellness through his work with President Truman's Commission on the Health Needs of the Nation. Their work focused on how to meet the needs of long-term health care requirements (Miller, 2005). Dunn also emphasized the mental and spiritual dimensions of wellness and was critical of the Western culture of the separation of the body, mind, and spirit. He recognized that these three areas must harmonize together. He is credited with the original wellness continuum illustrated by a scale instead of a fixed state of being. Individuals are located at various locations along the continuum based on their particular circumstances.

The term wellness found meaning in the early 1950s but evolved into more significance in the 1970s. Hettler (1998) noted John Travis as another pioneer in developing the wellness concept. Travis founded the Wellness Resource Center in 1975 soon after Dunn's death. Based on Dunn's work he created a wellness inventory to assess an individual's health based on 12 dimensions. Travis' contribution to the concept of wellness was a greater emphasis on individual responsibility. It was not the responsibility of a medical doctor to make a patient well, but rather the patient was responsible for the prevention of illness and disease. He popularized the concept of wellness through his many publications and presentations. Around this same time Donald Ardell, in 1977, began his career as a health planner and became instrumental in presenting wellness ideas to the public. He is credited in making wellness a household term. Because his writing style was more understandable in lay terms, he became a well-paid speaker on the subject of wellness. Unlike Travis and Dunn, however, Ardell

rejected the spiritual dimension of wellness. Because of his outspokenness about the subject, many of his colleagues labeled him as controversial.

As the 1980s evolved, so did the topics and issues associated with wellness. State and local governments began to actively promote wellness programs in hopes of reducing health care costs. Professional associations began to actively push for more wellness programs in corporations. Wellness became the new health paradigm as one of the ten most important new developments that would shape individual's lives (Naisbitt, 1982). The academic and scientific arenas of health and physical education began to collaborate and work in conjunction with the mind/body approach. The awareness of the benefits of lifestyle change increased along with the participation in lifestyle sports.

The relationship between the mind and body continues to be widely accepted in regards to health. Although scientific evidence provides the basis for research and teaching in physical education, the ideas of physical and cognitive improvement, moral and character development, and in some cases, spiritual development are included in defining wellness. Currently wellness refers to the mind/body relationship in terms of its various dimensions - physical, emotional, intellectual, spiritual, interpersonal, social, and environmental.

Impact of Wellness Education on Students

Through education college and university students can learn to be independent consumers who are knowledgeable about their health and well-being and high-risk individuals may be motivated to change their health behaviors. Late adolescence may be the optimal time for conducting health promotion activities (Twellman, Biggs, & Lantz,

2001). College is the time for students to investigate lifestyle behavior patterns that strongly influence behaviors that will continue throughout life (Pearman & Valois, 1997). Dishman and Dunn (1988) found that many adult behaviors are influenced and established during late adolescence.

Physical inactivity is a major health concern in the United States and illustrates the decrease in the recognition of the importance of the physical dimension of wellness in our society. Research examining this phenomenon has identified several contributing factors. One of the key determinants is attitude (Dzewaltowski, 1994; Noland & Feldman, 1984). Studies have shown that persons with positive attitudes toward physical activity generally exercise more frequently and more intensely than individuals with less positive attitudes (Ennis, 1996; McPherson et al., 1967; Portman, 1995). Mack and Shaddox (2004) distributed an "Attitudes Toward Exercise and Physical Activity" (ATEPA) to 1625 students enrolled in a Personal Wellness course. Results from the study found significant improvement in short-term attitudes toward exercise and physical activity after completing Personal Wellness. Participating in and studying the benefits of exercise over the course of a semester appeared to have improved students' attitudes. Wellness courses can help students develop knowledge, skills, attitudes, and behaviors needed to adopt healthy behaviors (Corbin & Lindsey, 2000).

Research has also demonstrated the relationship between student health and academic performance (Pritchard & Wilson, 2003). Studies report a correlation between the negative effects of substance abuse, risky sexual behavior and emotional issues on

academic performance (Marlatt & Witkiewitz, 2002; Pritchard & Wilson, 2003; Riley, Durbin & D'Ariano, 2005; Von Ah, Ebert, Ngamvitroj, Parj & Kang, 2004).

The current health and wellness practices of the college age population are often unhealthy and moving in a negative direction. The American College Health Association Healthy Campus 2010 document (2010) highlights the importance of health status with regard to the future health potential of college students and the impact college years have on their health. Education is the best strategy to empower college students to improve their health behaviors and decision-making skills (CDC, 1997; Marlatt & Witkiewitz, 2002; Wechsler, Kelley, Weitzman, San Giovanni, & Seibring, 2000).

Results reported by Becker et al. (2008) suggest that it is effective to deliver health information in a Liberal Arts Core course and can reverse the negative trend regarding the health behaviors of college students. Requiring students to take a wellness course in a Liberal Arts Core ensures that students will receive helpful information about health and related knowledge, behaviors, attitudes, and skills.

The Importance of Wellness in a Liberal Arts Core

In classical Greek philosophy liberal arts education was deemed necessary to free the mind from distraction. It was the type of education that free men received and it differed from technical or vocational training (Arnold, 1977). According to Arnold liberal arts education involved extending an individual's intellectual capacities and decreasing narrow-minded societal views. Liberal arts education facilitated the freedom to use one's imagination in elaborate and expansive directions. Peters (1966) attempted to provide criteria for what it means to be liberally educated when he suggested that it

implies the transmission of what is worthwhile; it must involve knowledge and understanding. Liberal education should enable one to have a sense of appreciation for the world not already experienced and in some way transform him or her into a better individual. Drewe (2001) noted that students are developing the knowledge and understanding of the world and its citizens for their own sake and idealistically to prepare them for the rest of their lives.

Liberal Arts Core curricula have undergone extensive revisions recently as universities strive to meet the goal of helping students succeed (Glynn, Aultman & Owens, 2005). Dooris (2001) stated that university officials should embrace their sense of responsibility to educate "the next generation of decision makers and managers, developing in students' values, skills and competencies that will be taken beyond the setting of the university into their future lives, careers and communities" (p. 59).

Universities are in a distinctive position to promote healthy behaviors by providing educational programs to students (Brener & Gowda, 2001). College campuses may represent the last chance for educating a large segment of the adult population about health and wellness (Sullivan, Keating, Chen, Guan, & Delzeit-McIntire, 2008). A wellness course may improve the well-being of the students during their university careers and prepare them for their lives after college. Brener and Gowda (2001) listed several features of universities and the populations they serve. These characteristics fostered the development of wellness because:

1. The most common health issues faced by college students, such as sexuality, alcohol use, and fitness, are related to lifestyle and personal behavior.

2. College students tend to be receptive to educational programs, including those addressing personal improvement.
3. The mission of these institutions is education, and healthy students are better learners.
4. Most college health services are financed through prepaid arrangements (tuition or fees).
5. The college or university is a defined community, making it conducive to establishing community norms and organizational policies that can improve health (p. 223).

A university's Liberal Arts Core program has a responsibility to respond to students' health concerns. Myers and Mobley (2004) found lower levels of wellness in both traditional and non-traditional students compared to non-students, but less than 6% of students polled reported receiving comprehensive health-related information in college (Brener & Gowda, 2001). The University of Northern Iowa recognized the important responsibility to invest in their students' well-being by establishing Personal Wellness as a required Liberal Arts core course. A requirement of wellness within the Liberal Arts Core curriculum had an opportunity and challenge to impact a large number of students. This course contributed to the Liberal Arts curriculum by providing students with an opportunity to develop an understanding and appreciation of wellness as a consciously chosen lifestyle. Requiring students to take a wellness course in a Liberal Arts Core ensured that students would receive helpful information about health and related knowledge, behaviors, attitudes and skills. The purpose of the Personal Wellness course

analyzed in this study is to develop students' knowledge to help them make sound decisions regarding their health. Students were provided with an opportunity to bring actions into closer harmony with an optimal wellness lifestyle (UNI Programs & Courses, 2008-2010).

Effectiveness of Large Class Settings

Among university administrations there is a lack of consensus over what size enrollment constitutes a large class setting. It appears to be a subjective number from 60 to 100 students and is dependent on the school's average class size. In general terms, it applies to more than 100 students (University of Maryland Center for Teaching Excellence, 2010). Heppner (2007) defined a large class as one "taught in a lecture hall with fixed seats and has a number of students greater than the number whose names you can reasonably learn by semester's end" (p. 2).

Poe (2007) said it is easy to overlook the many advantages of learning in large classroom settings, such as the synergy from interaction and assistance from fellow students. He also noted that class organization and student characteristics are more important than class size in determining academic success. If the teacher of a large class is not organized, the magnitude of difficulties for students becomes quickly unmanageable.

The large lecture hall need not be a barrier to learning for face-to-face students. With innovative teaching techniques students may experience engaging and positive experiences that will enhance their learning. There are many resources available to help face-to-face instructors provide stimulating classes. Visual reinforcements are critical in

large group settings (Wambuguh, 2008). Examples are powerpoint presentations, document viewers, posters, blackboards and handouts. These allow students to have multiple experiences within the classroom to enhance their learning. These techniques are vital for students who are field-dependent and visual rather than auditory learners.

There are, however, certain difficulties in teaching large classes. The University of Maryland Center for Teaching Excellence (2010) listed several difficulties encountered by instructors of large classes:

1. Involving students in active learning
2. Personalizing the environment
3. Working with diverse student needs and backgrounds
4. Managing classroom disruptions
5. Adapting one's teaching style to the large lecture situation
6. Addressing these concerns over the long-term. (p. 1)

These difficulties refer mainly to the face-to-face lectures but are applicable to the online environment as well.

What were successful and effective teaching techniques for smaller classes are no longer feasible with larger groups. Teachers are expected to create learning environments with very definite challenges. Jarvis (2000) stated that class size was not as much of a factor as the effectiveness of the teacher. The University of Maryland Center for Teaching Excellence (2010) stated that teaching large classes is difficult for teachers and maybe the least prestigious and most dreaded teaching assignment. At one time instruction of large size courses was reserved for senior faculty who were counted on to

showcase discipline and attract new students (Center for Teaching Excellence, 2000). Many faculty choose not to teach this type of class and feel that it is difficult to motivate and engage students in learning. The University of Maryland Center for Teaching Excellence (2010) noted that faculty members fear students in large classes may lower their faculty evaluations by expressing their dissatisfaction with the size of the class. Jarvis (2000) agreed, noting that the most effective teachers in large sections were also the most effective in small sections.

Wambuguh (2008) described teachers with large classes as having special challenges in teaching, controlling students, and simply keeping students awake. Felder (1997) wrote:

> Anything you can do in a large class you can do better in a small one... there's no chance of getting any responsiveness out of 150 or 300 students in an auditorium, and spend 45 hours showing transparencies to the listless 60% who bother to show up from day to day. (p. 1)

Little research exists concerning interactive learning in lecture format with the large class settings accommodating 100 or more students in face-to-face classrooms. These classes tend to have more first and second year college students. These students are accustomed to smaller high school class size with more interaction with the teacher. With so many students enrolled in the course, many students may feel too intimidated to speak up and ask questions if they do not understand the material. In addition, some students may feel anonymous in the lecture which may make it harder to stay motivated to keep up or even to attend class. A feeling of anonymity and zero accountability can create an unresponsive learning environment. Many students with this feeling may attend class unmotivated, tired, overwhelmed and also with no fear of having to demonstrate their

knowledge of the day's subject matter. These difficulties are not unique to either delivery method. Dutton and Dutton (2005) noted students in large face-to-face sections are already engaged in a form of distance education.

Face-to-face courses which are available to large online courses save universities substantial amounts of funding but also provide greater flexibility in time and space for their students. These large course enrollments reduce costs by decreasing the number of face-to-face sections and the availability of online sections give their students a flexible learning schedule. Even though creating these large sections of courses can potentially save money for colleges and universities, the effectiveness of the teacher must be certain.

Student Subgroups

Student subgroups have differences which can affect their academic achievement. Accommodating student groups in their quest for education is essential for higher educational institutions. Institutions of higher learning are striving to provide flexible learning experiences including those not confined to lecture halls. This flexibility in the learning experience can reduce tremendous strain on all students, especially non-traditional students.

Examples of the educational need for flexibility for non-traditional students are wide-ranging. Corporations and companies have moved many jobs internationally making many non-traditional students unemployed yet geographically established with a family. These students desire an education to advance themselves to a more marketable position (Lake & Pushchak, 2006). Due to the locations of institutions of higher learning, some students may be at a disadvantage in pursuing a degree. In addition, many non-

traditional students may be from rural and under-served areas. Many of those students would not be able to participate in courses without online education (Olsen, 2002; Phipps & Merisotis, 1999). Giving students an opportunity to complete their course work at a chosen institution via online educational instruction enables them to pursue their academic interests no matter where they are geographically located. The decline in enrollment of non-traditional students that many institutions have experienced may be attributed to programs not being made available for this population. "Distributed learning" allows students the flexibility to follow their individual quest for an education. It is an instructional model that allows instructor, students, and content to be located in different, noncentralized locations so that instruction and learning occurs independent of time and place (Saltzberg & Polyson, 1995).

Education about wellness initiatives may serve many cultural groups. In particular there are some under-represented student subgroups that may have difficulty acquiring information but have a pertinent need for wellness education. As an example, the Obesity Society (2009) found that "In the past 30 years the occurrence of overweight in children has doubled and it is now estimated that one in five children in the U.S. is overweight" (p. 1). They continue that this prevalence of overweight children is especially high among certain populations such as Hispanic, African American and Native Americans where some studies indicate prevalence of over 85%.

Recognizing this need, the Secretary of Health and Human Services strived to implement the process to develop and coordinate a national program to enhance physical

activity, fitness, sports participation, and good nutrition. The Secretary of the 2010 President's Council on Fitness, Sports, and Nutrition primary focus was to:

> target all Americans, with particular emphasis on children and adolescents, as well as populations or communities in which specific risks or disparities in participation in, access to, or knowledge about the benefits of physical activity, fitness, sports participation, and good nutrition have been identified. (para.2)

Distribution of this vital wellness information through various means is important to all student groups to ensure the likelihood of implementation.

The diversity of the student population of colleges and universities has changed dramatically in the last decades. The Delta Cost Project (2008) has found that the diversity in student populations has increased, driven particularly by rapid growth among Hispanic, Black, and Asian populations. Since 1998 higher proportions of minority students are enrolling in public two-year colleges than in previous decades. The availability of online education has positively impacted the enrollments of some of these ethnic student groups who are particularly restricted in terms of access to traditional types of education. Rudestam (2004) wrote:

> New groups of learners are able to access formal education, including members of traditionally under - represented groups. The nature of distributed learning allows both students and faculty the flexibility of participating at convenient times from any location that has a suitable computer connection. (p. 428)

Additional studies have reported other findings about student subgroups in relation to online courses. Van den Berg and Hofmann (2005) studied the effect of online education and the relationships of gender and age and concluded that women have been shown to be more successful academically in online environments than men. Dutton and Dutton (2005) reported that females were more heavily represented in the online sections

than males. Holcomb, King, and Brown (2004), Van den Berg and Hoffman (2005), and Wieling and Hofman (2008) stated that older students are less successful than younger college age students because they do not have as much experience with computers. Davis and Ragsdell (2000) reported that off-campus students taking online classes tend to require more personal attention than on-campus students to fully participate in the course of study. Chen, Gonyea and Kuh (2008) agreed with Dutton et al. (2002): "online and campus-based learners differ in their biographical and academic characteristics" (p 2). Their survey of online students reported:

1. Forty-four percent of first-year and half of the senior online education learners were enrolled part-time compared with only 4% of first-year and 13% of senior campus-based learners.
2. Online learners were older, with median ages of 25 and 32 for first-year students and seniors, respectively, compared to 18 and 22 for campus-based first-year and senior students.
3. More online learners reported earning A or A- average grades than campus-based students.
4. Ninety-six percent of online learners cited the convenient schedule of online course offerings.
5. Thirty-five percent of online learners reported taking online courses because they did not live near enough to a college that offered the desired courses.
6. Twenty-seven percent of online learners preferred taking courses online because they felt other online learners were more likely to be the same age. (p. 2)

Online Education in the United States

After World War II the United States government channeled money into the educational system to keep the United States at the cutting edge of technology, math, and science and to keep up with the growth of international industry. Providing students with an opportunity for education across distance began with very low level technology avenues. Herring and Smaldino's *Planning for Interactive Online education: A Handbook* (2005) detailed the evolution from the earliest distance education to present time. The earliest stages of online education were experienced by individual or correspondence courses through continuing education. Students received a package through the postal service with course materials such as textbook, manual, and worksheets. This option is still in existence today for classes that do not need video or other technological media. Other examples of low-level technology were audio and video, cable television, and magnetic recording. The beginning of the medium-level technology was the advent of audio teleconferencing and audio graphic teleconferencing. Teleconferencing has been updated with new technology and is used today in educational institutions as well as in corporations internationally. The introduction of personal computers in the late 70s brought a large new audience to the developing internet. Current high-level technology includes E-learning networks, television, microwave, satellites, compressed video and fiber optics.

Reasons for increasing educational technology for students became evident due to changes in industry and lifestyle. Because corporations increasingly began exporting jobs overseas to countries that had a technically advanced labor force, it was necessary for

higher education to update students' knowledge in technology. Technically driven curricula and instruction became an avenue for education to be brought to students who otherwise might not be on campus. Satellite and cable TV, which incorporated in-class experience, was implemented into college courses nationwide.

What was originally thought to be a step forward however became alluded to as just a "talking box." Some early research completed on the utilization of TV programs or CD-ROMs in the classrooms showed dismal results in student achievement due to the ineffectiveness of this type of technology (Herring & Smaldino, 2005). It was at this time that the quality of instruction began to be scrutinized.

When the internet entered the educational mainstream, curricula, teaching strategies, and methods were expanded to introduce students to new avenues for acquiring information. With even newer technologies and resulting methodologies that emerged, educational administrators examined whether schools were keeping pace with the needs of a new student population. This new generation of technology-savvy students became the new educational consumer. They entered higher education institutions with expectations of receiving their advanced educational degrees with teachers readily and efficiently utilizing technology within their class settings.

Higher education institutions and faculty, for the most part, have accepted technology into their classrooms and expanded their offerings in many venues. The creation of online courses has risen dramatically in the past several years to increase flexibility for students. More than 4.6 million students took at least one online course in fall 2008, an increase of 17 % over the previous year (Allen & Seaman, 2009). Fifty-six

percent of all post-secondary institutions offered online courses at the beginning of the 21st century. This represented an increase of 12% in institutions who reported offering online education courses from the academic years of 1997–98 and a 23% increase over the 1994–95 year (Waits & Lewis, 2003). Draves (2002) predicted that by the close of the first decade of the 21st century 50% of all learning (by educational institutions, business and industry) would be done online. Technology has shown that the physical classroom no longer has to be the center of the educational system. Teaching and learning can now permeate every location imaginable (McClintock, 1999).

While educational institutions use different systems for learning but many across the country use online technology or E-learning in a high percentage of their classes. The term E-learning is closely related to online education and is usually included within it. Zhang, Zhou, Briggs, and Nunamaker (2006) noted that E-learning has become one of the fastest moving trends for educational settings and can be delivered quickly, effectively and economically.

Research Related to Online Education

The concern if students were as academically successful online as their face-to-face counterparts is always important. Numerous studies have examined the academic success of students in both delivery methods trying to determine which one is more effective. Some studies have shown that online education learners do as well academically as campus-based learners based on test scores (Bartlett, 1997; Bothun, 1998; Dutton et al., 2002; Heines & Hulse, 1996; Kabat & Friedel, 1990; Neuhauser, 2002).

Schutte (1996) reported that students enrolled in online learning courses were more successful academically than face-to-face students in their course exams.

In several studies students in courses with face-to-face and online delivery methods were compared and were found to have had similar experiences (Beare, 1989; Martin & Rainey, 1993; McCleary & Eagan, 1989; Souder, 1993; and Verduin & Clark, 1991). Russell (1999) took an inventory of many courses in different subject areas, and concluded that there is no significant difference between the average performance of face-to-face learners as compared with online learners. But there may be differences depending on the expectations of the courses. Ross and Bell (2007) concluded that there was no significant difference between the two delivery systems in simple constructs; the face-to-face classes, however, outperformed the online classes when it came to higher level thinking.

Carnevale (2003) noted that with the rising student demand for online courses, comes uncertainty among some faculty, administrators, and government officials regarding the quality of online education. He noted that at a United States House of Representatives subcommittee meeting in 2003, several legislators called for "more federal supervision over online-education programs" (p. 1). Blin and Munro (2008) estimated that 95% of academic staff believed that the traditional face-to-face lecture was the most effective model. Levine (2000) feared that online education would make universities obsolete. He stated his "fear is that we will provide personal, highly interactive campuses for those who can afford them, and the rest will be given virtual higher education" (p. 37). Studies show 58% of senior academic officers at United States

degree-granting higher education institutions expressed beliefs that online learning is "inferior" or "somewhat inferior" to traditional face-to-face learning (Allen & Seaman, 2009). However, as experimental online courses have seen much success based upon student academic assessment results, more faculty have become increasingly engaged in online learning (Neuhauser, 2002).

Advantages of Online Education

Draves (2002) listed the following ten reasons why online delivery is better cognitively than face-to-face delivery:

1. You can learn at your own peak learning time of day.
2. You can learn at your own speed.
3. You can learn faster.
4. You can interact more with the teacher and other participants.
5. There are more topics and subjects online.
6. Participants come from around the world.
7. You can learn from the foremost authorities and experts.
8. Online learning is less expensive and thus more accessible.
9. Internet links provide more resources.
10. You can form a virtual community. (p. 3)

There are several advantages to online delivery. One advantage noted by Wieling and Hofman (2008) is that face-to-face lectures can be recorded and made available for online viewing for students who have to miss class for acceptable reasons. In this way, the online student is provided all necessary information to be academically successful.

Conaway (2011) noted that typically there is no additional work for the instructor. Bart (2011) stated that adding audio commentary to powerpoint slides engages students and injects the instructor's personality into the lecture. Meeting the needs of auditory learners is thus also addressed. Videos of lectures allow students to improve their learning by viewing lectures online on multiple occasions and as exam review. Another benefit of providing videos of lectures is that students are able to receive clarification of lecture material they found to be particularly difficult to comprehend. Students learn at different rates so have videos recording for review is particularly important. Videos of lectures are beneficial for non-English speaking students when there may be a language barrier. They can replay lectures until comprehension has been attained. Conaway (2011) noted that all of these scenarios are truly useful to students.

A second advantage to online delivery is the asynchronous style of instruction. Zhang et al. (2006) stated scalability is something to be considered in applying technological advances to online course elements. An asynchronous style of delivery of class material seems to be a viable, scalable method. He defined scalability as "the capability to serve a larger number of users without degradation or major changes in existing procedures" (p. 2). An asynchronous style of instruction offers an increasingly flexible schedule for students to learn course material. Mayer (2008) stated instruction is most effective when it is available as the student needs it. Marsh and McFadden (2003) listed several benefits of asynchronous instructional delivery:

1. Equivalent or improved instruction.
2. An engaged model of learning.

3. Accelerated completion of courses.
4. Self-paced or personalized instruction.
5. Reduced dropout and re-enrollments in the same courses.
6. Reduction of course duplication and redundancy.

Zhang et al. (2006) researched Carnegie Mellon University's Virtual Classroom project using asynchronous learning and videotaped lectures of information systems and computer science classes. The study compared the effectiveness of the online sections with their traditional sections and found that "Students who completed online courses tended to do as well as those in traditional classrooms...and support the same level of teaching and learning effectiveness as face-to-face instruction" (p. 17).

Olsen (2002) and Phipps and Merisotis (1999) argued that some students are provided access to courses in which they would not have been able to participate due to time constraints. Time and geographic constraints during the pursuit of undergraduate degrees are key factors in the demand for the creation of online courses (Harasim, 2000). Harvel (2006) reported that the increase of students gravitating to online education is due to ease of use. Online delivery can be an effective tool for students to learn and also be motivated by ease and convenience. In terms of flexibility in time and location, online education has many advantages over the traditional face-to-face methods. This flexibility of scheduled course hours offers a more convenient way to obtain a degree (Charp, 2000). This flexibility would assist in alleviating individual financial concerns and would enable students to work part- time jobs while pursuing degrees.

A third advantage, one for administrators, is the cost saving feature of online courses. Institutions of higher learning are faced with decreasing budgets for their academic programs. Many higher education officials view online education as a means to cut costs while increasing enrollment during budget tightening fiscal years. Moving courses online cuts costs extensively. Twigg (2003) created a course re-design program which focused on:

1. Online course management systems that reduced or eliminated the amount of time faculty spent on nonacademic tasks such as recording, calculating and storing grades; photocopying course materials; posting changes in schedules and course syllabi; making special announcements; and transporting syllabi, assignments and examinations.
2. Online automated assessment of exercises, quizzes, and tests.
3. Online tutorials that resulted in less preparation time for teaching assistants.
4. Shared resources among different instructors to reduce duplication of effort. (p. 38)

Challenges of Online Education

While there are advantages to online education, there are challenges as well. When comparing face-to-face students and online students, face-to-face students faced more difficulties when in an online learning environment (Jenkins & Downs, 2003; Robinson & Doverspike, 2006; Roblyer, 1999) and tended to value personal interaction with students and faculty members. Lewis and Abdul-Hamid (2006), Perreault, Waldman, Alexander, and Zhao (2002), and Powers and Mitchell (1997) documented this

lack of personal interaction between students and faculty as an obstacle in online learning environments. Students had a sense of loneliness and isolation which were a significant barrier to online delivery (Conrad & Donaldson, 2004; Everhart, 1999; Haythornthwaithe, Kazmer, Robins, & Shoemaker, 2000; Kazmer, 2004). One way to overcome this absence of personal interaction is for the online course to have multiple means of communication such as discussion boards, emails and chats (Perreault et al., 2002). Personal involvement with teachers can serve as a means for student acceptance and as a positive usefulness of technology (Martins & Kellermanns, 2004). Students, however, are more willing to tolerate a less personal and interactive learning environment when education is adaptable and available asynchronously (Robinson & Doverspike, 2006) and when there is convenience and flexibility of time and space (Harris & Gibson, 2006; Jenkins & Downs, 2003).

Attrition rates for web-based courses are higher than those for traditional face-to-face courses (Diaz, 2002; Institute for Higher Education Policy, 1999). DiRamio and Wolverton (2006) blamed the online classes' high attrition rates to the isolation and remoteness that online students feel. The Zhang et al.Virtual Classroom project (2000) reported that more online students withdrew or took an incomplete grade than face-to-face students. Carr (2000) estimated that online courses had an attrition rate 10% higher than on-campus courses. According to Carr (2000) and Zhang et al. (2006), this 10% drop out rate for the online environment was alarming and needed to be addressed. DiRamio and Wolverton (2006) claimed that the online courses' higher attrition rates were due to the isolation and remoteness that online students felt.

One challenge in online education is the potential to procrastinate when there is no scheduled class time (Lake & Pushchak, 2006). When taking a face-to-face course there is a set time in the student's schedule for learning. When taking a course online the student must set aside a time for learning. Lack of a set learning time can be a problem for some students if assignments are not scheduled and there is no accountability required from the instructor.

Another challenge is related to the fact that students of certain majors have characteristics less conducive to online learning than others. Students enrolled in business education, MBA programs and engineering online classes tend to be self-disciplined and motivated (Devi, 2002; Harvel, 2006; Jana, 1999). Diaz and Cartnal (1999) found that health education online students possessed more of an independent learning style. Business management students were more comfortable learning through written communication (Neuhauser, 2002).

Effective Online Instruction

The focus of education is for the students to have the best opportunity to receive a quality education no matter the location or time. Winthrop University administration stated that:

> An effective teacher is a scholar who shares knowledge, uses appropriate methodology, demonstrates and encourages enthusiasm about the subject matter, and shows a concern for students, all in such a way as to leave the student with a lasting and vivid conviction of having benefited from the instruction. (Winthrop University web-site, n.d., p. 1)

Teaching effectiveness is a concern no matter the instructional delivery, face-to-face or online, and is one issue that institutions must consider when providing online choices.

Online delivery may be the most cost effective measure since it can serve more students, but the effectiveness of the teacher is a concern. With both delivery methods, it is important to determine the most effective teaching strategies to reach various student learning styles. For effective teaching and learning, teachers need to utilize a variety of teaching strategy. While many of these suggestions can be applied to both face-to-face and online education, online educators must address the distinct teaching challenge of not having the physical presence of the student.

Husson and Waterman (2002) elaborated on measures they felt were imperative for university-level eLearning courses to be as effective as traditional courses:

1. Select suitable faculty members for web-based delivery.
2. Provide faculty training and support.
3. Design a learning environment with care.
4. Provide students with technical and academic support.
5. Develop technology policies to support monitoring and upgrading. (p. 258)

DiRamio and Wolverton (2006) expanded on these and conducted an exploratory study that delved into effective learning community programs and pedagogy. They concluded that there was a three-factor framework, C-E-R Diagnostic Tool, that was important in providing effective strategies for online learning communities. The three factors were "Connections," "Experience," and "Responsibility." The "Connections" factor referred to discussions and interactions amongst the students; the "Experience" factor referred to the technology familiarity of students and the teachers; and "Responsibility" refers to the student's motivation and maturity to be an effective student.

Colleges and universities are working diligently to develop innovative teaching methods to provide students with tools for academic success. A great deal of time needs to be allocated to ensure that the student is given the opportunity to be able to have an equitable learning experience. If there are problems with the technology or if there has not been adequate technical training for all students, the shortcomings outweigh the benefits of delivering the classes online.

Course planning on the teacher's part is a very important aspect in order for the students to have a good experience in the course. Many teachers recommend to others that pre-course organization and planning can overcome many questions and frustrations generated by their students (Lewis & Abdul-Hamid, 2006). Conrad and Donaldson (2004) noted that in planning activities requiring interaction between learners online, more time must be allowed in online courses compared to face-to-face classes. Lowes (2008) explained that when a teacher is given an opportunity to educate students in an online environment, complications become magnified.

Effective teaching strategies are necessary for success in the classroom whether face-to-face or in a web-based classroom. Although teachers may use online material to supplement their face-to-face courses with readings, discussions, and test review material as well as course objectives, the delivery of the subject matter used in a face-to-face environment may not suffice in a web-based setting. Because of the use of technology teachers must re-think their teaching pedagogy to be effective in the online environment. Effective strategies used in a traditional classroom need more clarification in an online environment. Verbal expressions and physical movements are lost in a web-based course

but assigning students to collaborate in discussion boards, chats about lecture topics, email, and blogging, students can take ownership and direction in their learning.

Bringing technology into the educational climate has motivational and interaction challenges, but faculty willing to implement new techniques need to be given support for their creativity and strategies for success. The appropriate technological skills are a necessity for teachers in order to be effective in an online environment. Some instructional techniques require teachers to receive technological training to implement these ideas. In a study that supports DiRamio and Wolverton (2006) and Krentler and Willis-Flurry (2005) found that effective use of technology can enhance student learning but faculty need assistance in their web design to reflect their course goals and objectives effectively.

A large time commitment is necessary for the teacher to completely create a course for online education. Presentations need to be constructed using the proper format for the web, which may need to be videotaped; films may need to be streamed; and narrations may need to be completed in advance. Teachers may also benefit by enrolling in online courses themselves so as to better understand the difficulties that may arise. Learning how to be effective and efficient with the different technological areas of the course allows teachers to be effective troubleshooters in managing the technology for their students. Privateer (1999) stated that by re-designing instructional technology as a strategic and cognitive tool, meaningful change will occur.

DiRamio and Wolverton's "Responsibility" factor stated that students should be held accountable for their own learning by taking ownership and responsibility. One

concern that teachers have expressed is the degree of support that teachers should give their students (Lake & Pushchak, 2006; Lewis & Abdul-Hamid, 2006). Teachers want to help students with any potential difficulty they have in terms of maneuvering the technology but also want the students to become independent and not to rely solely on the teacher for solving difficulties they experience. For example, teachers have anecdotally reported to the researcher that instead of taking the initiative to examine the information themselves or looking at the syllabus, students find it much easier to write an email to ask the teacher. Instructors may offer to answer students' questions but still challenge students to take responsibility for their own performance (Lewis & Abdul-Hamid, 2006).

Teachers also shoulder responsibility to provide their online students with appropriate instructional practices. Instructors need to be "visible" in the online environment by answering students' questions and by submitting grades in a timely manner. Following recognized best practices for online learning gives teachers established principles to ensure quality online instruction. Hanover Research (2009) organized online teaching strategies into three major components of instructional process:

1. Planning and development
2. Teaching in action
3. Student assessment and data evaluation.

Since teachers do not have a physical presence in a web-based course, organizational skills are even more imperative than in the face-to-face classroom. Knowlton (2000) stressed teacher organization by explaining "the emphasis should be placed on managing the learning experience, not on managing the technology" (p. 11). The teachers must be

organized in order to have students understand the procedures quickly. The teachers must have a vision of the difficulty their students may encounter and be proactive in their syllabus and course structure. Frequent course evaluations can maintain and strengthen the course offerings and interaction amongst the students. Teachers can send weekly email reminders and maintain contact with students which can alleviate some of the online concerns. This requires extensive organization on the part of the teacher.

Teaching in an online environment has distinct quality issues. Chickering and Gamson (1987) identified some other key qualities. These qualities are effective in face-to-face classrooms also. They identified seven principles of effective online teaching for undergraduate instruction:

1. Frequent faculty and student interaction
2. Collaborative learning
3. Using active learning techniques
4. Giving prompt feedback
5. Emphasizing time on task
6. Communicating high expectations
7. Respecting diversity.

Online delivery options could provide educational success with financial efficiency for all involved. The current financial situation together with concerns that students are receiving similar educational experiences in the online environment as they are in face-to-face classrooms exists for administrators and teachers alike. This study comparing final course grades between the two delivery methods may provide

information that is beneficial in the decision making in determining what is most effective for students. Many online research studies involved various subject areas and with a small student sample size. By examining a large group wellness course at the undergraduate level in a required undergraduate Liberal Arts Core class, valuable insight may be gained in an area not previously explored.

CHAPTER III

METHODOLOGY

The purpose of this study was to investigate two alternative methods of instructional delivery in a wellness course at the undergraduate level in a university setting. The two methods of delivery were large-group face-to-face instruction and online instruction. Specifically this study addressed the following questions:

1. Are students who chose to enroll in face-to-face large-group sections and students who chose to enroll in an online version of the same course demographically equivalent (gender, age, year in school, ethnicity, country of citizenship, ACT upon entering university, course load, and major)?
2. Are there differences in academic achievement as measured by final course grade between students who chose to enroll in face-to-face large-group sections and students who chose to enroll in an online version of the same course?
3. Are there differences in academic achievement as measured by final course grade between subgroups of these students (gender, year in school, ethnicity, and major) who chose to enroll in face-to-face sections and those who enrolled in online sections?

Research Design

The study was descriptive in nature using historical quantitative data from the fall 2006 and spring 2007 semesters. Some students who were enrolled in a Personal Wellness course, a required three credit hour Liberal Arts Core course at the University of

Northern Iowa, were examined. The intent was to examine academic success based on final course grades between the face-to-face and online delivery sections. The independent variable was the instructional delivery methods, face-to-face and online. The dependent variables were the final course grade and the student demographic data (gender, age, year in school, ethnicity, ACT, course load, and major) of those who chose to enroll in face-to-face sections and those who enrolled in online sections.

Participant Descriptions

Demographic data was requested from the University Registrar's office for all students who were selected from the fall 2006 and spring 2007 semesters. The data requested was student's age, gender, country of citizenship, ethnicity, course load, ACT if available, classification, and major college. Gender, country of citizenship and ethnicity were recorded from the student's declaration on his/her university application. Table 1 describes each demographic category:

Table 1

Student Subgroup Descriptions

Age	Student's date of birth as recorded on the first day of the semester in which the student was enrolled in Personal Wellness.
Gender	Sex that the student declared on admission.
Country of Citizenship	Country in which the person was born or a naturalized citizen.
Ethnicity	Student's racial, cultural or national group.
Course load	Number of academic credit hours the student was registered for during the semester taking the Personal Wellness course.
American College Testing (ACT)	Electronic submissions of official scores to the University from the ACT corporation. International students did not have this data.
Classification	Total credit hours the student had earned at the beginning of the semester he/she was enrolled in Personal Wellness. If a student had fewer than 30 hours, the student had a freshman classification; 30-59 academic credit hours, a sophomore classification; 60-89 academic credit hours, a junior classification; and 90 or more credit hours, a senior classification.
Major	Declared and prospective major or unknown.

Participant Selection

Every student pursuing an academic degree from this university must successfully complete this course at some time throughout his/her academic tenure since Personal Wellness is a required Liberal Arts Core (LAC) course. Students may choose to register for the course in any semester. Only students enrolled in Personal Wellness during the traditional 2006 – 2007 academic year were selected.

During the fall 2006 semester six different lecture sections were offered, three face-to-face (sections 1, 2, & 5) and three online (sections 3, 4, & 6). Five sections (#2 - 6) were selected for this study. The five sections were chosen because the same instructors taught them throughout this academic year, the lecture content and format were the same, and the same textbook was used. Section one was excluded in this study because of its individualized lecture content and structure. Every student enrolled in one of the selected sections was included in this study. Thus, a total of 1,005 students were selected for participation during this semester.

During the spring 2007 semester five different lecture sections were offered, three face-to-face sections (sections 1, 2, & 4) and two online (sections 3 & 5). Four sections (#2 - 5) were chosen for analysis based on the same criteria mentioned above with section one being eliminated. All students in these four sections were included in this study for a total of 808 students.

Course Description

Data from two semesters, fall 2006 and spring 2007, were examined because these classes were team taught by the same three instructors. The three instructors were

female and had taught the course content for many years. Each of the three instructors taught within her area of expertise: one taught the decision making and exercise theory modules, one taught the nutrition module; and one taught the contemporary health issues and stress management modules. For the lecture component, there were 29-30 class periods of 50 minutes for each of the two academic semesters. The course content of the lecture (which ran the entire semester) was structured into learning modules: decision making, exercise theory, nutrition, contemporary threats (substance abuse, risky sexual behavior, cardiovascular disease, violence), and stress management. Additionally, each student was enrolled in two half semester activity labs: an aerobic activity and a lifetime skill activity.

All the lectures, no matter the delivery method, utilized the WebCt platform as the course management software. Each lecture section had its own WebCt class site that contained the same syllabus, lecture schedule, lecture notes, review notes, and grade book. The face-to-face lectures were recorded using the Accordant Capture technology and put on WebCt for the online sections. The online sections were provided access to these video recordings of the face-to-face lectures, but the students enrolled in the face-to-face sections did not have access to these recorded lectures. The course content, exams, lectures, and laboratory activities were almost identical except that students in the online sections did not attend the regular lectures but rather had access to video recorded lectures from the face-to-face lectures.

Instructional activities did not require interaction between any students no matter which delivery method they chose. The online class did not have interactive capabilities

between the teachers and students or amongst the students themselves. A one-way delivery system of information from the teacher to the students existed through pre-recorded lectures. The only one-on-one communication between students and faculty instructors occurred with reminders of due dates, technology explanations, students' questions or students' request for clarification of lecture material.

Two sequences of lecture schedules, as displayed in Table 2, were created so that the aerobic activity lab occurred concurrently with the exercise theory and nutrition modules, providing students with an opportunity to better understand exercise theory through practical application. These sequences also helped accommodate the approximately 1,000 students enrolled in the activity components, provided more flexible scheduling, and allowed the instructors to rotate sections to teach their lecture content.

Table 2

Schedule A and B Lecture Organization

Personal Wellness Lecture Schedule A		Personal Wellness Lecture Schedule B	
Lecture	Activity	Lecture	Activity
Decision Making Exercise Theory Nutrition	Aerobic	Contemporary Threats Stress Management Decision Making	Skill
Contemporary Threats Stress Management	Skill	Exercise Theory Nutrition	Aerobic

The goal for the activity lab sessions was to introduce students to lifetime physical activities that promote health-related fitness. The activity labs were divided into aerobic activities and lifetime skill activities and met face-to-face for a half semester two times per week for 60 minutes. Students were not permitted to complete both activity courses in the same half semester unless there was an extenuating circumstance.

For the aerobic activity experience students chose from eight different activities such as power walk/jog, aqua aerobics, and biking (Appendix A). For the lifetime skill activities students chose from an extensive list of 23 activities which included rock climbing, ballroom dance, racquetball, and canoeing (Appendix B). Assessments varied according to each lifetime skill activity class but each of them had a written multiple choice exam and an attendance policy, and skills test as illustrated by the volleyball class syllabus (Appendix D). All assessments for the aerobic activity classes were similar. For example, the aerobic activity experience had lab assessments such as caloric expenditure, rate of perceived exertion, and nutritional analysis as illustrated in the aerobic syllabus (Appendix C). Based on what they had learned in the lecture and what they discovered about themselves in the laboratory experiences, students then designed an individual program to meet their present needs. Each lifetime skill activity course was unique in its respective experience.

Total Course Grade

The final course grade was determined based on the grades earned on the three lecture exams (60%) and two activity courses (40%). Each of the three lecture exams occurred at the conclusion of the lecture units. The exams were multiple choice

questions and were taken face-to-face no matter the lecture delivery method. Because the number of questions for each lecture unit varied, the percentages also varied. For example, the Decision Making and Exercise Theory exam consisted of 45 questions. The exam over the Nutrition and Contemporary Threats sections was composed of 60 questions and the final comprehensive exam, which also included the Stress Management section, consisted of 100 questions. Thus, the lecture exam covering the Decision Making and Exercise Theory material was worth 12% of the student's final course grade, the Nutrition and Contemporary Threats exam was worth 19%, and the final comprehensive exam was worth 29%. The two activity courses were each worth 20% of the final course grade.

The lecture exam scores were submitted electronically into the University's test scoring course management system. Each activity instructor submitted student scores to the course administrator through the email system. These were sent to the Associate Director of Security and Systems who encoded them into the respective course management system. A student's scores were then compiled using the above mentioned breakdown, resulting in a student's overall percentage of points earned. Based on the percentage earned, students' final course grades were converted to a 12 point scale as shown in Table 3. For example 90-93% was an A- (10 pts.), while 94% and higher was an A (11 pts.).

Table 3

Grading Scale

Letter Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
Scale	11	10	9	8	7	6	5	4	3	2	1	0

Data Collection and Analysis

Prior to beginning the study the Institutional Review Board (IRB) at the University of Northern Iowa approved the research application (Appendix E and F). The demographic data requested from the University Registrar's Office and final course grades were collected for the fall 2006 semester and spring 2007 semester. This data was in hard copy only and only in possession of the researcher who was responsible for final course grades. To assure anonymity the data was collected and matched utilizing the student's university identification number. After the researcher entered the data into the computer, the identification numbers were deleted.

The Statistical Package for the Social Sciences (SPSS) was used to analyze the data and determine if there was a significant difference between the independent variables. The specific statistical analyses that were performed for the first research question are listed in Table 4. The significance level was set at $p < .05$ for all analyses.

Table 4

Statistical tests for research question number 1

Research Question 1	Variable	Statistical Test
	Gender, Ethnicity, Citizenship, Major	Chi-Square test of independence
	Age, ACT, Course Load	Independent samples *t*-test
	Year in school	Mann-Whitney *U*

For the second research question the mean differences of the final course grades were compared between the face-to-face and online sections using an independent samples *t*-test. Instructional delivery was the independent variable with two point nominal subsets: face-to-face and online. The significance level was set at $p < .05$.

Two different types of statistical analyses were used to examine research question number three: an independent samples *t*-test and one-way Analysis of Variance (ANOVA). The mean differences of the final course grades in relation to gender were examined using an independent samples *t*-test. Potential differences in the final course grade were examined for year in school, ethnicity, and major subgroups using an

ANOVA. The significance level was set at $p < .05$. If significant differences were found, an appropriate post-hoc follow-up test was performed.

CHAPTER IV

RESULTS

The purpose of this study was to investigate two alternative methods of instructional delivery in an undergraduate wellness course in a university setting. This study examined the degree to which students who enroll in this course were demographically equivalent. This study also examined the differences in students' academic achievement as measured by final course grades between these two different methods of instructional delivery: face-to-face large-group instructional settings and an online version of the same course as well as the academic achievement of subgroups as defined by selected student demographics. This chapter presents the quantitative findings based on the analyses of the data. The chapter has been organized as follows: (a) descriptive statistics, (b) statistical analyses, and (c) summary.

Descriptive Statistics

Characteristics of Sample

A total of 1,814 students were enrolled in the Personal Wellness course for the fall 2006 and spring 2007 semesters (n = 1,005 & 809, respectively). This sample consisted of 1,017 females (56.1%) and 797 males (43.9%) and closely reflects the composition of the University (e.g., 58.1% females, 41.8% males) according to the University of Northern Iowa Office of Institutional Research (2006/2007). Students in this study ranged in age from 18 to 56 years with a mean age of 20.75 years (SD = 2.38). Only 56 students (3.1%) were classified as non-traditional (i.e., were over 24 years old)

compared to the 9% UNI non-traditional student population (University of Northern Iowa Office of Institutional Research, 2006/2007).

The student's year in school was classified based on the number of credit hours the student had completed at the beginning of the semester they enrolled in Personal Wellness. The number of credit hours each student had completed ranged from 0 to 221 with a mean of 62.1 hours (SD = 35.03). The breakdown of students' classification in terms of earned semester credit hours is provided in Table 5. As illustrated, the Personal Wellness course is most often taken early in a student's academic career.

Table 5

Year in School, Frequencies, Percentages and Semester Hours

Year in School	n (%)	Semester Hours
Freshman	593 (32.7%)	Less than 30
Sophomore	589 (32.5%)	30 – 59
Junior	347 (19.1%)	60 – 89
Senior	284 (15.7%)	90 and over

By ethnicity the majority of respondents indicated they were Caucasian (n = 1,630, 89.9%), followed by African American (n = 42, 2.3%), Asian (n = 24, 1.5%), Hispanic (n = 25, 1.4%) or non-resident alien classifications (n = 23, 1.3%). Two codes, Native Hawaiian/Pacific Islander and "two or more races," had no student

representatives. The students' declared country of citizenship was predominantly from the USA (n = 1,790, 98.7%) with only 24 (1.3%) international students for these two semesters compared with the UNI international student population of 253 students (2.3%) as noted by the University of Northern Iowa Office of Institutional Research (2006/2007).

Of the 1,695 students (93.4%) who took the ACT exam prior to enrolling at the University, the ACT Composite mean was 22.74 (SD = 3.6) with a range from 13 to 35. At UNI 12 credit hours is the minimum credit load for a student to be declared full time and a course load of 15 credits is considered a full course of study. Students in this sample had an average of 14.0 credit hours (SD = 2.68), which was higher than the average class load of 12.93 for all UNI students during this time frame. During these two semesters the largest contingency of students declared their majors from the Colleges of Business Administration (22.6%), followed by Education (20.8%), Social and Behavioral Sciences (16.6%), Humanities and Fine Arts (16.2%), Natural Sciences (15.1%), the General Studies Program (7.2%), and no specific college (1.5%). This is consistent with the overall enrollment figures from the University.

Of the 1,814 students who enrolled in the fall 2006 and spring 2007 semesters, 1,068 students (58.9%) registered for online delivery while 746 students (41.2%) registered for face-to-face delivery. The percentage of students registered for online delivery dropped from 65.8% for the fall semester to 50.3% for the spring semester.

Statistical Analyses

Research Question #1: Demographic Equivalence

A number of statistical analyses were performed to examine whether students who enrolled in face-to-face sections were demographically equivalent (gender, age, year in school, ethnicity, country of citizenship, ACT upon entering the university, course load, and major in college) to students enrolled in online sections. A chi-square test of independence was calculated comparing the frequency of delivery choice for men and women. A significant interaction was found $X^2(1, N = 1{,}814) = 14.230, p < .05)$. Females overwhelmingly chose the online delivery (63%) over the face-to-face choice (37%) while 54% of the males chose online delivery compared with 46% in the face-to-face delivery.

An independent-samples *t*-test was calculated to compare the mean age of students who enrolled in online sections to students who enrolled in face-to-face sections. No significant difference was found ($t(1{,}812 = .395, p > .05)$. The mean age of the face-to-face sections ($m = 20.77$, $sd = 2.37$) was not significantly different from the mean of online sections ($m = 20.73$, $sd = 2.39$).

A Mann-Whitney *U* test was used to examine differences in the student's year in school for students enrolled in online sections and students enrolled in face-to-face sections. No significant difference was found ($U = 381424.00, p > .05$).

A chi-square test of independence was calculated to compare the delivery choice of the ethnic groups. A significant interaction was found $X^2(6, N = 1{,}814) = 12.911, p < .05)$. Caucasian students chose online delivery (60%) over face-to-face delivery (40%).

The Hispanic student population also chose online (64%) over face-to-face delivery (36%) whereas African American students chose face-to-face (64%) over online delivery (36%).

To examine the frequency of delivery choice based on country of citizenship another chi-square test of independence was performed. No significant relationship was found $X^2(17, N = 1,814) = 23.51, p > .05$)

An independent-samples *t*-test was calculated comparing the mean ACT scores of students who enrolled in online sections with students who enrolled in face-to-face sections. There was a significant difference in ACT scores between the online and face-to-face students ($t(1,693) = -2.339, p < .05$). For students who completed the course the mean ACT score for online sections ($m = 22.92$, $sd = 3.64$) was higher than that for the face-to-face sections ($m = 22.50$, $sd = 3.65$).

Another independent-samples *t*-test was conducted comparing the semester course load of students who enrolled in online sections with students who enrolled in face-to-face sections. There was a significant difference in course load between the online and face-to-face students ($t(1,812) = -2.171, p < .05$). Online students were enrolled in slightly more credit hours ($m = 14.12$, $sd = 2.53$) than the face-to-face students ($m = 13.84$, $sd = 2.87$).

A chi-square test of independence was calculated comparing the frequency of delivery choice by declared major. A significant interaction was found $X^2(6, N = 1,814) = 15.299, p < .05$). Majors in all the colleges preferred online sections over face-to-face sections. The majors in the College of Social and Behavioral Science (57% to 43%), the College of Business Administration (53% to 47%), the College of Education (65% to

35%), the College of Humanities and Fine Arts (57% to 43%) , the College of Natural Sciences (63% to 37%), and majors in General Studies Program (61% to 39%) chose online over face-to-face delivery.

In summary statistical analyses for the first research question found that the students in the face-to-face sections were not demographically equivalent to the students in the online sections. Results revealed that students who chose online delivery had statistically higher ACT scores as well as carried a slightly higher semester course load than students in the face-to-face sections. Significant differences were also found for gender, ethnicity, and major. Females overwhelmingly chose online delivery whereas males were much more evenly split between online and face-to-face delivery. By ethnic group Hispanic and Caucasian students were more likely to take an online section than a face-to-face section while African American students chose face-to-face sections more often than online ones. Finally, while students in all majors chose online sections over face-to-face ones, those with declared majors in the Colleges of Education, Natural Sciences, and the General Studies Program did so at a higher rate. There were no significant differences in age, year in school, and country of citizenship between the two methods of course delivery.

Research Question #2: Differences in Academic Achievement

The second research question examined whether there were differences in final course grades between the two delivery methods. The data regarding final course grades was based on the 1,757 students who received final class scores. Fifty-six students (3.1%) did not complete the Personal Wellness course. Eighteen students (2%) dropped

out of the face-to-face sections while 38 students (4%) dropped out of the online sections. Overall the Personal Wellness mean final course grade was 7.02 (SD = 2.47), which is a B-.

To compare the final course grade of students who enrolled in the face-to-face sections with students who enrolled in online classes, an independent-samples t-test was used. There was no significant difference in mean final course grades between the online and face-to-face students ($t(2) = .244$, $p > .05$). In terms of delivery for students who completed the course, the final course grades were not significantly different between the face-to-face sections (m = 7.03, sd = 2.47) and the online sections (m = 7.01, sd = 2.47). The frequency and percent of letter grades earned is provided in Table 6 for each method of delivery.

Table 6

Letter Grade Frequencies and Percentages by Method of Delivery

	Face-to-Face		Online	
	n	%	n	%
A	55	7.4	62	5.8
A-	82	11.0	109	10.2
B+	65	8.7	93	8.7
B	125	16.8	202	18.9
B-	89	11.9	167	15.6
C+	130	17.4	163	15.3
C	100	13.4	129	12.1
C-	37	5.0	30	2.8
D+	13	1.7	18	1.7
D	6	.8	12	1.1
D-	2	.3	2	.2
F	23	3.1	43	4.0
Dropped	18	2.5	38	3.6

Research Question #3: Academic Achievement by Subgroups

A number of statistical analyses were performed to examine various subgroups (gender, year in school, ethnicity, and major). These subgroups of students were

compared to see if there were significant differences in academic achievement based on method of delivery.

Gender. An independent-samples *t*-test revealed a significant difference between the mean final course grades of females and males ($t(1,755) = -6.698$, $p < .05$). The overall mean score for females was significantly higher ($m = 7.36$, $sd = 2.34$) than that for males ($m = 6.57$, $sd = 2.55$). Because significant differences were found, the data was then split based on gender to examine potential differences in final course grades by method of delivery. Based on independent–samples *t*-tests results, no significant differences were found for females ($t(2) = .847$, $p > .05$) or males ($t(2) = .144$, $p > .05$). The mean final course grades of females enrolled in online sections ($m = 7.37$, $sd = 2.29$) was not different from the mean in face-to-face sections ($m = 7.34$, $sd = 2.43$). Similarly, the mean final course grades of males enrolled in face-to-face sections ($m = 6.72$, $sd = 2.47$) was not different from the mean in online sections ($m = 6.44$, $sd = 2.62$).

Year in School. The data was examined to find potential differences in final course grades based on student's year in school using a one-way Analysis of Variance (ANOVA). The ANOVA showed a significant difference ($F(3, 1,753) = 15.732$, $p < .05$). Post-hoc analyses using the Bonferroni post-hoc criterion for significance indicated that there were significant differences in final course grades. This analysis revealed that seniors ($m = 7.74$, $sd = 2.14$) had statistically higher final course grades than freshmen ($m = 6.56$, $sd = 2.38$), sophomores ($m = 7.17$, $sd = 2.43$), and juniors ($m = 6.94$, $sd = 2.76$). Sophomores ($m = 7.17$) also scored significantly higher than freshmen ($m = 6.56$). No other group differences were found.

The data was then split based on delivery to examine potential differences in final course grades by student's year in school. The ANOVA showed a significant difference ($F(3, 723) = 3.006$, $p < .05$) for the face-to-face sections. However, post-hoc analyses using the Bonferroni post-hoc criterion for significance was not able to find significant differences between any of the four years in school for face-to-face final course grades.

ANOVA results also revealed a significant difference for the online sections ($F(3, 1,026) = 14.680$, $p < .05$). Bonferroni post-hoc results revealed that seniors ($m = 7.93$, $sd = 2.19$) had higher final course grades than freshmen ($m = 6.44$, $sd = 2.41$), sophomores ($m = 7.11$, $sd = 2.34$), and juniors ($m = 6.90$, $sd = 2.78$). Sophomores ($m = 7.11$) also had significantly higher final course grades than freshmen ($m = 6.44$).

Ethnicity. A one-way ANOVA was used to examine potential differences in final course grades of the different ethnic groups. A significant difference was found between these groups ($F(6, 1,750) = 9.087$, $p < .05$). Post-hoc analyses using the Bonferroni post-hoc criterion for significance indicated that there were significant differences in final course grades among various ethnic groups. Caucasian ($m = 7.13$, sd = 2.40), Asian ($m = 6.77$, sd = 2.73), non-resident ($m = 6.59$, $sd = 2.67$), and students with race/ethnicity unknown ($m = 6.53$, $sd = 3.00$) had significantly higher final course grades than African American students ($m = 4.61$, $sd = 2.21$). Caucasians ($m = 7.13$) also statistically scored higher than Hispanic students ($m = 5.61$, $sd = 2.82$).

Because significant differences were found, the data was then split, based on delivery, to examine potential differences in final course grades. An ANOVA showed a significant difference between ethnic groups ($F(6, 720) = 5.906$, $p < .05$) for the face-to-

face section. ANOVA results also revealed a significant difference ($F(6, 1,023) = 4.035$, $p < .05$) for the online sections. Because one group had fewer than two cases, a post-hoc analysis could not be performed. A cursory examination of the results showed that the overall final course grades were very similar in the face-to-face and online sections by ethnic group (Caucasians 7.18 to 7.09, African American 4.44 to 4.93, Asian 6.46 to 7.08, Hispanic 6.56 to 5.0, non-resident 7.08 to 6.0, and students with race/ethnicity unknown 6.62 to 6.45, respectively.) It is interesting to note that Hispanic and non-resident students appeared to have had higher final course grades in the face-to-face sections than online sections while African American and Asian students had higher final course grades in the online sections than face-to-face sections.

Major. The data was also examined using a one-way ANOVA to find potential differences in final course grades between students with different declared majors. A significant difference was found between these groups ($F(6, 1,750) = 12.518$, $p < .05$). Post-hoc analyses using the Bonferroni post-hoc criterion for significance indicated that there were significant differences among various declared college majors. The majors in the Colleges of Natural Sciences ($m = 7.64$, $sd = 2.64$) and Business Administration ($m = 7.58$, $sd = 2.19$) scored higher than the majors in the Colleges of Social and Behavioral Sciences ($m = 6.76$, $sd = 2.49$), Education ($m = 6.66$, $sd = 2.22$), Humanities and Fine Arts ($m = 6.85$, $sd = 2.61$), the General Studies Program majors ($m = 6.21$, $sd = 2.47$), and undeclared majors ($m = 5.43$, $sd = 2.89$).

The data was then split, based on delivery, to examine potential differences in final course grades. The ANOVA showed a significant difference ($F(6, 720) = 6.341$, p

< .05) for the face-to-face sections. Post-hoc analyses using the Bonferroni post-hoc criterion for significance indicated that there were significant differences in final course grades among various declared majors in college. In the face-to-face sections the majors in the College of Business Administration (m = 7.69, sd = 2.19) were significantly different from the majors in the Colleges of Social and Behavioral Sciences (m = 6.60, sd = 2.39), Education (m = 6.59, sd = 2.22), the General Studies Program majors (m = 6.43, sd = 2.30), and the students with undeclared majors (m = 4.90, sd = 3.14). The majors in the College of Natural Sciences (m = 7.54, sd = 2.85) also scored higher than the students with undeclared majors (m = 4.90).

ANOVA results also revealed a significant difference for the online sections (F(6, 1,023) = 6.825, p < .05). Post-hoc analyses using the Bonferroni post-hoc criterion for significance indicated that there were significant differences in final course grades. The majors from the College of Natural Sciences (m = 7.70, sd = 2.52) were more academically successful based on final course grades than those in the Colleges of Education (m = 6.70, sd = 2.22), Humanities and Fine Arts (m = 6,80, sd = 2.66), and the General Studies Program majors (m = 6.08, sd = 2.56). The majors in the College of Business Administration (m = 7.47, sd = 2.20) scored higher than the majors in the Colleges of Education (m = 6.70) and the General Studies Program majors (m = 6.08).

In summary statistical analyses for the third research question found that there were differences in academic achievement between subgroups of students and the chosen method of delivery. Results revealed that there were significant differences in mean final

course grades of males and females. Females had significantly higher final course grades than males no matter the delivery.

Year in school also provided academic achievement differences in subgroups. Overall seniors were more successful academically than freshmen, sophomores, and juniors while sophomores had higher final course grades than freshmen. When examined by method of delivery, there were no significant differences in final course grades based on year in school for students enrolled in the face-to-face sections. Conversely, there were significant differences for the online sections. Seniors had higher final course grades than freshmen, sophomores, and juniors, and sophomores were more successful academically than freshmen.

Results also revealed that there were significant differences between ethnic groups. Caucasian, Asian, non-resident, and students with race/ethnicity unknown had higher final course grades than African American students. Caucasian students also had higher final course grades than Hispanic students.

Another subgroup that showed a significant difference was the student's major. In both the face-to-face and online delivery, the majors from the Colleges of Natural Sciences and Business Administration had overall higher final course grades than the other colleges. For the face-to-face delivery method, the College of Business Administration had higher final course grades than two other colleges. For the online method of delivery, the majors from the College of Natural Sciences had higher final course grades than two other colleges while the College of Business Administration majors were higher than one other college.

Summary

To summarize the overall findings the students who chose to enroll in face-to-face sections were not demographically equivalent to the students in the online sections. Students in the online delivery sections had statistically higher ACT scores and greater semester course loads. Female students, Hispanic students, Caucasian students, and students with declared majors in the Colleges of Education, Natural Sciences and the General Studies Program were more likely to select the online method of delivery. Conversely, male and African American students were more likely to enroll in the face-to-face delivery sections.

Results also revealed there was no significant difference between final course grades of the online and face-to-face students. However, there were significant differences found between academic of subgroups of students. Overall, females had higher final course grades than males, but no significant differences were reported in delivery method. Seniors had higher final course grades than freshmen, sophomores, and juniors in the overall analysis and in the online environment and sophomores were more successful academically than freshmen whereas no differences were found for face-to-face delivery.

Caucasian, Asian, non-resident, and students with race/ethnicity unknown had higher final course grades than African American students. Caucasian students also had higher final course grades than Hispanic students.

The majors in the Colleges of Business Administration had higher final course grades overall in the face-to-face sections and statistically higher than two other colleges

in the face-to-face delivery method. In the online sections, the College of Natural Sciences had the highest overall grades and higher grades than two colleges while the College of Business Administration had higher final course grades than one other college.

CHAPTER V

DISCUSSION

The creation of online courses has risen dramatically in the past several years. Fifty-six percent of all post-secondary institutions offered online courses at the beginning of the 21st century. Draves (2002) predicted that 50% of all learning (by educational institutions, business and industry) would done online by the close of the first decade of the 21st century. Most freshmen now begin their college careers with their own personal computer, cell phone, and digital music device (Salaway & Caruso, 2008). More than 4.6 million students took at least one online course in fall 2008, an increase of 17% over the previous year (Allen & Seaman, 2009). Allen and Seaman (2008) reported that as technology becomes a part of modern life and fuel prices remains high more and more college students are enrolling in online courses. As teachers and administrators add online sections with existing traditional face-to-face sections, a concern exists as to whether or not students will be successful academically in the online environment. This chapter addresses: (a) summaries of the research questions, (b) implications for practice, (c) recommendations for further study, and (d) conclusion.

The purpose of this study was to investigate two alternative methods of instructional delivery in a wellness course at the undergraduate level in a university setting: large-group face-to-face instruction and online instruction. This study examined the degree to which students who enrolled in these two different delivery methods were demographically equivalent. This study also examined the differences in students' academic achievement as measured by final course grade between the face-to-face large-

group instructional settings and the online versions of the same course as well as the academic achievement of subgroups as defined by student demographics. Specifically this study looked to address the following questions:

1. Are students who chose to enroll in face-to-face large-group sections and students who chose to enroll in an online version of the same course demographically equivalent (gender, age, year in school, ethnicity, country of citizenship, ACT upon entering university, course load, and major)?
2. Are there differences in academic achievement, as measured by final course grade between students who chose to enroll in face-to-face large-group sections and students who chose to enroll in an online version of the same course?
3. Are there differences in academic achievement as measured by final course grade between subgroups of these students (gender, year in school, ethnicity, and major) who chose to enroll in face-to-face sections and those who enrolled in online sections?

Summary of Research Question 1

In response to research question 1, a significant difference was revealed in the demographic make-up of the students enrolled in the two types of instructional delivery related to gender, ethnicity, ACT, course load, and major. A higher percentage of females chose online delivery for their lecture more often than face-to-face delivery whereas males were much more evenly split between online and face-to-face delivery. This finding reflects Dutton and Dutton's (2005) report that females are more heavily represented in online sections of classes. Harrell and McClinton (2011) suggests that women may enroll

in online sections of class more than face-to-face sections due to family and work commitments. Another reason that women may choose the online delivery method more is that they can be invisible and therefore may feel there is greater gender equality. Anderson and Haddad (2005) found that "females experience greater perceived deep learning in online than in face-to-face courses, and that expression of voice appears to contribute to this outcome" (p. 1). Danet (1998) and Graddol and Swann (1989) stated that traditional patterns of male dominance have been observed in face-to-face class conversations. Males may be more vocal in the face-to-face environment and females may be more reserved.

By ethnic group Hispanic students chose online over face-to-face delivery about twice as much while African American students chose face-to-face almost twice as much as online delivery. Cultural differences may be one of many possibilities in explaining this outcome. Hispanic students may have chosen online sections of the course if language was a barrier. Online courses afford students time to look up difficult terminology and give students time to translate if necessary. Conversely, under-represented minority groups such as African Americans or students who have not had a solid academic background or adequate experience with computers and software may choose face-to-face delivery for interaction with teachers and other students that not available in the online environment.

Students who chose online courses had higher ACT scores than did students enrolled in the face-to-face format. This difference may be due to better academically prepared students choosing online courses because of the freedom online courses afford.

Dutton and Dutton (2005) stated that online sections of courses seem to attract students who are able to handle the scheduling and organizational demands of online education. The online environment's asynchronous learning style allows much greater flexibility in accommodating student scheduling constraints (Hill, 2006). This explanation is supported by the finding that students enrolled in online sections of the course had higher course loads. Students taking higher course loads may have academic class schedules which conflict so taking online courses enable them to manage their class schedule. However, even though ACT scores and course load were statistically different in this study, the actual ACT scores and course load were not much different and may not have many practical implications.

A significant difference was also found in students' choice of delivery based on declared majors. The majors in the Colleges of Education and Natural Sciences and the majors in the General Studies Program had higher percentages of students in the online sections than the face-to-face sections. This finding supports research by Chen, Lambert, and Guidry (2010) who noted that students who majored in education, nursing, and occupational therapy were more likely to enroll in online courses. Because majors in the Colleges of Education and Natural Sciences must participate in numerous outside experiences in schools or research for their majors they may encounter difficulties in scheduling their classes. Being able to choose online courses, these majors may be able to accommodate their various other course requirements. Students who major in the General Studies Program may have conflicts with their academic schedules since they may be taking classes from several different colleges. Faculty within colleges may schedule their

departmental courses so that their required major courses are not scheduled at the same time. Students in the General Studies Program may need the flexibility online classes afford to decrease this type of conflict.

This study found no significant differences in age, year in school, and country of citizenship with regard to delivery type. These results differ from those of Dutton and Dutton (2005) who found a significant difference in age and year in school. They found that seniors chose online sections twice as much as face-to-face ones. In addition, they found that the students in the online sections were almost two years older than those in the face-to-face sections. The non-significant findings in the present study may be because by the time students are seniors at UNI, a large percentage of students have taken the Personal Wellness course. Indeed, the largest percentages of enrolled students in this course were in their freshmen and sophomore years. In addition, freshmen are not able to register for courses until the summer prior to their initial enrollment in the fall semester. Such late registration puts them at a disadvantage in availability of delivery methods and they therefore may enroll in whatever section is still open, which is often the online sections. As a result the average age of the students enrolled in the online sections of required Personal Wellness course was lowered.

Summary of Research Question 2

The second question in the study examined if there was a difference in academic achievement based on final course grade and student's choice of instructional delivery method. There was no significant difference in final course grade between the two delivery methods, face-to-face and online. This result is consistent with the findings of

the literature review. Dutton et al. (2002) and Neuhauser (2002) showed that online education learners do as well academically as campus-based learners based on test scores. Beare (1989), Martin and Rainey (1993), McCleary and Eagan (1989), Souder (1993), and Verduin and Clark (1991) also compared students from the two delivery methods and found them to be similar.

The findings of the current study may be a result of the online sections having access to recorded video lectures of a face-to-face delivery. The Zhang et al. (2006) research of videotaped lectures found that online courses support the same level of teaching and learning effectiveness as face-to-face instruction. Wieling and Hofman (2008) and Conaway (2011) suggest that the ability to record face-to-face lectures and have them available for online viewing for students is truly useful to students.

The fact that each student participated in two activity classes that met face-to-face is another factor that must be considered. First, grades from the two activity labs were 40% of the final course grade, which is a large portion of the final grade, and therefore reduced the variability between the two delivery methods. Second, the non-significant results may have been influenced by having face-to-face interaction with an activity instructor twice a week. This is an unusual occurrence in most online courses.

Summary of Research Question 3

The third question then examined if student subgroups' final course grades were different based on their choice of face-to-face or online delivery. A significant difference in course grade was found for gender, year in school, ethnicity, and major.

Females' final course grades were higher than males in general and in both methods of delivery. No significant differences were found between delivery modes for females or males. The Education Portal (2007) stated that women get better grades, study harder, party less, and take advantage of more opportunities than men no matter the delivery choice. Results of this study support that finding.

The students' final course grades were statistically different in the online sections by year in school. Seniors performed statistically better than freshmen, sophomores, and juniors in the online sections of class. One possible explanation is that seniors had more opportunities in which to have had online course experience. Also seniors may better utilize the online university resources that are available. In addition, sophomores were more successful academically than freshmen. It may be that freshmen lack experience with the educational technological formats used by higher education institutions or perhaps lack the organizational skills to budget their study time successfully in the online environment.

Unlike the online sections, there was no statistically significant difference in achievement between any of the years in school for the face-to-face sections. This was probably due to the seniors having a lower course grades in face-to-face (7.40) than online (7.93). Perhaps, seniors wanted to avoid the large number of underclassmen enrolled in face-to-face sections so they chose not to attend class, which left them unprepared for exams. It could also be that during a student's senior year, the majority of their classes are within their major and minor requirements. The emphasis of their studying may not

be focused on a Liberal Arts Core course, resulting in lower grades for the Personal Wellness course.

In terms of ethnicity, differences were found in their final course grades. Caucasian, Asian, non-resident, and students with race/ethnicity unknown had higher final grade averages than did African American students. The concerning factor is the relatively low performance of the African American students. To reduce this achievement gap, additional academic support services such as tutoring, supplemental technological training, and one-on-one sessions could be provided. Institutional interventions may also mediate some of these problems by offering one-on-one counseling, group study sessions, and other assistance programs. Special technological training may be warranted if students did not have computer availability due to low socio-economic background. Students may need assistance with computer technology, software or time-management and independent learning skills. Any one or more of these services could alter academic achievement. However, it should be noted that the population of this student subgroup composed only 2.3% (n = 42) of the student enrollment so assumptions should be made with extreme caution.

Differences in final course grades were also found based on students' choice of major. Students with declared majors in the Colleges of Business Administration had the highest final course grades in the face-to-face sections while the College of Natural Sciences had the highest grades in the online sections. Devi (2002), Harvel (2006), and Jana (1999) reported that online students enrolled in business education and natural sciences tended to be self-disciplined and motivated which may explain their success.

Conversely, students with undeclared majors had the lowest final course grades in both methods of delivery. Because the composition of undeclared majors is unclear, it may be that these students are struggling to find their academic interests and are less motivated in their current academic studies.

Implications for Practice

Utilization of online delivery for lecture in an undergraduate wellness course is unique and undocumented in research. The purpose of this study was to examine an undergraduate wellness course and evaluate academic achievement between the two delivery methods and amongst subgroups of students. Before reviewing the implications, the context of the course is important to understand. The Personal Wellness course lecture component was structured in the face-to-face environment. This lecture was recorded and then utilized for the online sections of the course. Students were also enrolled in two face-to-face activity labs no matter the lecture delivery method. Thus, the results of this study should only be applied to other courses with similar parameters.

One possible implication from this study is derived from the finding that there was no significant difference in final course grades between the two delivery methods, face-to-face and online. Students had similar academic success based on final course grades in either face-to-face or online sections of Personal Wellness. Based on the results of this study, a recommendation would be to offer half the enrollment of Personal Wellness in face-to-face sections and the other half in online sections.

Based on the results of this study, face-to-face sections should also be offered. Offering some face-to-face sections would provide students the opportunity for

interactions between the teacher and students and amongst the students themselves. This can eliminate feelings of isolation (Conrad & Donaldson, 2004; Everhart, 1999; Haythornthwaithe et al., 2000; Kazmer, 2004) or lack of motivation sometimes associated with the online delivery method. When teachers organize in-class small group activities where students can ask and answer questions and have meaningful interactive dialogues with others, students feel they are a part of a caring class environment. This would also serve the needs of those students who prefer face-to-face courses, as supported by the large number of students who chose to enroll in the face-to-face version of the existing course (e.g., 49% for the spring 2007 semester).

If the educational outcome is the same, online sections are an excellent cost effective option for administrators faced with decreasing budgets for their academic programs. Online education is a means to cut costs during current budget tightening fiscal years by increasing online course enrollment. By offering large group online sections, students also have the flexibility to carry a heavier academic course load, which is more cost effective for students. To be most effective, online courses should include interactive qualities such as discussion boards, chats, and blogging where students can collaborate, take ownership, and direct their learning. Teachers can also increase this communication by sending weekly email reminders, provide internet links with more resources, add audio commentary to power point slides, and online tutorials.

A second implication relates to student subgroups and delivery method. Different student subgroups chose to enroll in either face-to-face or online sections. Females, Hispanic and Caucasian students, and students with declared majors in the Colleges of

Education, Natural Sciences, and the General Studies Program were more likely to select the online method of delivery. Conversely, male and African American students were more likely to enroll in the face-to-face delivery sections.

Knowing the characteristics of the student population that gravitate to the different methods of delivery, teachers could tailor lecture content that is most appropriate for those student subgroups. Because there is a much higher distribution of female students, for example, teachers could incorporate additional information on women's health. Teachers could also provide additional academic assistance to specific student populations. Research has found that the prevalence of overweight children is especially high among Hispanics, who also had high online enrollment percentages. Providing internet links, which would provide specific health resources, and including chat rooms to discuss these issues may be beneficial for these populations. Hispanic and non-native English speaking students overwhelming chose to enroll in online sections, teachers could provide multilingual video lectures that students could re-play for increased comprehension. Other options would be to have specific native language discussion groups, chat rooms, and tutoring available to help clarify the lecture material. These would help address social and cultural factors, which could enhance the learning opportunities for these students. In summary, both delivery options need not have identical content to best meet the needs of the diverse students enrolled.

Another implication pertains to the lower final course grades reported for some of the subgroups. More specifically, an achievement gap was discovered in this study for African American students as well as male students. African American students had the

lowest final course grades in both delivery methods. It is impossible to determine if social, cultural, environmental, or institutional factors were influences. The National Governors Association (2011) stated "Across the U.S., a gap in academic achievement persists between minority and disadvantaged students and their white counterparts. This is one of the most pressing education-policy challenges that states currently face" (p. 1).

To counteract the achievement gap for African American students, possible solutions would be to provide smaller class sizes, more group learning activities, implementing different assessment procedures, and providing additional academic support services. Smaller classes allow greater interaction with the teacher as well one-on-one clarification of subject matter if needed. Jencks and Phillips (1998) stated that smaller classes raise test scores and Krueger and Whitmore (2002, p. 39) found that "black students tend to advance further up the distribution of test scores from attending a small class." Working in groups in class provides social support and may also offer higher positive response to course work with African American students. "High communal learning tends to facilitate identification and performance among African American students (Boykin, Coleman, Lilja, & Tyler, 2004, p. 27). Instead of multiple choice assessments, which were used for the course assessment in this study, presentations or essays may be more advantageous to African American students "to develop students' abilities to articulate the meaning of what they read" (Rothman, 2002, p. 1).

Another method of addressing this achievement gap, involves academic support services such as tutoring, supplemental technological training, and one-on-one and group study sessions. Charles and O'Quinn (2001) found that providing one-on-one tutoring

gave African American students the necessary support to help them "catch up" and learn the necessary study skills required to learn on their own. Special technological training may be warranted if students did not have computer availability.

The other subgroup that displayed lower academic scores in this study was males. Research indicates that male students receive less faculty support than females (Giguette, Lopez, & Schulte, 2006). Teachers may not be aware of this perceived lack of support so institutional seminars highlighting this discrepancy could mitigate this alleged inconsistency. Aycock (2011) noted that males react more poorly to high levels of stress than females in academic situations so learning coping techniques from academic support services may assist in alleviating this concern. Males also respond more positively academically in socially supported situations such as the group work suggestions previously provided for African American students. Research also indicated that males study less, party more, and take less advantage of opportunities than females (The Education Portal, 2007). Stressing greater attention to academic pursuits for men such as study skills sessions and career planning may instill some degree of academic leadership they're currently lacking (Baenninger, 2011).

One final implication addresses senior students who had significantly higher final course grades than the other classifications in the online sections but not in the face-to-face sections. Based on the results of this study, a recommendation for academic advising would be to encourage students who are seniors to enroll in online sections of Personal Wellness. For some reason, seniors performed better than the other classifications in the online class experience. Academic advisors may also want to encourage sophomores to

enroll in online courses since they had a significantly higher final course grade average than freshmen in the online version of the course.

Recommendations for Further Study

As higher education institutions expand their course options to more online instructional deliveries, further research needs to be conducted to determine whether or not the students are receiving the same level of education and how these courses can be improved. A mixed methodology of qualitative and quantitative research should be developed to further examine various student characteristics that may help determine which subjects should be taught in each delivery method to best meet the needs of their students. For example, this study found there were differences in academic success for the characteristics of year in school, gender, and ethnicity. A study examining why female students were more academically successful no matter the delivery method and African American students had lower final course grades in both delivery methods may have educational impact for teachers, administrators, and students themselves.

Some characteristics not examined in this study that future researchers should examine could include prior experience in online courses, full-time or part-time status, work commitments, and commuting to campus. Meeting with students and determining the "why" and "how" they came to make certain decisions utilizing a qualitative research approach may also be helpful. Information on preparedness, reasons for section choice, interactions, and motivation such as the survey Dutton and Dutton (2005) utilized might be insightful. A follow-up survey at the conclusion of the semester could be administered, which would give the students an opportunity to rate their experiences in

their chosen delivery method. These surveys may provide insight into the needs of students in relation to their chosen method of delivery. Future researchers should also administer pre and post-tests to further examine whether students are receiving the same level of education using different methods of delivery.

Another study which addresses the current change in the structure of the Personal Wellness course at this particular university would be meaningful. The Personal Wellness course no longer has the two face-to-face activity laboratory classes. That activity component may have influenced the results of this study. A study examining the final course grades of the two delivery methods as the course is currently structured may have a different result and be more indicative of the differences between the lectures delivered face-to-face and online.

Conclusion

Utilization of online delivery for lecture in an undergraduate wellness course is unique and undocumented in research. The purpose of this study was to examine an undergraduate wellness course and evaluate academic achievement between the two delivery methods and subgroups of students. Statistical analyses found that students in the face-to-face classes were not demographically equivalent to the students in the online classes. Results revealed that students who chose online delivery had statistically higher ACT scores as well as carried a slightly higher semester course load. Significant differences were also found for gender, ethnicity, and major. Females overwhelmingly chose online delivery, while males were much more evenly split between online and face-to-face delivery. By ethnic group, Hispanic and Caucasian students were more likely to

take an online section while African American students chose face-to-face sections more often than online ones. There were no significant differences in age, year in school, and country of citizenship between the two methods of delivery.

Understanding the characteristics of the student population that gravitate to the different methods of delivery would allow teachers to tailor lecture content that is most appropriate for those student subgroups. Both delivery options need not have identical content to best meet the needs of the diverse students enrolled. Hispanic and non-native English speaking students, who overwhelming chose to enroll in online sections, could be provided additional academic assistance via multilingual video lectures they could re-play for increased comprehension. Face-to-face sections could offer more opportunities for interactions, which are beneficial for males and African American students who were more likely to enroll in these sections.

Results also revealed that students achieved similar academic success based on final course grades in the face-to-face and online sections of the Personal Wellness course. Thus, a recommendation would be to offer both face-to-face and online sections of Personal Wellness. Online sections are a cost effective option for administrators faced with decreasing budgets. By administrators offering large group online sections, students also have greater flexibility in scheduling their courses, which allows them to carry a heavier academic course load and is more cost effective for students. In contrast, offering face-to-face sections would provide interaction between students and teacher and amongst students themselves, fulfill the desires of many students, and eliminate feelings of isolation and lack of motivation sometimes associated with the online delivery method.

Finally, differences were found in the academic achievement of students in different subgroups. Females had higher final course grades than males in both methods of delivery. Seniors had higher final course grades than freshmen, sophomores, and juniors in the overall analysis and in the online environment but not for the face-to-face format. Sophomores were more successful academically than freshmen for the online method of delivery. Caucasian, Asian, non-resident, and students with race/ethnicity unknown had higher grade averages than African American students. Caucasian students also had higher final course grades than Hispanic students. Students with declared majors in the Colleges of Business Administration had the highest final course grades in the face-to-face sections while the College of Natural Sciences had the highest final course grades in the online sections.

Thus, an achievement gap was revealed for African American and male students. To counteract the achievement gap for African American students, possible solutions would be to offer various class configurations such as smaller class sizes, provide group learning activities, incorporating a variety of assessment procedures, and offering academic support services options such as tutoring, supplemental technological training, and one-on and group study sessions.

The other major subgroup which displayed lower academic scores in this study was males. The following suggestions could serve to enhance their course grades. Male students may benefit from coping techniques designed to alleviate high levels of stress in academic situations. Next, because male students may also receive less faculty support than females, institutional seminars for teachers that provide communication strategies to

reach male students could alleviate these concerns. Since males respond more positively in socially supported situations, group learning activities should be incorporated work within the Personal Wellness course.

To summarize, the students who chose to enroll in face-to-face sections were not demographically equivalent to the students in the online classes. No significant difference was discovered in final course grades between the two delivery methods, face-to-face and online. A significant difference was found in the final course grades based on the student subgroups of gender, year in school, ethnicity, and major. These findings should be used to influence how the Personal Wellness course is taught in the future at this particular university. Future research should further examine these characteristics which may have educational impact for teachers, administrators, and students themselves.

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APPENDIX A

AEROBIC CONDITIONING LAB CLASS OPTIONS

Aerobic Combo

Aerobic Cross Training

Aerobic Dance and Exercise

Aqua Aerobics

Bike Conditioning

Circuit Aerobics/Weights

Indoor Cycling

Swimming, Conditioning

APPENDIX B

LIFETIME SKILL ACTIVITY OPTIONS

Backpacking

Ballet, Beginning

Canoeing

Ballroom, Beginning & Intermediate

Capoeira

Celtic Dancing, Beginning

Clogging, Beginning

Cross Country Skiing

Dance Improvisation

Golf

Jazz, Beginning

Brazilian Jiu jitsu

Karate

Mind, Body, Fitness

Modern Dance, Beginning

Outdoor Survival Skills

Racquetball

Rock climbing

Skin Diving/Snorkeling

Skin/Scuba Diving

Tennis

T'ai Chi

Volleyball, Beginning & Intermediate

Weight Lifting-Free Weights

Yoga/Pilates

APPENDIX C

AEROBIC CONDITIONING LAB SYLLABUS

440:A/B

Lab: _____ Instructor: _____
Final lab points will be Posted Office: (Room #): _____
Office Hours: _____ Phone: _____

The School of Health, Physical Education and Leisure Services promotes wellness as its central integrating theme for this course and other curricular endeavors. Wellness can be thought of as a concept wherein one's physical, social, intellectual, and emotional components are addressed in a holistic fashion. Toward that end, the essential outcomes of "Personal Wellness" include the acquisition of knowledge and development of skills and attitudes necessary for implementing positive wellness decisions. The common goal of all the aerobic conditioning classes is to provide students an opportunity to be introduced to lifetime leisure physical activities that promote physical fitness. Such activities, if embraced, may increase the quality of one's life.

1. Desired Outcomes

Students will: 1) understand the importance of participation in activities contributing to wellness-related fitness throughout their lifetime, 2) experience the process of becoming physically fit through participation in activities contributing to wellness-related fitness, 3) demonstrate knowledge of personal conditioning concepts, and 4) develop a personal exercise program.

2. Course Content (content may be adapted to student needs)

Exercise theory concepts will be applied through the lab while working on the following content:

A. Monitoring one's own heart rate
B. Determining one's own target heart rate
C. Physical fitness evaluations
    1. Cardiovascular assessment
    2. Abdominal crunch (abdominal strength and endurance)
    3. Push-ups (arm, shoulder and shoulder girdle muscular strength and endurance)
    4. Body composition
    5. Flexibility – modified sit and reach test
    6. Blood pressure and resting heart rate
D. Aerobic activity for cardiovascular endurance and healthy body composition
E. Resistance exercises for muscular strength and endurance and healthy body composition
F. Prevention of injury

G. Development of a four week personal aerobic exercise program
H. Maintenance of an exercise diary
I. Warm up and cool down exercises

3. Evaluation

Aerobic Conditioning Laboratory Evaluation

A.	Point System		Points
1.	Attendance		15
2.	Assessments		
	Lab 1	Par-Q & You (P 12)	-
	Lab 2	General Health Profile (P 3-4)	-
	Lab 3	Lifestyle Evaluation (P 5-7)	-
	Lab 4	Factors that Promote Lifestyle Change (P 9-11)	-
	Lab 5	Behavior Change Contract (P 13)	-
3.	Fitness Assessments		
	Lab 8	Estimating VO2 max using a Walk Test (P 21-22) or	-
	Lab 9	Estimating VO2 max using a Jog Test (P 23–27) or	-
	Lab 11	12 minutes Swim Test (P 31-34)	-
	Lab 12	Measurement of Muscular Endurance: (Push-Up, Sit-Up, Curl-Up Test) (P 35-36)	-
	Lab 13	Measurement of Muscular Endurance: (Modified Push-Up Test) (P 37)	-
	Lab 14	Assessment of Flexibility: Trunk Flexion (P 39)	-
	Lab 15	Assessment of Body Composition (P 41–44)	-
	Lab 17	Aerobic Lab Fitness Assessments (P 47-48)	-
	Lab 18	Avoiding Harmful Stretches (P 49-50)	
4.	Fitness Labs		
	Lab 19	Heart Rate Response to Varying Activity (P 51-52)	2
	Lab 20	Determining Training Heart Rate Using Percentage of Maximum Method and Heart Rate Reserve Method (P 53)	2
	Lab 21	Heart Rate and Blood Pressure Response to Exercise and Understanding the Response (P 55-57)	4
	Lab 22	Rate of Perceived Exertion (P 59-60)	3
	Lab 23	Caloric Expenditure During Physical Activity (P 61-63) or Lab 24 Using Swim Test (P 65)	5
	Lab 25	Nutrition Analysis Project and Questions (P 67-69)	5
	Lab 26	Daily Exercise Record (P 71-72)	5
	Lab 27	Strength Training Log (P 73)	3
	Lab 28	Disease Risk Assessment (P 75)	1
5.	Laboratory Written Exam		15
	TOTAL AEROBIC CONDITIONING LABORATORY POINTS		60

APPENDIX D

BEGINNING VOLLEYBALL LAB SYLLABUS

Instructor:
Office:
Phone:
Email:
Office Hours:

The School of Health, Physical Education, Leisure, Youth and Human Services promotes wellness as its central integrating theme for this course and other curricular endeavors. Wellness can be thought of as a concept wherein one's physical, social, intellectual and emotional components are addressed in a holistic fashion. Toward that end, the essential outcome of "Personal Wellness" includes the acquisition of knowledge and development of skills and attitudes necessary for implementing positive wellness decisions. The goal for the skill classes is to provide students an opportunity to be introduced to a lifetime leisure physical activity. Such an activity, if embraced, may increase the quality of one's life.

1. Desired Outcomes

Students will understand the importance of physical activity and participate in activities contributing to holistic wellness throughout their lifetime. Students will progress to a skill and knowledge level such that they can enjoy volleyball as a lifetime leisure activity.

2. Course Content

Skill enhancement concepts will be applied throughout the course while working on the following content:

A. Footwork
B. Overhead Pass
C. Forearm Pass
D. Serve-underhand and overhead
E. Serve Reception
F. Set
G. Spike
H. Block-1 and 2 player
I. Dink
J. Offensive Strategy
    1. 4-2 offense
    2. Center back-up
K. Defense Strategy
    1. Cover for spike

2. Cover for block
3. Free ball

L. USVBA Rules

3. Evaluation (See reverse side)

LIFETIME SKILL LAB EVALUATION

A. Point System

1.	Attendance/participation (see explanation below)	30 pts.
2.	Written exam	15 pts.
3.	Skill	15 pts.
	TOTAL	60 pts.

B. Explanation of Attendance

1. Classes meeting two times per week – start with 30 points. Two (2) points will be subtracted for the first unexcused absence and an additional five (5) points thereafter.
2. Points may also be deducted for lack of participation even if present.
3. Excused absences include required school related travel, funerals, and illness. It will be up to the instructor to decide if the illness is excused or not. Arrangements to make up excused absences must be made through the class instructor. Excused absences not made up become subject to point reduction.

C. Grading: Grading will be based on the following percentages.

> 93% = A
90-92%= A-
87-89%= B+
83-86%= B
80-82%= B-
77-79%= C+
73-76%= C
70-72%= C-
60-69%= D
< 60% = F

NOTE: All absences are considered unexcused unless the student informs the instructor otherwise on the first day back to class.

APPENDIX E

APPLICATION FOR USE OF EXISTING DATA

Note: Before completing application, investigators must consult guidance at:
http://www.uni.edu/osp/irb
Always check website to download current forms.

All items must be completed and the form must be typed or printed electronically. Submit 2 hard copies to the Human Participants Review Committee, Office of Sponsored

Title **of** proposal: A Comparison of face-to-face and online instructional delivery methods in large group settings in an undergraduate wellness course

Name of (PI) Principal Investigator(s): **Lea Ann Shaddox**

PI Status: ☐ Faculty ☐ Undergraduate Student X Graduate Student ☐ Staff ☐ Non-UNI

Project Type: ☐ Faculty/Staff Research X Thesis/Dissertation ☐ Other-specify:

PI Department:	**HPELS**	PI Phone:	**273-6157**	PI Email:	**lea.shaddox@uni.edu**
PI Address or Mail Code:	**0241**				
Faculty Advisor Mail Code:	**0606**	Advisor Phone:	**273-7759**	Advisor Email:	**lynn.nielsen@uni.edu**
Source of Funding:					
Project dates: Beginning	June 2010	Through	May 2011		

Programs, 213 East Bartlett, mail code 0394

All key personnel and Advisor (if applicable) must be listed and must complete IRB training/certification in Human Participants Protections. Attach a copy of the certificate, if not already on file *in the IRB office.*

Principal Investigator Lea Ann Shaddox Certificate Attached
X On File X
Co-Investigator(s) Certificate(s) Attached
☐ On File ☐
Faculty Advisor Lynn Nielsen
Certificate Attached ☐ On File X
Other Key Personnel: Mick Mack Certificate Attached ☐ On File X
Other Key Personnel: _____ Certificate Attached ☐ On File ☐

SIGNATURES: The undersigned acknowledge that: 1. this application represents an accurate and complete description of the proposed research; 2. the research will be conducted in compliance with the recommendations of and only after approval has been received the UNI IRB. The PI is responsible for reporting any adverse events or problems to the IRB, for requesting prior IRB approval for modifications, and for requesting continuing review and approval.

Principal Investigator:	Lea Ann Shaddox		May 3, 2010
	TYPED NAME	SIGNATURE	DATE
Co-Investigator(s):			
	TYPED NAME	SIGNATURE	DATE
Faculty Advisor (required for all student projects):	Lynn Nielsen		
	TYPED NAME	SIGNATURE	DATE

A. PURPOSE OF RESEARCH.

Explain 1) why this research is important and what the primary purposes are, 2) what question(s) or hypotheses this activity is designed to answer, and 3) whether and how the results will be used or disseminated to others.

1) The popularity of online classes has grown drastically in recent years in higher education institutions. The purpose of this study is to investigate two alternative methods of instructional delivery in a wellness course at the undergraduate level in a university setting. The first method of instruction is characterized by large-group face-to-face delivery. In this context, large-group instruction is defined by settings in which the ratio of students to instructors is at or greater than 100 students to one instructor. A second method is characterized by online instruction where students asynchronously and individually access instructional activities and course materials.

This study will examine the degree to which students who enroll in face-to-face large-group instruction and students who enroll in online versions of the same course, are demographically equivalent. This study will also examine the differences in academic achievement as measured by test scores, between students who enroll in face-to-face large-group instruction and students who enroll in the online version of the same course. This study will also examine the academic achievement of subgroups as defined by student demographics, in both face-to-face large-group instructional settings and in the online version of the same course.

2) 1. Are students who enroll in face-to-face large-group instruction and students who enroll in an online version of the same course, demographically equivalent (e.g., gender, age, year in school, ethnicity, and country of citizenship)?
2. Are there differences in academic achievement as measured by test scores, between students who enroll in face-to-face large-group instruction and students who enroll in an online version of the same course?
3. Are there differences in academic achievement as measured by test scores, between subgroups of students (e.g., gender, age, year in school, ethnicity, and country of citizenship) who enroll in face-to-face large-group instruction and students who enroll in an online version of the same course?

3) This is a dissertation and will be published if accepted and used as reference for instructors and administrators.

B. RESEARCH PROCEDURES INVOLVED IN THE SECONDARY DATA ANALYSIS.

Provide a complete description of your study design and all the study procedures that you will perform (e.g., description of data access).

The research conducted will be investigating three semesters: Fall 2006, Spring 2007 and Fall 2008. There will be statistical analysis examining the face-to-face lecture sections to the online lecture sections using three lecture exams and two activity lab grades. The lead instructor of the class is the principal investigator and has access to this historical information on their password protected office computer which no one else has

access. There will also be statistical cross referencing of this data and comparing it to the students' sub-groups of age, gender, race, total hours earned, country of citizenship, ethnicity, ACT/SAT, major college, and academic course load of same semester. This demographic information will be obtained from the Registrar's office.

C. PARTICIPANTS.

1. Number: 2,952

2. Age(s)/Age Range: 18-65 (?) Any students that are 17 will be excluded from this research.

3. Will children and/or adolescents (individuals 17 and under) be included in this research? ☐Yes X No

D. EXISTING DATASET.

4. Will the research involve collecting raw data from:

a.	Medical Records	☐Yes ☐No
b.	School Records	X Yes ☐No
c.	Prison Records	☐Yes ☐No
d.	Personnel/Employment Records	☐Yes ☐No
e.	Other Records?	☐Yes ☐No

Specify_____

5. Are the data existing at the current time? X Yes ☐No

6. What/who is the source from which the data set was obtained? Registrar's office and the principal investigator's previous classes with test scores and activity lab grades.

7. Is it a public use data file (access is available without need for a passwords, agreement, credentials, etc.)?

Yes X No

4a) *If no,* describe the process you took to gain permission to use the data set, including any requirements, agreements, or credentials necessary to access the data. Attach a letter of cooperation or agreement for the data access.

The research conducted will be investigating three semesters: Fall 2006 and Spring 2007. There will be statistical analysis examining the face-to-face lecture sections to the online lecture sections using the three lecture exams and two activity lab grades. The lead instructor of the class is the principal investigator and has access to this historical information on their password protected office computer which no one else has access. There will also be statistical cross referencing of this data and comparing it to the students' sub-groups of age, gender, race, total hours earned, country of citizenship, ethnicity, ACT/SAT, major college, and academic course load of same semester. This demographic information will be obtained from the Registrar's office. The Registrar's has agreed to this data access, see attached letter.

8. Does the original file contain direct or indirect personal identifiers? (Direct personal identifiers include information such as name, address, telephone number, social security number, identification number, medical record number, license number, photographs, biometric information, etc. Indirect personal identifiers include information such as race, gender, age, zip code, IP address, major, etc.)

Direct: X Yes ☐No

Indirect: X Yes ☐No

If you answered yes to either, please respond to the following:

a) *Describe* the personal identifiers.

The direct personal identifiers are the student university ID numbers. The indirect personal identifiers include age, gender, race, total hours earned, country of citizenship, ethnicity, ACT/SAT, major college, and academic course load of same semester.

b) Will you remove the identifiers from the data set or otherwise maintain and analyze the data in such a manner that individuals cannot be identified either directly or indirectly through identifiers linked to participants? (A de-identified data set refers to original data that has been stripped of all elements that might enable a reasonably informed and determined person to deduce the identity of the participant.)

Yes X No

9. If the data file is *not* de-identified:

a) Justification: Explain why it is necessary to maintain identifiers.

The student identification numbers will be used to match test scores and activity lab grades with demographic information. Once entered in computer and before analysis, the direct personal identifiers will be deleted. No individual statistics will be released. Data, stripped of identifiers, will be kept on principal investigator's password protected office computer which no one else has access.

b) Informed Consent: Describe the consent process.

☐ Consent for use of the data was obtained at the time the data were originally collected. If possible, attach the original consent document.

☐ Consent will be obtained from each participant group.

[IF YOU PLAN TO OBTAIN CONSENT FROM THE PARTICIPANTS, YOU MUST COMPLETE ATTACHMENT A.]

X Waiver of consent is requested. Provide written justification explaining why a waiver of consent is necessary (e.g., the challenges involved in obtaining consent retroactively, the potential emotional or other harms to participants in being contacted, and/or the benefits of the research in light of the potential risks).

All data is an existing data set. The potential risks are minimal. Once entered in computer and before analysis, the direct personal identifiers, stripped of all elements that might enable a reasonably informed and determined person to deduce the identity of the participant, will be deleted.

c) Confidentiality: Explain how you will maintain confidentiality of the data. (Describe how you will protect data against disclosure to the public or to other researchers or non-researchers. Other than members of the research team, explain who will have access to the data [e.g., sponsors, advisors, government agencies], and how long you intend to keep the data.)

There is only one principal investigator. There is a dissertation committee but only one identified key personnel working on data project. The data will be collected and kept in password protected office computer where no one else has access. Data will be de-identified after installing on computer and before analysis.

d) Future Use: Do you anticipate using these data for other studies in the future? ☐Yes X No

If yes, please explain.

APPENDIX F

IRB APPROVAL

Office of Sponsored Programs

University of Northern Iowa

Human Participants Review Committee
UNI Institutional Review Board (IRB)
213 East Bartlett Hall

Lea Ann Shaddox
HPELS
0241

Re: IRB 09-0296

Dear Ms. Shaddox,

Your study, **A Comparison of face-to-face and online instructional delivery methods in large group settings in an undergraduate wellness course**, has been approved by the UNI IRB effective **07/07/10**, following a review performed by **IRB member Helen Harton, Ph.D.** You may begin enrolling participants in your project.

Modifications: If you need to make changes to your study procedures, samples, or sites, you must request approval of the change before continuing with the research. Changes requiring approval are those that may increase the social, emotional, physical, legal, or privacy risks to participants. Your request may be sent by mail or email to the IRB Administrator.

Problems and Adverse Events: If during the study you observe any problems or events pertaining to participation in your study that are *serious* and *unexpected* (e.g., you did not include them in your IRB materials as a potential risk), you must report this to the IRB within 10 days. Examples include unexpected injury or emotional stress, missteps in the consent documentation, or breaches of confidentiality. You may send this information by mail or email to the IRB Administrator.

Expiration Date: Your study is **Exempt from continuing review**.

Closure: Your study is Exempt from standard reporting and you do not need to submit a Project Closure form.

Forms: Information and all IRB forms are available online at http://www.uni.edu/osp/forms-documents#IRB

If you have any questions about Human Participants Review policies or procedures, please contact me at 319.273.6148 or at anita.gordon@uni.edu. Best wishes for your project success.

Sincerely,

Anita M. Gordon

Anita M. Gordon, MSW
IRB Administrator

Cc: Lynn Nielsen, Faculty Adviser

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