A COMPARATIVE STUDY OF VIRTUAL HIGH SCHOOL INSTRUCTION VERSUS TRADITIONAL INSTRUCTION OF HIGH SCHOOL STUDENT OUTCOMES AND ATTITUDES IN PHYSICAL EDUCATION

by

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Abstract

This study is a comparative study of virtual high school instruction vs. traditional face-to-face instruction of high school student performance and attitudes in physical education. This study was designed to compare the performance outcomes and course satisfaction of face-to-face classroom-based instruction and online instruction of a Personal Fitness course. The population of this study included 24 students enrolled in an online physical education class and 36 students in a face-to-face physical education class at two high schools in Atlanta, Georgia. The results of the study indicated that, the online physical education students improved effectively with regard to physical performance overall, especially in upper body strength. Additionally, the sample of face-to-face students indicated that 80.7% fell into a “healthy zone” at the end of the course. Course satisfaction between the two groups was not statistically significant.
Dedication

This study is dedicated to the memory of my African and European ancestors, my parents, Lourenza H. Futrell and Winsor H. Futrell, Aunt Katie and my brother, Abraham. I would also like to dedicate this study to my brother, Willie, my sisters, Harriet and Ella, my daughter, Jestein, and my loving and supportive wife, Belinda.
Acknowledgments

I would like to first thank my Lord and savior, Jesus Christ, from whom all things are possible. It is by his grace and mercy, that I have come this far.

Born in rural North Carolina, into a family of very meager means, it was hard for me to phantom earning a doctorate degree. My mother had only a seventh-grade education, but inspired me to pursue a formal education. Her encouraging spirit has been a major influence in all of my endeavors.

My brother Abraham (aka John Henry) had a major influence on my education. He insisted that I attend college, and pursue education with vigor, and to never stop learning. Abraham was the first PhD candidate in our family but died before completing his studies. He not only inspired me to pursue a college degree, he enrolled me in Upward Bound at Rutgers when I was 14 years old. I honor his memory by picking up the torch and running as far I can.

My sister, Ella loaned me $40 in 1991 to have my transcripts evaluated to return to college. As I reflect, that loan changed my whole life. Ella, your $40 has brought me a mighty long way.

My brother Willie co-signed for a large loan for me to finish undergraduate studies. He had one request, do not let me down. I hope I did you proud.

My sister Harriet always made me the best care packages while I was in undergraduate studies.

My Aunt Katie once rallied her sisters to make sure that their nephew had the food, clothing, and toiletries to last an entire school year. That act of kindness taught me to help the next one.
My daughter, Jestein taught me a lesson in following through with your dreams. Jestein endured many setbacks, but continued to keep her eyes on the prize. We are so proud of you.

Lastly, I can never thank my wife Belinda for putting up with me for the past five years. She is definitely my soul mate.
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CHAPTER 1. INTRODUCTION

Introduction to the Problem

Over the last two decades, American schools have had an overwhelming growth with distance learning and the delivery of education. Today’s high school students enjoy the convenience of having their subject matter delivered in a variety of ways including satellite, microwave, cable, broadcast television and Internet-based technologies. No longer confined in a classroom of brick and mortar, students are now virtually linked to the Internet, that allows them to participate in learning activities from anywhere in the world any given time.

This comparative study will examine online and traditional educational outcomes and attitudes in traditional health and physical education classes. This research will offer new data to the Health and Physical Education Department of Fulton County School District. During the 2006-2007 school year, the nearly 90,000 students attended classes in 53 elementary schools, 18 middle schools, 12 high schools, two open campus high schools, and five charter schools. Like most schools in America, Fulton County Schools in Atlanta, Georgia have an array of problems including solving overcrowding, schedule conflicts, Advanced Placement (AP) courses, disciplinary actions, and home schooling. Each school year, Fulton County School’s Leadership Team develops plans and strategies for addressing these issues and providing students with the best education available.

Taking into consideration Fulton County’s budget and time constraints, a few
administrators found the idea of planning and implementing an online program intriguing. The Virtual Campus learning is one strategy that can help Fulton County School’s overcome these challenges;

Background of the Study

According to the National Center for Education Statistics, during the 2002-2003 school year, some 328,000 public school students were enrolled in distance education courses. Of those enrolled 68% were in high schools, 29% in combined or un-graded schools, 2% in middle or junior high schools, and 1% in elementary schools. These statistics clearly show that nearly a third of the nation’s school districts were offering online courses (NCES, 2002).

According to Stadtlander (1998), the classroom environment has changed significantly during the 20th century. Classrooms are evolving from the one-room rural schoolhouse constructed of wood, bricks, and mortar to learning opportunities available in an online virtual cyberspace environment in many cases. Traditionally, the learning environment was a face-to-face interaction among students and teachers at a physical site. Then in the late 19th century, distance education by means of correspondence emerged (Stadtlander, 1998).

As early as 1873, Anna Eliot Ticknor, of a Boston-based society, encouraged study at home. The Society to Encourage Studies at Home attracted more than 10,000 students in 24 years (Watkins, 1991). Students in early correspondence courses waited on materials through the mail and responded to teachers monthly. The materials offered
guided readings, frequent tests and provided learners with a formal structure for pursuing a learning goal.

Beginning in the 1930s, radio was used simultaneously to bring courses to school students and to help teachers learn progressive Deweyan methods of teaching (Bianchi, 2002), in what might have been among the earliest professional development school models. During the same period in the 1930s, experimental television teaching programs were produced at the University of Iowa, Purdue University, and Kansas State College. Though colleges attempted to produce great programming, it was not until the 1950s that college credit courses were offered via broadcast television. Western Reserve University was the first to offer continuous series of such courses beginning in 1951 (Buckland & Dye, 1991).

In 1957 the Soviet Union successfully orbited a space satellite Sputnik; proving how far behind American students were in mathematics and science. In 1958 Congress passed the National Defense Education Act (NDEA), which appropriated federal funds to improve instruction in those areas considered crucial to national defense and security. The programs authorized under NDEA helped the United States (U.S.) to improve rapidly in math, science, engineering and technology, and would inevitably improve face-to-face and distance learning education (Matthews, 1998). This legislation had a huge positive impact on the quality of U.S. education, especially in high schools and in the curriculum areas of math, science and foreign languages.

compensation, and the many interrelationships between teachers and pupils, parents, communities and governmental agencies” (Lieberman, 1960, p. 39). During the 1960s and 1970s, a number of research studies examined the effectiveness of refinement in technology related to the use of tele-conferencing as a means of face-to-face instruction with students (Reiser, 1987). This method of instruction was referred to as computer-mediated communication (CMC). This methodology related to computer-assisted instruction allowed a number of individuals to talk at the same time. In addition, CMC allowed for equal participation (Stadtlander, 1998). Then Interactive television (ITV), a format for synchronous classes held over an interactive network emerged. In this format, the instructor could be in a different location or classroom, but the class was live and interactive. The instructor could see and hear the students at the remote site and vice versa using technology. The result was that students at a remote site could join a class being taught on campus. The advantage of this format was more students from remote areas could participate in classes without the cost and time of travel. The concern was the classes must be conducted at a location that had the appropriate technology.

Initially, technology was a strategy to attract students. In 2001, “more than 1,100 institutions of higher education in the United States offered courses online” (Elvers, Polzella, & Graetz, 2003, p. 159). Today almost every school either has online courses available or is investigating implementing them. Harvard, Vanderbilt, MIT, and a number of Ivy League schools have launched initiatives on online learning. Enrollment in online courses continues to grow. The concept of a site compass with face-to-face participation has evolved to an “individual remote participant” model (Benigno & Trentin, 2000, p. 259).
Students need not go beyond their computer keyboards to gain knowledge of other nations and cultures, to work with peers from other countries and, in the process, to gain insights into how persons from other lands think about the world. Numerous resources have been identified to connect students in countries around the world.

Statement of the Problem

Technology is continuously changing and improving the way that lessons are delivered in the classroom. Delivery system for curriculum of physical education has changed because of the availability of more distance education opportunities. Health and physical education is delivered both in a traditional format and online in Fulton County Schools, in Atlanta, Georgia. It is not known in the Fulton County School System if high school student outcomes and attitudes in traditional health and physical education classes are the same as students in the Virtual High School (VHS). According to Trust for America’s Health, Georgia holds the six highest level of adult obesity in the nation at 25.2%, the 16th highest overweight levels of high school students at 11.1%, and the 25th highest levels of low income children ages 2-5 at 11.9% (TFAH Obesity Report, 2007). The Georgia Department of Education reports that over the 1.5 million children in Georgia attend school, half of them are in secondary education. Students in Georgia receive six hours of instructional time per day and attend school 180 days per year (Ga DOE Enrollment Report, 2006).

The Georgia Department of Education’s standards for health education aim to increase students’ knowledge and skills in disease prevention, family living, growth and development, mental health, nutrition, personal health, and safety. Educational programs
play a key role in improving health outcomes and quality of life. Objective 7-2 of Healthy People 2010 (5), aims to increase the quality, availability and effectiveness of educational and community-based programs designed to prevent disease and improve health and quality of life. High school physical education programs focus on personal fitness with opportunities to explore a variety of individual healthy lifestyles and how to maintain them for a lifetime (Georgia DOE, Health Report, 2006).

School policies and programs, including classroom training, can help school-aged adolescents establish behaviors that promote and maintain lifelong health and prevent health-risk behaviors among youth. School health education, policies, and programs should focus on reducing behaviors that place youth at risk for important health problems, which include sedentary lifestyles; tobacco use; improper nutrition; intentional and unintentional injuries; and sexual behaviors that increase risk for human immunodeficiency virus (HIV) infection, other sexually transmitted diseases (STDs) and unintended pregnancies (Georgia Department of Human Resources, 2006).

This study will provide valuable data in the assessment of how the Fulton County School System’s students are receiving instruction and their attitudes toward the delivery. The Virtual Campus in Fulton County School System presents a unique opportunity to help improve the health status of students. Students in the Virtual Campus take advantage on receiving the same instruction on health issues and prescribed physical activities.

According to the National Association for Sports and Physical education (NAPSE), some physical education teachers have embraced online courses, an equal number are not persuaded of such approaches. Online physical education is neither
fundamentally good nor bad, and the value of any new educational technology or pedagogical strategy must always introduce the question of learning (NAPSE, 2006).

According to NAPSE, the empirical data concerning online and distance learning in the field of education (Grades 7-12), found no significant differences in learning when comparing face-to-face learning with online approaches (McIsaac & Gunawardena, 1996; Russell, 2001). Likewise, there are no empirical studies in physical education comparing face-to-face learning with online approaches (NAPSE, 2006). NAPSE guidelines suggest that quality physical education programs must include opportunity to learn, meaningful content, appropriate instruction, and student and program assessment (NASPE, 2004a, 2004b, 2004c).

Purpose of the Study

The purpose of this study is to investigate and identify whether high school students who participate in Fulton County Schools health and physical education have the same outcomes in traditional and online delivery. Additionally, the study will explore the relationship between students’ academic fitness skills as defined by the pretest and posttest scores in physical and health education.

Personal fitness is offered in both online and traditional face-to-face delivery methods. The Physical Education Department offers personal fitness throughout Fulton School to more than 90,000 students. Fulton County Schools have an array of problems including solving overcrowding, schedule conflicts, AP courses, disciplinary actions, and home schooling. To meet the demand in physical education, the physical education
department added online physical education courses. There is no evidence to suggest which delivery is more effective in terms of learning outcomes and course satisfaction.

Rationale

The rationale for this study reflects the need to investigate the effectiveness of performance outcomes in physical education programs in an online environment. Since the initiation of online courses in various academic areas, as explained by Lim, Kim, Chen, and Ryder (2008) and the need to examine how physical education as discussed by NASPE (2004) will assist children in improving their health and well being as an overall result of increasing physical activity. It is apparent that a study would be of benefit to explore and consider whether online physical education courses compared with face-to-face course could be more efficient for high school students.

Nicholas and Ng (2009) have researched the number of virtual schools and the theories behind the increase in variability of online learning that is prevalent in education today. With the advent of restructuring the way education is delivered, it is apparent that using Vygotsky’s (1978) theories of constructivist learning as well as the recent work of Freire’s (2005) explanation of children’s learning as becoming critical, the online environment has become a breeding ground for more universal self directed learning approaches. Nicholas and Ng (2009) have reported that the versatility of online learning has presented students with many opportunities to be successful in interacting and learning with both professors/teacher, as well as peers. Therefore, a study in the area of physical education as a non academic subject may present a new dimension in the online environment to promote more online classes in physical education or physical fitness.
Research Questions

The following research questions frame this study.

R$_1$: What effect does the online learning environment have on online high school physical education fitness scores?

R$_2$: What effect does the learning environment (online vs. face-to-face) have on high school physical education course satisfaction?

R$_3$: Does there appear to be a thematic relationship between online high school physical education students’ fitness scores and their course satisfaction?

Significance of the Study

This study is significant to the body of research because of the physical health of our children. As a result of this study, educators may have an alternative to instructing physical education that may be more beneficial to students. This study will also help to determine if online physical education students participated more and have a greater academic performance compared with students in face-to-face physical education classes. Fulton County’s Virtual Campus has been in existence since the fall of 2005 with no formalized data available to support the continued use of this program in this district. Results of this study will provide the students’ attitudes and presumptions of their program delivery.

Definition of Terms

The following terms will be used operationally throughout this study:

*Activitygram. Activitygram is a physical activity assessment that lets students take charge of their own program. Activitygram keeps track of the intensity level of the*
activities students’ record, assesses the cumulative impact of those activities, and
compares the results to guidelines in the activity pyramid. Fitnessgram and Activitygram
reports help educate students by showing them how much of which physical activities will
help reach their physical activity goals.

*Body fat.* Body fat or Adipose tissue is a normal constituent of the human body
that serves the important function of storing energy as fat for metabolic demands.

*Descriptive study.* Descriptive study is used to obtain information concerning the
current status of the phenomena to describe "what exists" with respect to variables or
conditions in a situation. The descriptive study may range from the survey which
describes the status quo, a correlation study which investigates the relationship between
variables, to developmental studies.

*Face-to-face learning.* Face-to-face learning is done when students receive their
instruction in a brick and mortar classroom from a teacher.

*Fitnessgram.* Fitnessgram is a computerized tool that enables schools to perform
quality fitness assessments, and physical activity assessments of school aged boys and
girls. Fitnessgram includes software, a test manual, and related ancillaries, including a
heart rate monitor (Stokes and Schultz, 2002). Fitnessgram assessment module contains a
complete battery of health-related fitness items that are scored using criterion-referenced
standards. Fitnessgram is the first health-related fitness test to use such standards, which
are age and gender specific and based on how fit children need to be for good health.

*Heart rate monitor.* Heart rate monitors are devices that allow a user to measure
their heart rate in real time. It usually consists of two elements: a chest strap transmitter
and a wrist receiver (which usually doubles as a watch). Strapless heart rate monitors are
available as well, but lack some of the functionality of the original design. Advanced models additionally measure heart rate variability to assess a user's fitness.

*Likert Scale.* Likert scale is a type of psychometric response scale often used in questionnaires, and is the most widely used scale in survey research. Respondents specify their level of agreement to a statement.

*Obesity.* Obesity refers to an increase in total body fat. The easiest and most widely accepted method of determining whether you are obese is by measuring your body mass.

*Online learning.* Online learning is instruction and learning by way of the Internet.

*Physical fitness.* Physical Fitness refers to the ability to attain certain physical attributes. The most commonly accepted definition of physical fitness of well-being that affords you to: (a) perform daily activities with vigor, (b) reduce risk of health problems, and (c) establish a fitness base for participation in a variety of physical activities (Stokes, and Schultz, 2002).

*Quantitative methodology.* Quantitative is based on a volume or numbers based research discipline that statistically measures customer attitudes, behavior, and performance.

*Wellness.* Wellness is a choice to assume responsibility for the quality of your life. It begins with a conscious decision to shape a healthy lifestyle. Wellness is the dynamic process of becoming aware of, taking responsibility for, and making choices that directly contribute to one's well being and that of the common good. It is the integration of body, mind and spirit and the ongoing development of one's own meaning in life.
Zoomerang. Zoomerang is a questionnaire with a high-performance online survey for higher participation, faster response and easy analysis.

Assumptions

Several assumptions were taken into consideration as it relates to this study:

1. This study assumes that the students enrolled in both the face-to-face courses and the online courses are not engaging in academic dishonesty. The students enrolled in the study are those who actually signed a fitness contract and do not engage in any academically dishonest behaviors.

2. This study assumes that the content in both the face-to-face courses and the online course will be conducted by the intended participant. Many of the online student activities are purely based on the belief that the student is reporting accurate data from a heart monitor.

Limitations

Several factors were expected to limit the capacity to generalize the results:

1. This study will be limited to health and physical students enrolled at Fulton County Schools System, Atlanta, Georgia.

2. The sample size will be limited to include 50-60 students each in online and face-to-face classrooms. Twenty-five to 30 students will be enrolled in an online course, and 25-30 students will be enrolled in a face-to-face course.

Nature of the Study

This study will be conducted using quantitative methodology, using descriptive research through a Likert scale questionnaire, surveying students enrolled in both online and face-to-face courses at the high school level. The study will compare VHS instruction and traditional instruction of high school student outcomes and attitudes in health and