THE EFFECT OF A HIGH AUTONOMY TEACHING INTERVENTION

ON FITNESS OUTCOMES IN FIFTH GRADE PHYSICAL EDUCATION

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THE EFFECT OF A HIGH AUTONOMY TEACHING INTERVENTION ON FITNESS OUTCOMES IN FIFTH GRADE PHYSICAL EDUCATION

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THE EFFECT OF A HIGH AUTONOMY TEACHING INTERVENTION ON

FITNESS OUTCOMES IN FIFTH GRADE PHYSICAL EDUCATION

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VITA

J. Brandon Sluder, son of Eric Sluder and Terry Sluder, was born September 10, 1976 in Walhalla, South Carolina. He attended Walhalla High School in Walhalla, South Carolina where he graduated in May, 1995. After high school he attended the University of South Carolina where he graduated in May of 2001 with a Bachelor of Science degree (Physical Education). He then entered the graduate program at Auburn University in August of 2001 and received his Master of Science degree in Health and Human Performance Pedagogy in May of 2003. Following graduation he worked at The University of Alabama in Huntsville and at The University of Alabama at Birmingham from August 2003 to May 2005. He returned to Auburn University in May of 2005 to pursue a Doctor of Philosophy degree in Kinesiology Pedagogy.

DISSERTATION ABSTRACT

THE EFFECT OF A HIGH AUTONOMY TEACHING INTERVENTION ON FITNESS OUTCOMES IN FIFTH GRADE PHYSICAL EDUCATION

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The purpose of this investigation was to examine the difference between two different teaching conditions when teaching a fitness unit. The current study investigates the difference between a high autonomy teaching condition and a teacher directed teaching condition. Specifically, the purposes are to investigate three areas, (a) What is the difference in improvement on the pacer fitness test between the two teaching models. (b) What is the increase in the proportion of students meeting the healthy fitness standard after the program. (c) What is the difference in total active participation between the two

teaching models. The participants in this study were comprised of 120 (60 students in each of the two teaching conditions) fifth grade students enrolled in physical education classes in the local school district. The study was conducted at 3 different schools in the district using a total of 6 classes of 20 participants each (3 classes were high autonomy and 3 were teacher directed).

Pre and Post PACER fitness test were conducted to measure fitness level. Pedometers were worn to measure total activity during each class. The results of this study indicate that a high autonomy teaching model is not significantly different than a traditional teacher directed approach.

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Style manual or journal used Publication Manual of the American Psychological Association (5th edition)

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CHAPTER I

INTRODUCTION

Promoting physical activity and physically active lifestyles among children and adults represents an important goal for public health in this country, and school physical education is recognized as an important part of this journey (Xiang, McBride, & Bruene, 2006). Regular physical activity provides numerous health benefits-from leaner bodies and lower blood pressure to improved mental health and cognitive functioning. Despite our knowledge of these facts, Americans are becoming more sedentary and more obese each year (Mokdad et al., 1999).

The role of fitness in physical education programs has never been more important than it is today. With the rapid growth of childhood obesity and other problems, physical education teachers have an important obligation to improving the health of America's youth. A report from the Centers for Disease Control and Prevention (CDC) indicates that "61.5% of children aged 9-13 years do not participate in any organized physical activity during their nonschool hours and that 22.6% do not engage in any free-time physical activity" (CDC, 2002, p. 785).

Over the last decade there has been a large amount of research indicating the benefits of daily exercise (Mokdad et al., 1999; Roland, 2007; Warburton, Nicol, & Bredin, 2006). That said, why are children not engaging in exercises that will improve their fitness? Many children find fitness boring, arduous, and routine. Elementary age children have stated they preferred skill-related over health-related activities (McKenzie,

Alcaraz & Sallis, 1994). We know that physical educators can “do fitness to children” through traditional teaching methods. However, there is little if any transfer from classroom fitness to outside- of-class activity.

Teachers need to experiment with new teaching strategies that will motivate the learner. “If educators are serious about the need for enhancing student motivation and engagement in learning, they need to focus on classroom environment and examine how the classroom can be structured to optimize student motivation” (Brophy, p. 23 1983). By shifting ownership and responsibility to the students they can take charge of their own individual fitness. Incorporating a high autonomy teaching climate into a fitness based unit can accomplish just that.

School physical education programs may be the only institutions that provide all children opportunities to develop lifetime physical activity patterns (Iverson, Fielding, Crow, & Christenson, 1985; Sallis & McKenzie, 1991). Physical education specialists, given adequate time and facilities, have the potential to influence public health by promoting student participation in physical activity for a lifetime. Studies have indicated that the physical activity patterns in adulthood are strongly correlated to physical activity habits established in childhood (Dennison, Straus, Mellits, & Charney, 1988).

Purpose

The purpose of this investigation was to examine the difference in health related fitness gains between a high autonomy teaching climate and a traditional teaching climate. Specifically, the purposes were to investigate three areas in order to answer these questions; (a) What is the difference in improvement on the PACER fitness test between the two teaching models? (b) What is the increase in the proportion of students meeting

the healthy fitness standard after the program? (c) What is the difference in total active participation between the two teaching models? It was hypothesized that the high autonomy teaching approach would show significant fitness gains over the traditional direct teaching approach.

Limitations

Limitations in this study include student absences and familiarity with the PACER fitness test. Data from a student missing more than four days of the twelve lesson unit will not be used. Many students have never taken the Physical Best FITNESSGRAM PACER fitness test. After taking the test once it is possible their scores could slightly improve on the second test due to the familiarity with the test. While all of the participants are fifth graders, two of the schools are elementary schools and the other school is a middle school, class hierarchy could have an effect on their performance. All participants are from the same school district.

Delimitations

Delimitations in this study include the parameters set by the two teachers in both of the two teaching models. In the interest of time, all obstacle courses designed, regardless of teaching models, will have to be completed in less than one minute by each student. In both models all teams will be made approximately equal by placing students in teams based on their pre- PACER fitness test score.

Glossary of Terms

High Autonomy – high level of student choice and responsibility (Siedentop et al, 2004).

Teacher Directed (Direct Style) – the most teacher controlled approach to teaching, teacher guides the pace and direction of the class (Pangrazi, 2007).

PACER – a 20 meter shuttle run test that measures aerobic fitness and can be administered indoors (Pangrazi, 2007).

Pedometer – a small electronic device that attaches to the hip and measures step count (Pangrazi, 2007).

Aerobic Fitness - refers to endurance, or the ability to sustain work for prolonged periods (Pangrazi, 2007).

Physical Activity –Bodily movement that is produced by the contraction of skeletal muscle and that substantially increases energy expenditure (Pangrazi, 2007).

Physical Education – education through movement (Pangrazi, 2007).

Obstacle Course – is a set distance with a beginning and end with various obstacles in between the start and end points that the participant must negotiate (Hastie et al, 2007).

Manipulative Skills – skills in which a chid handles an object with hands, feet, or other body parts (Pangrazi, 2007).

Event Cycle – this is a three day cycle where days 1 and 2 are pratice days and day 3 is a competition day (Hastie et al, 2007).

Active Exploration – when learners move while practing with equipment which helps them develop ideas about practice (Hastie et al, 2007).

CHAPTER II

REVIEW OF THE LITERATURE

History of role of fitness in physical education

Fitness has played a major role in physical education throughout history. In the early 1800's physical education programs consisted of gymnastics. Pioneers in the field at that time believed that through gymnastics their military would grow stronger. One such pioneer in this era was Friedrich Ludwig Jahn. Jahn was a German educator and patriot that sought to develop fitness in German youth. Jahn's long term goal was the unification of all German people through this movement. Some of his teaching methods included having his students climb trees, jump over ditches, run, and throw stones on half-holiday excursions from classes (Lumpkin, 1997). Jahn eventually established an outdoor exercise area known as a turnplatz where his students, who became known as turners, trained using balance beams, climbing ropes and ladders, high-jumping standards, horizontal bars, parallel bars, pole-vaulting standards, broad-jumping pits, vaulting horses, a figure eight-shaped track, and a wrestling ring (Lumpkin, 1997). Jahn's influence eventually found its way to the United States by way of Charles Beck, Charles Follen, and Francis Lieber, who were all followers of Jahn.

During about the same time period that Jahn was beginning his form of gymnastics in Germany a Danish teacher named Franz Nachtegall was starting his form of gymnastics in Denmark. Both Nachtegall and Jahn's teachings were rooted in the readings of Johann GutsMuths, who later would be known by many as the grandfather of physical education. Nachtegall was responsible for opening the first institution for

physical training in Denmark. The equipment employed by Nachtegall included hanging ladders, climbing poles, balance beams, vaulting horses, and rope ladders (Mechikoff & Estes, 2006). Nachtegall's popularity soon grew and a law was passed so that grade schools, when possible, would incorporate Nactegall's physical education into their program.

Nachtegall's teaching inspired a Swedish scholar by the name of Per Henrik Ling. Ling also developed a style of gymnastics that differed from Jahn and Nachtegall. Ling had a more free approach to his teaching and did not use implements such as dumbbells or wands. Like Germany and Denmark during this time period, Sweden was also interested in physical education for military purposes only. Like Jahn and Nachtegall, Ling's popularity grew and Sweden adopted his teaching and formed a training center. Unlike others, Ling's interest in fitness was not just for military purposes. Ling began taking fencing lessons and noticed that fencing and the associated exercises had a wonderfully therapeutic effect on his arthritic arm; thus began his lifelong interest in the medical effects of exercise (Mechikoff & Estes, 2006). Ling grounded his work in the medical sciences field. He was the first teacher to use gymnastics as a means to restore health to those who suffered medical problems.

The Swedish, German, and Danish influence eventually made its way to the United States. Many reformers in the United States focused on bettering conditions of life. They focused on a myriad of problems; prison conditions, alcoholism, the treatment of the insane, hospital conditions, and children's illnesses. Reformers' concern about people's health and fitness led to physical education in schools (Spears & Swanson, 1988). The majority of the first programs in the United States looked similar to that of

those that were developed in Germany, Sweden, and Denmark. The European legacy of athletics, gymnastics, and sports laid the foundation for physical education and sport programs in the United States (Lumpkin, 1997). Many professional preparation institutions started forming in the United States called normal schools. These college level schools were rooted heavily in gymnastics and physical training.

At this time the focus had shifted from just building strong military personnel to the general public's health and fitness as well. Formal physical education programs emerged in the late 1800's when the political policies of democracy signaled the need for physically fit citizen armies (Glassford, 1992). The advocates of school physical activities, few though they were, were unanimous in their conviction regarding the healthful benefits of exercise and sport (Spears & Swanson, 1988). Two of the major contributors to implementing fitness in U.S. schools were Catherine Beecher and Dr. William Alcott. Both Alcott and Beecher stressed the importance of physical activity not only for males, but females as well (Spears & Swanson, 1988). At this time most programs were either German or Swedish or a combination of both. Some physical educators were developing systems that did not resemble either one. Beecher was one of those who branched out and developed a system of her own called calisthenics. Most of Beecher's efforts were devoted to promoting health and exercise for women (Mechikoff & Estes, 2006). Beecher believed that through fitness a woman's body could be changed and transformed into something strong and beautiful. She also advocated the use of fitness for bodily correctional purposes such as spinal curvature. Her system was that of light exercises using little to no weight.

Physical education drew heavily on medicine to establish its body of knowledge (Mechikoff & Estes, 2006). The majority of directors and teachers by the end of the 19th century held degrees in the field of medicine. In the early 1900's interest in exercise began to increase for a variety of reasons: changing concepts of work and leisure, the desire of individuals to improve themselves, popular literature that stressed the relationship between health and exercise, an expanding body of knowledge about human physiology, and the influence of evolutionary theory on concepts of race regeneration (Mechikoff & Estes, 2006). Exercise was also seen as a way to improve oneself in sports and athletics.

Due to the health concerns European and American physical education began to grow. In the early 20th century physical education was required in grade schools all over. This brought about a large demand for physical education teachers to fill those needs. Unfortunately there were not enough teachers that actually had medical backgrounds to fill the positions. This sparked the philosophical shift from physical education moving from medical into the education field. During this time more teacher preparation programs were developed and rooted more in education than medicine. The American physical education began to incorporate the "new physical education" including exercise, play, games, and dance. The learning of social values could be accomplished not only through reading, writing and arithmetic, but also through art, drama, music, and play. These beliefs led to a uniquely American form of physical education (Spears & Swanson, 1988). With the growing popularity of sports many college physical education programs replaced gymnastics with sport. Many schools that had programs began to look similar to those of nearby colleges and universities. High school physical education in the twenties

and thirties is difficult to describe in generalities. Some cities and towns had excellent programs, others mediocre to poor programs, and many had no programs at all (Spears & Swanson, 1988).

One of the architects of the "new physical education" was a teacher by the name of Clark Hetherington (Mechikoff & Estes, 2006). Hetherington believed that exercise was necessary for children's physical development. Large muscle movement through play, games, dance, and sport were more beneficial than that of gymnastics. He viewed gymnastics as boring and would only use gymnastics when weather confined his students indoors. Eventually, almost all physical educators came to enthusiastically embrace play, games, dance, and sport as the primary modes of physical education (Mechikoff & Estes, 2006).

Dr. Thomas K. Cureton drew attention to fitness in the 1940's through research on the benefits of regular exercise and the role of fitness in improving health. He also established one of the first physical fitness research labs in the country at the University of Illinois Urbana-Champaign in 1944. In the 1950's one of those fitness pioneers, Jack LaLanne, started to bring fitness to the masses through his popular television series, "The Jack LaLanne Show", which aired from 1951-1984 (Wargo, 2007).

Many changes in the United States were beginning to take place in the middle to late 20th century. In the mid 1950's the Kraus-Weber report indicated that American children were less fit than European children. This report drew the attention of the President of the United States. In 1956 President Eisenhower hosted the President's conference on the Fitness of American Youth at the United States Navel Academy. One month after this meeting President Eisenhower established the President's Council on

Youth Fitness. The purpose of the new agency was to educate, stimulate, motivate, and encourage local communities and individual Americans to promote and adopt active lifestyles (Wargo, 2007). Public and official concern resulted in a temporary emphasis on physical fitness-producing activities in school programs. This led to the concept of "movement education" (Spears & Swanson, 1988). This type of teaching encouraged children to move around and explore their environment and different ways of moving.

In 1971 Dr. Harrison Clarke was the first to actually define the components of physical fitness (Hartman, 2001). The early components of fitness were muscular strength, muscular endurance, and circulatory-respiratory endurance. The majority of Dr. Clarke's work was on the relationships between physical fitness, health, and mental achievement. He strongly believed the mind and body can both benefit from enhanced fitness. The majority of research in the field prior to 1980 was focused on performance or skill-related fitness (Hartman, 2001).

In 1980 AAHPERD redefined fitness to emphasize the health-related components of fitness (Hartman, 2001). The new definition differed from Dr. Clarke's definition. The new health-related fitness components were defined as cardiorespiratory fitness, muscular strength and endurance, flexibility, and body composition (Physical Best, 1999).

- Cardiorespiratory Fitness – Cardio respiratory endurance involves the ability of the heart and lungs to supply oxygen to the working muscles for an extended period of time.
- Muscular Strength and Endurance – Muscular strength is a measure of the greatest force that can be produced by a muscle or group of muscles. Muscular endurance

is the ability to contract a muscle or group of muscles repeatedly without incurring fatigue.

- Flexibility – Flexibility is the ability of a joint to move freely in every direction or, more specifically, through a full and normal range of motion.
- Body Composition – Body composition refers to the quality or makeup of total body mass.

The importance of fitness in the physical education curriculum has been reinforced over the last three decades. A report of the Surgeon General (USDHHS, 1996) noted that there is a link between physical activity and health. According to the Surgeon General, "Regular physical activity that is performed on most days of the week reduces the risk of developing or dying from some of the leading causes of illness and death in the United States. Regular physical activity improves health in the following ways:

- Reduces the risk of dying prematurely
- Reduces the risk of dying prematurely from heart disease.
- Reduces the risk of developing diabetes.
- Reduces the risk of developing high blood pressure.
- Helps reduce the risk of developing colon cancer.
- Reduces feelings of depression and anxiety.
- Helps control weight.
- Helps build and maintain healthy bones, muscles, and joints.
- Helps older adults become stronger and better able to move about without falling.
- Promotes psychological well-being."

Healthy people 2010 (USDHHS, 2000) is a public health policy that identified strategies to promote lifelong participation in sports and physical activity. Recommendations are as follows:

1. Include education for parents and guardians as part of youth physical activity promotion initiatives.
2. Ensure schools have certified physical education specialists; appropriate class size; and the facilities, equipment, and supplies needed to deliver quality daily physical education for all children in grades K-12.
3. Publicize and disseminate tools to help schools improve their physical education and physical activity programs.
4. Enable state education and health departments to work together to help schools implement quality, daily physical education and physical activity programs.
5. Enable more after-school-care programs to provide regular opportunities for active, physical play.
6. Help provide access to community sports and recreation programs for all young people.
7. Enable youth sports and recreation programs to provide coaches and recreation-program staff with the training required to offer developmentally appropriate-program staff with the training required to offer developmentally appropriate, safe, and enjoyable physical activity experiences for young people.
8. Enable communities to develop and maintain safe sidewalks, crosswalks, bicycle paths, trails, parks, and recreation facilities.

9. Implement ongoing media campaign to promote physical education as an important component of quality education and long-term health.
10. Monitor youth physical activity, physical fitness, and school and community physical activity programs in the nation and each state.

Regular physical activity provides numerous health benefits; from leaner bodies and lower blood pressure to improved mental health and cognitive functioning. Even though we know these facts, however, Americans are becoming more sedentary and more obese each year (Mokdad et al., 1999). Promoting physical activity and physically active lifestyles among children and adults represents an important goal for public health in this country, and school physical education is recognized as an important part of this journey (Xiang, McBride, & Bruene, 2006).

History of Fitness Testing in Physical Education

The first actual fitness testing derived from anthropometric work that began in the 19th century. Anthropometry was the study of the measurements of body segments, girths, and lengths. Anthropometry was used by many different disciplines, particularly anthropology, to prove or disprove all kinds of theories on the nature of humans (Mechikoff & Estes, 2006). In the early 1900's Dudley Sargent invented tests that evaluated strength. Around the same time motor ability and physical efficiency tests were being created. The first of these tests were conducted in New York, New Jersey, and Michigan in 1914. Several other universities developed tests to gauge physical ability. The California Decathlon Test was implemented in 1918 under the supervision of Clark Hetherington. Most of these tests addressed such skills as running, jumping, throwing,

and climbing. Some included proficiency in such gymnastic skills as marching, juggling Indian clubs, vaulting, and rope climbing (Mechikoff & Estes, 2006).

In 1923 a study was conducted by M.H. Landis to see if physical achievement was related to low intellect. The study used four physical tests to measure physical abilitiy: (1) the 100-yard dash, (2) the running broad jump, (3) the baseball throw, and (4) the fence climb. The Ohio State University intelligence test was used to determine mental capacity. No significant correlation was ever found between mental ability and physical ability (Mechikoff & Estes, 2006).

In the 1920's a man by the name of Frederick Rand Rogers picked up where Dudley Sargent left off with strength training. Rogers believed that strength was a very important indicator of measuring physical ability. Through his work he developed a strength index. The strength index was very basic and was represented by a single digit. Rogers not only believed strength was an indicator of physical ability, but health and progress as well. Through statistical procedures he later converted his strength index into an athletic index that was a measure of ones total athletic ability (Mechikoff & Estes, 2006). The two things that Rodgers did not include in his athletic index were endurance and intelligence which he admitted were short comings of his index.

In the 1950's fitness assessments had slightly became more sophisticated. These assessments included a shuttle run, 600 yard walk/run, 50 yard dash, softball throw for distance, single-leg balance, flexed arm hang, pushups and sit-ups. Many of these items had military significance, that is, the pull-up (pulling yourself into a boat) and softball throw (chucking hand grenades) (Hartman, 2001). In 1958 AAHPERD published the first survey on American youth. This survey showed children's results on many of the

performance related skills mentioned above. Even though these fitness tests were being modified they were still mainly focused on skill related components until 1980 (Hartman, 2001).

After the Eisenhower administration President Kennedy continued to move forward stressing the importance of fitness for Americans. This call for Americans to become more fit led to more research involving fitness. In the early 1960's Dr. Henry Taylor conducted a study on physical fitness and heart disease using U.S. Railway workers as participants. The findings of this study and other epidemiological investigations are evidence of a shift in the way physical activity and fitness were viewed in relation to health. Evidence suggested that physical or fitness-enhancing activities were not only necessary to improve performance, but that certain types or degrees of physical activity produced health benefits as well (Wargo, 2007).

As a health-related definition of fitness gradually evolved, performance-related measures were removed from the test in order to assess measures that were predictive of health (e.g., cardiovascular fitness, flexibility, muscular strength and endurance) (Wargo, 2007). In 1980 AAHPERD redefined fitness to emphasize the health-related components of fitness (Hartman, 2001). After 30 years of misguided fitness testing practice (Seefeldt & Vogel, 1989), health-related fitness components became central to youth fitness test programs in the 1980's (Safrit, 1995). As the focus of health-related physical education increased, promoting physical activity leading to the development of physical fitness becomes an important component of school physical education programs (Keating, 1999).

In 1966 the President's Council on Fitness introduced its first fitness test called the Presidential Physical Fitness Award. This fitness test still exists today and is used in many schools throughout the United States. This fitness test is a norm referenced test that tests students in five events: curl-ups, shuttle run, endurance run/walk, pull-ups, and sit and reach. Each student participant in this fitness test receives one of three different awards. The first award is called the Presidential Physical Fitness Award, and participants who score in the 85th percentile on all five events receive this award. The second award is called the National Physical Fitness Award, and participants who score in the 50th percentile on all five events receive this award. The third award is called the Participant Physical Fitness Award, and any participant that scores below the 50th percentile receives this award.

The major drawback of the Presidential fitness test (hereafter referred to as President's challenge, its current name) is that it is uses norm-referenced standards. Therefore it is not accurate to assume that students with high scores on fitness tests are necessarily physically fit. Going and Williams (1989) noted that it is more appropriate to employ criterion-referenced standards to assess student performance, since norm-referenced standards are not considered useful in evaluating health fitness.

In the 1980's the Cooper Institute for Aerobic Research (CIAR) developed the FITNESSGRAM physical fitness test. The FITNESSGRAM used criterion-referenced data instead of normative data. In 1987 AAHPERD challenged the nation's youth to become more physically fit. AAHPERD designed a program called Physical Best which is a total curriculum package designed to assist youth in understanding the importance of a lifetime of physical activity (Physical Best, 1999). A milestone was set in 1993 with the

formation of a partnership between AAHPERD and CIAR to promote health-related fitness (Hartman, 2001). Unlike norm referenced tests, Physical Best and FITNESSGRAM are individualized and the students only compete with themselves, not against others. One of the unique features of the program is that it allows teachers to produce individualized reports for each student in a class. The reports provide feedback based on whether the child achieved the criterion-referenced standards for physical activity or fitness (FITNESSGRAM, 2005). The FITNESSGRAM also differs from other tests in the events that are used to evaluate fitness. In some cases the FITNESSGRAM provides more than one reliable option when accessing a fitness component. Having several options is sometimes necessary when schools do not offer facilities conducive to that particular test. When accessing aerobic capacity the pacer test (recommended), one-mile run, or the walk test can be used. When accessing body composition skin fold measurements (recommended), body mass index, or impedance analyzers can be used. Abdominal strength and endurance is measured by the curl-up. Trunk extensor strength and flexibility is measured by the trunk lift. Upper body strength and endurance can be measured by a 90 degree push-up (recommended), modified pull-up, pull-up, or a flexed arm hang. Flexibility is measured by either the back-saver sit and reach or the shoulder stretch.

Although youth fitness testing programs primarily focus on students, it is the teachers who determine whether fitness tests should be used when there is no mandatory state fitness testing program (Keating, Silverman, & Kulinna, 2002; McKenzie & Sallis, 1996). A recent study by Keating & Silverman (2004) found that most teachers used fitness tests, with the majority using nationally available fitness test such as the

President's Challenge and the FITNESSGRAM. Most of these teachers utilized the norm-referenced test (President's Challenge) instead of the criterion-referenced test (FITNESSGRAM). Even though researchers and national health-related organizations have recommended that teachers switch to the criterion-referenced standards, the majority have not changed. Keating & Silverman (2004) suggests that this is due to teachers reluctance to make a change in their program, even if the alternative test is better than the one they have been using.

High autonomy teaching models

Many educators believe that students rather than the teacher should be at the center of the teaching and learning process. This view of a learning centered curriculum moves the teacher off center stage and provides an opportunity for the students to help one another learn (Dyson, Griffin, & Hastie, 2004). According to Brophy p. 23 (1983), "If educators are serious about the need for enhancing student motivation and engagement in learning, they need to focus on classroom environment and examine how the classroom can be structured to optimize student motivation." Instructional models that promote high autonomy are ways to change the learning environment. Some examples of high autonomy models are sport education and cooperative learning.

An autonomy-supportive climate can be characterized as a climate with a motivational style including behaviors such as offering choices, encouraging independent problem solving, involving students in the decision making process, and minimizing the use of pressure (Reeve, Bolt, & Cai, 1999; Reeve, 2002). Studies have suggested that environments and classroom practices that are perceived by students as autonomy

supportive may enhance students' internal locus of causality, intrinsic motivation, and self-determination (Deci et al., 1991; Reeve, 2002).

A study by Standage, Duda, and Ntoumanis (2003) found that autonomy-supportive climates can positively impact variables (i.e., autonomy, competence, relatedness) that foster self-determined motivation and self-determined motivation was found to positively predict leisure-time physical activity intentions. Hagger, Chatzisarantis, Culverhouse, and Biddle (2003) conducted a study using the trans-contextual model to see if perceived autonomy in physical education translated into leisure-time physical activity intentions and behavior. The trans-contextual model uses a unique multitheory approach, adopting constructs from two social-cognitive models of motivation-self-determination theory (Deci & Ryan, 1985, 1995, 2000) and the theory of planned behavior (Ajzen, 1985, 1988, 1991). The results of the study suggest that perceived autonomy support in an educational context influences motivation in a leisure-time context (Hagger et al., 2003).

Two studies conducted by Valentini and Rudisill (2004) examined the effects of motivational climate on motor-skill development and perceived physical competence in kindergarten children with developmental delays. The first investigation showed that the mastery-climate (high autonomy) group demonstrated significantly better locomotor performance and higher perceived physical competence than did the low autonomy group (Valentini & Rudisill 2004). The second investigation revealed that the mastery climate group showed positive changes in skill development and perceived physical competence, and this positive pattern of change was maintained over time (Valentini & Rudisill, 2004).

More than 50 Sport Education (High Autonomy model) articles have been published in the 1990's, an increasing portion of which are research studies, most of which report results that are more similar than different. Teachers and students report that they like Sport Education (Siedentop, 2002). Teachers report that students become better games players than in traditional approaches. As students become excited about Sport Education, so do their teachers. Students enjoy the multiple roles and they particularly seem to like learning from their peers (Siedentop, 2002). When used in combination with lifetime leisure activities, the Sport Education model represents an effective alternative to more traditional approaches to teaching physical activity as part of a healthy lifestyle (Mohr, Townsend, & Pritchard, 2006).

A goal of sport education is for students to decide voluntarily to participate in sport, fitness, and recreational activities outside of class. This goal is fully consistent with the current focus in physical education to help students develop physically active lifestyles (Siedentop, 2004). Siedentop, Hastie, and Van der Mars (2004) suggests, that Sport Education is a particularly good curriculum and instruction model through which to achieve that goal because it tends to empower students and fully engage them in the learning and management of their own sport experiences.

Wallhead and O'Sullivan (2005), highlight the effectiveness of the sport education model in facilitating student engagement within student-centered learning tasks (62 peer-reviewed journal articles and 28 empirical studies). Hastie (1996b) suggests that student's levels of engagement are higher during seasons of sport education. Alexander, Taggart, and Medland (1993) and Carlson and Hastie (1997) provided specific examples of student eagerness and increased engagement.

Grant (1992) commented that due to this increased enthusiasm, teachers have become strong advocates of the model. In an sport education season of "Ultimate" Hastie (1998) found that the students who participated made gains in competence which included skill development, tactical awareness, and execution. In a survey study of 344 Australian teacher's perceptions of the Sport Education model, Alexander and Luckman (2001) found that 83% of teachers agreed that the model yields greater student interest in physical education than their previous approach to teaching sport in physical education.

Research in sport (Pelletier, Fortier, Vallerand, et al., 1995) and physical education (Ntoumanis, 2001) has shown that intrinsic motivation is positively related to students feeling less bored, reporting greater self-effort, and being more intent on future participation in physical activity. In a study on motivational responses Wallhead and Ntoumanis (2004) suggest, that the Sport Education curriculum may increase perceptions of a task-involving climate and perceived autonomy, and in so doing, enhance the motivation of high school students toward physical education. Studies by Mitchell (1996) and Papaioannou (1995) found that students in physical education report higher intrinsic motivation when they perceive a task-involving climate.

Research suggests there are some additional benefits of the Sport Education model that exist for both physical education students and teachers (e.g., Alexander, Taggart, & Luckman, 1998; Hastie, 1998). For students the reported benefits include, an enhanced personal investment in physical education, improved opportunities for girls and lowered skilled students to participate, and increased levels of student achievement. For teachers the benefits involve, increased freedom from direct instruction, more

opportunities to focus on the individual needs of students, and a renewed interest in teaching (Mohr, Townsend, & Pritchard, 2006).

Sport Education has been found to facilitate the development of leadership and teamwork skills, peer support, social responsibility, and equitable participation (Grant, 1992; Alexander et al., 1996). Sport Education provides increased opportunities for students to interact with peers, which aids in the development of students' abilities to cooperate and socialize while developing personal and social leadership and trust skills (Pope & Grant, 1996; Carlson & Hastie, 1997).

A study conducted by Hastie and Buchanan (2000) intended to improve student's social responsibility skills by designing and implementing the 'Empowering Sport Model', which is a hybrid model of Sport Education and Hellison's (1995) Teaching Personal and Social Responsibility (TPSR) model. The research revealed positive effects on increasing personal responsibility, student empowerment, and problem-solving skills.

Despite the wide spread use of certain cooperative learning (High Autonomy Model) elements in the gym, there has been little research on this approach in physical education (Dyson, 2001). Though not empirically validated in the physical education setting, studies using cooperative learning groups have noted positive attitudes toward learning (McBride, 2004). The small amount of research on cooperative learning in physical education indicates that the results are promising (Dyson, 2002).

Cooperative learning is an effective instructional alternative to competitive learning and individualistic learning (Slavin, 1991). Researchers have provided evidence that cooperative learning is a viable method to enhance academic performance of students across all developmental levels (Slavin, 1991). Cooperative learning has social outcomes

such as positive inter-group relations, the ability to work collaboratively with others, and the development of self-esteem (Cohen, 1994; Johnson & Johnson, 1989; Slavin, 1990, 1996). As active learners students are not passive recipients of knowledge, but are involved in tasks that stimulate decision-making, critical thinking, and problem-solving (Perkins, 1999). One of the most appealing attributes of cooperative learning is its dual focus on social and academic outcomes (Antil et al., 1998; Cohen, 1994; Putnam, 1998). The group dynamic in cooperative learning allows for students to take on roles and responsibilities and provides students with the opportunity to achieve tasks while they are socially interacting (Dyson, Griffin, & Hastie, 2004).

Several physical educators have encouraged the use of cooperative learning as a resource for change in physical education classes (Dyson, 2001; Grineski, 1996; Rovegno & Kirk, 1995). Grineski (1989) suggest, that cooperative learning could enhance physical fitness and social interactions for elementary students, kindergartners, and preschool children. In a study on the use of cooperative learning in a third grade physical education class, Smith, Markley, and Goc Karp (1997) found improvements in student's social reasoning skills, interaction, and social participation.

In an elementary physical education program using cooperative learning Dyson (2001) found that a teacher and students emphasized improving motor skills, developing social skills, working together as a team, helping others improve their skills, and taking responsibility for their own learning. Later Dyson (2002) conducted a similar study on the implementation of cooperative learning in an elementary physical education program. This study showed that students and teachers shared similar perspectives in the categories of goals, student roles, accountability, communication skills, working together, and

practice time. The results indicated that the cooperative learning format holds much promise for physical education.

In physical education, cooperative learning has enhanced students' goals of the lessons, helped students take responsibility through roles, improved students' motor skills and strategizing, enhanced student's communication skills, improved students' working together, and held students accountable through the use of peer assessment and task sheets (Dyson, 2001, 2002). By means of experiments with cooperative activity based on interaction in certain events (e.g. golf), research has shown development in the skills needed in prosocial behavior, such as helping, caring for others, giving feedback and making friends, in addition to the development of motor skills (Johnson et al., 1980; Johnson et al., 1984).

Physiological Testing Measurements

As the focus on promoting health-related physical education becomes more and more prominent, increasing opportunities for physical activity leading to the development of physical fitness in school physical education programs becomes a central focus (Bar-Or, 1987; Freedson & Rowland, 1992; Sallis & McKenzie, 1991; Sallis et al., 1997; Simons-Morton, O'hara, Simons-Morton, & Parcel, 1987). A number of studies have indicated that the physical activity patterns in adulthood are strongly correlated to physical activity habits established in childhood (Blair, 1992; Blair, Clark, Cureton, & Powell, 1989; Corbin, 1987). A study by Dennison, Straus, Mellits, & Charney (1988) found that childhood fitness tests results could predict adult physical activity levels.

Several methods of measuring fitness have been developed over the last decade that can assist in gauging fitness progress and physical activity. Many of these methods

are being used by physical education researchers and some teachers today. Some of the subjective instruments include the (SOFIT) System for Observing Fitness Instruction Time (McKenzie, Marshall, Sallis, & Conway, 2000), Previous Day Physical Activity Recall (Weston, Petosa, & Pate, 1997), and Self Administered Checklist for Assessing Physical Activity (Sallis, et al., 1996). The major drawback of subjective instruments is that they can be very time consuming.

Objective measurement instruments include pedometers, heart rate monitors, and accelerometers. Like the subjective measurement instruments the objective measurement instruments also have their drawbacks. However, most of the objective measures are less time demanding and seem to be gaining popularity.

The pedometer is quickly becoming the measurement tool of choice among researchers for field measurement of activity levels in children and adults (Vincent & Pangrazi, 2002). They are relatively inexpensive, unobtrusive, lightweight, and attach easily to the students waistband on the hip. Tudor-Locke and Myers (2001) found the pedometer to be a valid assessment method for measuring physical activity in research and practice.

Tudor-Locke and Myers (2001), examined concurrent direct measures of a standardized activity log and pedometers with respect to responsiveness to change. They tracked diabetic adults' activity levels during a walking program. The findings in this study indicated that activity levels increased in adults due to the pedometer feedback.

Being able to check ones steps daily can provide motivation. It can also help the student understand that activity during a movement program is not the only activity that is accounted for (Beighle, Pangrazi, & Vincent 2001). A further study by Vincent and

Pangrazi (2002) examined if reactivity in elementary school children existed. Vincent and Pangrazi (2002, p.56) define reactivity, “as a change in normal activity patterns when people are aware that their activity levels are being monitored.” The findings in this study showed that reactivity did not exist with these children.

Pedometer Reliability

Pedometers are an accepted way of measuring movement, but are they accurate? According to Vincent and Pangrazi (2002), p.56), “These results suggest that the pedometer is an inexpensive, valid, and reliable device for measuring children’s physical activity.” Studies showed that compared with heart rate monitors and accelerometers there was less error with the pedometer (Beighle, Pangrazi, & Vincent, 2001).

The simple and inexpensive pedometer is a valid option for assessing physical activity in research and practice (Tudor, Locke, & Myers 2001). Research findings suggest that in most cases pedometers were very consistent and reliable if worn correctly (Tudor-Locke, 2001). In cases when students would not reach their normal step count range it was due to placement of the pedometer on the waist, not the pedometer itself. While the pedometer is shown to be a valid measure of physical activity, it does have its limitations. The pedometer is unable to measure frequency, intensity, and duration of physical activity (Beighle, Pangrazi, & Vincent, 2001). The device is not flawless, but it is one of the most reliable and inexpensive ways to measure activity.

CHAPTER III

METHODOLOGY

The purpose of this investigation was to examine the difference in health related fitness gains between a high autonomy teaching climate and a traditional teaching climate. Specifically, the purposes were to investigate three areas in order to answer these questions; (a) What is the difference in improvement on the PACER fitness test between the two teaching models? (b) What is the increase in the proportion of students meeting the healthy fitness standard after the program? (c) What is the difference in total active participation between the two teaching models? It was hypothesized that the high autonomy teaching approach would show significant fitness gains over the traditional direct teaching approach.

Participants

One hundred and twenty fifth-grade students (sixty male and sixty female) from three different schools in rural Alabama were participants in this study. A power analysis revealed that eighty three students were needed to validate the study. Two schools were elementary schools that enrolled students in the first through fifth grades, one school was a middle school that enrolled students in the fifth through eighth grades. The school district's ethnic average is eighty percent Caucasian, fifteen percent African American, and five percent Latino. Each school had forty participants: twenty in condition one, and twenty in condition two. All the participants were randomly selected from a pool of students who had volunteered and returned their consent forms (Appendix A) for the study. The participants that were chosen were assigned either to the condition one class

(high autonomy) or the condition two class (teacher directed). Ten girls and ten boys were randomly chosen and placed in either the condition one class or the condition two class for a total of 20 students in each class (ten boys and ten girls each).

Once the students were placed in classes each teacher administered the Progressive Aerobic Cardiovascular Endurance Run (PACER) fitness test (Cooper Institute for Aerobic Research, 2000). Participants were divided into four teams of five by the physical education teachers based upon their pre-test scores on the PACER fitness test. All teams were coeducational and there was no need for manipulation by gender.

Teachers

The teachers in this study were both part-time physical education teachers within the school district. Both teachers worked part-time on a contract basis with the local school system. Each teacher had previous teaching experience with both high autonomy and traditional teaching models. The teachers were randomly assigned prior to teaching at each school to teach either the condition one or the condition two class.

The Teaching Unit

Over a period of three weeks, teaching at all three schools, simultaneously teaching the condition one class and the condition two class, the students completed a sixteen-lesson unit called “Obstacle Course Fitness.” Lessons were of 45 minutes in duration, and full details of the season plans are presented in Appendix B (Condition one) and Appendix C (Condition two). Condition one was taught using a high autonomy teaching approach and condition two was taught using a traditional teaching approach. Both classes were taught using health related fitness activities. There were no manipulative skills used in any lessons or in the obstacle course designs.

Each of the two teaching conditions used an event cycle. There were four cycles and each cycle consisted of three days. Day one of each cycle was the exact same for both condition one and condition two. Day one consisted of activity stations where each team rotated to each station, read the station card, and completed the health related fitness task. On day two the condition two class completed another set of fitness tasks created by the teacher (the same as day one). On day two in condition one the teams rotated around to different areas practicing and actively exploring with various equipment set out by the teacher. There was no teacher intervention during this time. Each team was free to create and explore ways of using the equipment in obstacle course designs and practice. Additionally on day two in condition one, one team was chosen for every cycle to design their own obstacle course. This team had the entire class period to design a safe obstacle course that each team completed on day three. Day three was competition day for both conditions. The teams in condition two completed an obstacle course that was created by the teacher using equipment and tasks from the previous two days. The teams in condition one completed an obstacle course that was designed by the designated team for that cycle. The condition one design was also based on the students' ideas and creativity that was facilitated from the equipment practiced with and tasks performed from the previous two days.

Team Roles and Officiating Roles

Each class had four teams of five students each. The condition two class had teams but students did not have any responsibility within their team. They were only asked to complete tasks as a team and compete as a team. The teacher officiated all competitions in condition two. The condition one class had specific team roles (Appendix

F) and officiating roles (Appendix G). The team roles were captain, equipment managers, fitness coordinator, and course design leader. The officiating roles were starter, timer, and course officials.

Condition one

Day one was allocated to direct teacher instruction and guided practice around a particular fitness component (e.g. muscular endurance or cardiovascular endurance). During these lessons, the students completed activity cards with specific tasks for each group. Day two was allocated to team training, where the students worked at various stations with different pieces of fitness equipment (e.g., Styrofoam noodles, jump ropes, cones, polyspots, boxes, balls, and benches) set out by the teacher at each of four stations. Each group rotated through the stations and were responsible for designing fitness activities without teacher intervention. The only stipulations were that the activities could not be manipulative (e.g., a ball might be used as an obstacle to jump over or carry, but could not be used for a skill such as dribbling), and must be safe. Additionally, every week on Day two a designated team was responsible for designing and preparing its obstacle course for the upcoming competition. The same stipulations applied, and in addition the course had to be one that each team member could complete in less than one minute. Tasks could not duplicate those from a prior course. The teacher did not intervene in the team planning, but occasionally would facilitate with questions, such as "can you think of ways that you haven't seen to make the task go quicker or be more challenging?"

Day three was competition day in which the presenting team first explained the rules and then demonstrated the obstacle course. This team would then officiate the

completion of the course by one of the other teams. During these lessons, each team would take one of three roles. Those were (a) completing the course, (b) officiating the completion of the course by another team, and (c) sitting in the allocated team area and watching/cheering for other teams.

Condition two

Day one and day two were allocated to direct teacher instruction and guided practice around a particular fitness component (e.g., muscular endurance or cardiovascular endurance). During these lessons the students completed activity cards with specific tasks for each group. Day three was the competition day, in which the teacher would first explain the rules and then demonstrate the obstacle course which was designed by the teacher. Each team would then take turns running through the obstacle course. The competing team would run through the course while the other teams were sitting in the allocated team area watching and cheering for the other teams.

Student survey

A survey was conducted at the end of each teaching unit to gauge the student's perceptions of the teaching climate. This survey was specifically created to see if the students could differentiate between the high autonomy teaching climate and the teacher directed teaching climate (Appendix H). Seventeen questions were asked having only two answers, for each question one answer indicated a high autonomy teaching climate and the other indicated a direct teaching climate. Out of the sixty students in the high autonomy classes seventy two percent (43 out of 60) indicated that there class was a high autonomy climate, while twenty eight percent (17 out of 60) disagreed. Out of the sixty students in the teacher directed classes forty six percent (27 out of 60) indicated that there

class was a high autonomy climate, while fifty four percent (33 out of 60) disagreed. The majority of students in each of the two teaching conditions correctly identified the type of teaching climate they were in. The survey was designed by professionals in the field of physical education and they were based on the literature of high autonomy climates.

Climate check

A live climate check was also conducted to ensure each teaching model was being taught correctly. The climate checklist (Appendix I) was based on the literature of the high autonomy climates. Two outside observers familiar with teaching and instructional models conducted the observations. Both of these observers were professionals in the field of physical education and had previous experience with high autonomy models and climate checks. These observers rated each condition without prior knowledge of what that climate was. They answered a battery of questions on the checklist at each class. Both observers correctly identified each teaching climate.

Reflective Researcher Journal

A reflective journal was kept throughout each of the six teaching units at all three schools. Student comments and teacher reflections on each lesson were kept throughout the data collection process.

Data collection

Data included in this study were student aerobic fitness and active lesson participation. Student aerobic fitness was measured by the PACER fitness test. Active lesson participation was measured by W4L Elite pedometers.

Student Aerobic Fitness

Each student's aerobic fitness status will was measured and recorded (Appendix D) using the PACER fitness test. The PACER test was administered at the beginning and at the end of the teaching unit. The PACER was administered according to the procedures outlined in the FITNESSGRAM Test Administration Manual (Cooper Institute for Aerobic Research, 2000). That is, the students were instructed to run across the 20m distance and touch the opposite marked end with their foot by the time the beep sounds on an audio compact disc. Keeping time to the audio beep, students would run back and forth between the marked 20m distances for as many laps as possible. The test was completed for each student when they either voluntarily stopped, or could not maintain the required speed for two laps. The number of laps completed was recorded for data analysis.

Active lesson participation

During each lesson of the unit, all students wore a W4L Elite pedometer to measure their step counts. Their daily step count was recorded as shown in Appendix E. Each pedometer was tested prior to the teaching unit. Each pedometer was worn on the hip of the researcher and thirty steps were taken. At the end of the thirty steps the researcher checked the pedometer to make sure the number of steps fell within three steps of thirty. Additionally ten of these pedometers were tested on students as they took thirty steps and all fell within 2 steps of each other. Step counts from pedometers are considered to be an accurate and valid measure of physical activity (Easton, Rowlands & Inglenew, 1998). Each pedometer was numbered, and each student wore the same model each lesson.

Data Analysis

Aerobic fitness

Two statistical tests were used to determine aerobic fitness. The first statistical test used was a one-way repeated measure analysis of variance (ANOVA) to evaluate improvement in the number of laps achieved by the students. The second test used was descriptive statistics to determine the proportion of students meeting the healthy fitness standard after the program.

Pedometer counts

A multivariate analysis of variance (MANOVA) was employed to evaluate the differences in step counts between the two conditions. Days 1, 2, and 3 were set as the dependent variables while the type of condition was set as the independent variables.

CHAPTER IV

RESULTS

The purpose of this investigation was to examine the difference in health related fitness gains between a high autonomy teaching climate and a traditional teaching climate. Specifically, the purposes were to investigate three areas in order to answer these questions; (a) What is the difference in improvement on the PACER fitness test between the two teaching models? (b) What is the increase in the proportion of students meeting the healthy fitness standard after the program? (c) What is the difference in total active participation between the two teaching models? It was hypothesized that the high autonomy teaching approach would show significant fitness gains over the traditional direct teaching approach.

Pacer Improvement

The one-way repeated measure analysis of variance (ANOVA) test confirmed that both teaching conditions showed significant improvement from the pre to post pacer test. However, there was no significant difference between the two teaching conditions. Table 4.1 shows the significance, power, and Eta for the two classes pacer scores.

Table 4.1

Condition	Significance	Power	Eta
Pre PACER	.008	.770	.059
Post PACER	.001	.942	.097

The one-way repeated measure analysis of variance (ANOVA) revealed a significant improvement in PACER Fitness scores for both conditions. Over the period of sixteen lessons both conditions significantly improved their PACER scores. Table 4.2 shows the means, minimums, and maximums for the two conditions.

Table 4.2

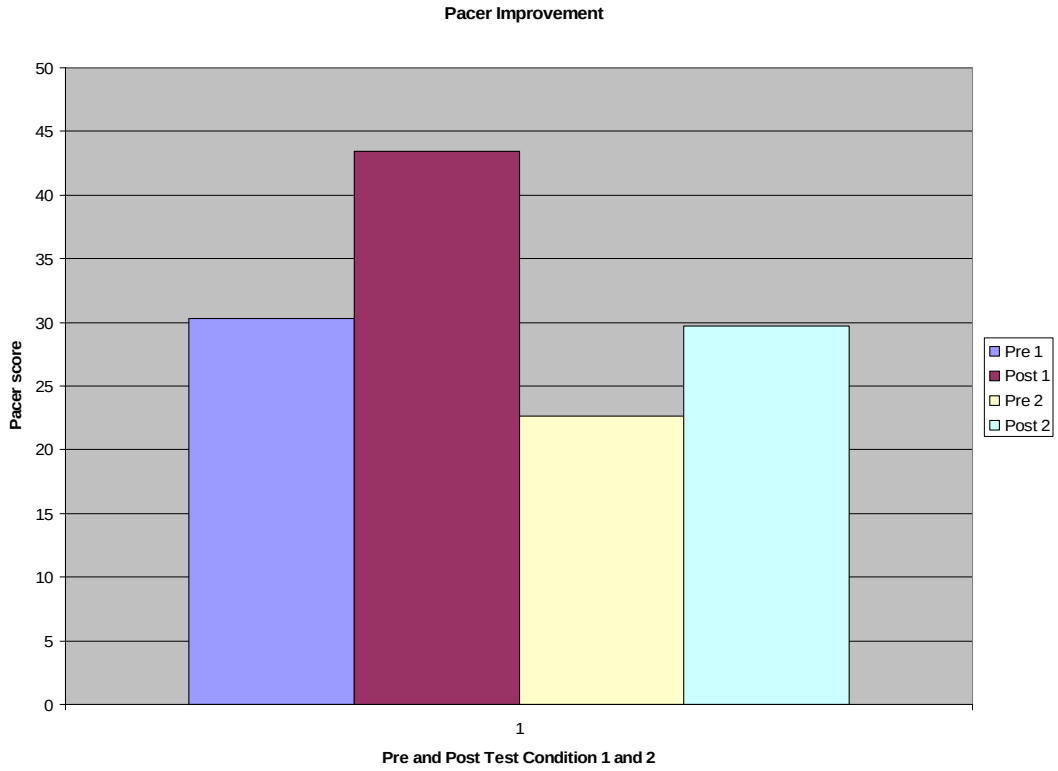
Condition	N	Mean	Minimum	Maximum
Prepacer	1	30.30	0	247
Prepacer	2	22.66	0	247
Postpacer	1	43.40	0	247
Post pacer	2	29.68	0	247

Researcher Journal Commentary

The researcher observed that the majority of students in both teaching conditions took the pre and post PACER fitness tests seriously. On the post PACER fitness test many participants remembered their previous score and wanted to try and beat it. Several of the participants were challenging each other to see who could stay in the longest during the test. After participants dropped out they began cheering on their peers who

were still taking the test. Figure 4.1 further illustrates the pacer improvement for both conditions.

Figure 4.1



Healthy Fitness Zone for Pacer

There were a total of 60 participants in condition one and a total of 60 participants in condition two. Descriptive statistics revealed improvement into the healthy fitness zone by both conditions. Out of the total number of sixty participants in condition one 51 (85%) were in their healthy fitness zone at the end of the teaching unit, while 9 (15%) failed to meet the healthy fitness standard. Out of the sixty participants in condition two 44 (74%) were in their healthy fitness zone at the end of the teaching unit, while 16 (26%) failed to meet the healthy fitness standard. Between the pre and post PACER fitness tests ten participants from condition one improved into their healthy fitness zone.

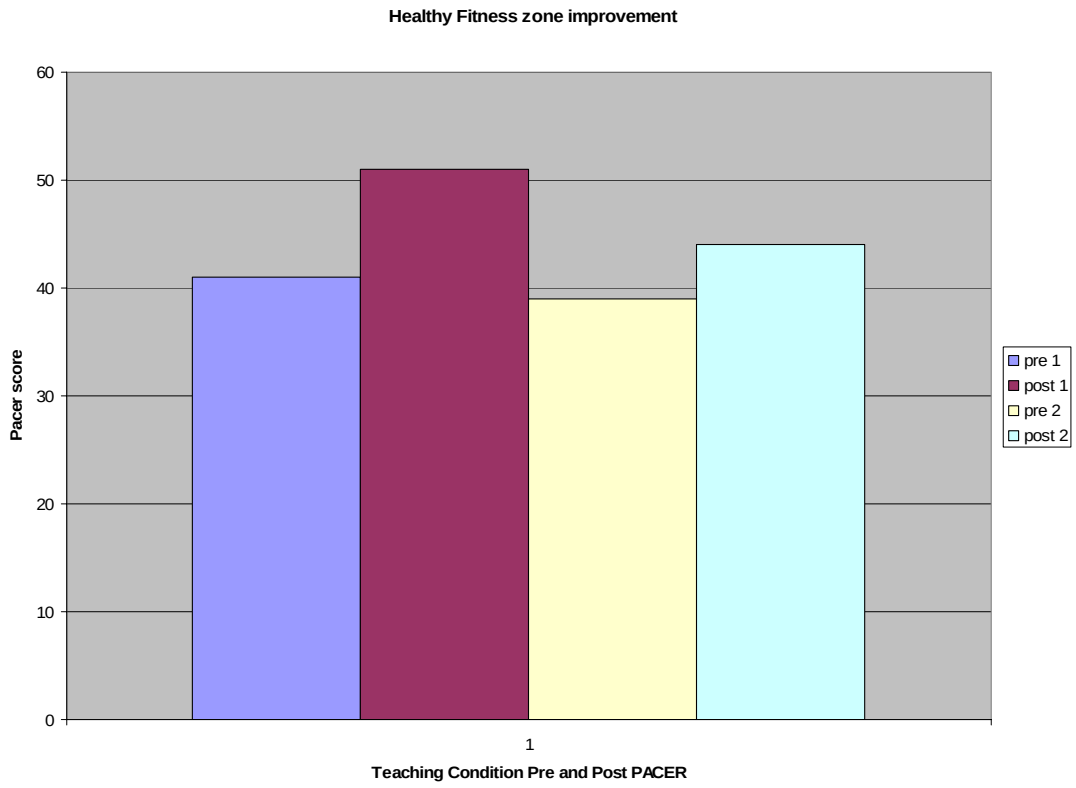
Five participants improved into their healthy fitness zone in condition two. Table 4.3 explains the number of students per teaching condition that fell within their healthy fitness zone on the PACER fitness test at the end of the teaching unit.

Table 4.3

Condition	HF Zone	Not in HF Zone	Improved to HF Zone	% of Students in HF Zone	n
Condition 1 High Autonomy	51	9	10	85 %	60
Condition 2 Teacher Directed	44	16	5	74 %	60

Figure 4.2 further illustrates the proportion of the number of participants that improved into their healthy fitness zone between the Pre and Post PACER fitness test for both conditions.

Figure 4.2



Researcher Journal Commentary

The students were made aware of their healthy fitness zone standard on the PACER fitness test prior to testing. Students were talking about making sure they got into their healthy fitness zone before each test.

Active Participation

A multivariate analysis of variance (MANOVA) test confirmed that there was no significant difference between the two teaching conditions with respect to active participation. Table 4.4 shows the significance, power, and eta test data for the two conditions on days one, two, and three.

Table 4.4

Day	Significance	Power	ETA
1	.072	.436	.027
2	.941	.051	.000
3	.056	.481	.031

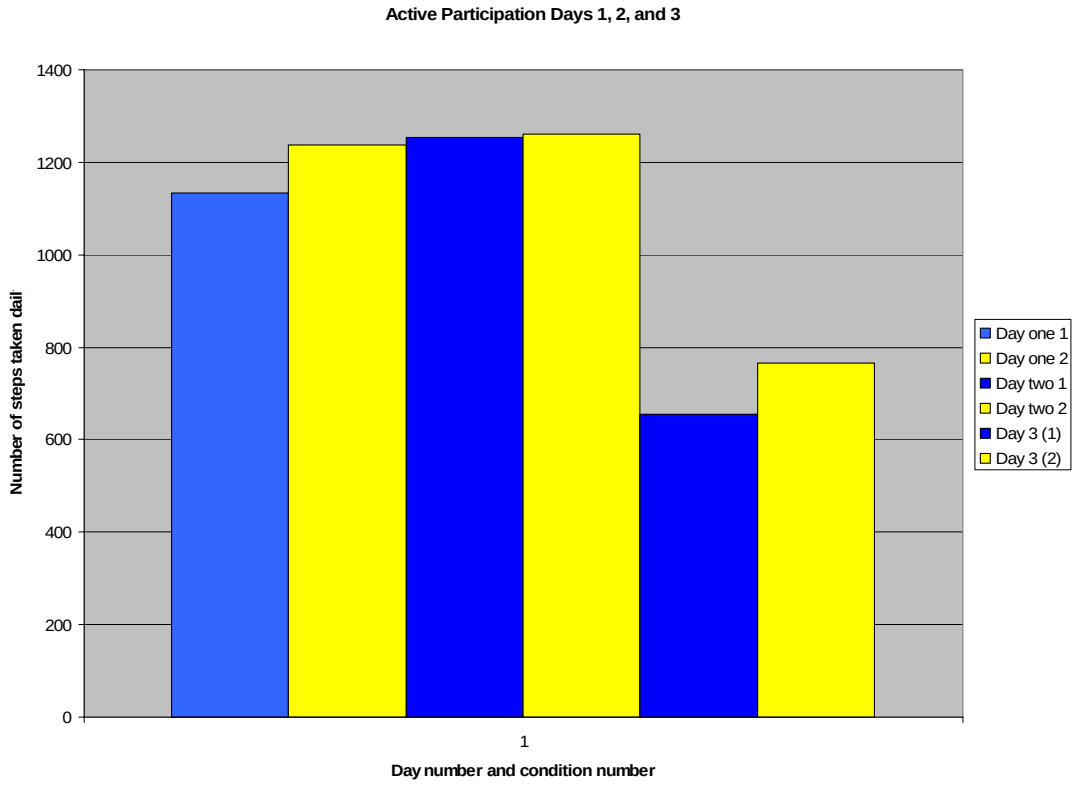
Both conditions had a total of 60 participants for a total of 120. The average number of steps was slightly higher for the participants in condition two on each of the three days. For both conditions the most steps taken by the participants was on day two. The least amount of steps taken was on day three. Table 4.5 shows the mean, standard deviation, and number of students for all three days for both conditions.

Table 4.5

Condition N		Mean	Std. Deviation	N
Steps Day 1	1	1133.90	317.47	60
	2	1236.40	301.84	60
	Total	1185.15	312.71	120
Steps Day 2	1	1254.84	403.08	60
	2	1260.16	376.43	60
	Total	1257.50	388.35	120
Steps Day 3	1	655.21	281.73	60
	2	765.79	343.47	60
	Total	710.50	317.69	120

Figure 4.3 Further illustrates the steps on days one, two, and three.

Figure 4.3



CHAPTER V

DISCUSSION

The purpose of this investigation was to examine the difference in health related fitness gains between a high autonomy teaching climate and a traditional teaching climate. Specifically, the purposes were to investigate three areas in order to answer these questions; (a) What is the difference in improvement on the PACER fitness test between the two teaching models? (b) What is the increase in the proportion of students meeting the healthy fitness standard after the program? (c) What is the difference in total active participation between the two teaching models? It was hypothesized that the high autonomy teaching approach would show significant fitness gains over the traditional direct teaching approach.

Prior to the study it was thought that the high autonomy teaching model would have significantly greater fitness gains, participants falling within their healthy fitness zone, and more total activity than the traditional teacher directed approach. Analyses of the data suggest that there were no significant differences between the two teaching models in any of the three areas.

The research on high autonomy teaching models indicates that students enjoy the model more than the traditional teacher directed approach (Siedentop, 2002). Although enjoyment was not analyzed in this study it is important to mention because with both teaching units producing the same results it would seem logical to use the teaching model that children will enjoy more. Children interviewed by Hopple and Graham (1995) stated that fitness tests would be more palatable if they were made more “gamelike and fun” (p.

414). In addition to enjoyment, high autonomy models also influence engagement and motivation to participate in physical activity. High autonomy climates empower students and fully engage them in the learning and management of their own learning experiences (Sidentop, Hastie, & Van der Mars, 2004). Alexander, Taggert, and Medland (1993) and Carlson and Hastie (1997) found that the high autonomy teaching approach raised student eagerness and increased engagement.

In the student survey that was conducted at the close of each teaching unit, the majority of students were able to correctly identify which teaching climate they were in. Thus they were able to perceive the autonomy support given by the teacher. Research has indicted that perceived autonomy support in an educational context influences motivation in a leisure-time context (Hagger et al., 2003). The fidelity checks by the outside observers were also identified correctly. Deci et al, 1991 & Reeve, 2002 suggested that environments that are perceived by students as autonomy supportive may enhance students' internal locus of causality, intrinsic motivation, and self-determination. Autonomy-supportive climates can positively impact variables (i.e., autonomy, competence, relatedness) that foster self-determined motivation and self-determined motivation was found to positively predict leisure-time physical activity intentions (Standage, Duda, and Ntoumanis, 2003.) A study conducted by Hagger, Chatzisarantis, Culverhouse, and Biddle (2003) suggests that perceived autonomy in the educational context influences student motivation in a leisure-time context.

Previous studies in fitness education have shown that even simple choices can result in students who are more intrinsically motivated (Prusak, 2004). High autonomy teaching models have also shown to not only increase skill but motor performance as

well. A study by Valentini & Rudisill, 2004 indicated that the mastery-climate (high autonomy) group demonstrated significantly better locomotor performance and higher perceived physical competence than did the low autonomy group (Valentini & Rudisill 2004). However, there has been very little research that looks specifically at achieving fitness gains. Grineski (1989) suggest, that cooperative learning (high autonomy) could enhance physical fitness and social interactions for elementary students. Several physical educators have encouraged the use of cooperative learning (high autonomy) as a resource for change in physical education classes (Dyson, 2001; Grineski, 1996; Rovegno & Kirk, 1995).

This study examined the differences between two teaching conditions and the findings indicate that the fitness outcomes of a high autonomy teaching model are at least equal to that of the traditional teacher directed approach.

PACER Improvement

The improvement on the PACER fitness test scores was not significantly different between the two teaching conditions. There was however, a significant increase by both teaching conditions from the pre PACER to the post PACER fitness test. A similar study conducted by Hastie, Sluder, Buchanan, and Wadsworth in 2007 revealed opposite results. In that study the results revealed a significant difference between the two teaching models on the PACER fitness test. The Sport Education Model (condition one – high autonomy) had significantly more improvement than the teacher directed model (condition two – traditional). Wallhead and O'Sullivan (2005) suggest that changes in student aerobic fitness are an elusive outcome of autonomy supportive curriculum models. The results of this study provide some support to this claim. The results of the

current study indicate that the success of the high autonomy teaching model is equal to that of the teacher directed model in the attempt to increase cardiovascular fitness.

There was no significant difference in PACER improvement between groups. The researcher's journal indicates that as a whole, both groups gave full effort on both the pre PACER and post PACER fitness test. There were a few participants from both groups that stated that they just wanted to be in their healthy fitness zone and then they were going to drop out. They also tried to convince their peers to run together and then drop out together.

In some cases the possibility exists that the improvement from pre and post PACER fitness test scores was due to familiarity with the test. The majority of the students' at all three schools in this study had never experienced the PACER fitness test. The participating schools were still using the Presidential fitness testing. The component on the Presidential fitness test that measures cardiovascular fitness is the mile run and not the PACER fitness run.

Cases where students regressed or did not improve from pre to post PACER fitness test could have also been the result of several variables. These variables include not having on appropriate clothing/shoes, being sick, or having allergies on that particular day.

Healthy Fitness Zone for PACER

By the end of the teaching unit 85% of the participants in condition one met their healthy fitness standard for the PACER fitness test. The condition two class had only 74% of participants meeting the healthy fitness standard at the close of the teaching unit. Both of these conditions had an increase in the amount of students meeting their healthy

fitness zone standard between pre and post PACER fitness test. Although the difference between the two conditions was minimal, both conditions showed an increase in the number of students meeting their healthy fitness standard. Prior to both PACER fitness tests for each group the participants were made aware of their healthy fitness zone standard. For the participants already meeting their healthy fitness zone standard, they simply wanted to improve their score from the previous test. According to researcher's observation, for those not meeting the standard, they wanted to at least improve into their healthy fitness standard.

There were only 25 participants that failed to meet their healthy fitness standard by the end of the teaching unit. Out of the possible 120 participants 95 were in their healthy fitness zone standard. The large majority of the students were already meeting their healthy fitness standard before the teaching unit started. Most of the 15 participants that improved into their zone were very close after the first PACER test.

Active Participation

The results indicate that there was no significant difference between both teaching conditions in terms of active participation. Both conditions produced step counts on each day of the three day cycle that were close and not significantly different.

Very few steps separated the groups for all three days of the event cycle. The step counts on days one and two were close on average for both groups combined. The combined step counts on day two were a little higher than day one, both of which were practice days.

Day three's step count was much lower on average for both groups due to the nature of day three. The third day of the event cycle was competition day in which the

teams that were not competing or officiating were sitting in their teams observing competition. This period of observation is done sitting down within their team which keeps them from moving around.

Although the significance in the step counts from day one and day two in condition one was not measured it is worth noting due to the difference in teaching styles between those two days. Just as in Hastie, et al, in 2007 there was a difference in the step counts between days one and two of the event model. There was a difference of more than one hundred twenty steps between day one (1133.90) and day two (1254.84) in condition one. Within condition one day one is allocated to teacher direct instruction where as day two is allocated to autonomy supportive team practice. Condition two had a difference of less than 24 steps between day one (1236.40) and day two (1260.16). Both day one and day two classes in condition two are teacher directed team practice days.

Although the results between the groups were not significant in any of the three areas measured, there was a perplexing slight difference that was worth mentioning. Condition one had a higher lap average on the PACER than did condition two. On the other hand, condition two had slightly more daily steps than did condition one. This is possibly due to the stride length difference between running, jogging, and walking. The class that was less fit (condition two) could have jogged or walked more than the class that was more fit (condition one) which would have given them a higher step count. The opposite could be true for condition one, they may have been running more during the lessons. Running takes longer stride lengths than does walking or jogging, therefore someone could cover the same amount of ground with less steps by running.

Conclusion

It is suggested that high autonomy teaching climates are a viable option when teaching fitness units within the physical education curriculum. Children have stated they enjoy autonomy supportive climates more than traditional teacher directed climates (Siedentop, 2002). The opportunity to make decisions and collaborate with their peers provides students with opportunities that will not only enhance their fitness but will also help them grow and develop socially as well. You can give children choices and autonomy and they will still get better fitness scores. Autonomy supportive teaching climates provide practitioners an equal if not better alternative to the traditional drill-oriented teaching approach with which many fitness units are taught.

Recommendations

Traditional educational settings offer little opportunity for students to engage in decision making and responsibility (Buchanan, 2001). Thus, a caveat about any high-autonomy model is that students must be taught how to be independent. Providing student choices and autonomy without preparing them is tantamount to a roll-out-the-ball program in which students may simply engage (or not) in any activity they please. Team voting, progressively increasing doses of responsibility, and providing opportunities for decision-making help to facilitate independent and autonomous learners. Listed below are a few recommendations that might be useful to teachers who are considering teaching a similar fitness unit using a high autonomy model.

- Encourage experimentation with equipment
  - Add more and different equipment weekly to broaden student choices and to nurture their creativity.

  - Encourage use of equipment in ways other than customary.
  - Carefully select limits and boundaries on tasks in order to facilitate creative use of equipment.
  - Give opportunities to work in groups with equipment in order to facilitate hands-on problem solving.
- Have students keep a journal to log out of class activity
  - Use their activity in their team totals.
  - Devote a portion of class time to discussion of out of class activity.
- Nurture student autonomy and problem solving
  - Provide opportunities to explore activity options independent of teacher direction.
  - When children get stumped, prompt them with movement concepts (e.g., over, under, etc.) and other hints.
  - When children ask questions, do not be too quick with answers encourage students to talk out the idea, or to otherwise problem-solve it.
- Provide lots of feedback and coaching to the team leaders and captains relative to being a leader.

This study is one of only two studies using a high autonomy teaching condition in a pure fitness unit. This study used an obstacle course fitness unit. It would be worth while to reproduce the current design with other fitness units (eg. Step aerobics, track and

field, etc.). The nature of other fitness activities could have a large effect on the outcome when doing the same study.

Videotaping the classes would also aid in validating the teaching climate. This would also allow the researcher to use the SOFIT system to track time on task during each of the class sessions for both teaching conditions.

Several surveys and/or questionnaires would have been beneficial in this study as well. Conducting an enjoyment inventory and gauging student perceptions after the unit would be beneficial. Investigating student attitudes toward participation in out of class fitness activities would be a good way to measure their motivation. Practitioners and researchers would benefit from more studies on health related fitness units taught with autonomy supportive climates.

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APPENDICES

APPENDIX A: INFORMED CONSENT

(NOTE: DO NOT AGREE TO PARTICIPATE UNLESS AN APPROVAL STAMP WITH CURRENT DATESS HAS BEEN APPLIED TO THIS DOCUMENT.)

PARENTAL PERMISSION/CHILD ASSENT
For a Research study entitled

"THE EFFECT OF A HIGH AUTONOMY TEACHING INTERVENTION ON FITNESS OUTCOMES IN AN ELEMENTARY PHYSICAL EDUCATION CLASS."

Your child is invited to participate in a research study to examine the difference in health related benefits between a high autonomy teaching climate and a traditional teaching climate. The study is being conducted by Brandon Sluder, (Ph.D. student and Alabama certified physical education teacher) and assisted by Francois Langevin, (M.S. student and Alabama certified physical education teacher) under the direction of Dr. Alice Buchanan, Associate Professor in the Auburn University Department of Kinesiology. Your child was selected as a possible participant because he or she is enrolled in the physical education class at the school. Since your child is age 18 or younger we must have your permission to include him/her in the study.

What will be involved if your child participates? I will randomly select 40 children from each school. If you decide to allow your child to participate in this research study and your child is selected as one of those 40 children, your child will be asked to participate in a three week obstacle course fitness unit. They will be assigned to either a control group or an experimental group. The differences between the two groups are in obstacle course design. In the control group the teacher will design the obstacle course each week. In the experimental group the students will design the obstacle course each week. Both groups (experimental and control) will have small team competitions each week. The competitions will consist of each team running through a obstacle course designed either by themselves (experimental group) or by the teacher (control group). They will also be asked to wear a pedometer (a small electronic device that attaches to the hip and measures step count) during this unit and complete a Pacer fitness run (a 20 meter shuttle run that measures cardiovascular endurance). Your child's total time commitment will be approximately 40 minutes each day during their normal scheduled physical education class. If your child is one of the 40 students selected to participate you will be notified by a letter that I will send home with your child. If your child is not chosen to participate in the study they will remain in their regular physical education class.

Are there any risks or discomforts? Breach of Confidentiality is a risk involved in this study. This risk will be reduced by both Brandon Sluder and Francois Langevin making the data anonymous after it is analyzed. Other risks associated with participating in this study are the same as those associated with the regular scheduled physical education class.

Are there any benefits to your child or others? If your child participates in this study, your child can expect to benefit physically from participation in a health related fitness unit. We cannot promise you that your child will receive any or all of the benefits described.

Will you or your child receive compensation for participating? There is no compensation for participation in this study.

Are there any costs? If you decide to allow your child to participate, there will be no cost to you or your child.

Parent/Guardian Initials_____

Participant Initials_____

If you (or your child) change your mind about your child's participation or if your child changes schools, your child can be withdrawn from the study at any time. Your child's participation is completely voluntary. If you choose to withdraw your child, your child's data can be withdrawn as long as it is identifiable. Your decision about whether or not to allow your child to participate or to stop participating will not jeopardize you or your child's future relations with Auburn University or the Department of Kinesiology.

Your child's privacy will be protected. Any information obtained in connection with this study will remain anonymous. The data collected will be protected by a locked file cabinet located on the second floor of Beard-Eaves Memorial Coliseum at Auburn University. Information obtained through your child's participation may be used in preparation of a dissertation on the differences in fitness outcomes of two teaching model's. All data in the dissertation and any other presentation or publication related to this project will be reported as group averages.

If you (or your child) have questions about this study, *please ask them now or* contact Brandon Sluder (sludejb@auburn.edu) or Dr. Alice Buchanan (buchaa2@auburn.edu) at 334 844 – 1472. A copy of this document will be given to you to keep.

If you have questions about your child's rights as a research participant, you may contact the Auburn University Office of Human Subjects Research or The Institutional Review Board by phone (334) 844 – 5866 or email hsubjec@auburn.edu or IRBChair@auburn.edu.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER OR NOT YOU WISH FOR YOUR CHILD TO PARTICPATE IN THIS RESEARCH STUDY. YOUR SIGNATURE INDICATES YOUR WILLINGNESS TO ALLOW YOUR CHILD TO PARTICIPATE. YOUR CHILD'S SIGNATURE INDICATES HIS/HER WILLINGNESS TO PARTICIPATE.

_____ _____

Participant's signature Date Investigator obtaining consent Date

_____ _____

Printed Name Printed Name

_____

Parent/Guardian Signature Date

_____

Printed Name

APPENDIX B: CONDITION ONE UNIT OUTLINE

Lesson Number	Format	Teachers Role	Student's Role	Health Related Fitness Focus
1	Explanation of the obstacle course fitness unit and introduction to pedometers.	N/A	N/A	N/A
2	Pacer Pre Test	N/A	N/A	N/A
3	Put students in teams. Teams choose captain and other roles. Then practice those roles.	N/A	N/A	N/A
4	**Teacher Directed Day** Station Activities using 1.Noodle limbo 2. weight shuttle 3.jump, ski hop, jump 4. hoping on foot and dizzy bat.	Explain tasks. Make sure the students are performing task correctly, rotating, and talk about HRF as it relates to each task.	Rotate to each station and perform each task correctly. Ask teacher if they have any questions.	Muscular Strength Muscular Endurance
5	**Student Choice Day** various equipment set up at 4 different areas including Noodles, buckets, cones, hula hoops and poly spots. Team 1 designs their own course.	Make sure the students are on task at each equipment area. Also answer any questions team 1 has about their course design (rules, etc.)	Spend 7 minutes at each equipment area and design and carry out practice using the provided equipment. Team 1 designs their obstacle course using their requested equipment.	Cardiovascular Strength Muscular Strength Muscular Endurance Flexibility
6	**Competition** All teams will run through the obstacle course designed by team 1. Team 1 goes first. Each team will be duty team for another team (ref, timer, etc.)	Make sure the approved course from lesson 5 is the one team 1 sits up. Make sure the duty team for each group is in the correct area as well as the non duty or competitions teams. Also run a backup timer.	Each team runs through the obstacle course created by team 1. Each team duty's for another team. When not competing or duty each team sits in correct area and cheers/watches the competition.	Cardiovascular endurance Muscular strength Muscular Endurance
7	**Teacher Directed Day** Station activities using 1. jump rope, 2. bag carry, 3.jumping jax, push ups, sit ups, 4. slide steps down and back, and	Explain tasks. Make sure the students are performing each task correctly, rotating, and talk about HRF as it relates to each task.	Rotate to each station and perform each task correctly. Ask teacher if they have any questions. Answer HRF questions about each task as a group.	Cardiovascular Endurance Muscular endurance Muscular strength
8	**Student Choice** Various equipment set up at 4 different areas including Noodles, balance beam, cones, poly spots, jump ropes. Team 2 designs their own course.	Make sure the students are on task at each area. Answer any questions team 2 has concerning rules as it pertains to their course design.	Spend about 7 minutes at each area designing and carrying out practice using the provided equipment. Team 2 designs their obstacle course using their requested equipment.	Cardiovascular endurance Muscular Strength Muscular Endurance
9	**Competition** All teams will run through the obstacle course designed by team 2. Team 2 goes first. Each team will be duty team for another team.	Make sure the approved course from lesson 8 is the one team 2 sets up. Make sure all teams are in their designated areas and run a back up timer.	Each team runs through the obstacle course created by team 2. Each team duty's for another team. When not competing or duty each team sits in designated area and watches/ cheers on other teams.	Cardiovascular endurance Muscular Strength Muscular endurance
10	**Teacher Directed Day** Activity cards at 5 areas. 1. Hand weight shuttle run	Make sure students are interpreting the	Each teams reads the activity card and	Cardiovascular endurance

	2. balance beam crossing 3.Noodle limbo 4. running around the pole	station cards correctly and are on task. Talk to each group about directions and pathways as it pertains to each task as well as HRF.	performs the activity at each area correctly. When complete the team sits down. Teams will rotate on teacher whistle.	Muscular endurance
11	**Student Choice Day** Various equipment set up at 4 different areas including standing pole, weights, cones, balance beam, noodles, poly spots, boxes, buckets, and bags of balls. Team 3 designs their own obstacle course.	Make sure the students are on task at each area. Answer any questions team 3 has concerning rules as it pertains to their course design.	Spend about 7 minutes at each area designing and carrying out practice using the provided equipment. Team 3 designs their own course using their requested equipment.	Cardiovascular endurance Muscular Strength Muscular Endurance
12	**Competition** All teams will run through the course designed by team 3. Team 3 goes first. Each team will be duty team for another team.	Make sure the approved course from lesson 11 is the one team 3 sets up. Make sure all teams are in their designated areas and run a back up timer.	Each team runs through the obstacle course created by team 3. Each team duty's for another team. When not competing or duty each team sits in designated area and watches/cheers on other teams.	Cardiovascular endurance Muscular strength Muscular endurance
13	**Teacher Directed Day** Activity cards at 5 areas. 1. Human wheel barrel 2. Cartwheels 3.Bear Crawling 4. Crab walking	Make sure students are interpreting the station cards correctly and are on task. Talk to each group about directions and pathways as it pertains to each task as well as HRF.	Each teams reads the activity card and performs the activity at each area correctly. When complete the team sits down. Teams will rotate on teacher whistle.	Cardiovascular endurance Muscular strength Muscular endurance
14	**Student Choice** Various equipment set out at 4 different areas including standing pole, weights, cones, balance beam, noodles, poly spots, boxes, buckets, and bags of balls. Team 4 designs their own obstacle course.	Make sure the students are on task at each area. Answer any questions team 4 has concerning rules as it pertains to their obstacle course design.	Spend about 7 minutes at each area designing and carrying out practice using the provided equipment. Team 4 designs their own obstacle course using their requested equipment.	Cardiovascular endurance Muscular strength Muscular endurance
15	**Competition** All teams will run through the course designed by team 4. Team 4 goes first. Each team will be duty for another team.	Make sure the approved course from lesson 14 is the one team 4 sets up. Make sure all teams are in their designated areas and run a back up timer.	Each team runs through the obstacle course created by team 4. Each team duty's for another team. When not competing or duty each team sits in designated area and watches/cheers on other teams.	Cardiovascular endurance Muscular strength Muscular endurance
16	Post Pacer test and awards ceremony.	N/A	N/A	N/A

APPENDIX C: CONDITION TWO UNIT OUTLINE

Lesson Number	Format	Teachers Role	Student's Role	Health Related Fitness Focus
1	Explanation of the obstacle course fitness unit and introduction to pedometers.	N/A	N/A	N/A
2	Pacer Pre Test	N/A	N/A	N/A
3	Put students in teams. Teacher discuses teamwork and how each individual counts within the team.	N/A	N/A	N/A
4	Station Activities using 1.pushups, 2. box hops, 3.long jump, 4. vertical jump	Explain tasks. Make sure the students are performing task correctly, rotating, and talk about HRF as it relates to each task.	Rotate to each station and perform each task correctly. Ask teacher if they have any questions.	Muscular Strength Muscular Endurance
5	Station Activities using 1.Noodle limbo 2. box hops, 3.hop scotch (poly spots) 4. Cone weave	Explain tasks. Make sure the students are performing task correctly, rotating, and talk about HRF as it relates to each task.	Rotate to each station and perform each task correctly. Ask teacher if they have any questions.	Muscular Strength Muscular Endurance
6	**Competition 1** All teams will run through the obstacle course designed by the teacher.	Sets up an obstacle course using equipment from the previous two lessons. Then time and officiate each team as they run through the course.	Each team runs through the obstacle course created by the teacher. When not competing each team sits in correct area and cheers/watches the competition.	Cardiovascular endurance Muscular strength Muscular Endurance
7	Station activities using 1. jump rope, 2. bag carry, 3.jumping jax, push ups, sit ups, 4. slide steps down and back, and	Explain tasks. Make sure the students are performing each task correctly, rotating, and talk about HRF as it relates to each task.	Rotate to each station and perform each task correctly. Ask teacher if they have any questions. Answer HRF questions about each task as a group.	Cardiovascular Endurance Muscular endurance Muscular strength
8	Station activities using 1. Bear Crawl, 2. Crab walking 3.jumping jax, push ups, sit ups, 4. slide steps down and back.	Explain tasks. Make sure the students are performing each task correctly, rotating, and talk about HRF as it relates to each task.	Rotate to each station and perform each task correctly. Ask teacher if they have any questions. Answer HRF questions about each task as a group.	Cardiovascular Endurance Muscular endurance Muscular strength
9	**Competition 2** All teams will run through the obstacle course designed by the teacher	Sets up an obstacle course using equipment from the previous two lessons. Then time and officiate each team as they run through the course.	Each team runs through the obstacle course created by the teacher. When not competing each team sits in correct area and cheers/watches the competition	Cardiovascular endurance Muscular Strength Muscular endurance
10	Activity cards at 5 areas. 1. one foot hoping. 2. Jumping rope. 3.box hops. 4. Sideways down balance beam.	Make sure students are interpreting the station cards correctly and are on task. Talk to each group about directions and pathways as it pertains to each task as well as HRF.	Each teams reads the activity card and performs the activity at each area correctly. When complete the team sits down. Teams will rotate on teacher whistle.	Cardiovascular endurance Muscular endurance
11	Activity cards at 5 areas. 1. forward/backward down balance beam. 2. Run around the cone and back. 3. Bucket hop. 4. Football drill with hula hoops.	Make sure students are interpreting the station cards correctly and are on task. Talk to each group about directions and pathways as it pertains to each task as well as HRF.	Each teams reads the activity card and performs the activity at each area correctly. When complete the team sits down. Teams will rotate on teacher whistle.	Cardiovascular endurance Muscular endurance

12	**Competition 3** All teams will run through the obstacle course designed by the teacher	Sets up an obstacle course using equipment from the previous two lessons. Then time and officiate each team as they run through the course.	Each team runs through the obstacle course created by the teacher. When not competing each team sits in correct area and cheers/watches the competition	Cardiovascular endurance Muscular Strength Muscular endurance
13	Station activities using 1. Crawl under noodle. 2. Jump over noodle. 3. Dizzy bat cone run. 4. Jump rope burn out.	Make sure students are interpreting the station cards correctly and are on task. Talk to each group about directions and pathways as it pertains to each task as well as HRF.	Each teams reads the activity card and performs the activity at each area correctly. When complete the team sits down. Teams will rotate on teacher whistle.	Cardiovascular endurance Muscular strength Muscular endurance
14	Station activities using 1. Backward run around cone. 2. Wheel barrel cone weave. 3. Hand weight shuttle run. 4. Jumping jax, mountain climbers, push ups, sit ups.	Make sure students are interpreting the station cards correctly and are on task. Talk to each group about directions and pathways as it pertains to each task as well as HRF.	Each teams reads the activity card and performs the activity at each area correctly. When complete the team sits down. Teams will rotate on teacher whistle.	Cardiovascular endurance Muscular strength Muscular endurance
15	**Competition 4** All teams will run through the obstacle course designed by the teacher	Sets up an obstacle course using equipment from the previous two lessons. Then time and officiate each team as they run through the course.	Each team runs through the obstacle course created by the teacher. When not competing each team sits in correct area and cheers/watches the competition	Cardiovascular endurance Muscular Strength Muscular endurance
16	Post Pacer test and awards ceremony.	N/A	N/A	N/A

APPENDIX D: PACER FITNESS RECORDING SHEET

High Autonomy Class	Sex	Age	pre	post	Teacher Directed Class	Sex	Age	pre	post

APPENDIX E: PEDOMETER RECORDING SHEET

#	Name	1	2	3	4	5
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

Male = 10 Female = 10

APPENDIX F: TEAM ROLES AND RESPONSIBILITIES

Team Role	Responsibilities
Team Captain	Provide overall team leadership Lead team practice Help teammates learn skills They are the spokesman for their team Their teams conduct during every lesson
Equipment Manager	Distribute the equipment to teammates Collect and put away equipment
Fitness Coordinator	Reads the station cards to their teammates
Course design leader	Provide overall leadership during course design Ensure safety of all obstacles in the course Assess and test the course

APPENDIX G: OFFICIATING ROLES AND RESPONSIBILITIES

Officiating Role	Responsibilities
Starter	Signal to begin the race Watch for false-start Ensure correct baton exchange procedures
Timer	Keep track of individual times Calculate individual times into team total times
Course official	Confirm the accuracy of the obstacle completion Assess penalties and deductions for uncompleted obstacles Reposition fallen obstacles and equipment Relay all penalty information to the timer and teacher for scoring

APPENDIX H: TEACHING CLIMATE SURVEY

DO NOT PUT YOUR NAME!
I am a GIRL / BOY (CIRCLE one)

- This is not a test – this is a survey. There are no wrong answers.
- We want to know what YOU think. Please give your honest feelings.
- None of your teachers will see your answers.

DIRECTIONS: Thinking about the obstacle course unit, please answer the following questions by circling the answer that best describes how you feel.

Circle This One……OR……Circle This One

1	Do students help each other learn?	OR	Does the teacher do all the helping?
2	Do students get to independently problem solve?	OR	Does the teacher solve all the problems?
3	Does the teacher create the obstacle course?	OR	Do the students create the obstacle course?
4	Do the students get to make decisions in the class?	OR	Does the teacher make all the decisions?
5	Do you get to make your own choices in this class?	OR	Does the teacher make choices for you?
6	Does the teacher tell you what activities to do?	OR	Do you get to choose your own activities?
7	Do you have responsibilities in your team?	OR	Does the teacher take responsibility for all the decisions?
8	Do you feel that everyone has the opportunity to participate?	OR	Do the higher skilled students get to participate more?

9	Do both girls and boys get to participate equally?	YES	NO
10	Do you feel like you are important to your team?	YES	NO
11	Do you feel like your team thinks you are important to the team?	YES	NO
12	Do you have any responsibilities on your team?	YES	NO
13	Does this class make you like PE better than before?	YES	NO
14	Do you feel like you have more choices in this class than in other PE classes that you have had?	YES	NO
15	Do you feel as though you are more active outside of school because of being in this class?	YES	NO
16	Do you feel like your fitness has improved from being in this class?	YES	NO
17	Do students get to be leaders in this class?	YES	NO

APPENDIX I: CLIMATE CHECK LIST

Observer_____ DATE _____ MODEL A or B

Mark YES or NO if the criteria was met during the instructional intervention.

1. Students discuss among each other how to do the tasks.
   YES NO

2. Students design their own tasks.
   YES NO

3. Students help each other when confused.
   YES NO

4. Students work out problems on their own.
   YES NO

5. Students design their own obstacles.
   YES NO

6. Students design their own obstacle course.
   YES NO

7. Students create the rules for running the obstacle course.
   YES NO

8. Students engage in roles such as officiating.
   YES NO

9. Students have opportunities to make their own decisions.
   YES NO

10. Teacher facilitates with prompts and questions.
    YES NO

11. Teacher facilitates by giving students the answer.
    YES NO

12. Students have responsibilities, such as equipment, etc.
    YES NO

13. When faced with a decision, students make the decision.
    YES NO

14. When faced with a decision, teacher makes the decision.
YES NO

15. Students design the activities to be done.
YES NO

16. Teacher assigns activities to be done.
YES NO

17. Participation is equitable for all children.
YES NO

18. Certain children (e.g., higher skilled, boys, etc.) get to participate more than others.
YES NO