Physical Activity in Physical Education Classes and Achievement on the Washington Assessment of Student Learning

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A Special Project

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Amy Hammons

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FACULTY APPROVAL

Physical Activity in Physical Education Classes and Achievement on the Washington Assessment of Student Learning

Approved for the Faculty

_____, Faculty Advisor

ABSTRACT

The purpose of this project was to evaluate the relationship between regular physical activity in physical education classes and achievement on the Washington Assessment of Student Learning. This study was limited to only one rural high school. Therefore, there was not a very large sample size. The study was also limited to only students who took the Washington Assessment of Student Learning in 2007 and students who were enrolled in a physical education course both fall and spring semesters in the 2006-2007 school year. The author hoped to sway district administration with the findings of a positive relationship into hiring elementary physical education specialists and to provide more opportunities for all students to be physically active on a consistent and regular basis during the school day.

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CHAPTER 1

Introduction

Background for the Project

The high school where this project took place was in a school district located in the heart of the Mid-Columbia Basin and was primarily an agricultural community in the north of Franklin County, Washington. The district was 250 miles east of Seattle and 100 miles south of Spokane, Washington. The district covered some 700 square miles - the second largest geographic district in the state. Many residents of the community had found that life in a county with a rich agricultural heritage was favorable country living. Because of the rural nature of the region, the school was often not only the focal point for learning, but also for recreation and socialization.

Strong families were the anchors of the school district and parents and grandparents provided thousands of hours of volunteer service at schools each year. Churches also played an important role in the social and religious fabric of the community. Many churches had stepped forward to support the school district in projects that had benefited youth. Churches had been leaders in establishing tutoring and reading programs, building a first class sports facility for the district,

providing a safe after-school environment for teenagers and implementing scouting programs and other student-supporting activities.

There were four rural towns within the school district. All four towns were agriculturally dependent, and businesses were centered on service to orchards, irrigated crops and dry land wheat farms. The majority of parents of students within the district were employed in farm labor-related jobs. The single largest non-education employer within the district boundaries was a potato processing plant.

The district had seen great cultural changes in the last two decades as many new families had immigrated and migrated for jobs to this agriculturally rich area. Beginning with sugar beets in the 1950s and 60s to today, with other row crops and burgeoning orchards, there had always been a need for seasonal labor. Many of the migrating families had recognized the advantages and opportunities for growth in the Columbia Basin and had chosen to permanently settle in this region and seek year-round employment and business ventures. The high school's 2006-2007 school improvement plan reported that Franklin County's population was 37.6 percent Caucasian, 60.3 percent Hispanic and 1.4 percent Asian.

Preparing students to be technologically capable and assertive was foremost in the plans of the school district. The district was a leader in the state in bringing distance learning through networking to rural and remote communities in

Washington State. Through a school-to-work program, the district administration and board of directors were leading the way for students to leave the high school ready for advanced education in universities, colleges, and technical institutions, as well as immediate career opportunities that offered students financial success as well as satisfying and productive work. The goal and mission of the school district was to provide such excellence in education that all students would have confidence in the future ahead.

Statement of the Problem

Despite the increasing number of overweight and obese children in the United States, many schools had cut physical education programs or reduced physical education requirements in favor of offering more academic courses. Such curricular changes had aimed at increasing students' academic achievement even though previous studies had shown positive relationships between academic achievement and physical activity or participation in sports (Sigman Somerset, 2007). During the 2006-2007 school year, the high school used in this special project reduced physical education requirements from two credits (2.0) to 1.5 due to the increase of Washington Assessment of Student Learning intervention classes.

The school district did not have physical education specialists in any of the district's three elementary schools. Classroom teachers were required to teach physical education to the students. Many elementary classroom teachers in the

district were not Highly Qualified in teaching physical education and viewed taking time out of the school day to teach physical education as a burden or not as important as teaching reading, writing, mathematics or science.

Purpose of the Project

The purpose of this project was to evaluate the relationship between regular physical activity in physical education classes and achievement on the Washington Assessment of Student Learning. The author hoped to sway district administration with findings of a positive relationship into hiring elementary physical education specialists and to provide more opportunities for all students to be physically active on a consistent and regular basis during the school day.

Delimitations

This study was limited to only one rural high school. Therefore, there was not a very large sample size. The study was also limited to only students who took the Washington Assessment of Student Learning in 2007 and students who were enrolled in a physical education course both fall and spring semesters in the 2006-2007 school year. In other words, Washington Assessment of Student Learning scores were only used in this study if that student was enrolled in a physical education class for the entire 2006-2007 school year.

Curricular restructuring at the high school was also a delimitation. During the 2006-2007 school year the high school used in this special project reduced physical education requirements from two credits (2.0) to 1.5 due to the increase

of Washington Assessment of Student Learning intervention classes. Students who did not pass portions of the Washington Assessment of Student Learning or who scored low on fall and spring Measures of Academic Progress tests were withdrawn from physical education classes and placed in intervention classes.

A decrease in student population was also a delimitation in this study. High school enrollment decreased by over 100 students from the 2004-2005 school year to the 2005-2006 year. Vocational funding was in danger of being lost due to low enrollment in vocational classes. Therefore, some students who were already enrolled in physical education classes were withdrawn and put into vocational classes.

Assumptions

Students were physically active when enrolled in physical education classes. Students enrolled in physical education classes participated with vigorous effort. Teachers were Highly Qualified in Physical Education.

Hypothesis

Students who participated in physical activity on a regular basis in physical education classes would pass more portions of the Washington Assessment of Student Learning than students who were not enrolled in physical education classes as measured by chi square.

Null Hypothesis

Students who participated in physical activity on a regular basis in physical education classes would not pass more portions of the Washington Assessment of Student Learning than students who were not enrolled in physical education classes as measured by chi square.

Significance of the Project

Many schools had cut physical education programs or reduced physical education requirements in favor of offering more academic courses. Such curricular changes had aimed at increasing students' academic achievement even though previous studies had shown positive relationships between academic achievement and physical activity or participation in sports (Sigman Somerset, 2007). The high school used in this special project reduced physical education requirements from two credits (2.0) to 1.5 due to the increase of Washington Assessment of Student Learning intervention classes.

The school district did not have physical education specialists in any of the district's three elementary schools. Classroom teachers were required to teach physical education to the students. Many elementary classroom teachers in the district were not Highly Qualified in teaching physical education and viewed taking time out of the school day to teach physical education as a burden or not as important as teaching reading, writing, mathematics or science.

If a relationship could be established between regular physical activity in physical education classes and achievement on the Washington Assessment of Student Learning, the author hoped to convince district administrators to hire elementary physical education specialists and to provide more opportunities for all students to be physically active on a consistent and regular basis during the school day. Without convincing data the author had little hope of bringing about such a significant change within the district.

Procedure

The author first discussed the scope and purpose of evaluating the relationship between regular physical activity in physical education classes and achievement on the Washington Assessment of Student Learning with the building vice-principal. Washington Assessment of Student Learning scores from 2007 were gathered and compared to student rosters of physical education classes. Students enrolled in both 1st and 2nd semester physical education classes in the 2006-2007 school year and students that also took the 2007 Washington Assessment of Student Learning test were placed together in a group titled "physically active group." Students not enrolled in physical education classes in the 2006-2007 school year and students that also took the 2007 Washington Assessment of Student Learning test were placed together in a group titled "non-physically active group." Chi square was used to measure the relationship between the number of portions passed on the 2007 Washington Assessment of

Student Learning by the physically active group and the number of portions passed on the 2007 Washington Assessment of Student Learning by the non-physically active group. The author hoped to prove that students who participated in physical activity on a regular basis in physical education classes would pass more portions of the Washington Assessment of Student Learning than students who were not enrolled in physical education classes as measured by chi-square.

Definition of Terms

FINESSGRAM: FITNESSGRAM was developed by The Cooper Institute in an effort to provide physical educators with a tool that would facilitate communicating fitness testing results to students and to parents. The assessment measured three components of health-related physical fitness that have been identified as important to overall health and function: aerobic capacity; body composition; and muscular strength, endurance, and flexibility.

Highly Qualified: The federal No Child Left Behind Act (NCLB), reauthorized in 2001, required that all teachers be highly qualified in the core academic content area(s) in which they taught. The federal No Child Left Behind Act placed major emphasis upon teacher quality as a factor in improving achievement for all students. This emphasis grew out of the research showing that teachers' mastery of the academic content they taught was critical to engaging students and was a significant factor in raising levels of student achievement. All veteran teachers of core academic content areas should have met

the highly qualified teacher requirement by the end of the 2005-2006 school year. All instructional paraprofessionals in Title I school-wide or Title I targeted assistance programs should also have met the highly qualified paraprofessional requirements by the end of the 2005-2006 school year.

Non-Physically Active Group: Students not enrolled in physical education classes in the 2006-2007 school year that took the 2007 Washington Assessment of Student Learning test.

Physically Active Group: Students enrolled in both 1st and 2nd semester physical education classes in the 2006-2007 school year that took the Washington Assessment of Student Learning test.

STATPAK: A statistical tool used to help calculate frequently used statistical tests quickly and efficiently. When scores were entered STATPAK generated and printed statistical results. STATPAK was run on a Windows-based personal computer. The following were the statistical tests from which to choose:

1. MEAN AND STANDARD DEVIATION
2. SPEARMAN RHO
3. PEARSON r
4. z and T Scores
5. t TEST FOR INDEPENDENT SAMPLES
6. t TEST FOR NONINDEPENDENT SAMPLES
7. ANOVA

8. ONE DIMENSIONAL CHI SQUARE

9. TWO DIMENSIONAL CHI SQUARE

Washington Assessment of Student Learning: A standardized educational assessment system that was also used as a high school graduation examination in Washington State.

Acronyms

ACSM: The American College of Sports Medicine

MAP: Measures of Academic Progress

MET: A unit of metabolic equivalent, or MET, is defined as the ratio of a person's working metabolic rate relative to the resting metabolic rate.

NCLB: No Child Left Behind

NPAG: Non-Physically Active Group

PAG: Physically Active Group

PFT: Physical Fitness Test

WASL: Washington Assessment of Student Learning

CHAPTER 2

Review of Selected Literature

Introduction

Literature selections reviewed for the study dealt with some aspect of the relationship between physical activity and academic achievement. While the focus of the literature primarily came from educational periodicals, the author also took advantage of the research that surrounded studies used in science and medical fields. The review of literature in education and in science and medicine provided the historical and specific content necessary for conducting a study in the relationship of physical activity and achievement on the Washington Assessment of Student Learning.

The five major themes discovered in the literature on physical activity and academic achievement were: 1. The Role of Physical Activity in Academic Achievement, 2. Physical Fitness Levels and Academic Achievement, 3. Vigorous Physical Activity and Academic Achievement, 4. The Need for Physical Education and Physical Activity in Public Schools, and 5. High-Stakes Testing and the Status of Physical Education.

The Role of Physical Activitiy in Academic Achievement

Action for Healthy Kids (2004) cited numerous studies that supported increased physical activity led to higher academic achievement. These recent studies revealed:

1. Academic achievement improves even when the physical education reduces the time for academics. A reduction of 240 minutes per week in class time for academics to enable increased physical activity led to consistently higher mathematics scores.
2. A recent study has shown a correlation between the SAT-9 test results with the Fitnessgram indicating that the physical well-being of students has a direct impact on their ability to achieve academically. Students with the highest fitness scores also had the highest test scores.
3. Intense physical activity programs have positive effects on academic achievement, including increased concentration; improved mathematics, reading, and writing test scores; and reduces disruptive behavior.
4. Aerobic conditioning may help to improve memory. Exercise may strengthen particular areas of the brain, and oxygen intake during exercise may enhance greater connections between neurons. (Action for Healthy Kids, 2004, p. 2)

Physical Fitness Levels and Academic Achievement

A study performed by James Grissom of the Journal of Exercise Physiology Online (JEPonline) evaluated the relationship between physical fitness and academic achievement. Grissom compared physical fitness test (PFT) results from FITNESSGRAM to reading and mathematics scores on the Stanford Achievement Test 9th edition (SAT/9). A sample of 884,715 California students enrolled in public school in 2002 was used. Each student in the sample had complete data on both the physical fitness and academic achievement tests. Students in the sample were all in 5th, 7th, and 9th grade.

Results identified that when the overall PFT scores were compared to mean SAT/9 reading and mathematics scores, there was a consistent positive relationship between physical fitness and academic achievement. Analysis of Variance was used to test this relationship. Analyses of Variance exhibited, as overall PFT scores increased mean SAT/9 scores also increased in a statistically significant way, indicating a significant positive linear relationship between fitness and achievement (Grissom, 2006).

Vigorous Physical Activity and Academic Achievement

Students who participated in vigorous physical activity, such as sports, performed better in school, according to a study released by the American College of Sports Medicine. The examination of activity and physical education compared to academic achievement showed that the most active students more often had

better grades. The study was published in the August 2007 issue of *Medicine & Science in Sports & Exercise*, the official journal of ACSM. Coe, Pivarnik, Womack, Reeves, and Malina (2006) hypothesized that increased physical activity, including the activity from physical education classes, would lead to better classroom performance because of the positive effects physical activity had on arousal level, concentration and self-esteem.

The researchers enlisted 214 sixth-graders from one public school in western Michigan. Students were divided into two groups: a physical education class and an "exploratory class" (i.e., computer science or art). Both classes met every weekday for 55 minutes during one semester. The data measured over the course of the school year for the two groups of students included height, weight, body mass index, amount of physical activity outside of school, academic grades, and fitness instruction time in physical education classes. Students were asked to report all physical activities engaged outside of school in the three days previous to class. The activities were divided into 30-minute time blocks, for which students were asked to identify the activity and the activity's intensity level. The number of moderate-intensity and vigorous-intensity activity blocks and their corresponding MET values (i.e., energy required for the activity) were used to assess the students' overall activity level outside of school. Physical education classes were observed four times during the semester, and student activity levels--specifically quantity and type of physical activity--were recorded and analyzed.

Academic achievement was measured from the standardized test scores and students' grades in mathematics, English, science and world studies.

The main finding was that enrollment in physical education classes was not related to academic achievement scores, but involvement in vigorous physical activity was. Students who engaged in vigorous activity outside of school at least 20 minutes per day, three days per week, were found to have higher academic scores. The students that were in physical education class spent an average of only 19 minutes out of a 55-minute class engaged in moderate-to-vigorous physical activity. Given that this amount and intensity of activity had no correlation to students' academic achievement, whereas there was a significant association between academic achievement and vigorous activity outside of the school, the researchers proposed that there could be a "threshold level of activity" necessary "to produce these potentially desirable effects" (Coe, Pivarnik, Womack, Reeves, & Malina, 2006).

"Physical education and activity during the school day may reduce boredom and help keep kids attention in the classroom," said Dawn Podulka Coe, Ph.D., the study's lead author. "We were expecting to find that students enrolled in PE would have better grades because of the opportunity to be active during the school day. But, enrollment in PE alone did not influence grades. The students who performed better academically in this study were the most active. Meaning

those who participated in a sport or other vigorous activity at least three times a week" (Coe et al., 2006, p. 1516).

Most of the vigorous activity was achieved outside the classroom in sports such as soccer, football, basketball and baseball/softball. Since vigorous levels of activity favorably influenced academic performance, the researchers suggested incorporating vigorous activity in PE classes. Ultimately, while causal relationships between physical activity and academic achievement have remained uncertain, this study added to the evidence that has shown that involvement in physical education does not have negative effects on academic achievement (Coe et al., 2006).

The Need for Physical Education and Physical Activity in Public Schools

On July 27th, 2007, the Westside Gazette published *The Need for Physical Education and Physical Activity in Our Schools*. The article stated that studies have shown that when children's exercise and fitness needs were met, children were more able to learn and achieve. Given the growing epidemic of obesity and the link between physical activity and academic performance, the article urged that parents and schools should work together to make quality daily physical education a priority in public schools and children should be given more opportunities to be physically active throughout the school day. The article discussed and provided data about the following four areas: 1. Children were becoming overweight and were developing "adult" diseases, 2. Children were

becoming increasingly less physically active, 3. Many children were sedentary at school, and 4. When children were active, academic performance improved (Westside Gazette, 2007).

High-Stakes Testing and the Status of Physical Education

Stevens-Smith, Fisk, Keels-Williams, and Barton (2006) sought to determine where physical education fell in the priorities of elementary school principals. Eighty-six elementary and primary school principals representing 25 school districts containing 213 schools, distributed across a socioeconomic range based on students' eligibility for free or reduced-price lunches, completed a 30-question survey that assessed the principals' perceptions of the academic value of the following subjects: language arts, math, science, social studies, history, physical education, art, music, technology, foreign language, and health. Data was also collected on how curricular areas were prioritized with regard to their importance and time allocation.

Sixty-four percent of the principals ranked physical education last out of all academic subjects identified, and 31 percent did not view physical education as an academic area. One of the reasons that principals gave for the low rankings was that physical education was not vital to the school's functioning. Principals saw physical education as a place to go and be active, but not as a subject that enhanced academic learning. Not surprisingly, time allotment followed perceptions of academic viability, with physical education being given 84 minutes

per week compared to 523 for language arts, 335 for mathematics, 186 for science, 171 for social studies, 154 for history, 97 for health, 90 for foreign language, and 87 for technology. Only music (64) and art (59) were allocated less time. Furthermore, while 96 percent of the principals indicated awareness of standards of learning for physical education, only 61 percent indicated accountability for physical education standards. Thirty-nine percent of the principals were not accountable for physical education standards in contrast to 95 percent of principals who indicated accountability for language arts and math, and 91 percent for science (Stevens-Smith, Fisk, Keels-Williams, & Barton, 2006).

Data revealed that principals viewed physical education as having lower academic value and as a subject area in which students participated in activity that was not critical to the mission of public schools (e.g., 21 of the 86 principals ranked physical education a low-priority course and none as a high priority). As noted by the Shape of the Nation Report (NASPE, 2001), "... content that is not tested becomes lower in priority" (p. 3). The subjects for which teachers and principals were not held accountable have continued to be relegated to a lower priority. The researchers recommended that physical educators advocate for legislation that addressed accountability if the status of the subject as a viable curricular area was to improve (Stevens-Smith et al., 2006).

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Summary

The literature that surrounded physical activity and academic achievement was both positive and negative in nature. While the studies found in the literature deemed physical activity as vital to academic achievement, there was data that revealed that principals viewed physical education as having lower academic value and as a subject area in which students participated in activity that was not critical to the mission of public schools.

CHAPTER 3

Methodology and Treatment of Data

Introduction

The author hoped to prove that students who participated in physical activity on a regular basis in physical education classes would pass more reading and writing portions of the 2007 Washington Assessment of Student Learning (WASL) than students not enrolled in physical education classes. The author conducted a causal-comparative study that utilized the chi square method.

Methodology

The author used a causal-comparative study for the research method. "Causal-comparative research attempts to determine the cause, or reason, for existing differences in the behavior or status of groups of individuals" (Gay, L. R., Mills, G. E., & Airasian, P., 2006, p. 217). In this study the author hoped to prove that students who participated in physical activity on a regular basis in physical education classes would pass more reading and writing portions of the 2007 WASL than students not enrolled in physical education classes. In other words, the author hoped to prove that physical activity in physical education classes was the cause of higher achievement on the reading and writing portions of the WASL.

Participants

The project involved 120 ninth and tenth grade high school students who took the 2007 WASL. The project was conducted during the 2006-2007 school year.

Instruments

A two dimensional chi square test was used to compare the number of reading and writing portions passed on the 2007 WASL by students enrolled in physical education classes and students not enrolled in physical education classes. Washington Assessment of Student Learning scores from 2007 were gathered and compared to student rosters of physical education classes. Students enrolled in both 1st and 2nd semester physical education classes in the 2006-2007 school year and students who also took the 2007 WASL were placed together in the Physically Active Group (PAG). Students not enrolled in physical education classes in the 2006-2007 school year that took the 2007 WASL were placed together in the Non-Physically Active Group (NPAG). Chi square was used to measure the significance between the number reading and writing portions passed on the 2007 WASL by the PAG and the number of portions passed on the 2007 WASL by the NPAG.

According to Gay et al., (2006), chi square was a nonparametric test of significance appropriate when the data were in the form of frequency counts or percentages and proportions that could be converted to frequencies. “Chi square is

appropriate when the data are a nominal scale and fall into either true categories (e.g., male vs. female) or artificial categories (e.g., tall vs. short). A true category is one in which persons or objects naturally fall, independently of any research study, whereas an artificial category is one that is operationally defined by a researcher" (Gay et al., 2006, p. 370). In this study students fell into artificial categories (PAG vs. NPAG) and passed 0, 1, or 2 portions on the reading and writing portions of the 2007 WASL. Chi square tests compared the proportions actually observed in a study to the expected proportions to see if they were significantly different (Gay et al., 2006). In this study the observed proportions of a nominal value of 0, 1, or 2 (number of reading and writing portions passed on the 2007 WASL) were converted to frequencies of 1 (0 portions passed), 2 (1 portion passed) and 3 (2 portions passed) and compared to the expected proportions of reading and writing portions passed. Whether the chi square was significant was determined by consulting a chi square table.

Design

The author used a causal-comparative study for the design method. A two dimensional chi square test was used to compare the number of reading and writing portions passed on the 2007 WASL by students enrolled in physical education classes and students not enrolled in physical education classes.

Procedure

The author first discussed the scope and purpose of evaluating the relationship between regular physical activity in physical education classes and achievement on the WASL with the building vice-principal. Washington Assessment of Student Learning scores from 2007 were gathered and compared to student rosters of physical education classes. Students enrolled in both 1st and 2nd semester physical education classes in the 2006-2007 school year and students who also took the 2007 WASL were placed together in the PAG. Students not enrolled in physical education classes in the 2006-2007 school year that took the 2007 WASL were placed together in the NPAG. Chi square was used to measure the significance between the number reading and writing portions passed on the 2007 WASL by the PAG and the number of portions passed on the 2007 WASL by the NPAG. The author hoped to prove that students who participated in physical activity on a regular basis in physical education classes would significantly pass more reading and writing portions of the WASL than students who were not enrolled in physical education classes as measured by chi-square.

Treatment of the Data

The author used chi square to statistically calculate the data. A two dimensional chi square test was used to compare the number of reading and writing portions passed on the 2007 WASL by PAG students and NPAG students.

The author used STATPAK (2007) to conduct the two dimensional chi square test.

Summary

The author conducted a causal-comparative study that utilized the chi square method. A two dimensional chi square test was used to compare the number of reading and writing portions passed on the 2007 WASL by students enrolled in physical education classes and students not enrolled in physical educational classes. STATPAK (2007) was used to conduct the two dimensional chi square test. The author hoped to prove that physical activity in physical education classes was the cause of higher achievement on the reading and writing portions of the WASL.

CHAPTER 4

Analysis of the Data

Introduction

The author hoped to prove that students who participated in physical activity on a regular basis in physical education classes would pass more reading and writing portions of the 2007 Washington Assessment of Student Learning (WASL) than students not enrolled in physical education classes. The author conducted a causal-comparative study that utilized the chi square method.

Description of the Environment

The high school where this project took place was in a school district located in the heart of the Mid-Columbia Basin and was primarily an agricultural community in the north of Franklin County, Washington. The project involved 9th and 10th grade high school students who took the 2007 WASL. The project was conducted during the 2006-2007 school year. A two dimensional chi square test was used to compare the number of reading and writing portions passed on the 2007 WASL by PAG students and NPAG students.

Hypothesis

Students who participated in physical activity on a regular basis in physical education classes would pass more portions of the Washington

Assessment of Student Learning than students who were not enrolled in physical education classes as measured by chi square.

Null Hypothesis

Students who participated in physical activity on a regular basis in physical education classes would not pass more portions of the Washington Assessment of Student Learning than students who were not enrolled in physical education classes as measured by chi square.

Results of the Study

Chi square equaled 15.2 with a degree of freedom of 59. Results of the study supported the null hypothesis. Results of this study indicated that students who participated in physical activity on a regular basis in physical education classes did not pass more portions of the Washington Assessment of Student Learning than students who were not enrolled in physical education classes as measured by chi square. The raw data for the test was included for review.

TABLE 1

Raw data of 2007 reading and writing WASL portions for chi square test of students enrolled in physical education classes (PAG) and students not enrolled in physical education classes (NPAG).

Student number	Reading and Writing WASL portions passed by PAG	Reading and Writing WASL portions passed by NPAG
1	**2/2=3**	**0/2=1**
2	**0/2=1**	**2/2=3**
3	**2/2=3**	**2/2=3**
4	**2/2=3**	**2/2=3**
5	**2/2=3**	**0/2=1**
6	**2/2=3**	**1 / 2=2**
7	**2/2=3**	**2/2=3**
8	**2/2=3**	**2/2=3**
9	**2/2=3**	**0/2=1**
10	**2/2=3**	**2/2=3**
11	**2/2=3**	**2/2=3**
12	**1 / 2=2**	**2/2=3**

13	**2/2=3**	**2/2=3**
14	**2/2=3**	**1 / 2=2**
15	**2/2=3**	**2/2=3**
16	**2/2=3**	**2/2=3**
17	**2/2=3**	**2/2=3**
18	**2/2=3**	**2/2=3**
19	**1 / 2=2**	**1 / 2=2**
20	**2/2=3**	**2/2=3**
21	**2/2=3**	**1 / 2=2**
22	**2/2=3**	**0/2=1**
23	**2/2=3**	**1 / 2=2**
24	**2/2=3**	**1 / 2=2**
25	**1 / 2=2**	**1 / 2=2**
26	**2/2=3**	**0/2=1**
27	**0/2=1**	**2/2=3**
28	**2/2=3**	**2/2=3**
29	**2/2=3**	**2/2=3**
30	**2/2=3**	**2/2=3**
31	**2/2=3**	**2/2=3**
32	**2/2=3**	**1 / 2=2**

33	**1 / 2=2**	**0/2=1**
34	**2/2=3**	**2/2=3**
35	**2/2=3**	**1 / 2=2**
36	**2/2=3**	**0/2=1**
37	**2/2=3**	**2/2=3**
38	**2/2=3**	**2/2=3**
39	**2/2=3**	**2/2=3**
40	**2/2=3**	**2/2=3**
41	**2/2=3**	**2/2=3**
42	**2/2=3**	**2/2=3**
43	**2/2=3**	**2/2=3**
44	**2/2=3**	**2/2=3**
45	**2/2=3**	**1 / 2=2**
46	**2/2=3**	**2/2=3**
47	**2/2=3**	**2/2=3**
48	**2/2=3**	**1 / 2=2**
49	**2/2=3**	**2/2=3**
50	**2/2=3**	**2/2=3**
51	**2/2=3**	**2/2=3**
52	**2/2=3**	**2/2=3**

53	**2/2=3**	**2/2=3**
54	**2/2=3**	**2/2=3**
55	**2/2=3**	**2/2=3**
56	**2/2=3**	**2/2=3**
57	**2/2=3**	**2/2=3**
58	**1 / 2=2**	**1 / 2=2**
59	**2/2=3**	**2/2=3**
60	**2/2=3**	**2/2=3**

Findings

The sample included 120 ninth and tenth grade students who took the 2007 WASL. Chi square was used to measure the difference of reading and writing portions of 60 PAG students and 60 NPAG students. Chi square found that there was a degree of freedom of 59. With a sample of 60 students per group a degree of freedom of 59 meant that there was literally no difference in the number of reading and writing portions passed by the two groups. In other words, one group did not pass more reading and writing portions of the WASL than the other. Results of the study supported the null hypothesis.

Discussion

This study was limited to only one rural high school. Therefore, there was not a very large sample size. The physically active group was also limited to only

students who took the Washington Assessment of Student Learning in 2007 and students who were enrolled in a physical education course both fall and spring semesters in the 2006-2007 school year. The non-physically active group contained any student who took the 2007 WASL that did not take physical education course both fall and spring semester in the 2006-2007 school year. Consequently, the NPAG contained several students who participated in extra-curricular sports and activities. If the author were to conduct the study again the author would not include athletes in the NPAG or would include athletes in the PAG. Because the author wished to prove that enrollment in physical education classes resulted in higher achievement on the WASL the author was disappointed with the results.

Summary

Results of study supported the null hypothesis. Results of this study indicated that students who participated in physical activity on a regular basis in physical education classes did not pass more reading and writing portions of the Washington Assessment of Student Learning than students who were not enrolled in physical education classes as measured by chi square. If the author were to conduct the study again the author would not include athletes in the NPAG and would include all four areas of the WASL. Because the author wished to prove that enrollment in physical education classes resulted in higher achievement on the WASL the author was disappointed with the results.

CHAPTER 5

Summary, Conclusions and Recommendations

Introduction

The high school where this project took place was in a school district located in the heart of the Mid-Columbia Basin and was primarily an agricultural community in the north of Franklin County, Washington. The project involved 120 ninth and tenth grade high school students who took the 2007 WASL. The project was conducted during the 2006-2007 school year. A two dimensional chi square test was used to compare the number of reading and writing portions passed on the 2007 WASL by PAG students and NPAG students.

The author hoped to prove that students who participated in physical activity on a regular basis in physical education classes would pass more reading and writing portions of the 2007 WASL than student not enrolled in physical education classes. The author conducted a causal-comparative study that utilized the chi square method.

Summary

The high school where this project took place was in a school district located in the heart of the Mid-Columbia Basin and was primarily an agricultural community in the north of Franklin County, Washington. Despite the increasing number of overweight and obese children in the United States the high school

used in this special project reduced physical education requirements from two credits (2.0) to 1.5 due to the increase of WASL intervention classes.

The school district did not have physical education specialists in any of the district's three elementary schools. Classroom teachers were required to teach physical education to the students. Many elementary classroom teachers in the district were not Highly Qualified in teaching physical education and viewed taking time out of the school day to teach physical education as a burden or not as important as teaching reading, writing, mathematics or science. The purpose of this project was to evaluate the relationship between regular physical activity in physical education classes and achievement on the reading and writing portions of the 2007 WASL. The author hoped to sway district administration with findings of a positive relationship into hiring elementary physical education specialists and to provide more opportunities for all students to be physically active on a consistent and regular basis during the school day.

Literature selections reviewed for the study dealt with some aspect of the relationship between physical activity and academic achievement. The five major themes discovered in the literature on physical activity and academic achievement were: 1. The role of Physical Activity in Academic Achievement, 2. Physical Fitness Levels and Academic Achievement, 3. Vigorous Physical Activity and Academic Achievement, 4. The Need for Physical Education and Physical Activity in Public Schools, and 5. High-Stakes Testing and the Status of Physical

Education. The literature that surrounded physical activity and academic achievement was both positive and negative in nature. While the studies found in the literature deemed physical activity as vital to academic achievement, there was data that revealed that school principals viewed physical education as having lower academic value and as a subject area in which students participated in activity that was not critical to the mission of public schools.

Conclusions

Results of study supported the null hypothesis. Results of this study indicated that students who participated in physical activity on a regular basis in physical education classes did not pass more reading and writing portions of the Washington Assessment of Student Learning than students who were not enrolled in physical education classes as measured by chi square.

Recommendations

If the author were to conduct the study again the author would not include athletes in the NPAG. The author also recommends including all four areas of the WASL. Because the author wished to prove that enrollment in physical education classes resulted in higher achievement on the WASL the author was disappointed with the results.

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