

MATH WASL PERFORMANCE AND PHYSICAL EDUCATION

Math WASL performance and physical education:

Score comparison between students enrolled

in PE classes versus students not

enrolled in PE classes.

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Abstract

Research suggests that daily physical activity in schools will result in high academic achievement. Studies have shown that schools requiring daily physical education classes achieved higher test scores in math and reading and that schools who lowered the physical education requirements had no gains in testing in those areas. This study examined 306 students in one high school and searched for a correlation between physical education participation and the scores earned on the mathematics portion of the Washington Assessment of Student Learning during the 2005-2006 school year. The hypothesis of this project was that students who are enrolled in a physical education class during the school year will have a higher chance of passing the math portion of the WASL. The results of this specific experiment did not show the expected results. The investigator discovered that in this particular high school there was no significant change in WASL scores for students enrolled in a physical education class.

Introduction

The Problem

Beginning in the year 2008, students will be required meet a specific standard on the Washington Assessment of Student Learning in order to graduate high school. The current rate of students meeting standard on the math section of this assessment is 51% which means 49% of students are not on track to graduate high school on time. This has caused educators to consider what they are doing right and what they could be doing better in the educational system. A recent study held by the California School Board Association reports that "children in daily physical activity have shown superior academic performance." Education law in the state of Washington requires students to have a minimum of 100 minutes of physical activity per week but many schools are receiving waivers for this requirement to add extra time in the classroom (Rakoz, 2007). A study in Virginia showed that elementary schools that reduced class time in physical education in hopes of raising

test scores failed to raise their test scores. The schools that reduced physical education had virtually no change in test scores (Wilkins, Graham, Parker, Westfall, Fraser, and Tembo, 2003). Reducing time spent in physical education classes failed to raise test scores in one case while adding time in physical education classes in a second case raised test scores. According to the Seattle P.I. there is a legislative bill that could require a full hour of physical activity every day, "especially these K-5 kids, they need to get out" (Santos, 2007). Even if this bill passes, schools will still be able to receive waivers for this requirement.

Only 32% of students in grades 9-12 participated in daily physical education nationwide in 2001, down from 42% in 1991 (McNaughton Tittel & Lichiello, 2004). This reduction of participation in physical education is quite alarming.

The purpose of this study was to explore the relationship between time spent in physical education classes and math WASL scores. If spending 40 minutes

a day in a physically active classroom really does have academic benefits the state should reconsider the waivers they are handing out to schools who require less time in physical education classes.

Related Literature

The California School Board Association has shown that "the benefits of physical education are not isolated to good health. There is growing evidence that regular physical activity enhances learning and school achievement" (CSBA, 2006). A study conducted on the effects of reducing class time for increased physical activity found that "test scores increased for those students. Specifically, when class time for academics was reduced in the two schools by 240 minutes per week to enable increased physical activity exposure, mathematics scores in the experimental group were consistently higher" (Symons, Cynthia Wolford, 1997). Physically active children have a much higher chance at success academically than physically inactive children. An article titled "Fit in Body =

Fit in Mind" helped confirm "that physically fit kids perform better academically" (Covino, 2003).

Another journal article discussing the effects of physical education in elementary children and test results states that "students who received more hours of physical education scored significantly higher on the test" (Tremarche, Ellyn, and Graham, 2007).

Research has been conducted within elementary schools and has shown that physical activity has a direct result on test scores. This would indicate the likely chance that the same results will be seen at the high school level (Tremarche, 2007).

Kathleen Vail, in an article exploring the relationship between the human mind and body, said "When Garrett Lydic's students scale the climbing wall in their physical education classes, they are doing more than exercising their bodies - they are giving their brains a workout, as well" (Vail, 2006).

With so much data showing the benefits of daily physical activity in children it is very surprising to read that "only 8% of elementary schools, 6% of

middle/junior high schools, and 6% of senior high schools provide daily physical education or its equivalent for the entire school year for all grades in the school" (Burgeson, Wechsler, Brener, Young, and Spain, 2000). If it is true that daily physical activity has such benefits children should have these opportunities no matter what school or what grade they are in.

"It is clear that enrollment in school physical education drops precipitously between grades 9 and 12...the bulk of the decline occurs during grades 9 and 10, accounting for approximately 90% of the total decline" (Trost, 2000). In a typical high school the physical education requirement is one year. Some high schools require two full years of physical education but very few require, or even offer, physical education during all four years of high school (Trost, 2000).

Hypothesis

Students who are enrolled in a Physical Education class during the school year will have a higher passing rate on the math portion of the WASL than students who are not enrolled in a physical education class.

Method

Participants

The participants of this study were 10th grade students in a King County High School. Some students were enrolled in a Physical Education class and some were not. Physical education at this specific high school is required as a 9th grader and between 10th and 12th grade students can earn a second required credit by either being involved in a sports activity or taking a second physical education course (weight training, PE 2, or fitness and conditioning) during one of those three years. The students who were enrolled in a physical education course were the experimental group and the students who were not

enrolled in a physical education class were the control group. Physical education is chosen because the state can choose to require this course at the 10th grade level whereas sports activities are on a volunteer basis only. Physical education classes are also monitored for participation at a specific activity level which you can look back on in the form of a grade in most cases. Some students in each group, the experimental and control, may have been involved in a sports activity but this data is excluded because the main concern of this research was specific to physical education classes.

Materials and Instruments

Data from the school year 2005-2006 was gathered from the administration of the high school which was used to find a correlation between Math WASL scores and the enrollment in a physical education class. The data received includes the WASL scores of all 10th grade students for the 2005-2006 school year as well

as the enrollment lists of each physical education class during the 2005-2006 school year.

Design and Procedures

The investigator organized the Math WASL scores into 4 main categories using an excel spreadsheet. The three categories are: near miss, which is defined as a score between 380 and 399; far miss, which is defined as a score lower than 380; passing, which is defined as a score of 400 or higher; and no score, which is defined as any student who did not take the math portion of the WASL that year. Students miss this portion of the test if they miss the day of school it is administered. In this example the names of the participants are omitted for confidentiality.

LastName	FirstName	MathPasCode
1	1	Far Miss
2	2	Far Miss
3	3	Near Miss
4	4	Near Miss
5	5	No Score
6	6	Pass
7	7	Pass

The investigator then took the enrollments lists of all physical education classes during the 2005-2006 school year and organized the lists alphabetically by student last name. This alphabetical list shows which physical education class each student was enrolled in during the school year. If a student was enrolled in more than one physical education class both classes are listed. If a student was not enrolled in a physical education class the space was left blank. This information was then added to the excel spreadsheet shown above. Again, names are omitted for confidentiality in this example.

LastName	FirstName	MathPasCode	Fitness	PE 2	Weights
1	1	Far Miss			x
2	2	Far Miss			
3	3	Near Miss			
4	4	Near Miss			
5	5	No Score	x		x
6	6	Pass			x
7	7	Pass		x	

At this point the investigator used excel to organize the spreadsheet in several different ways. The data was looked at from each category to determine

whether or not students who were enrolled in a physical education class during the school year had a higher passing rate on the math portion of the WASL than students who were not enrolled.

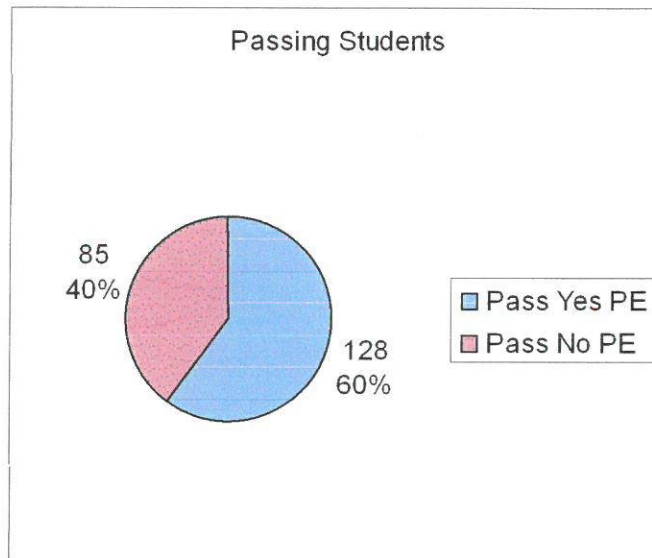
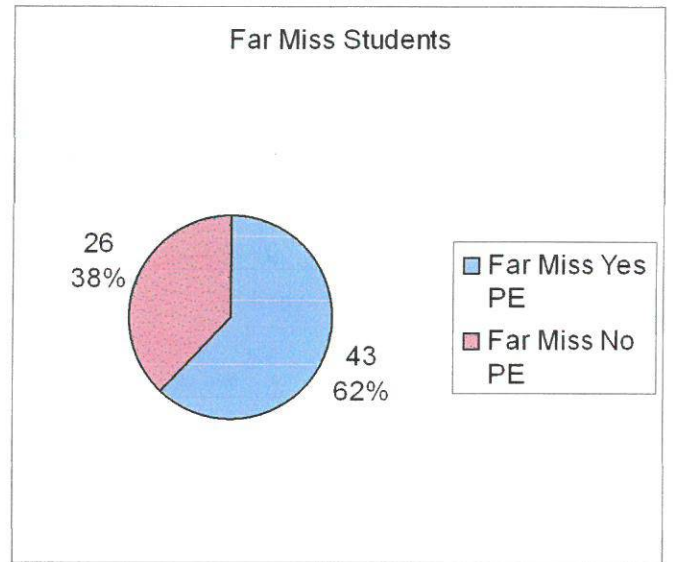
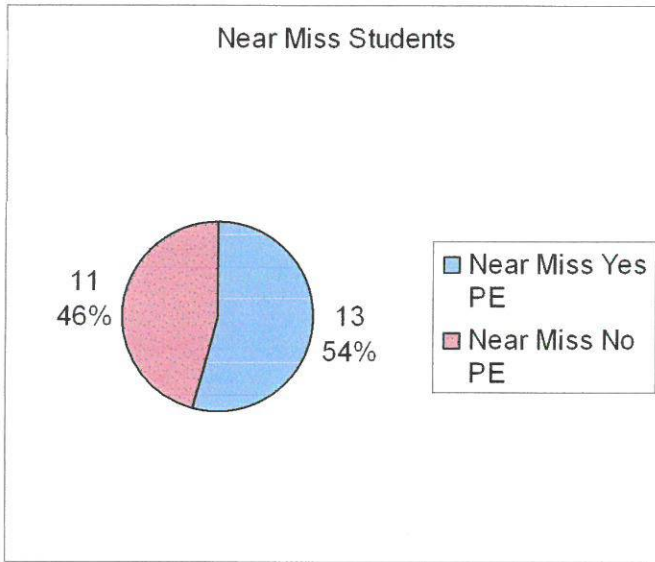
Results

Data Analysis

Three hundred and six students from this high school took the WASL during the 2005-2006 school year. The investigator divided these students into groups based on their scores: Far Miss, Near Miss, and Pass. The passing score of the Math WASL is a score of 400 or higher, a near miss is defined as a score between 380 and 399, a far miss is a score lower than 380.

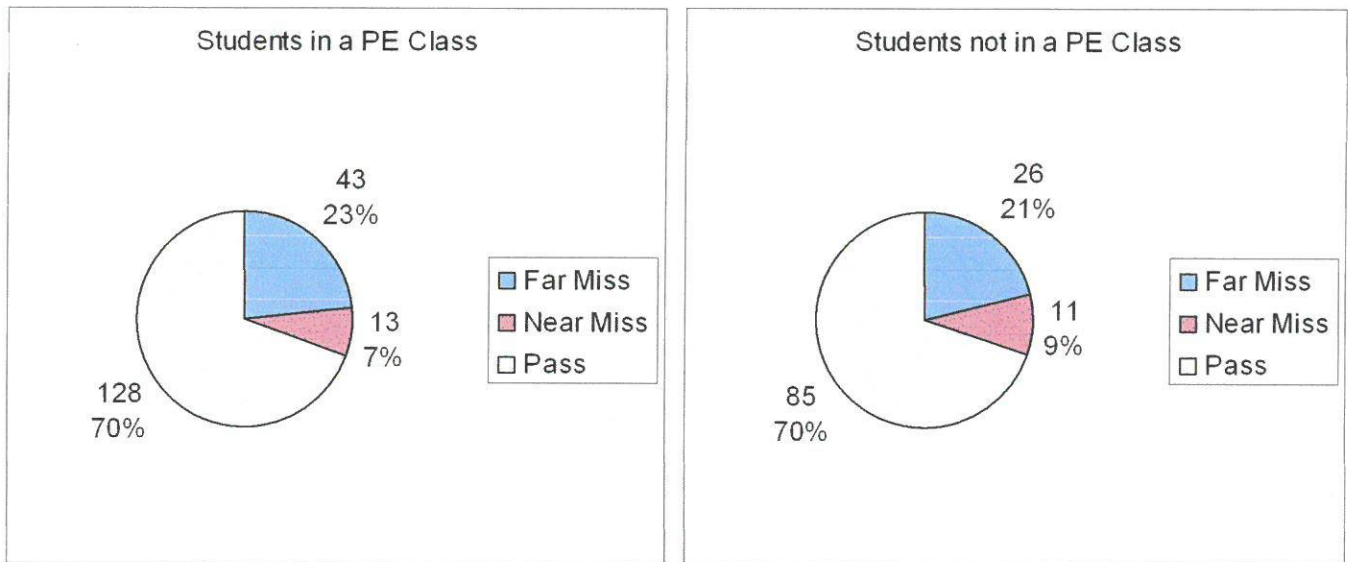
When looking at the data using these three categories it was found that 62% of the students in the Far Miss category were enrolled in a physical education class, 54% of the students in the Near Miss category were enrolled in a physical education class, and 60% of the students in the passing category were

enrolled in a physical education class during the 2005-2006 school year.

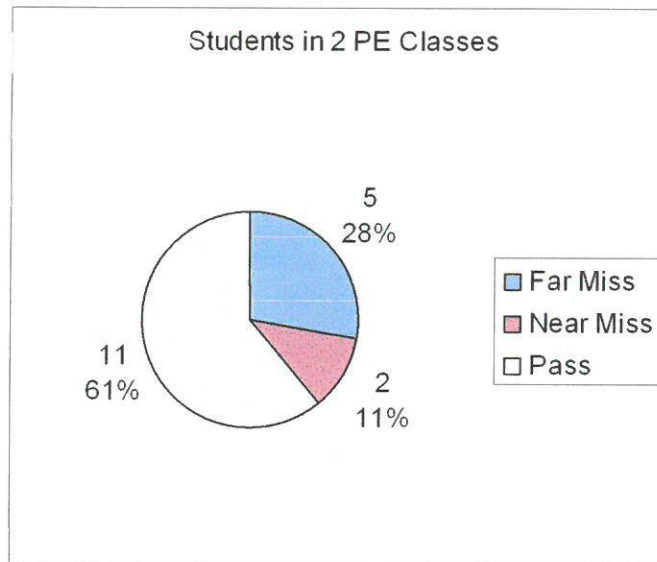


The investigator also looked at the data based on whether or not the students were enrolled in a PE class. 70% of the students enrolled in at least one PE class passed the Math WASL, 7% were a Near Miss, and 23% were a Far Miss.

Of the students not enrolled in a PE class during that same school year, 70% passed the Math WASL, 9% were a Near Miss, and 21% were a Far Miss.



Some students enrolled in two PE classes, of these students, 61% passed the Math WASL, 11% were a near miss, and 28% were a far miss.



Conclusion

The conclusion is that at this specific King County high school, WASL scores are not affected by being enrolled in a physical education class. The data may suggest that being enrolled in two PE classes might lower the students Math WASL score but the sample size for this category was very small. Seventy percent of the entire sample passed the Math WASL, 70%

of the students enrolled in a PE class, and 70% of the students not enrolled also passed. Because there was no difference in the passing rate of students enrolled in a physical education class versus students not enrolled in a physical education class the investigator looked at other factors that may have influenced this outcome. Students at this particular high school who were not enrolled in a physical education class might have been involved in an after school sport or other physical activity. The passing rate at this particular high school was 70% which is almost 20% higher than the state average. With such a high baseline score the effects of physical activity may be less than expected.

Evaluation and Reflection

With so much evidence from other sources showing a correlation between physical education classes and academic success it is surprising that the same correlation was not seen in this investigation. Although the hypothesis of this project was not

supported there are still several uses and applications of this study.

It is definitely clear that being enrolled in a physical education does not lower academic performance. In the related research it is seen that a school that lowered the amount of time spent in physical education classes failed to raise test scores. Like the related research, the data seen in this research shows that students who were not enrolled in a physical education class did not score any higher on the math portion of the WASL than students who were enrolled in a physical education class.

This study did not show a great gain in test scores due to being enrolled in a physical education class, but there are many other benefits to being physically active. These benefits include, but are not limited to: building and maintaining healthy bones, muscles, and joints, controlling weight, building lean muscles, preventing or delaying high blood pressure, as well as lowering the risk of heart

disease. There is no benefit to taking away physical education classes and there are several benefits to providing these classes, therefore we should see a push toward requiring more physical education in schools, specifically at the high school level where the percentage of participants drastically drops off.

The research also shows a negative correlation between students who were enrolled in two or more physical education classes and their math WASL scores. It is possible that the benefits of being physically active begin to decay once a certain amount of hours per day is reached. This would be an interesting study for the future.

With so many requirements being pushed into public education it is going to be very important to weigh the benefits of each service offered. Schools are bound by the amount of time and money they receive and are forced into the position of choosing which programs to continue and which programs to cut. District administrators can use this information to make more informed decisions about the requirements

for physical education classes in their prospective districts.

Summary

Although research suggests that daily physical activity in schools results in high academic achievement the same result was not confirmed by this research. The investigator discovered that in this particular high school there was no significant change in WASL scores for students enrolled in a physical education class when compared with students who were not enrolled in physical education classes.

References

- California School Board Association. (2006).
Retrieved May 20, 2007, from
<http://www.csba.org/is/ch/linkages.htm>
- Burgeson, Charlene R., Wechsler, Howell, Brener, Nancy
D., Young, Judith C., Spain, Christine G.
(2000). Physical Education and Activity:
Results from the School Health Policies and
Programs Study 2000. *Journal of School Health*,
00224391, September, 2001, Vol. 71, Issue 7.
- Covino, Jennifer K. (2003). Fit in Body=Fit in
Mind. *District Administration*, March, 2003, Vol
39, Issue 3, 15.
- McNaughton Tittel, Caroline, Lichiello, Patricia.
(2007, June 26). Childhood Nutrition and
Physical Activity in the Schools: Background
Briefing. Retrieve June 26, 2007, from
http://depts.washington.edu/uwcphn/download/BP_BackgroundBriefing.pdf

Rakoz, Lisa. (2007). Shape of the Nation. Retrieved July 5th, 2007, from http://www.aahperd.org/NASPE/ShapeOfTheNation/template.cfm?template=stateProfile_WA.html

Santos, Melissa. (2007). Exercised legislators defend recess. Retrieved June 26th, 2007, from http://seattlepi.nwsourc.com/health/303023_was109.html

Symons, Cynthia Wolford. (1997). Bringing Student Health Risks and Academic Achievement through Comprehensive School Health Programs. *Journal of School Health*, 67 (6), 224.

Tremarche, Pamela V., Ellyn, Robinson M., Graham, Louise B. (2007). Physical Education and its Effect on Elementary Testing Results. *Physical Educator*, Spring 2007, Vol. 64, Issue 2, 58-64.

Trost, Stewart G. (2004). School Physical education in the Post-Report Era: An Analysis From Public Health. *Journal of Teaching in Physical Education*, 2004, 23, 318-337.

Vail, Kathleen. (2006). Mind and Body. *American*

School Board Journal, March, 2006, 30-33.

Wilkins, Jesse L.M., Graham, George, Parker, Suzanne,
Westfall, Sarah, Fraser, Robert G., Tembo, Mark.
(2003). Time in the arts and physical education
and school achievement. *J. Curriculum Studies*,
2003, Vol. 35, No. 6, 721-734.