

**The Relationship between Student Involvement in Extracurricular  
Sports and Scores on Benchmark Tests in Core Classes**

by

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## Abstract

The purpose of this study was to investigate the relationship between student involvement in extracurricular athletics and student achievement on benchmark exams in core classes. This study was a causal comparative study which tracked groups of eighth-grade students and used their scores on state-standard aligned benchmark exams to measure academic achievement. The groups were divided into students who participated in extracurricular athletics and those who were nonparticipants. The hypothesis was made that students involved in extracurricular sports activities would not have higher scores on benchmark tests in core classes than those students who were not involved in extracurricular sports. Using the benchmark scores and a *t* test for the samples, it was found that students who participated in extracurricular sports showed significantly higher scores in social studies, mathematics, and the average benchmark scores overall. Students who participated in extracurricular athletics scored higher in all classes but the classes mentioned above were the only ones with significant data. The hypothesis that students involved in extracurricular sports activities would not have higher scores on benchmark tests in core classes than those students who were not involved in extracurricular sports was not supported. Further research is warranted to determine the impacts of such things as the involvement of a coach or mentor and if a team mentality provides peer motivation to be successful in academic courses.

# CHAPTER I

## INTRODUCTION

Athletes and athletic involvement have become large focal points in American culture. From youth sports programs with corporate sponsorships to television networks devoted solely to the broadcast of a single sport, many people are drawn to sports (Fox, Barr-Anderson, Neumark-Sztainer, & Wall, 2010). In spite of this huge draw to sports and the recognition that athletic involvement is an important part of childhood physical and cognitive development, many school districts are limiting or even doing away with athletic programs altogether (Taylor, 2012). Often schools take such action to require students to take more academic courses which require formal classroom study; the hope is that this action will bolster standardized test scores. On the contrary, there have been numerous studies which have argued physical activity and sports involvement actually stimulate the brain and increase students' abilities within the classroom (Coe, Pivarnik, Womack, Reeves, & Melina, 2006). With schools eliminating athletic and physical programs, students are often required to seek out extracurricular athletics in order to find athletic opportunities.

According to national studies and the advice of the Surgeon General of the United States in 2001, schools have been encouraged to play a role in encouraging physical activity in order to combat increasing inactivity and obesity among students. The same studies indicate that as many as 33% of American schools have not required physical education for their students (Thomas, 2004). In the same light, a trend has been found indicating schools requiring daily physical education decreases as students advance in grade from roughly 50% in Grades 1-5 to only around 5% by grade 12 (Coe et al., 2006).

There has been a concerted effort in trying to find the effects of athletics on school achievement and to investigate the positive and negative repercussions of implementing, or not implementing, such programs. One important relationship between students, particularly middle school-aged students, and participating in this type of physical activity is how activity and physical movement can stimulate the mind and increase blood flow which encourages health brain development and physical growth (Reys & Reys, 2011). Other studies have shown students' health and physical condition plays a large role in overall achievement in classes and on standardized tests; physical activity greatly contributes to the overall physical health of the student (Renfrow, Caputo, Otto, Farley, & Eveland-Sayers, 2011).

The amount of physical activities readily available to students in most schools is far less than it should be (Piche, Fitzpatrick, & Pagani, 2012). On the high school level, most schools offer interscholastic sports and recreation teams giving all students some form of opportunity to participate and be physically active as part of their education experience. At the middle and elementary levels, these opportunities are far more limited and without access to this level of physical activity, many students are missing important opportunities to further their health and psychological development. Studying students who are involved in extracurricular sports activities and comparing their scores to their classmates who do not have the same level of physical activity, may give some greater insight into the importance of increasing the implementation of extracurricular opportunities and physical activity opportunities among students.

### **Statement of the Problem**

The problem being researched in this study is whether there is a relationship between eighth grade students' involvement in extracurricular sports activities and their scores on

benchmark tests in their core classes. The study is designed to determine if participation in extracurricular sports has any influence on how students perform on assessments in their core classes.

### **Hypothesis**

The null hypothesis for this study is that the eighth-grade students involved in extracurricular sports activities will not have higher scores on benchmark tests in core classes than those students who are not involved in extracurricular sports. The demographic groups investigated in this study included course-level, gender, and extracurricular sports involvement.

### **Operational Definitions**

*Involvement in extracurricular sports:* The operational definition of involvement in extracurricular sports is currently being a member of a recreational athletic team, and actively attending practices and games

*School achievement:* The operational definition of school achievement is scores on benchmark tests in core classes and the percentage registered for mathematics, science, social studies, and language arts in Anne Arundel County's achievement series score registry.

## **CHAPTER II**

### **REVIEW OF THE LITERATURE**

This review of the literature will highlight the findings of researchers and the results of studies which have attempted to determine the relationship between academic success and involvement in extracurricular sports. Section one will provide a brief overview of the issue. Section two will address the relationship between extracurricular sports and academics. Section three will discuss the effects of students' involvement in sports. Section four will review the benefits of sports, and section five will focus on the impact of sports on performance.

#### **Overview**

The academic success of students is determined by much more than what occurs within the walls of the schoolhouse. Success can be impacted by factors within the school building as well as the interactions and encounters outside the school building. Many studies have been conducted to try to determine the factors producing positive and negative impacts on students' academic success. Studies have been done over extended periods of time to determine long term effects of athletic involvement, such as what has been done by Rees and Sabia (2010), while others have focused on short term trials with specific subjects (Reys & Reys, 2011).

Involvement in extracurricular sports has been studied to see the presence between the sport and academic success along with the many outside factors which can contribute to students excelling in school. Recent research has shown there may be a correlation between success in the classroom and involvement in extracurricular sports programs for adolescents (Haudenhuyse, Theeboom, & Coalter, 2012). With student achievement and academic success at the forefront of education, it is important to delve into the impacts of extracurricular sports programs on academic success and to investigate this relationship.

## **Students and Extracurricular Sports**

For well over a century, academic programs have partnered with athletics in many institutions (Rees & Sabia, 2010). From collegiate athletic programs to even some elementary schools, academic programs often partner with either athletic programs or offer some form of extracurricular sports opportunities for their students.

This involvement and membership of a team comes with a number of influences which may be factors in making extracurricular involvement beneficial toward academic achievement. Many studies have set out to find if there is a relationship between athletics and academics and much of the research has been debated as to whether it is sports themselves or the ancillary relationships which act as the main motivating factor (Rees & Sabia, 2010; Reys & Reys, 2011).

In order to gain data and to have concrete information to support the hypothesis of a relationship between sports and academic success, there needs to be a clear measurement of success. Many studies have used a myriad of achievement tests and academic measures which track the success of students along with the impact of extracurricular involvement. The focus behind these studies is the involvement of students in extracurricular settings and not specifically the relationships, accountability, required dedication, or athletic ability which is generally associated with these types of involvement (Rees & Sabia, 2010; Renfrow et al., 2011; Reys & Reys, 2011).

### **Impact of Sports Involvement**

In schools across the country, sports programs and students are active. Programs have been started and students are encouraged to participate through partnership programs such as the National Football League's Play 60 programs. Sports range from individual activity programs

such as gymnastics or swimming to team-based programs such as football or volleyball (Cardon, Van Acker, Seghers, De Martelaer, Haerens, & De Bourdeaudhuij, 2012).

### **Requirements**

These sports programs and extracurricular sport activities have a wide range of requirements and mandates which determine students' ability to participate. Students, in most cases, must have met a set of predetermined standards to begin participating and must maintain good standing to remain a part of the sport or extracurricular program (Haudenhuyse et al., 2012). Generally extracurricular sports programs require students to maintain good academic standing with a "C" average or a 2.0 grade point average. Along with these academic requirements, students are also required to meet attendance requirements. These extrinsic motivators act to encourage students to have positive attendance in school and maintain passing grades in their classes (Cardon et al., 2012).

### **Outside Factors**

Involvement in extracurricular sports has a number of outside factors associated with it. One of these factors is the commitment necessary to be a part of an extracurricular sport or club. Students are required to be responsible enough to be on time to practices and events. They have to be responsible enough to act in a manner which represents their teams. One more outside factor associated with extracurricular sports is the value placed behind effort. Students who participate in extracurricular sports programs are expected to give full effort when participating in their sport. Their team, their coach and in many cases their school are counting on them to try their hardest and put forth their best effort (Haudenhuyse et al., 2012). If this mentality is perpetuated on the field or sport arena, then there is a hope it might translate into the classroom where students can realize the importance of their efforts.

A factor that is out of the control of the students when it comes to extracurricular sports involvement is the involvement of their parents. Students who have supportive parents have a more readily available way to get to and from practices and games and have the support system necessary to balance school and sports. Students who lack a supportive home or even students who cannot participate in extracurricular activities due to a job or home responsibility will be deterred by those other obligations (Cardon et al., 2012).

### **Benefits of Extracurricular Sports**

Extracurricular sports have been widely researched and many researchers have found benefits beyond exercise and physical fitness (Reys & Reys, 2011).

#### **Socioemotional Development**

One particular area where extracurricular sports have been found helpful is socioemotional development. As students grow and develop there are a number of socioemotional needs that arise and both structure and support become essential (Metsapelto & Pulkkinen, 2012). Students, particularly in middle and high school years, tend to highly value the opinions of their peers and seek acceptance from the group. Being a part of an extracurricular program in which a group is predefined and being a part of a team or squad brings identification, the need for fitting in can be met (Metsapelto & Pulkkinen, 2012).

Along with the presence of group dynamics, there is a socioemotional benefit in the relationships built between the students and the coach or program leader in extracurricular athletics. In many cases the coach or program leader can influence the students by acting as a mentor or even an enforcer to ensure the students are meeting the requirements to remain a part of the extracurricular program.

#### **Motor Skills**

Extracurricular sports programs can assist students in the development of skills which may translate into other areas of life. One of these types of skills is the development of motor skills. Students involved in extracurricular sports activities interact with equipment and are actively moving in ways that allow them to develop these skills (Reys & Reys, 2011). The motor skills developed and sharpened through involvement in a sport are very similar to the skills one develops and applies when learning math or putting words together in sentence structuring (Reys & Reys, 2011). The interactions and challenges on the sports court or field, place students in situations where they have the opportunity to develop necessary and beneficial motor skills (Pietsch & Jansen, 2012).

### **Other Skills**

Besides the motor functions, sports can help to develop and teach processes and strategies which can be applied in different contents within the classroom. In many cases students who have been involved in some form of extracurricular sports have dealt with the logistics of that sport and had to learn how to operate in that realm. Students who play a sport with an expiring clock need to know the importance of telling time and relative time. All sports deal with science and students are often exposed to the physics of a sport without evaluating the sport as a scientific study (Piche et al., 2012). Many curriculums incorporate sports-related analogies to pique students' interest and to make an instructional situation relatable for the students. By being involved in extracurricular sports, students can apply the information and experiences they gain from their sports experience to the content with which they are dealing in the classroom (Reys & Reys, 2011).

### **Impacts on Performance**

Research has been conducted for many years to determine a correlation between involvement in sports and achievement in academics. Researchers have found correlations between the overall preparedness of students for school and the health of students. Studies indicate these to be linked in some fashion to student involvement in sports activities (Renfrow et al., 2011). Studies have widely shown that students tend to have higher scores and perform better on standardized tests than their classmates who do not participate in athletics (Fox et al., 2010). Even tests that have been completed on a long term scale have shown the trend that students participating in these sports programs tend to perform well academically (Rees & Sabia, 2010).

The data appears to support the existence or presence of a connection between sports involvement and success, but the data does not account for the many outside factors which are associated with the commitment and responsibility to be involved in an extracurricular sport. Part of this correlation could correlate with the link between good health in students and success in the classroom as well (Coe et al., 2006). The reduction of opportunities for students to be involved in physical education within state curriculums has shown a challenge for students to remain healthy; extracurricular participation provides an environment to be physically active (Renfrow et al., 2011). Many studies have shown the presence of a relationship between academics and athletic achievement; therefore, it is important to explore the possibility of implementing extracurricular programs in a middle schools and investigating the impact it may have on students.

One factor which intertwines academic achievement and extracurricular sports involvement is the effect of sports programs on students' academic involvement. With requirements in place for students to have sufficient attendance and passing grades, sports

programs demand that students maintain a certain level of academic involvement (Broh, 2002). Each of these factors in some way relates to how involvement in extracurricular sports can have a positive impact on students.

### **Summary**

Extensive research data has been gathered to support the idea that involvement in extracurricular sports can have a positive impact on students' academic achievement. Numerous factors associated with extracurricular sports, from positive peer and coach interactions to the development of motor skills, contribute to an increased success of students in the classroom. Overall, students who participate in extracurricular sports will outperform their classmates who do not participate.

## **CHAPTER III**

### **METHODS**

The purpose of this study was to determine the relationship between eighth grade students' involvement in extracurricular sports activities and their scores on benchmark tests in their core classes. Research results will be used to encourage larger involvement of students in extracurricular sports and to increase availability of extracurricular sports to middle school students.

#### **Design**

This study was causal-comparative in nature. This study used a survey to find a relationship between school achievement of eighth-grade participants and nonparticipants in extracurricular activities.

#### **Subjects**

The subjects used for this study included 60 eighth-grade students from a middle school in Anne Arundel County, Maryland. These students were selected based on their response to a survey determining their involvement in extracurricular sports. Fifty percent of the students selected were male, and 50% were female. Of each gender, half of the students responded as being actively involved in extracurricular sports. The students were selected from three different academic levels within the eighth grade as determined by the Maryland School Assessment scores.

The sample used in this population was similar to the population of the study school's eighth-grade class in relation to race and socioeconomic status. Approximately 10% of the students selected were African-American, 3% were Hispanic, and 3% were identified as "other." The demographic statistics reported at the study school were roughly 10% African-American, 4%

Hispanic, and 4% “other.” The students also represented a larger range of socioeconomic statuses.

### **Instrument**

The instrument used for this study was the Anne Arundel County benchmarks for each of the students’ core subjects. Each of the benchmark tests were administered in their respective classes of social studies, science, mathematics, and language arts. These tests were given at the end of the academic quarter to measure students’ achievement in each of their core classes. The tests themselves were mixtures of selected response, short response, and extended response questions. The tests were designed by the respective department resources offices at the Board of Education and were aligned with the State Curriculum and State content standards for each unit of study.

The benchmark exams were administered for each student, graded by the core subject teacher and submitted into an online data base for academic tracking known as Achievement Series. These test scores were reported to the Board of Education for review of student progress and presented to the school as a means of measuring progress. The scores were reported in a numerical percentage out of 100 indicating the level of mastery. A score of 90-100 was considered excellent; 80-89 was good, 70-79 was fair, 60-69, was poor and 0-59 was considered failing.

### **Procedure**

A survey was given to each of the eighth-grade students through his/her science class to determine his/her involvement in extracurricular sports. The students returned their surveys and, of the classes in which the survey was administered, three were chosen for their academic level: one for each of the three course levels. From each of these classes, students were chosen

according to whether or not they were involved in extracurricular sports and according to their gender. The students were selected at random using alphabetical information to select 15 female extracurricular sports participants, 15 female nonparticipants, 15 male extracurricular sports participants, and 15 male nonparticipants.

After all students were given the benchmark exams, their scores were taken from the online Achievement Series data base and entered into a spreadsheet to compare their achievement. The data was analyzed using the criteria set by each benchmark, and students were given an average score for their core class benchmarks in order to compare the overall achievement. Cumulative scores were calculated to determine which group overall was more successful between the students participating in extracurricular sports and the nonparticipants.

## CHAPTER IV

### RESULTS

The purpose of this study was to determine the relationship between eighth grade students' involvement in extracurricular sports activities and their scores on benchmark tests in their core classes. The math, science, language arts, and social studies benchmark scores for the students who participated in or did not participate in extracurricular athletics were analyzed using a *t* test for independent groups. The results are presented in Table 1.

Table 1

*Benchmark Scores for Participants and Nonparticipants in Extracurricular Sports*

Benchmark	Group	Mean	M	Standard Deviation	t.	Significance
Math	Participant	77.6	30	12.2	2.13	0.038*
	Non Participant	69.5	30	16.2		
Science	Participant	77.2	30	16.5	1.25	0.26
	Non Participant	71.1	30	21.0		
Language Arts	Participant	80.1	30	14.7	1.71	0.092
	Non Participant	73.7	30	14.1		
Social Studies	Participant	87.5	30	13.8	2.70	0.009*
	Non Participant	75.0	30	21.4		
Benchmark Average	Participant	80.6	30	11.3	2.39	0.020*
	Non Participant	72.3	30	15.1		

- $P \leq 0.038$

The hypothesis that there would be no difference in the benchmark scores for the participants and nonparticipants in extracurricular athletics was rejected for mathematics, social studies, and benchmark average.

## **CHAPTER V**

### **DISCUSSION**

In this study, the researcher surveyed students' participation in extracurricular athletics. From the results of those surveys, the researcher then divided the students into the appropriate groups of participants and nonparticipants. Each student took a benchmark exam for each of his/her core classes of mathematics, language arts, social studies and science; the results of each of these exams were recorded.

The results provide evidence that overall, the students who were participants in extracurricular athletics scored higher on all benchmark exams than their counterparts who did not participate in extracurricular athletics. There was a significant difference for mathematics, social studies, and the overall benchmark average as the participants showed a clearly higher score on these tests. The scores in language arts for participants were very close to being significant but were not quite enough to be considered valid data. In all of the benchmarks, science proved to have the lowest level of significance with a score of 0.026, and social studies had the highest significance of 0.009. According to this data, the hypothesis that there would be no difference in the benchmark scores for participants and nonparticipants in extracurricular athletics was rejected for mathematics, social studies, and the overall benchmark average.

#### **Implications**

When looking at the relationship between extracurricular athletics and student test scores, it is important to look at how this relationship impacts the students. Through this study there is data which shows a significant variation in student achievement between those who participated in extracurricular athletics and those who did not participate in the classes of mathematics and social studies as well as the overall benchmark average. The students who participated in

extracurricular sports surpassed their classmates in these areas and with this information it can be argued that there is some academic value in extracurricular athletic involvement. Applying this information to the classroom and the school environment could lead to an increase in athletic programs and the opportunity for students to become involved in athletics.

### **Threats to Validity**

Throughout this study the focus of this experiment was to test whether or not participation in extracurricular athletics impacted student achievement on benchmark exams in core classes. There were significant differences in the scores of mathematics, social studies, and the overall benchmark average. In analyzing the results of this study, there were a few threats to the validity. The possible threats can be identified as a series of items. The first of these items was the difference in groups and the fact that the students in each group may have had a too much variation. This should be clearer for better results. A second threat to validity was the coach or mentor of the extracurricular athletic may have had an influence on the students by requiring academic success and been a catalyst in the student achieving academically. A final threat to validity was the school in which this study was completed is a rural school where students do not have transportation to extracurricular athletics unless a parent is able to drive them. A student who has parents who work evenings or is unavailable to transport them may have been limited from being able to participate in athletics.

### **Relation to Literature**

Many studies have been conducted regarding the relationship between athletics and academics. Researchers have examined how athletic programs impact performance in specific subjects, such as mathematics, to see if the practices and processes associated with playing a

sport such as tennis would assist in activating the minds and allowing a student a tangible relationship between vectors and angles (Reys & Reys, 2011). This same study also looked at how active involvement in sports gives students the opportunity to interact with equipment, and actively move in ways that allow them to develop certain motor skills (Reys & Reys, 2011). The study conducted involving student achievement and extracurricular sports showed similar results to this study as one of the areas with the greatest significance in score difference between participants of extracurricular sports and non-participants was in the area of mathematics. It could be argued along the same lines that the skills and processes of specific sports may relate well and better equip students for the challenges and concepts in math.

Another study, which was published in the *Journal of School Health*, tracked the success of students in high school to see how student athletes scored on specific standardized tests in relation to the remainder of the students (Fox et al., 2010). The study conducted involving student achievement and extracurricular sports study, which focused on middle school students and extracurricular athletics, showed similar results in the fact that overall on the test score average students who were involved in athletics outperformed their classmates. Although not every test which was examined proved to have significant results across the board the scores were at least marginally higher in students who were athletic participants. The study mentioned above and the study comparing benchmarks and extracurricular sports showed very similar results and both have data to support the idea that involvement in athletics can be beneficial to academics.

One final study which relates well to this study is from the journal *Mind, Brain, and Education*. This study takes a look at how sports can help to develop and teach processes and strategies which can be applied in different contents within the classroom (Piche et al., 2012).

This study highlights the idea that sports have certain rules and limitations which require students to react and respond within a certain set of parameters. This study also recognizes the impact specifically on mathematics which the data from the study comparing benchmarks and extracurricular sports closely supports. The students participating in extracurricular sports were found to have significantly higher scores in mathematics and this finding could be related in some degree to this journal's argument.

### **Suggestions for Future Research**

Completing this study, as should be the case in any research, has led to a number of new questions. Although this study produced some significant results, there are many unanswered questions and ideas which could be addressed in a future study. The following are some ideas which could be addressed in future study or would be changed if this study were to be completed again. The first to be addressed in a future study was that this study only addressed eighth grade students in a single athletic season. It might be important to see how students at different levels perform and to see the results of a year round athletic participation. Another issue to be addressed in a future study was that since this study was done in a rural school district there may be value in studying if urban or suburban schools see similar results. For future studies it could be valuable to look at schools which have sports programs sponsored by the school and schools which lack such programs to see if there is any added benefit for a school to promote the presence of such activities. Finally a future study also might look at how these sports programs impact male students differently from female students.

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