12-1997

Examination of Students Engagement in a Block-Schedule Innovation Program

Isaac Kwa Kyemenu-Sarsa

The College at Brockport

Follow this and additional works at: https://digitalcommons.brockport.edu/pes_theses

Part of the Health and Physical Education Commons, Sports Sciences Commons, and the Sports Studies Commons

Repository Citation

https://digitalcommons.brockport.edu/pes_theses/35

This Thesis is brought to you for free and open access by the Kinesiology, Sport Studies and Physical Education at Digital Commons @Brockport. It has been accepted for inclusion in Kinesiology, Sport Studies, and Physical Education Master's Theses by an authorized administrator of Digital Commons @Brockport. For more information, please contact kmyers@brockport.edu.
EXAMINATION OF STUDENTS ENGAGEMENT IN A BLOCK-SCHEDULE INNOVATION PROGRAM

A thesis
Presented to the
Department of Physical Education and Sports
State University of New York
College at Brockport
Brockport, New York

In Partial Fulfillment
of the Requirements for the Degree
Master of Science in Education
(Physical Education)

by
Isaac Kwa Kyemenu-Sarsah
December 1997
Title of Thesis:
Examination of Students' Engagement in a Block-Schedule Innovation Program.

Name of Candidate:
Isaac Kwa Kyemenu-Sarsah
Master of Science

Thesis Proposal Approved by:

Dr. Reginald T. Ocansey
Associate Professor
Department of P. E. and Sports
State University of New York
Brockport, New York.

Dr. Arthur E. Smith
Associate Professor
Department of Education and Human Development
State University of New York
Brockport, New York.

Dr. Cathy Houston-Wilson
Assistant Professor
Department of P E and Sports
State University of New York
Brockport, New York.

Date Approved: August 3rd 2000

Accepted by the Department of Physical Education and Sports, State University of New York, College at Brockport, in partial fulfillment of the requirement for the degree of Master of Science in Education (Teacher Education)

Dr. Frank Short
Head of Department
Other Theses Written

1) The Need and Feasibility for Indigenous Games on the Physical Education program in Elementary School in Eastern and Central Regions in Ghana.

2) A comparative study of the physical qualities of boys and girls in the Specialist Training College Primary School, Ghana.
Acknowledgement

I would like to take this opportunity to express my heartfelt acknowledgment to all who helped with the completion of this thesis.

First, I would like to acknowledge the contributions of Dr. Reginald Ocansey (my course advisor), Dr. Cathy Houston-Wilson and Dr. Arthur Smith who served as my thesis committee members and helped in bringing the whole thesis into focus. They also read through the work and offered many useful suggestions.

Secondly, I would like to acknowledge the contributions of the Chair of the Department of Physical Education and Sport at SUNY - Brockport, Dr. Frank Short whose combined effort with Dr. Reginald Ocansey (SUNY - Brockport) and Dr. Nathaniel Peku (UCEW - Winneba) made it possible for me to study in the United States. Dr. Short also showed concern over the completion of my thesis by occasionally inquiring about where I had reached and then encouraging me to work on.

Thirdly, I would like to acknowledge the contribution of Ms. Beatrice Simmons who, throughout my course, never said she was too busy to type or photocopy my work and who sometimes stayed back late at her office to complete my work including this thesis.

Fourthly, I would like to acknowledge the contribution of Messrs Ellis and Jones of Brockport High School who helped in the collection of the data.

Finally, I would like to mention the contributions of my wife in Ghana and my nephews and nieces in New York City who kept calling me and whose encouragement helped with the successful completion of my course.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acknowledgement</td>
<td>v</td>
</tr>
<tr>
<td>Table of contents</td>
<td>vi</td>
</tr>
<tr>
<td>List of Tables</td>
<td>viii</td>
</tr>
<tr>
<td>List of Figures</td>
<td>ix</td>
</tr>
<tr>
<td>Abstract</td>
<td>x</td>
</tr>
<tr>
<td>Dedication</td>
<td>xi</td>
</tr>
<tr>
<td>1 INTRODUCTION</td>
<td>2</td>
</tr>
<tr>
<td>Statement of the Problem</td>
<td>5</td>
</tr>
<tr>
<td>Purpose of the Study</td>
<td>6</td>
</tr>
<tr>
<td>Significance of the Study</td>
<td>6</td>
</tr>
<tr>
<td>The Scope of the Study</td>
<td>6</td>
</tr>
<tr>
<td>Limitations of the Study</td>
<td>7</td>
</tr>
<tr>
<td>Assumptions</td>
<td>7</td>
</tr>
<tr>
<td>Definition of Terms</td>
<td>8</td>
</tr>
<tr>
<td>2 REVIEW OF LITERATURE</td>
<td>9</td>
</tr>
<tr>
<td>Curriculum Innovation and Change</td>
<td>9</td>
</tr>
<tr>
<td>Block-Schedule Program</td>
<td>12</td>
</tr>
<tr>
<td>Physical Education in the High School</td>
<td>14</td>
</tr>
<tr>
<td>Academic Learning Time in Physical Education</td>
<td>15</td>
</tr>
<tr>
<td>Physical Fitness</td>
<td>18</td>
</tr>
<tr>
<td>3 METHODS AND PROCEDURE</td>
<td>22</td>
</tr>
<tr>
<td>Subject Selection</td>
<td>22</td>
</tr>
<tr>
<td>Instrument</td>
<td>23</td>
</tr>
<tr>
<td>Administration of Instrument</td>
<td>27</td>
</tr>
</tbody>
</table>
The FITNESSGRAM Activities Used ........................................... 28
One-mile run ................................................................. 28
Pull ups ........................................................................... 28
Curl-ups .......................................................................... 29
Sit and reach .................................................................... 30
Push-ups (for girls) .......................................................... 30
How Data were Analyzed ................................................... 31

4 ANALYSIS OF DATA ........................................................... 33
Examination of Students' ALT-PE Accrual ............................... 33
Learner Involvement Level ................................................... 37
Discussion ......................................................................... 49

5 SUMMARY, CONCLUSION, AND RECOMMENDATIONS ........... 51
Summary ........................................................................... 51
Conclusion ......................................................................... 53
Recommendations ................................................................ 54

References ........................................................................... 55
Appendices ......................................................................... 62
  Appendix A - ALT-PE demographic information recording sheet 63
  Appendix B - ALT-PE interval recording sheet ....................... 65
  Appendix C - ALT-PE overall data ...................................... 67
List of Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>35</td>
</tr>
<tr>
<td>2</td>
<td>38</td>
</tr>
<tr>
<td>3a</td>
<td>41</td>
</tr>
<tr>
<td>3b</td>
<td>42</td>
</tr>
<tr>
<td>4a</td>
<td>43</td>
</tr>
<tr>
<td>4b</td>
<td>44</td>
</tr>
<tr>
<td>5</td>
<td>45</td>
</tr>
<tr>
<td>6</td>
<td>46</td>
</tr>
<tr>
<td>7a</td>
<td>47</td>
</tr>
<tr>
<td>7b</td>
<td>49</td>
</tr>
</tbody>
</table>
List of Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Percentages of Class Time Spent on Context Level episodes</td>
<td>36</td>
</tr>
<tr>
<td>2</td>
<td>Graph of Percentages of Class Time Spent on Learner Involvement</td>
<td>39</td>
</tr>
</tbody>
</table>
Abstract

Innovations in education occur in an attempt to bring about improvement in the educational process. But not all innovations turn out to have positive effect on the educational process. Kirk (1988) noted that it is possible to present an innovation that embodies some new idea without it ever bringing about any genuine change in what people think or do.

Block-scheduling developed about five ago is one innovation that has attracted attention in recent years and is gaining ground with an increasing number of schools block-scheduling. The schedule has as its aim, a reduced number of periods per day, (usually four), but with extended time blocks. Students in this schedule therefore meet once or twice for a particular subject depending on the rotation of the block.

The purpose of the study was to examine students' academic learning time in physical education (ALT-PE) within the new time frame of a block-scheduled program. The study also compared the pre-test and post-test scores of four health-related physical fitness items. These are, one-mile run, curl-ups, push-ups (for girls), pull-ups (for boys), and sit and reach.

Data were collected on ALT-PE and pre and post test fitness scores. Analysis consisted of determining percentages of time spent in various components of the lesson and a t-test was used to determine significant difference between pre and post fitness scores.

Results indicated that the block-schedule produced an ALT-PE of approximately 37% of class time. The research also found that, it was possible to improve the level of fitness in one-mile run, curl-ups, push-ups, pull-ups and sit and reach during fitness unit. This represents a higher percentage rate of ALT-PE compared to what has previously been reported in traditionally scheduled physical education classes.
DEDICATION

This thesis is dedicated to my wife Dora, and my children - Stella, Eunice, and Samuel, who sacrificed so much in order for me to do my master's degree in the United States.
EXAMINATION OF STUDENTS ENGAGEMENT IN THE BLOCK-SCHEDULE INNOVATION PROGRAM.
CHAPTER 1
INTRODUCTION

The human society is full of innovations, which bring about change to improve on our existence. These innovations occur regularly in all aspect of human life and do not leave education untouched. Curriculum innovations, the main agent of change in education, are usually made to address problems in the society such as AIDS, or to improve on the existing educational process.

Curriculum innovation, according to Jewett, Bain, and Ennis (1995), can originate in many different places within the educational setting. Top-down innovations are developed by experts outside the school or in the school district central office and Bottom-up innovations are designed by teachers in their own classroom and then spread to other classes or schools. Most large-scale innovations require the efforts of both administrators and teachers to address the magnitude of the problems involved in the change process. Innovation may also be developed by educational agencies or school districts to address social and educational problems.

Goodlad (1983) described innovations as usually designed and sponsored by national and state professional organizations, curriculum supervisors, textbook authors, and district level teachers groups to revise or modify existing curriculum. To him innovations often reflect recent research findings, social and community initiatives, and the practical ideas that innovators wish to bring in school programs. Innovation
has been described by experts as originating from small, expert, well-resourced teams often based in institutions of higher education or government agencies (Sparkes, 1991a; Heckman, Oakes, & Sirotnik, 1983). According to them, these groups provide highly researched and carefully developed curriculum packages that are then disseminated to schools. But not all innovations are accepted by the schools. Cuban (1990) for example notes that innovations fail because innovators are insensitive to value conflicts, which cannot be solved without negotiation and compromise. He suggests that curriculum change requires change in pervasive attitude of school personnel that maintain and stabilize the schools. Sparkes (1991b) explains that real change involves loss, anxiety, and struggle and even those individuals who eagerly support change may sometimes experience a sense of loss.

Currently the Block-Schedule Innovation is in vogue. This innovation started some five years ago and is gaining grounds in most schools. Boyce and Markos (1997) for example have noted that Block-schedule program is quickly becoming a part of the American education system. Claxton, Bryant, and James (1996) also note that, whether it is called Four-by-Four Plan, or Block Scheduling, or the Concentrated Curriculum, an alternative to the traditional six or seven period school day is an educational reform that is being used across the United States.

The advocates of the block-schedule innovation say that it allows students to spend greater periods of time concentrating on fewer subjects during the day. The students would also be encouraged to be more responsible for their own learning and
are expected to be more actively involved in their learning. The extended time blocks for the block-schedule innovation range from 80 to 120 minutes and are applicable to all subjects including physical education which itself is undergoing innovations. How does physical education function within this block-schedule innovation?

Though the place of physical education in the secondary school curriculum cannot be over emphasized, there are indications that all is not well with it. The quality of physical education in our schools have been questioned by many individuals and organizations especially in our secondary schools which many consider as crucial period in schooling. For example, at a conference held in Orlando, Florida, attention was focused on the plight of secondary school physical education. Participants acknowledged that all was not well with secondary school physical education, and efforts were made to identify concerns and suggest strategies and structural framework for improvement (O'Sullivan, 1990). It has been noted that outstanding high school physical education programs have been the exception and stated effective secondary physical education program are very rare and usually isolated in a single school, never in an entire district. Siedentop, Mand, and Taggart (1986) acknowledged that there are good high school Physical Education programs that are gaining the respect of their school administrators, teaching colleagues, communities, and most importantly their students. Therefore, with the current educational forces operating as a means of providing quality education for our students, it is not surprising that some physical educators have expressed concern about the survival of physical education.
Siedentop, Mand, and Taggart (1986) for example, indicated some concern about survival of physical education when they stated that education is more in the spotlight than any time this century and physical education will need to respond in some way to the current forces operating in the culture at large and in education specifically, and how physical education responds to these forces will shape the future of programs in schools. Vickers (1990) noted that physical education has a much harder time than other subjects fitting into the new vision of public schooling.

These outcries over the quality of physical education in our high schools have also stepped up innovations in Physical Education programs in the schools. But with all these innovations going on in education in general and physical education specifically, the objective of physical education must be kept focused. Students' gains in physical education in the area of skill acquisition and fitness must be maintained. Therefore physical education under the current Block-Schedule must be monitored closely to make sure that it is achieving its purpose of demonstrating tangible outcomes. (Siedentop, Mand, & Taggart, 1986)

Statement of the Problem

Bryant and Claxton (1996) note that, just as questions have been raised about the worth of the block-schedule in the classroom, questions also exist about the effect of block scheduling on physical education. There is therefore, the need to find answers to questions like whether students are accruing higher levels of Academic Learning
Time in Physical Education (ALT-PE) or whether their fitness levels are improving under the block-schedule program.

**Purpose of the Study**

The major purpose of the study was to examine students' academic learning time accruals in a fitness unit at the high school level within a block-schedule program. The study further examined students' pre and post-test scores in selected fitness test items under the block-schedule innovation program.

**Significance of the Study**

As a primary study of Academic Learning Time in Physical Education (ALT-PE) in the block-schedule innovation, the study will reveal the percentages of engagement time that are given to context level and learner involvement episodes in the allocated times for physical education lessons.

The study would also reveal the nature of student engagement in fitness and the associated changes in student behavior under the block-schedule innovation program.

**The Scope of the Study**

**Delimitations of the Study**

The study was delimited to the following:

1) It was delimited to Brockport High School Grades 9 and 10 classes.
2) The pre and post-tests were done only in the following activities:
   a) One-mile run, to test their cardio-vascular endurance
   b) Curl ups, to test abdominal strength
   c) Pull-ups / push ups to test strength in the arms, and
   d) Sit and reach to test trunk flexibility.

Limitation of the Study

1) The reliability of the data was dependent on the subjects' honesty in giving
   the correct scores of their partners in the pre and post-tests.

Assumptions

The following assumptions were derived:

1) Any physical activity outside the fitness unit activities does not affect the
data collected,

2) A longer allocated time for physical education lesson would allow teachers
   to save time on movement from classroom to the gymnasium. They would
   move once in a double period instead of twice in two single periods.

3) Students would have more time to practice immediately after they have
   been introduced to the skill thereby increasing ALT-PE.
Definition of Terms

1) Block-Schedule Program: This refers to an alternative day program with four or five classes per day and a four-day rotating cycle. Each period lasts between 80 and 100 minutes. Scheduling is done on an eight period basis with period 1 - 4 meeting on days one and three and periods 5 - 8 meeting on days two and four.

2) Innovation: This refers to the introduction of something that is new or deviates from established practices in the educational process. It also refers to something that differs from existing form in the schools.

3) Academic Learning Time in Physical Education (ALT-PE): This refers to that portion of engaged time when a student was involved with materials that were appropriate to his or her abilities, resulting in high success and low error rates.

4) FITNESSGRAM: This refers to a group of physical activities meant to test the fitness level of students.

5) Intervention: The period between a pre-test and post-test when the subjects are given training with the intent to change their physical fitness.
CHAPTER 2

REVIEW OF LITERATURE

The purpose of the study was to examine students' engagement in a fitness unit under the Block-Schedule Innovation program. The study further examined students' pre and post-test scores in selected fitness test items. This chapter provides an overview of literature related to this study.

The review is divided into five main sections.

(1) Curriculum Innovation and Change
(2) Block - Schedule program
(3) Physical Education in the High School
(4) Academic Learning Time in Physical Education
(5) Physical Fitness

Curriculum Innovation and Change

Curriculum innovations occur regularly in our schools. They take many forms, either on a large scale, which involves many schools and school districts, or on a small scale operated by the classroom teacher. But according to Cuban (1992) large-scale curriculum change is one most sought after phenomena in education. Jewett, Bain and Ennis (1995) also supported this when they mentioned that experts continually attempt to encourage large-scale changes to the curriculum and the operational structures in schools for improvement in the educational process. But
they concluded that large-scale change rarely occurs in most school systems and if it does, requires consensus from parents, teachers and administrators as well as adequate funding for materials and teacher training.

Richardson (1990) on the other hand places emphasis and supports only small-scale curricula innovations. He identifies and supports those teachers who constantly monitor and adjust content and management decisions to adapt to the variations in the school setting. Jewett, Bain, and Ennis (1995) also identified teachers and curriculum innovation as the two main factors for classroom and school improvement. They are of the view that, though experts continue to propose comprehensive programs that, if implemented, would change many aspects of educational systems, it is teachers who engage in small-scale, self-initiated change in their schools. On the implementation of innovations, although innovations are proposed and funded, many do not reflect sensitivity to the complexity of the school setting. According to Jewett, Bain, and Ennis (1995) curricula innovations in most cases do not acknowledge the central role of the teacher in the change process, thus minimizing the likelihood that teachers will accept and implement them. To them change is most effective and long lasting if it is designed and implemented by the teacher in his or her own classroom, or successful efforts to implement an externally developed innovation must win teachers’ support.

Ecological perspectives on curricular change envision the teacher as an integral part of the innovation process. Darling-Hammond (1990) also observed that within a
technical change perspective, the teacher is seen as a messenger of the knowledge and because they are not involved in the curriculum development process, they lack ownership and are unlikely to communicate interest for the subject matter. Kirk (1990) concludes that efforts by external curriculum makers to exclude teachers from the curriculum development process may limit the extent to which actual change will occur. Deal (1990) supports this notion and concludes that teachers directly influence program innovation and change. Jewett, Bain, and Ennis (1995), maintain that it is difficult to convince teachers to use new skills and teaching approaches in their lessons when they do not believe the innovation is in the best interest of their students. On the other hand, if teachers initiate the change, (bottom-up change), or see themselves as partners in the change, it becomes effective. The most effective innovations are those that are applauded at both outside and inside the classroom (Jewett, Bain, & Ennis, 1995).

An innovation may come to stay or may be overtaken by another innovation, but whether it stays or not is dependent on how it survives the test of time.

Now that the block-schedule innovation is being used in few schools and is expected to spread to other schools, the question that arises is whether it will contribute significantly to the educational process. Though innovations are specifically made to contribute to the educational process, not all end up positively, and one cannot always predict the effect until it has been operated for some time.
Block-Schedule Program

There is not much literature on the Block-Schedule program especially with respect to ALT-PE and fitness since it is virtually a new innovation. Cawelti (1994) reported, however, that 10 percent of high school principals responding to a survey had instituted fewer but longer class periods into their school day while another 15 percent were planning to adopt a block-schedule. Claxton, Bryant, and James (1996) also identified block-scheduling being used in some high schools and middle school settings and conclude that this may be the wave of the future for high schools and middle schools. They described the block-schedule as dividing the school day into four 90-minute blocks with a 50-minute lunch break. Each student may take the same four courses every day for the entire semester and then switches to four new courses the following semester, or have courses on alternate days.

Many reasons have been given for changing to a block-schedule. The proponents claim that it can enhance education by improving the quality of time students spend in school. They also claim that this type of innovative scheduling pattern can enhance the instructional environment, help solve classroom discipline problems, and result in a better use of space, time and human resources. According to Canady and Rettig (1995), the block-schedule will allow educators to use a variety of instructional approaches that require longer periods of time to implement. It will also diminish instructional segmentation, provide extended
learning opportunities and improves class management. The extended block-schedule makes it possible to incorporate cognitive and affective objectives, fitness training and skill practice into a single 90-minute period (Claxton, Bryant, & James, 1996).

While block scheduling presents an alternative to the traditional scheduling patterns, it poses challenges and problems according to Boyce and Markos (1997). Czaja and McGeo (1995) also observed that the block-schedule could be a real problem for students transferring from a school using a traditional schedule to one that employs the block-schedule. Questions have also been raised as to the effect of the block-schedule on slow learners, the problem with absentees (who miss a great deal from one day's absence), and the problem caused by fewer days of meeting a class over the course of a school year.

With the block-schedule and teaching of physical education, Claxton, Bryant, and James (1996) concluded that just as questions have been raised about the worth of the block schedule in the classroom, questions also exist about the effect of block scheduling on physical education. According to them, since block-scheduling has not been operated for a long time, proponents could only speculate about the place of physical education in the new schedule. But in a survey conducted on the use of block-scheduling and its effect on physical education in American high schools, Cawelti (1994) reported that the block-schedule seemed to provide many teachers with more time to spend on many physical education
objectives and the teaching strategies used to meet these objectives. Also, the expanded class period reduced the amount of time for dressing out and moving to and from physical education facilities. The additional times comes from all those many times used in dressing and moving from the dressing area to the field or facilities (especially the outside resources) where the days class is taught.

Another outcome of the survey indicated that the longer periods provide the potential for teachers to collaborate with other teachers on projects, better carry out their class objectives, improve their relationships with students and increase planning time.

**Physical Education in the High School**

The quality of high school physical education has maintained a continuing focus in the physical education literature within the past decade. According to O'Sullivan (1990) current attention has been focused on the plight of secondary school physical education with specific suggestions for improvement being offered by several prominent physical educators. Siedentop, Tousignant, and Parker (1982) lamented on the state of American middle and high school physical education in the 1970s and, while urging reform, noted that American physical educators could learn from what was being done in other parts of the world. In the "Critical Crossroads" series, they provided some guidelines for improving secondary school physical education. Rink (1992), however, acknowledged the presence of multiple
curricula models for secondary school physical education. She argued that effective physical education programs are only possible if teachers are committed and empowered to make changes in the current situation in secondary schools. Some answers have been prompted from the following question: Is physical education broke? And if it is so, should it be replaced? Locke (1992) observed that even if physical education is not broke it is not working well. Some reference has been made to describe how sports education has been adapted in secondary school physical education in New Zealand, and the conclusion drawn is that it can significantly contribute to students' learning about many things relevant to both sports and physical education (Grant & Sharp, 1992).

All these statements show that a lot of concerns have been shown about high school physical education. It is therefore necessary to improve on physical education in the high school through curricula innovations that promote disciplinary mastery, self-actualization, ecological integration, and the learning process.

**Academic Learning Time in Physical Education**

The notion that student engagement with the subject matter to be learned is a powerful predictor of achievement is not new (Carroll, 1967). Also, the Beginning Teacher Evaluation Studies (BTES) of the Far West Laboratory for Educational Research and Development have demonstrated that it is possible to
substitute a simple measure of student time-on-task for product measure of actual achievement (Marliave, Fisher, & Dishaw, 1972). Many descriptors had been applied to the concept, but the most prevalent phrase used to identify this concept is called "academic learning time." Academic Learning Time (ALT) was defined as that portion of engaged time when a student was involved with materials that were appropriate to his or her abilities, resulting in high success and low error rates. (Parker, 1982).

Academic Learning Time concept was developed originally to study teaching effectiveness in areas such as reading and mathematics. Designed in the Beginning Teacher Evaluation Studies as Academic Learning Time (ALT), the time-on-task concept is utilized to examine relationship between what teachers do and the amount of time students spend on specific learning tasks. The concept was later adapted for use in physical activity settings by physical education researchers (Siedentop, Birdwell & Metzler, 1979).

Academic Learning Time - Physical Education (ALT-PE) is therefore an application of this notion to a physical activity setting. Metzler (1979) originally modified the BETS instrument for use in physical education context.

The purpose of an ALT-PE instrument was to measure the portion of time in a physical education lesson that a student is involved in motor activity at an appropriate success rate. (Parker, 1982). According to Rink (1993), the amount of time the learner spends at an appropriate level of difficulty with the content to be
learned is the most single critical instructional variable related to student learning. This means that a student who spends more time practicing an activity at an appropriate level of difficulty and makes positive responses or achieves a high success rate, will learn more than a student who does not, all other factors being equal. Silverman, Shute, Dodds, Placek, and Rife (1982) investigated the relationship of ALT-PE to student learning and found that although the relationship is not as strong as anticipated, some relationship does exist between high levels of motor appropriate behavior and student learning.

ALT-PE is usually expressed in percentage of the engaged time. The percentages vary widely from setting to setting and activity to activity. Metzler's (1979) original study and one conducted by Godbout, Brunelle and Tousignant (1983) reported ALT-PE levels ranging from 14% to 22% when ALT-PE levels contained categories other than the motor appropriate (MA) category. (Parker, 1982). When all categories, except the motor appropriate, have been removed from the ALT-PE figure, percentages have ranged from approximately 2 to 30% for public school environments (Placek & Randali, 1986; Silverman, Shute, Dodds, et al, 1982). The average ALT-PE percentage for public school classes appear to be somewhere between 15% and 25%, but how high this rate should go is uncertain (Parker, 1982). Newer descriptive studies in physical education using ALT-PE have similarly found that students are engaged at an appropriate level of difficulty only about one third of the time allotted for a physical education lesson (Godbout,
Brunelle & Tousignant, 1983; Metzler, 1979).

There is some evidence that ALT-PE accrual may be affected by a variety of factors. McKenzie (1991) has illustrated that different instructional strategies can provide correspondingly different levels of ALT-PE. He suggested that different instructional strategies place varying requirements on students and teacher behaviors, thereby resulting in different opportunities to learn.

Since this original ALT-PE instrument was developed, the model has been applied in physical education research. According to Rife, Shute, and Dodds (1985) although many observation instruments have been developed in physical education, few have enjoyed such wide spread use in such a short time as ALT-PE model.

Research has shown that

1) teachers tend to produce widely varied amounts of ALT-PE based on activity with fitness and dance highest, individual sports next, and team sports and gymnastics lowest;

2) elementary students get more ALT-PE than do middle or senior high students;

3) girls and boys get about the same amount of ALT-PE (Siedentop, 1991).

Physical Fitness

The need for promoting wellness-based curriculum at the secondary level has been well documented by several researchers and authors.
For example, Pangrazi and Corbin (1993) have identified physical fitness and regular physical activity as central to producing physically educated individuals. Also, the National Association for Sports and Physical Education (1992) has defined a physically educated person as one who is physically fit, does participate regularly in physical activity; knows the implications and benefits of involvement in physical activity; values physical activity and its contributions to healthy lifestyles; and has learned the skill necessary to perform a variety of physical activities. These attributes have been confirmed and supported by the President's Council on Physical Fitness and Sports (1996).

Several research findings also indicate that adequate instruction and appropriate physical activity must be available during a PE class. Such findings have defined appropriate physical activity as exercise which involves large muscle groups in dynamic movement for periods of 20 minutes or longer, three or more days per week, and which must be performed at an intensity requiring 60 percent or greater of an individual's cardio-respiratory capacity.

People therefore show concern when they find that the fitness level of the society is on the decline. Currently, the professional literature is filled with articles lamenting the poor state of health-related fitness in the general population, and of children in particular (Ross & Pate, 1987). Therefore when the familiar slogan that "our kids are not fit," gained prominence, it had already been widely supported in research and clinical observation.
McGinnis (1985) describes a government report identifying youth fitness as a national priority area for promoting health. The report calls for improvement in the physical fitness of the nation. Three out of the five objectives of the report focused specifically on 10-17 year olds: that by 1990, 60 percent will attend physical education classes daily, 70 percent will periodically have their fitness levels tested, and 90 percent will participate in physical activities that are appropriate for the maintenance of an effective cardio-respiratory system.

Physical fitness, which is an aspect of physical education in schools might be affected by the Block-Schedule program since there is a reduction in the frequency as well as the total time of weekly contact. This is so because the President's Council on Physical Fitness and Sports (1996) had advised people of all ages to accumulate a minimum of 30 minutes of moderately intense physical activity on most, if not all, days of the week. Also, Kusinitz and Fine (1987) concluded that during the 30 or 45 hour course extending over a 15-week period, students would become experts in the "whys" of exercise and fitness, become highly fit, and develop the attitude needed to guarantee compliance with an exercise regimen. Pangrazzi and Corbin (1993) opined in their article "Physical Fitness: Questions Teachers Ask" that with regular exercise, fitness at or above minimum criterion levels is possible for most children during the course of the year. They believed however, that limited physical education time cannot accomplish adequate fitness levels for all children. These observations and conclusions put a question mark on the Block-Schedule time and frequency as regards fitness.
With other schools and districts now looking forward to adopting this block-schedule the question to ask is whether this program will be able to fulfill the objectives of the physical education program especially at the fitness levels advocated. Care must be taken such that any innovation in the curriculum, affecting P E, does not hinder the objectives of physical education in general and fitness in particular.

One area we can use to monitor curriculum innovation and its effect on physical education is to test the physical fitness level of students on this innovation. It could be tested either before or after the program, or when they have been involved over a number of years.
CHAPTER 3

METHODS AND PROCEDURE

This chapter deals with methods and procedure used to examine academic learning time of students in a high school during fitness unit under block-schedule innovation program. It also deals with how the FITNESSGRAM were obtained and examined.

The chapter has been divided into four sections to include the following

a) Subject Selection
b) Instrument
c) Administration of the instrument
d) Method of data analysis

Subject Selection

The study involved selected classes in the 9th and 10th grades at Brockport High School (Brockport, N. Y.). This school was used because it is the only high school in Brockport and operates the block-schedule innovation program. The school also has a gymnasium and holds physical education in high esteem.

Engagement of sixteen Targeted Students selected randomly in physical education classes was observed. Also students in four classes made up of eighty-three girls and one hundred and nine boys were involved in physical fitness activities.
Instrument

An Academic Learning Time - Physical Education (ALT-PE) instrument developed by Metzler and Parker (1979) was used to examine the engagement of students during a fitness unit. According to Parker (1989) this ALT-PE instrument is the observation most widely used to study students' engagement in physical education. The instrument as shown in the appendix has the following operational categories:

1) **Context Level/Contextual Level:** This describes the context of the setting within which specific individual student behavior is occurring.

2) **General Content:** Class time during which students are not intended to be involved in physical education activities.

3) **Transition:** Time devoted to managerial and organizational activities related to instruction.

4) **Management:** Time devoted to class business that is unrelated to instructional activity.

5) **Break:** Time devoted to rest and/or discussion of issues unrelated to subject matter.

6) **Technique:** Time devoted to transmitting information concerning the physical form of the motor skill.

7) **Strategy:** Time devoted to transmitting information concerning plans of action.
for performing either individually or as a group.

8) **Rules**: Time devoted to transmitting information about regulations that govern activity related to the subject matter.

9) **Social Behavior**: Time devoted to transmitting information about appropriate and inappropriate ways of behaving within the context of the activity.

10) **Background**: Time devoted to transmitting information about a subject matter activity such as its history, traditions, rituals, heroes, heroines, records, importance in later life, or relationship to fitness.

11) **Academic Learning Time (ALT)**: was defined as that portion of engaged time when a student was involved with materials that were appropriate to his or her abilities, resulting in high success and low error rates. (Parker - 1982).

12) **Subject Matter Knowledge Content**: Class time when the primary focus is intended to be on knowledge related to physical education content.

13) **Technique (TN)**: Time devoted to transmitting information concerning the physical form (topography) of a motor skill.

14) **Strategy (ST)**: Time devoted to transmitting information concerning plans of action for performing either individually or as a group.

15) **Rules (R)**: Time devoted to transmitting information about regulations that govern activity related to the subject matter.

16) **Social Behavior (SB)**: Time devoted to transmitting information about appropriate and inappropriate ways of behaving within the context of the activity.
17) **Background (BK):** Time devoted to transmitting information about a subject matter activity such as its history, traditions, rituals, heroes, heroines, records, importance in later life, or relationship to fitness.

18) **Subject Matter Motor Content:** Class time when the primary focus is intended to be on motor involvement in physical education activities.

19) **Skill Practice (P):** Time devoted to practice of skills or chains of skills outside the applied context with primary goal of skill development.

20) **Scrimmage/Routine (S):** Time devoted to refinement and extension of skills in an applied setting (i.e., in a setting that is like or simulates the setting in which the skill is actually used) and during which there is frequent instruction and feedback for the participants.

21) **Game (G):** Time devoted to the application of skills in a game or competitive setting when the participants perform without intervention from the instructor/coach.

22) **Fitness (F):** Time devoted to activities whose purpose is to alter the physical state of the individual in terms of strength, cardiovascular endurance, or flexibility.

23) **Learner Involvement Level:** The learner involvement level describes how individual learners are involved in the physical education setting described in the context level. The learner involvement level has two facets: not motor engage and motor engaged.

24) **Not Motor Engaged:** Any student involvement other than motor involvement
with subject matter-oriented motor activities.

25) **Interim (I):** The student is engaged in a non-instructional aspect of an ongoing activity.

26) **Waiting (W):** The student has completed a task and is waiting for the next instructions or opportunity to respond.

27) **Off-Task (OF):** The student is either not engaged in an activity he or she should be engaged in or is engaged in an activity other than the one he or she should be engaged in.

28) **On-Task (ON):** The student is appropriately engaged in carrying out an assigned non-subject-matter task (e.g., management task, transition task, and warm-up task).

29) **Cognitive (C):** The student is appropriately involved in a cognitive task.

30) **Motor Engaged:** Motor involvement with subject matter-oriented motor activities related to the goals of the setting. Thus the categories under the heading not motor engaged may include motor activity, but not subject matter-oriented motor activity.

31) **Motor Appropriate (MA):** The student is engaged in a subject matter motor activity in such a way as to produce a high degree of success.

32) **Motor Inappropriate (MI):** The student is engaged in a subject matter-oriented activity, but the activity-task is either too difficult for the individual's capabilities or so easy that practicing it could not contribute to lesson goals.
33) **Supporting (MS):** The student is engaged in subject matter motor activity whose purpose is to assist others in learning or performing the activity.

Also four fitness activities made up of One-Mile run, Pull-ups/Press-ups, Curl-ups and Sit and Reach were used to compare the fitness level of the students before and after the fitness unit.

**Administration of the Instrument**

Three graduate students of the Department of Physical Education and Sport, SUNY - College at Brockport (Brockport, N. Y.) were trained as observers to use the instrument. Videotapes of PE lessons as well as live lessons were coded for the training. An inter-observer agreement ranged from 84% to 93%. Periodically there was a cross check to ascertain observer reliability. This was calculated by finding the percentage of observer agreement units in relation to total number of observed units. That is

\[
\text{Observer Reliability} = \frac{\text{Number of agreed units}}{\text{Total number of observed units}} \times 100\%
\]

Target students were randomly selected and observed throughout the lesson. The percentage of the engagement categories like "wait time" or "cognitive" were calculated using the total amount of time spent on the category in relation to the time used in observation.
That is: \[
\text{Time spent on category} \times 100\
\text{Total time for Observation}
\]

Also a pretest on the fitness level of the students were taken with the help of the PE teachers before the commencement of the fitness unit. Four of the fitness activities specified by the State were used. The activities are One-Mile run, Pull-ups/Push-ups, Curl-ups and Sit and Reach.

**The FITNESSGRAM Activities Used**

**One-mile run**

**Equipment**: An athletic oval with one-mile marking, stopwatches with split recordings, scorecards.

**Method**: Each class was put into two groups for the mile run. This was to avoid a lot of overlaps. Students run a mile round the athletic track.

**Scoring**: Each student's time to complete the one-mile distance was recorded. Students were allowed to walk if tired and continue running.

**Pull-ups**

**Equipment**: A wooden or metal bar approximately 5 cm in diameter mounted so that students hanging with arms fully extended could not touch the floor with their feet, a stool or short stepladder, score cards.

**Method**: The students were tested one at a time because there were no sufficient bars. The student whose turn it was hanged from the bar by the hands
with palms turned outwards and arms fully extended. He raised his body with arm strength until the chin was just above the top of the bar and then returned to the starting position. The pull-up was repeated as many times as possible. (Swinging of the legs or lower body was not permitted).

**Scoring:** Regardless of the time spent, the student's score was the number of complete and properly executed pull-ups.

**Curl-ups**

**Equipment:** Stop-watch, Floor mats, score cards.

**Method:** The class was divided into pairs of students. One student performed the exercise while the other student held the feet and counted the number of properly completed curl-ups. The student whose turn it was lay on his/her back, with knees slightly bent and feet flat on the mat. The arms were held on the mat by the sides of the body. The curl-ups started when the student moved the upper body till the hip was off the mat. One curl-up was completed when the body returned to the mat with the shoulder blades touching the mat.

**Scoring:** Students were instructed to perform as many curl-ups as possible in one minute. A partial curl-up (when the back does not come off the mat) was not counted. Resting was allowed. Students' scores were noted in their scorecards.
Sit and reach

**Equipment:** A rectangular wooden box with calibrations in centimeters on one side of the box.

**Method:** The students were tested one at a time so that the researcher could provide accurate readings on the scale. The student whose turn it was sat on the floor mat with the legs stretched so that the feet pressed the box against a wall serving as a support. With one hand over the other, the student slid the hand over the scale on the box to as far as he/she could reach. Three attempts were given to each student to obtain the best of his or her ability.

**Scoring:** The maximum reach of the fingers on the scale after the three attempts represented the student's score.

**Push-ups (for girls)**

**Equipment:** Floor mats, scorecards.

**Method:** The class was divided into pairs of students. One student performed the activity while the other student counted the number of properly completed push-ups. The student whose turn it was went into prone lying position. The push up started when the student from a prone falling position pushes the body up so that the arms are straightened at the elbow, the knees off the ground, and the hips, the trunk and the head are in alignment. One push was completed when the body returned to the prone falling position again.

**Scoring:** Students were to perform as many push-ups as possible in one
minute. Their scores were noted in their scorecards.

The students were taken through eight weeks of activities the intent of which was to raise their fitness level. These activities were specifically for cardiovascular endurance, physical strength and flexibility. The fitness level of the students was measured using the same process as that of before the unit.

**How Data were Analyzed**

Data were analyzed in line with the two main purposes of the study.

1) The examination of academic learning time of the students during a fitness unit under the block-schedule innovation program.

2) The examination of pre-test and post-test scores in selected FITTESTGRAM under the block-schedule program.

The academic learning time of the students was analyzed by finding the percentage of time spent in each category. This was done by calculating total coded unit of that category in the instrument and dividing by the total unit of engagement and multiplying by 100%.

\[ t = \frac{\sum D}{\sqrt{\left( N \sum D^2 - \left( \sum D^2 \right) \right) / (N - 1)}} \]

The pre-test and the post-test scores were analyzed by comparing the means and standard deviation. Also the maximum and the minimum performances of the fitness activities by the students were noted. A t-test of significant difference between the pre-test and post-test scores. The formula above,
obtained from Research Methods in Physical Activity by Thomas and Nelson (1996) was used to calculate the significance.

where \( D \) = the post-test minus the pre-test for each subject
\( N \) = number of paired observations.

The meaning of the abbreviations used in the Table of analysis
- **Max** = Maximum
- **Min** = Minimum
- **SD** = Standard Deviation
- \( n \) = Number of Subjects
- **NS** = Not Significant
- **S** = Significant
CHAPTER 4
ANALYSIS OF DATA

The purpose of the study was to examine the academic learning time of students in a fitness unit at the high school level within a block-schedule innovation program. The study further examined the students' pre-test and post-test scores in selected FITNESSGRAM activities under the block-schedule innovation program.

This chapter deals with analysis of the data. The first section analyzes the academic learning time of the students in the fitness unit. The second section of the analysis presents the comparison of student's performances in the FITNESSGRAM at the beginning and at the end of the fitness unit.

Examination of Students' ALT-PE Accrual

Context Level:

Table 1 shows the descriptive data totals. An average percentage of 23.4% of the context level time was spent on General Contents. This figure compares favorably with results from other high school physical education ALT studies in which more time is reported for general content (Placek & Randall, 1986). Looking at individual episodes in the General Context, the mean percentage of class time spent on Transition was 6.4%. Management was 7.8%, Break was 3.4% and Warm-up was 5.8%.
Under the Subject Matter Knowledge, the percentage of class time spent on Technique was 1.2%, Strategy took 2.9%, Rules 4.9% and Background Knowledge had 3.8%. The total of these came up to 12.8% representing the percentage for the Subject Matter Knowledge. This percentage seems low considering the fact that Transition, Break and Management combined took 17.6%. When students were engaged in Subject Matter Motor, all the time was spent in Fitness. There was no activity under Practice, Game or Scrimmage. It might be due to the fact that the subject matter dictated the type of activity to be used. In all, a mean percentage of 63.8% class time was used for the Fitness.
Table 1: Percentages of Class Time Used in the Context Level Episodes.

<table>
<thead>
<tr>
<th>General Content</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Transition (T)</td>
<td>6.4%</td>
</tr>
<tr>
<td>Management (M)</td>
<td>7.8%</td>
</tr>
<tr>
<td>Break (B)</td>
<td>3.4%</td>
</tr>
<tr>
<td>Warm-up (Wu)</td>
<td>5.8%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subject Matter Knowledge</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Technique (TN)</td>
<td>1.2%</td>
</tr>
<tr>
<td>Strategy (ST)</td>
<td>2.9%</td>
</tr>
<tr>
<td>Rules (R)</td>
<td>4.9%</td>
</tr>
<tr>
<td>Background (BG)</td>
<td>3.8%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subject Matter Motor</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Skill Practice (P)</td>
<td></td>
</tr>
<tr>
<td>Scrimmage/Routine (S)</td>
<td>63.8%</td>
</tr>
<tr>
<td>Game (G)</td>
<td></td>
</tr>
<tr>
<td>Fitness (F)</td>
<td></td>
</tr>
</tbody>
</table>
Figure 1. Percentages of Class Time Spent on Context Level Episodes

- Fitness: 64%
- Transition: 8%
- Warmup: 6%
- Technique: 1%
- Strategy: 3%
- Rules: 5%
- Background: 4%
- Break: 3%
- Management: 8%
Learner Involvement Level

When the Learner Involvement Level was examined, (Table 2 and Figure 2), it was observed that for about 62% of the time, students were not Motor Engaged. The detailed analysis showed that when students were not motor engaged, they spent 3.9% in Interim, 9.3% Waiting, 1.1% in Off-Task, 36.8% in On-Task and 11.0% in Cognitive.

Looking at the Motor Engaged aspect of the Learner Involvement Level, 37.3% of the time was spent making appropriate responses. This represents the sum total of all ALT-PE units in the Learner Involvement Level. This figure is slightly higher than that reported for high school which is between 2 to 30% (Parker, 1982; Placek & Randall, 1986; Silverman, Shute, Dodds, et al, 1982).

Evident in this data is the "funneling effect" reported by other researchers (Godbout, Brunnelle, & Tausignant, 1983; Metzler, 1979; Silverman, Shute, Dodds et al., 1982; Rate, 1980). The funneling of percentages occurred from the subject matter motor category (63.8%) to the motor engaged category (37.90%), and finally into ALT-PE (36.3%).
### Table 2: Percentages of Class Time Used Learner Involvement Episodes

<table>
<thead>
<tr>
<th>Not Motor Engaged</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Interim (I)</td>
<td>3.9%</td>
</tr>
<tr>
<td>Waiting (W)</td>
<td>9.3%</td>
</tr>
<tr>
<td>Off-Task (OF)</td>
<td>3.9%</td>
</tr>
<tr>
<td>On-Task (ON)</td>
<td>9.3%</td>
</tr>
<tr>
<td>Cognitive (C)</td>
<td>1.1%</td>
</tr>
<tr>
<td></td>
<td>36.8%</td>
</tr>
<tr>
<td></td>
<td>11.0%</td>
</tr>
<tr>
<td></td>
<td>62.1%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Motor Engaged</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor Appropriate / ALT-PE</td>
<td>36.3%</td>
</tr>
<tr>
<td>Motor Inappropriate (MI)</td>
<td>1.0%</td>
</tr>
<tr>
<td>Supporting (MS)</td>
<td>0.6%</td>
</tr>
<tr>
<td></td>
<td>37.9%</td>
</tr>
<tr>
<td></td>
<td>100%</td>
</tr>
</tbody>
</table>
Figure 2: Graph of Percentages of Class Time Spent on Learner Involvement
Analysis of the pre-test and post-test scores for the one-mile run (Table 3)

Girls

In Grade 9 pre-test, the girls had an average of 10.59 minutes in the One-Mile Run. The fastest time was 7.40 minutes while the slowest time was 16.48 minutes.

The post-test came out with an average of 10.18 minutes. The fastest time was 6.71 minutes and the slowest time was 14.75 minutes. There was no significant improvement over the pre-test scores.

In Grade 10 pre-test, there was an average of 10.61 minutes for the girls One-Mile Run. The fastest student made a time of 7.53 minutes and the slowest time was 15.90 minutes.

The post-test came out with an average of 9.88 minutes. The fastest time was 7.42 minutes and the slowest time was 12.20 minutes. There was a significant improvement over the pre-test scores.
### Table 3a: Pre-Test and Post-Test Scores for One-Mile Run

**Girls**

<table>
<thead>
<tr>
<th>GRADE</th>
<th>TEST</th>
<th>MEAN</th>
<th>MAX</th>
<th>MIN</th>
<th>STDEV</th>
<th>N</th>
<th>S / NS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 9</td>
<td>Pre-Test</td>
<td>10.59</td>
<td>16.48</td>
<td>7.40</td>
<td>1.93</td>
<td>46</td>
<td>NS</td>
</tr>
<tr>
<td>Girls</td>
<td>Post-Test</td>
<td>10.18</td>
<td>14.75</td>
<td>6.41</td>
<td>1.88</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>Grade 10</td>
<td>Pre-Test</td>
<td>10.61</td>
<td>15.90</td>
<td>7.53</td>
<td>2.05</td>
<td>37</td>
<td>S</td>
</tr>
<tr>
<td>Girls</td>
<td>Post-Test</td>
<td>9.88</td>
<td>12.20</td>
<td>7.42</td>
<td>1.93</td>
<td>37</td>
<td></td>
</tr>
</tbody>
</table>

Analysis of the pre-test and post-test scores for the one-mile run (Table 3)

**Boys**

In Grade 9 pre-test, the boys had an average of 7.86 minutes in the One-Mile Run. The fastest time was 5.98 minutes while the slowest time was 11.68 minutes. The post-test results produced an average of 7.66 minutes. The fastest time was 5.90 minutes and the slowest time was 11.70 minutes. The result in the post-test showed no significant improvement over that of the pre-test scores.

In Grade 10 pre-test, there was an average of 7.40 minutes. The fastest time was 5.22 minutes and the slowest time was 12.65 minutes.

The post-test result shows an average of 7.35 minutes. The fastest time was 5.31 minutes and the slowest time was 10.55 minutes.

The post-test results show no significant improvement over that of the pre-test.
Table 3b: Pre-Test and Post-Test Scores for One-Mile Run

Boys

<table>
<thead>
<tr>
<th>GRADE</th>
<th>TEST</th>
<th>MEAN</th>
<th>MAX</th>
<th>MIN</th>
<th>STDEV</th>
<th>N</th>
<th>S / NS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 9</td>
<td>Pre-Test</td>
<td>7.86</td>
<td>11.68</td>
<td>5.98</td>
<td>1.13</td>
<td>48</td>
<td>NS</td>
</tr>
<tr>
<td>Boys</td>
<td>Post-Test</td>
<td>7.66</td>
<td>11.70</td>
<td>5.90</td>
<td>1.19</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>Grade 10</td>
<td>Pre-Test</td>
<td>7.40</td>
<td>12.65</td>
<td>5.22</td>
<td>1.16</td>
<td>66</td>
<td>NS</td>
</tr>
<tr>
<td>Boys</td>
<td>Post-Test</td>
<td>7.35</td>
<td>10.55</td>
<td>5.31</td>
<td>1.14</td>
<td>66</td>
<td></td>
</tr>
</tbody>
</table>

Analysis of the pre-test and post-test scores for the curl-ups activity.

Girls

In Grade 9 pre-test, the girls had a mean of 34.68 curl-ups per minute. The maximum number was 55 curl-ups per minute and the minimum number was 18 curls per minute.

In the post-test, the mean curl-ups per minute was 35.92. The maximum executed by a student was 60 curl-ups per minute and the minimum was 19 curl-ups per minute. Comparing the means statistically, there was a significant difference between the pre-test and the post-test scores.

In Grade 10 pre-test, the mean curl-ups per minute was 33.58. The maximum number was 60 and the minimum was 18.

The post-test mean was 34.60 curl-ups per minute. The maximum was 63
and the minimum was 20.

There was a significant difference between the means of the pre-test and that of the post-test.

Table 4a: Pre-Test and Post-Test Scores for Curl-Ups

<table>
<thead>
<tr>
<th>GRADE</th>
<th>TEST</th>
<th>MEAN</th>
<th>MAX</th>
<th>MIN</th>
<th>STDEV</th>
<th>N</th>
<th>S / NS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 9</td>
<td>Pre-Test</td>
<td>34.68</td>
<td>55</td>
<td>18</td>
<td>8.5</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>Girls</td>
<td>Post-Test</td>
<td>35.92</td>
<td>60</td>
<td>19</td>
<td>8.1</td>
<td>46</td>
<td>S</td>
</tr>
<tr>
<td>Grade 10</td>
<td>Pre-Test</td>
<td>33.58</td>
<td>60</td>
<td>18</td>
<td>9.8</td>
<td>37</td>
<td>S</td>
</tr>
<tr>
<td>Girls</td>
<td>Post-Test</td>
<td>34.60</td>
<td>63</td>
<td>20</td>
<td>9.3</td>
<td>37</td>
<td></td>
</tr>
</tbody>
</table>

Analysis of the pre-test and post-test scores for the curl-ups activity.

Boys

In Grade 9 pre-test, the boys had a mean of 48.47 curl-ups a minute. The maximum was 65 curl-ups per minute and the minimum was 27 curl-ups per minute.

The post-test produced a mean of 49.26 curl-ups a minute. The maximum number of curl-ups made by a student was 63 per minute and the minimum number was 29 per minute.

There was a significant difference between the pre-test and the post-test.
In Grade 10 pre-test, a mean of 50.95 curl-ups per minute was obtained. The maximum number made was 75 curl-ups per minute and the minimum was 25 curl-ups per minute.

In the post-test, a mean score of 51.88 curl-ups per minute was obtained. The maximum was 78 curl-ups per minute and the minimum was 24 curl-ups per minute.

There was a significant difference between the means of the pre-test and the post-test scores.

Table 4b: Pre-Test and Post-Test Scores for Curl-Ups

<table>
<thead>
<tr>
<th>GRADE</th>
<th>TEST</th>
<th>MEAN</th>
<th>MAX</th>
<th>MIN</th>
<th>STDEV</th>
<th>N</th>
<th>S / NS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 9</td>
<td>Pre-Test</td>
<td>48.10</td>
<td>65</td>
<td>27</td>
<td>10.31</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>Post-Test</td>
<td>49.26</td>
<td>63</td>
<td>29</td>
<td>10.53</td>
<td>53</td>
<td>S</td>
</tr>
<tr>
<td>Grade 10</td>
<td>Pre-Test</td>
<td>50.95</td>
<td>75</td>
<td>25</td>
<td>11.6</td>
<td>66</td>
<td>S</td>
</tr>
<tr>
<td>Boys</td>
<td>Post-Test</td>
<td>51.88</td>
<td>78</td>
<td>24</td>
<td>11.3</td>
<td>66</td>
<td></td>
</tr>
</tbody>
</table>
Table 5  Pre-Test and Post-Test Score for Girls

<table>
<thead>
<tr>
<th>Push-Ups GRADE</th>
<th>TEST</th>
<th>MEAN</th>
<th>MAX</th>
<th>MIN</th>
<th>STDEV</th>
<th>N</th>
<th>S / NS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 9 Girls</td>
<td>Pre-Test</td>
<td>15.42</td>
<td>35</td>
<td>3</td>
<td>8.8</td>
<td>46</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>Post-Test</td>
<td>17.90</td>
<td>37</td>
<td>4</td>
<td>9.0</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>Grade 10 Girls</td>
<td>Pre-Test</td>
<td>16.24</td>
<td>32</td>
<td>3</td>
<td>9.1</td>
<td>37</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>Post-Test</td>
<td>20.60</td>
<td>37</td>
<td>5</td>
<td>8.9</td>
<td>37</td>
<td></td>
</tr>
</tbody>
</table>

Analysis of the pre-test and post-test scores for the pull-ups activity (Boys) - [Table 6].

In Grade 9, the mean pre-test score of 4.60 pull-ups was obtained. A maximum number of 12 pull-ups and a minimum of one pull-up were obtained.

In the post-test, a mean of 5.40 pull-ups was obtained. The maximum of 13 pull-ups and a minimum of one pull-up were made.

There was a significant difference between the means of the pre-test and post-test scores.

In Grade 10, the mean pre-test score was 7.9 pull-ups. The maximum pull-ups was 20 and the minimum was one.

In the post-test, the mean pull-ups was 8.0. The maximum was 20 pull-ups
and the minimum was one.

There was no significant difference between the means of the pre-test and post-test scores.

Table 6: Pre-Test and Post-Test Score for Pull-Ups (Boys)

<table>
<thead>
<tr>
<th>GRADE</th>
<th>TEST</th>
<th>MEAN</th>
<th>MAX</th>
<th>MIN</th>
<th>STDEV</th>
<th>N</th>
<th>S / NS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 9 Boys</td>
<td>Pretest</td>
<td>4.60</td>
<td>12</td>
<td>1</td>
<td>2.97</td>
<td>53</td>
<td>S</td>
</tr>
<tr>
<td>Grade 9 Boys</td>
<td>Posttest</td>
<td>5.40</td>
<td>13</td>
<td>1</td>
<td>3.5</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>Grade 10 Boys</td>
<td>Pretest</td>
<td>7.9</td>
<td>20</td>
<td>1</td>
<td>4.7</td>
<td>66</td>
<td>NS</td>
</tr>
<tr>
<td>Grade 10 Boys</td>
<td>Posttest</td>
<td>8.0</td>
<td>20</td>
<td>1</td>
<td>3.97</td>
<td>66</td>
<td></td>
</tr>
</tbody>
</table>

Analysis of the pre-test and post-test scores for the sit and reach activity (Girls). (Sum-up in Table 7a)

Girls

In Grade 9 pre-test, the girls had a mean of 34.61 cm. The maximum reach was 48 cm and the minimum was 26 cm.

In the post-test, the mean reach was 35.04 cm. The maximum reach was 47 cm and the minimum was 27 cm.

Comparing the means statistically, there was no significant difference between the pre-test and the post-test scores.
In the Grade 10 pre-test, the mean reach was 35.97 cm. The maximum was 49 cm and the minimum was 28 cm.

The post-test produced a mean of 37.26 cm. The maximum reach was 49 cm and the minimum was 24 cm.

Statistically, there was a significant difference between the pre-test mean and the post-test mean.

Table 7a: Pre-Test and Post-Test Score for Sit and Reach

(Girls)

<table>
<thead>
<tr>
<th>GRADE</th>
<th>TEST</th>
<th>MEAN</th>
<th>MAX</th>
<th>MIN</th>
<th>STDEV</th>
<th>N</th>
<th>S/NS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 9</td>
<td>Pre-Test</td>
<td>34.61 cm</td>
<td>48 cm</td>
<td>26 cm</td>
<td>5.1</td>
<td>46</td>
<td>NS</td>
</tr>
<tr>
<td>Girls</td>
<td>Posttest</td>
<td>35.04 cm</td>
<td>47 cm</td>
<td>27 cm</td>
<td>5.9</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>Grade 10</td>
<td>Pre-Test</td>
<td>35.97 cm</td>
<td>49 cm</td>
<td>28 cm</td>
<td>6.3</td>
<td>37</td>
<td>S</td>
</tr>
<tr>
<td>Girls</td>
<td>Posttest</td>
<td>37.26 cm</td>
<td>49 cm</td>
<td>29 cm</td>
<td>6.6</td>
<td>37</td>
<td></td>
</tr>
</tbody>
</table>
Analysis of the Pre-Test and Post-Test Scores for Sit and Reach (Boys). (Table 7b)

Table 7b
In Grade 9 pre-test, the boys had a mean of 31.89 cm. The maximum reach was 46 cm and the minimum was 16 cm.

In the post-test, a mean of 33.35 cm was obtained. The maximum reach was 48 cm and the minimum reach was 17 cm.

Statistically, there was a significant difference between the pre-test mean and the post-test mean.

In Grade 10 pre-test, a mean value of 34.97 cm was obtained. The maximum reach was 57 cm and the minimum reach was 18 cm.

The post-test came out with 35.10 cm as the mean reach. The maximum reach was 58 cm and the minimum reach was 18 cm.

There was no significant difference between the pre-test and the post-test scores.
Table 7b: Pre-Test and Post-Test Scores for Sit and Reach (Boys)

<table>
<thead>
<tr>
<th>GRADE</th>
<th>TEST</th>
<th>MEAN</th>
<th>MAX</th>
<th>MIN</th>
<th>STDEV</th>
<th>N</th>
<th>NS /S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td>Pre-Test</td>
<td>31.89cm</td>
<td>46 cm</td>
<td>16 cm</td>
<td>7.0</td>
<td>53</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>Post-Test</td>
<td>33.3cm</td>
<td>48cm</td>
<td>17 cm</td>
<td>7.2</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>Grade 10</td>
<td>Pre-Test</td>
<td>34.9cm</td>
<td>57 cm</td>
<td>18 cm</td>
<td>7.9</td>
<td>66</td>
<td>NS</td>
</tr>
<tr>
<td>Boys</td>
<td>Post-Test</td>
<td>35.10cm</td>
<td>58 cm</td>
<td>18 cm</td>
<td>8.0</td>
<td>66</td>
<td></td>
</tr>
</tbody>
</table>

Discussion

The engagement percentage measures found in this study form one of the basis for students' engagement in a high school physical education under block-schedule program.

The high percentage of 63.8% in the subject matter motor at the context level was due to the fact that a lot of the equipment were available to give the students the opportunity to practice. Siedentop, Mand, and Taggart (1986) have mentioned 50% of class time used for skill practice or fitness.

The motor appropriate percentage of 36.3% is slightly above that reported by researchers. Parker (1982), Placek and Randall (1986), Silverman, Shute, Dodds, et al (1982) have reported motor appropriate percentage of 2% to 30% for
public schools.

In the pre-test and post-test scores, there was a significant improvement in most of the FITNESSGRAM with the exception of the one-mile run. The non-improvement in the one-mile run might be due to the fact that there wasn't much cardio-vascular endurance practice since the weather became cold during the intervention.
CHAPTER V

SUMMARY, CONCLUSION, AND RECOMMENDATION

The purpose of the study was to examine student engagement in lesson during physical fitness unit in a high school under the block-schedule innovation program. This chapter presents the Summary, Conclusion and Recommendation of the project.

Summary

The first chapter of the thesis was devoted to the introduction of the research. The role of innovation generally, and in education specifically was mentioned. Also the need for improvement in secondary school physical education was supported by related statement made by some researchers.

The second chapter dealt with literature related to the research. This chapter had five sub-related areas. These are innovation and change; Physical Education in the high school; Block-Schedule Innovation program; Academic Learning Time-Physical Education and Fitness.

The third chapter was devoted to methods and procedure. The chapter had subject selection, instrument, administration of the instrument, and how data were analyzed. Brockport High School was used for the examination of Academic Learning Time - Physical Education and Fitness Unit activities under the block-schedule innovation program. Data were collected through a systematic
observation of some lessons during physical fitness unit under the block-schedule innovation program. The observation instrument used was developed by Metzler and Parker (1979). Observers were trained for the observation. The inter-observer reliability percentage was averaged 91%. Seven girls and nine boys were used as the target for the observation. Their selection was randomly made. In all sixteen lessons were observed. Also, another set of data were collected for the pre-test and post-test for four of the activities of the FITNESSGRAM. The activities were, one-mile run, push-ups (for girls), pull-ups (for boys), curl-ups and sit and reach.

The fourth chapter dealt with data analysis. The data for the examination of student engagement were analyzed, and the percentages of student engagement episodes under contextual and learner involvement levels were calculated. Also, the pre-test and post-test scores for the FITNESSGRAM activities were examined. The mean, maximum and minimum of the pre-test and post-test were compared. A t-test for related samples was calculated using a formula obtained from Research Methods in Physical Activity by Thomas and Nelson (1996). This was used to determine whether there was a significant difference between the means of the pre-test and post-test scores. The level of significance used was $p \leq 0.05$. There were significant improvement between the pre-test and post-test for all the activities with the exception of one-mile run (grade 9 girls and boys, grade 10 boys), pull-ups (grade 10 boys), sit and reach (grade 9 girls and grade 10 boys).

Chapter five discusses the Summary, Conclusion and Recommendation.
Conclusion

The following conclusions were drawn from the research.

1) The percentages of time spent on Context Level Episodes are relatively the same as those suggested by some researchers for PE lessons.

2) Some researchers reported of management time being 15 to 35 percent of class time. Siedentop (1991) mentions that 15 to 30 percent of student time is used in listening to the teacher give rules, strategies, techniques and background information. He also makes mention of instruction accounting for anywhere from 10 to 50 percent of class time. He explains that the great variation in instruction is due to the type of activity being done. For example, aerobics needs minimal instruction. Also, instruction time varies across the duration of a unit (Metzler, 1991). Instruction time is typically high at the start of a unit and low towards the end of the unit when students are more likely to be engaged in culminating activity (Siedentop, 1991).

3) The 63.8% students' time spent on fitness activities is enough (according to above deduction) for lessons that have fitness as the objective.

4) The 36.3% of Learner Involvement time spent on Motor Appropriate is also acceptable since researchers report of percentages between 2 to 30% for public schools (Parker, 1982; Placek & Randall, 1986; Silverman, Shute, Dodds, et al, 1982).

5) There were significant improvements in the pre-test and post-test scores of
Grade 10 girls One Mile Run, Grades 9 and 10 (both boys and girls Curl-ups), and Grades 10 (girls) and 9 (boys) Sit and Reach

**Recommendations**

Based upon the results of this study, the following recommendations are made:

1. There must be research into innovations as early as practicable in order to come out with information on the innovation for its effect to be known.
2. Publicity of innovations (to other schools/teachers) as a way of dissemination of information and sharing must be increased.
3. There must be coordination and support of innovation by administrators and curriculum developers to unify innovated programs.
4. Administrators must provide training and financial support to implement the innovations in schools.
5. Teachers must be committed to the innovations in their schools.
6. Schools must be given the support and resources to create conditions that would empower them to initiate change.
7. Teachers from other schools must understand the innovation very well.
References


Heckman, P. E., Oakes, J., & Sirotnik, K. A. (1983): Expanding the


Placek, J., & Randall, L. (1986): Comparison of academic learning time in


Louis: Time Mirror/Mosby.


Meeting (Research Symposium).


Appendix

1. Academic Learning Time-Physical Education (ALT-PE) Instrument
Academic Learning Time-Physical Education (ALT-PE)

Date: ________________ Teacher: __________________ School: __________________

Class/Activity: ___________________ Observer: __________________

Start time _______________ Stop time _______________ Duration _______________ Page __________ of ______

This observation is day _______ of _______ days in this unit.

The teacher allocated _______ minutes of activity time for this lesson.

The source of this allocation information was (teacher, lesson plan)

Observer comments on this class:

Data summary

Total time _______________ Allocated practice time _______________ ALT-PE.

Context level data: general content _______________ subject matter knowledge _______________ subject matter motor _______________

Level involvement data: not motor engaged _______________ motor engaged _______________

Academic Learning Time-Physical (ALT-PE) demographic information recording sheet
Academic Learning Time - Physical Education (ALT T-PE)

Context level (C)
- General content knowledge
- Transition (T)
- Management (M)
- Break (B)
- Warm-UP (WU)

Subject matter
- Skill practice (P)
- Scrimmage/routine (S)
- Game (G)
- Fitness (F)
- Cognitive (C)

Learner involvement level (LI)
- Not motor
- Motor engaged
- Interim (I)
- Off-task (OF)
- On-task (ON)

Motor appropriate (MA)
- Waiting (W)
- Supporting (MS)
- Inappropriate Successful (IS)
- Inappropriate Unsuccessful (IU)
- Appropriate Unsuccessful (AU)

Academic Learning Time - Physical Education (ALT-PE) interval recording sheet
APPENDIX C
<table>
<thead>
<tr>
<th>sub</th>
<th>gen</th>
<th>tr</th>
<th>date</th>
<th>time</th>
<th>ln</th>
<th>b</th>
<th>wc</th>
<th>ln</th>
<th>sd</th>
<th>r</th>
<th>sdb</th>
<th>bkb</th>
<th>s</th>
<th>g</th>
<th>f</th>
<th>l</th>
<th>w</th>
<th>c</th>
<th>on</th>
<th>cma</th>
<th>mms</th>
<th>iu</th>
<th>is</th>
<th>au</th>
<th>AU</th>
</tr>
</thead>
</table>

ACADEMIC LEARNING TIME-PE OVERALL DATA

68
<table>
<thead>
<tr>
<th>SUBJECTS</th>
<th>GENDER</th>
<th>TEACHER</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-High-skilled</td>
<td>1-Male</td>
<td>1-Male Teacher</td>
</tr>
<tr>
<td>2-Medium-skilled</td>
<td>2-Female</td>
<td>2-Female Teacher</td>
</tr>
<tr>
<td>3-Low-skilled</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>