INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps.

ProQuest Information and Learning
300 North Zeeb Road, Ann Arbor, MI 48106-1346 USA
800-521-0600

UMI®
DEVELOPING SELF-REGULATED LEARNING STRATEGY USE WITH URBAN MIDDLE SCHOOL PHYSICAL EDUCATION STUDENTS

DISSERTATION

Presented in Partial Fulfillment of the Requirements for

the Degree Doctorate of Philosophy in the

Graduate School of The Ohio State University

By

Susan Carol Brown, M.A.

*****

The Ohio State University

2002

Dissertation Committee:

Dr. Mary O’Sullivan, Advisor

Dr. P. Karen Murphy

Dr. Phillip Ward

Approved by

Mary O'Sullivan
Advisor

College of Education

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
ABSTRACT

What students are learning in physical education is a valued yet understudied topic (Langley, 1995). What students learn and the strategies they use to learn in physical education needs attention. Extensive studies in general education have shown that students' use of self-regulated learning (SRL) strategies can enhance their academic achievement (Pintrich, 1999; Pintrich & DeGroot, 1990; Schunk & Ertmer, 2000; Zimmerman, 1986). These studies attest that self-regulation can be taught and students who use self-regulated learning strategies perform better in academic settings. However, few self-regulated learning studies in physical education exist (Anderson, 1992; Bouffard & Dunn, 1993). The purpose of this study was to understand the uses and perceptions of self-regulated learning strategies used by urban middle school physical education students. A quasi-experimental pretest posttest design included students in strategies (n=53), technology (n=47), and curriculum (n=72) instructional conditions. Students were pretested and posttested using the Learning Strategies in Physical Education Questionnaire (LSPEQ) and the Physical Activity Content Test (PACT). Thirteen target students, six high, two average, and five low self-regulated learners, were selected to participate in semi-structured interviews. The target students' self-regulated learning behaviors were observed using the Self-Regulated Learning in Physical Education Observation
Instrument. Results for the LSPEQ showed no significant differences in students’ gain scores between conditions. Results for the PACT indicated that students in the strategies instructional condition scored significantly higher ($p< .05$) as compared to students in the technology and curriculum instructional conditions. Through observations, the target students sought help more from the teacher than from other students and girls sought more help than boys during the physical education class. Regarding goal setting, the target students set mostly psychomotor goals. The intervention was not effective in significantly improving students’ self-regulated learning (based on their LSPEQ scores). However, interviews with the target students showed evidence that high self-regulated learners used more strategies than low self-regulated learners. Future research is needed to examine further the self-regulated learning strategies students’ use in a physical education setting and whether these strategies could improve students’ physical fitness content knowledge.
Dedicated to my parents
Tom and Mary Brown
ACKNOWLEDGMENTS

My sincere thanks to my advisor, Dr. Mary O'Sullivan. Dr. O. thank you for you guidance, patience, support, and encouragement. I can only hope that one day my students will gain from me half as much as I have gained from you. Your work ethic and dedication to physical education is inspiring. Thank you for everything these past four years.

To Dr. Phillip Ward, thank you for pushing me and making me think differently about physical education. I have enjoyed and learned a great deal from your experience and insight.

To Dr. P. Karen Murphy, that you for the long hours of statistical help. You went the extra mile and I am forever grateful.

To my fellow graduate students Pam Bechtel, Ismael Flores, Margaret Gehring, Myung Ah Lee, Kevin Lorson, Deb Pace, Ian Pena, Tristan Wallhead, and Christine Whipple, thank you for making my graduate school experience such a memorable one.

To Kim Bush, I am so glad that we shared an office four years ago because I would have never known what a special person you are. Thanks for all the late night support in the Pomerene Lab. To Marlene Dixon, your support was immeasurable. I am so thankful for the personal and professional friendship that we have developed.
To the four physical education teachers who worked with me on this study, thank you for letting me a part of your class. I appreciate all the extra time you put in to make this dissertation a success.

To my brother Stuart, thank you for your support and love throughout my time in Ohio. You are so special and I wish the very best to you. To my mom and dad, thank you for your love, support, encouragement, and patience. Your constant encouragement helped me in more ways than you ever will imagine. I love both of you so very much.

Finally, I want to thank my best friend and the love of my life, Scott Thomas Nye. I will never forget the day you asked me to marry you and the times that we will share in the future. Your undying love and support will never be able to be repaid. I feel it is a blessing that I will be spending the rest of my life with you.
VITA

March 11, 1973 .....................................................Born – Burlington, North Carolina

1991-1995 .............................................................Bachelor of Science
          Physical Education
          Roanoke College
          Salem, VA

1995-1998 .............................................................Physical Education Teacher
          Rockbridge County High School
          Lexington, VA

1998-1999 .............................................................Master of Arts
          Physical Education
          The Ohio State University
          Columbus, OH

1999-Present ........................................................Graduate Teaching Assistant
          The Ohio State University
          Columbus, OH

PUBLICATIONS


FIELDS OF STUDY

Major: Physical Education
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>ii</td>
</tr>
<tr>
<td>Dedication</td>
<td>iv</td>
</tr>
<tr>
<td>Acknowledgments</td>
<td>v</td>
</tr>
<tr>
<td>Vita</td>
<td>vii</td>
</tr>
<tr>
<td>Table of Contents</td>
<td>viii</td>
</tr>
<tr>
<td>List of Tables</td>
<td>xi</td>
</tr>
<tr>
<td>List of Figures</td>
<td>xii</td>
</tr>
</tbody>
</table>

### Chapters:

1. **Introduction**
   - Statement of Problem ........................................... 1
   - Research Questions ............................................ 5
   - Significance of Study ......................................... 6
   - Delimitations and Limitations ............................... 8
   - Definition of Terms ............................................ 9

2. **Review of Literature**
   - Self-Regulated Learning ....................................... 11
   - Self-Regulated Learning Strategies ........................ 11
   - Student use of self-regulated learning strategies .... 16
     - Gender Differences and SRL strategies ................. 20
   - Self-Monitoring and Self-Evaluation ....................... 22
   - Seeking Help .................................................. 25
     - Reasons to Seek Help ...................................... 25
     - Reluctance to Seek Help .................................. 29
     - Student self-esteem and seeking help .................. 31
     - Gender differences and seeking help ................... 31
     - Goal orientation and seeking help ....................... 33

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
### Table of Contents

- **Goal Setting** .............................................................. 34
- **Goal Setting and Physical Education** .......................... 37
- **Performance Approach and Performance Avoidance Goals** 39
- **Self-Handicapping Strategies** ...................................... 40
- **Self-Regulated Learning Teaching Strategies** ................. 42
- **Summary** ................................................................. 43

### 3. Methodology .............................................................. 45

- **Theoretical Framework** ................................................. 45
- **Setting** ........................................................................ 47
- **Participants** ................................................................. 49
  - Teachers ........................................................................ 49
  - Students ......................................................................... 51
    - Student attrition for LSPEQ ........................................... 53
  - Target Students ........................................................... 56
- **Study Design** .............................................................. 57
  - **Procedures** ............................................................... 62
    - Strategies Instructional Condition .................................. 63
    - Technology Instructional Condition .............................. 65
    - Curriculum Instructional Condition .............................. 65
  - **Data Collection** .......................................................... 66
    - Phase I .......................................................................... 66
      - Teacher Training Procedures ....................................... 66
    - Phase II ......................................................................... 67
      - Learning Strategies in Physical Education Questionnaire 68
      - Student Interviews .................................................... 69
      - Self-Regulated Learning Observation Instrument .......... 70
      - Goal Setting ............................................................ 71
      - Physical Activity Content Test ................................... 72
  - **Data Analysis** .............................................................. 73

### 4. Results ........................................................................ 75

- **Learning Strategies in Physical Education Questionnaire** 75
- **Physical Activity Content Test** ..................................... 86
- **Student Use of Self-Regulated Learning Strategies** ......... 89
- **Student Perceptions of Self-Regulated Learning Strategies** 96
- **Summary** ................................................................. 113

### 5. Discussion, Implications, and Recommendations ................. 115

- **Learning Strategies in Physical Education Questionnaire** 115
- **Physical Activity Content Test** ..................................... 117
- **Student Use of Self-Regulated Learning Strategies** ......... 119
- **Student Perceptions of Self-Regulated Learning Strategies** 126
- **Conclusions** ............................................................ 136
- **Implications** ............................................................. 137
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Self-Regulated Learning Strategies</td>
<td>18</td>
</tr>
<tr>
<td>3.1</td>
<td>Demographics for each school</td>
<td>49</td>
</tr>
<tr>
<td>3.2</td>
<td>Demographics for the physical education teachers involved in the study</td>
<td>50</td>
</tr>
<tr>
<td>3.3</td>
<td>Demographics by school and learning condition</td>
<td>52</td>
</tr>
<tr>
<td>3.4</td>
<td>Demographics for the selected target students</td>
<td>55</td>
</tr>
<tr>
<td>3.5</td>
<td>Random order of instructional conditions presented at each school</td>
<td>60</td>
</tr>
<tr>
<td>3.6</td>
<td>Treatments received by instructional condition</td>
<td>62</td>
</tr>
<tr>
<td>3.7</td>
<td>Internal consistency for the four factors on the LSPEQ</td>
<td>69</td>
</tr>
<tr>
<td>4.1</td>
<td>An example of LSPEQ items for each factor</td>
<td>78</td>
</tr>
<tr>
<td>4.2</td>
<td>Descriptive statistics for the LSPEQ and PACT by school and learning condition</td>
<td>80</td>
</tr>
<tr>
<td>4.3</td>
<td>Means, Standard Deviations, and Bivariate correlations for study variables</td>
<td>83</td>
</tr>
<tr>
<td>4.4</td>
<td>Descriptive statistics for LSPEQ gain scores by school and learning condition</td>
<td>84</td>
</tr>
<tr>
<td>4.5</td>
<td>Target students frequency of seeking help and student initiated monitoring with technology</td>
<td>91</td>
</tr>
<tr>
<td>4.6</td>
<td>Summary of the goals students set, achieved, evaluated, and types of goals when students wore pedometers</td>
<td>94</td>
</tr>
<tr>
<td>Figure</td>
<td>Description</td>
<td>Page</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>3.1</td>
<td>Model of triadic reciprocity of Social Cognitive Theory</td>
<td>46</td>
</tr>
</tbody>
</table>
Chapter 1

Introduction

Self-regulated learning denotes an active process by which students guide their behaviors across varying content and contexts (Pintrich, 2000). Self-regulated learning is a constructive process whereby learners set goals for their learning, monitor, regulate, and control their cognition, are aware of what they know and believe, and seek challenges with confidence and purpose (Pintrich, 2000; Zimmerman, 1990). Self-regulated learning implies students initiate, direct, and use strategies to enhance their own learning (Zimmerman, 1989).

Scholars in general education have suggested that students' use of self-regulated learning strategies plays an important role in their academic achievement (Pintrich, 1999; Pintrich & DeGroot, 1990, Schunk & Ertmer, 2000; Zimmerman & Martinez-Pons, 1986). Researchers have shown that the use of self-regulated learning strategies enables students to reach their desired academic outcomes (Garcia & Pintrich, 1993; Weinstein, 1996; Zimmerman & Martinez-Pons, 1986). Due to the lack of self-regulated learning studies in physical education (Anderson, 1992; Bouffard & Dunn, 1993), there is a need to understand if and how middle school students use self-regulated learning strategies to enhance their learning.
Students who use self-regulated strategies, such as monitoring progress and goal setting, were found to perform better than students who did not use these strategies (Pintrich & DeGroot, 1994). Studies found high achieving middle school students were more likely to report using self-regulated learning strategies (i.e. monitoring performance and goal setting) than low-achieving students. The use of these strategies correlated with higher academic performance (Pintrich & DeGroot, 1990; Sink, Barnett, & Hixon, 1991).

In general education, student monitoring has played an important role in promoting student learning (Johnson & Johnson, 1990; Schunk, 1995). Monitoring aids in students being aware of their behavior, which can led to students making changes to improve the efficiency of their behavior (Schunk, 1995). Weinstein (1987) suggested monitoring involves “assessing and comprehending the degree to which goals are being met and, if necessary, modifying the strategies being used to facilitate goal attainment” (p. 593).

Behavior analysts have found success using self-monitoring techniques in strengthening desirable behaviors (i.e. correctly solving math problems or on-task student behaviors) and decreasing nondesirable behaviors (i.e. stop smoking or weight control) (Cooper, Heron, & Heward, 1987; Grant & Evans 1994). Kinnunen and Varuas (1995) studied fourth graders monitoring during a reading task and found student monitoring aided in their reading comprehension. Hall and Zentall (2000) found, in a math task with middle school students, monitoring aided in students’ accuracy and correctness of math homework problems.
In the physical education literature, with the exception of Bouffard and Dunn (1993), student monitoring studies with middle school students are lacking. Monitoring fosters students awareness of their behavior, which can led to students making changes to improve the efficiency of their behavior (Schunk, 1995). Bouffard and Dunn (1993) found overt rehearsal of a movement sequence helped students to monitor how much of the movement sequence they already knew. Students were successful learning the task when they used self-checking techniques to monitor their learning during the movement sequence. Student monitoring of their behavior in a physical education setting could mimic the positive outcomes from general education such as increased comprehension of fitness concepts.

A second self-regulated learning strategy, goal setting has been linked to increased skill performance in a physical activity context (Boyce, 1990; Boyce & Wayda, 1994; Kitsantas, 1997). Setting goals allows students to guide their behavior and evaluate performance (Bandura, 1986; Locke and Latham, 1984). Goal setting also encourages students to monitor their progress and enhance their task performance (Pintrich, 2000; Zimmerman, 2000). There is an abundance of literature related to goal setting with college age students (Boyce, 1990; Boyce & Wayda, 1994; Hall and Byrne, 1988), however, the goal setting literature with middle school physical education students is lacking. Fairall and Rodgers (1997) found college track and field athletes had higher participation when they set goals verses not setting goals. Boyce and Wayda (1994) found college students in a weight training class had higher performance gains when they set goals or were assigned goals verses not setting goals.
It is unknown whether the positive results for goal setting among college age students could be replicated with the middle school population.

Another self-regulated learning strategy, seeking help, has also been found to enhance student learning in a general education context (Newman, 1994). Students who seek help use others as a resource to gain a deeper understanding of academic material (Newman, 1994). The body of literature for seeking help in physical education is limited however; the findings from general education with middle school students appear transferable into a physical education setting. These findings suggest seeking help is an important strategy to improve student learning (Newman, 1994; Zimmerman & Martinez, 1988). Studies in general education have found gender differences in help seeking (Kennedy, 1997; Newman, 1990) and differences between high and low performing students (Meij, 1990; Ryan, Gheen, & Midgley, 1998; Salmon & Strobel, 1996). Gender differences were found regarding boys seeking more help in math and science contexts than girls, and high achieving students seek more help than low achieving students. In physical education, it is important to understand why students do or do not seek help when performing a skill or learning physical activity content. By understanding students’ help seeking behaviors in physical education, activities could be modified to promote student learning by eliminating some of the stresses causing students to not seek help.

The theoretical framework for this study was situated within the social cognitive theory of self-regulated learning, which denotes a relationship between three processes: self-observation, self-judgment, and self-reaction (Bandura, 1986). Within this framework, students observe their behavior for quality, rate and quantity;
judge their behavior by comparing their performance to a standard; and react to their behavior by evaluating and resetting information or skills.

Statement Of The Problem

This investigation was in response to the apparent lack of emphasis on the cognitive domain exhibited within a physical education context. Self-regulated learning strategies focus on the cognitive domain within general education. Studies in general education have shown that self-regulated learning (SRL) strategies can be taught and students who use self-regulatory strategies will perform better in academic settings (Wolters & Pintrich, 1998; Zimmerman & Martinez-Pons, 1986). Infusing the teaching of self-regulated learning strategies to middle school physical education students may be a way to assist student learning in the cognitive realm. The National Association for Sport and Physical Education (1995) suggested cognitive, behavioral, and affective domains be apart of the physical education curriculum. However, Petray (1994) suggested that the emphasis on the fitness-related cognitive domain is scarce within a physical education setting. Langley (1995) also stated that student learning in physical education is a valued yet an understudied topic. Describing what students are learning and the strategies they use to learn in physical education needs attention.

Teaching students SRL strategies may be a way to improve student academic learning of fitness related concepts in physical education. However, few self-regulated learning strategy use studies in physical education exist (Anderson, 1992; Bouffard & Dunn, 1993). The purpose of this study was to understand the uses and perceptions of self-regulated learning strategy used by urban middle school physical education students.
Research Questions

1. To what extent did middle school physical education students' self-regulated learning scores differ by instructional condition (i.e. strategies, technology, and curriculum instructional condition)?

2. To what extent did students know the fitness content differ by instructional condition?

3. To what degree did the target students use self-regulated learning strategies (i.e. seeking information, self-monitoring, goal setting, and self-evaluation) during their physical education classes?

4. To what degree did the target students perceive their use of self-regulated learning strategies (i.e. seeking help, self-monitoring, goal setting, and evaluation) during their physical education classes?

Significance of Study

This research project represented an attempt to understand student self-regulated learning strategy use in a physical education setting. Students, who set goals, use a selection of strategies, and monitor their performance, demonstrated higher achievement than students who did not use these strategies (Pintrich and DeGroot, 1990; Zimmerman, 1990). Findings from this study could provide information on the necessary strategies students should use to become proficient learners during physical education lessons. This study could also extend the large body of knowledge on self-regulated learning in general education to a physical education context.

This study has relevance for physical education by contributing both methodological and instructional significance within physical education. Implementation of mixed-methods for this study was utilized to gather data regarding student self-regulated learning strategy use. Reliance on one method could limit the research by observing the data through one lens or angle (Patrick & Middleton, 2002).
By selecting mixed methods a deeper understanding of student self-regulated learning strategy uses could be explored. A mixed-method approach enables contextual information, which has previously been obscured, regarding self-regulated learning strategy use to be collected.

Instructional issues related to student self-regulated learning strategy use in physical education has been lacking. Teaching students self-regulated learning strategies could make learning authentic for students. The strategies utilized could provide students and teachers with feedback and opportunities to individualize physical education activities. Zimmerman and Martinez-Pons (1986) found 14 strategies used by high school students. Due to time constraints, it was not feasible to collect data on all 14 strategies. Four of these strategies were chosen because of the authentic nature these strategies posed for middle school students in a physical education setting. The targeted strategies included seeking help, self-monitoring, goal setting, and self-evaluating.

Teaching students self-regulated learning strategies may be a way to individualize and improve student academic achievement in a physical education setting. Students who learn to use self-regulated learning strategies during their physical education experiences could exercise personal control and responsibility for learning. Students could also learn to seek help, self-monitor, and set goals to improve their physical education learning experiences. This study is significant because it attempts to bridge the gap between general education and physical education regarding student self-regulated learning strategy use.
Delimitations and Limitations

There are a number of delimitations with this study. The delimitations of the study were boundaries decided upon by the researcher. They were as follows:

1. The study was limited to four teachers and nine middle school physical education classes.

2. The teachers and their classes were purposefully selected based on recommendations made by the Lexington Public School District's physical education coordinator.

3. The teachers were selected because they had at least three years teaching experience in a middle school. Fuller (1969) has designated that after three years of teaching experience, teachers begin to look for new teaching challenges. They have moved beyond focusing on management and basic instructional needs and have become inspired to find new ways to enhance student learning.

4. The target students were purposefully selected from the strategies instructional condition based on their attendance in the classes and their scores on the pre Learning Strategies in Physical Education Questionnaire (LSPEQ).

There are several limitations to this study that impact how the findings can be interpreted. The limitations of the study were:

1. The study was limited by the data collected during the physical education class. It was not possible to determine the impact of outside effects on the students.

2. The study was limited to the instruments used. One limitation when using questionnaires is that the researcher must rely on self-reporting by students.

3. The study was limited by using a quasi-experimental design because random samples could not be obtained due to having intact physical education classes. The classes were predetermined before the study began.

4. The study was limited by the lack of knowledge regarding teaching with technology by the four teachers. To help alleviate some of the management issues, training was provided to the teachers to help anticipate some of the technical problems that would arise. This training
was deemed necessary because none of these teachers had ever taught using technological resources. Two problems arose with management: (a) the heart rate monitors took time at the beginning of class to put on and (b) connection between the watch and transmitter. The teachers instructed the students on how to put them on and how to read their heart rates. The students were faster by the end of the unit but the students in the strategies and technology instructional conditions took longer to get into the warm-up than the curriculum instructional condition.

5. The study was limited by the observational data collected. The observational data were collected using event recording.

6. The study was limited by the large standard deviation regarding the Learning Strategies in Physical Education Questionnaire (LSPEQ). When a standard deviation is large even small differences between the groups can be masked (Fraenkel & Wallen, 2000). The large standard deviations denote a diverse spread of the scores around the mean. One possible explanation why significance was not found between the instructional conditions or schools and the four gain scores (i.e. learning goals, ability avoidance goals, ability approach goals, help seeking/persistence) could be associated with the large standard deviations.

7. The study was limited by the low response rate on the LSPEQ. The analysis of the questionnaire could have been affected by the low response rate. There were initially 254 students in the study however due to attrition for various reasons (i.e. changing schools or classes) only 174 or 69% of the LSPEQs were usable. Item substitution replaced some of the missing data values however, there were still 80 questionnaires that were not useable due to students not having completed either a pretest or a posttest. One solution to reduce the number of nonuseable questionnaires would be to have more occasions to allow students to take the questionnaire. Another solution could entail delaying the intervention to allow absentee students to complete the questionnaire.

Definition of Terms

**Ability Approach**: When students demonstrate or compare their ability relative to others (Middleton & Midgley, 1997).

**Ability Avoidance**: When students look or feel unable to demonstrate a skill (Middleton & Midgley, 1997).
Goal-setting: Statements indicating student setting of educational goals, or subgoals and planning for sequencing, timing, and completing activities related to those goals (Zimmerman & Martinez-Pons, 1986).

Rehearsal / Modeling a teacher or peer: Statements indicating student-initiated efforts to memorize material by overt or covert practice (Zimmerman & Martinez-Pons, 1986).

Seeking Assistance from a teacher or peer: Statements indicating student-initiated efforts to solicit help (Zimmerman and Martinez-Pons, 1986).

Seeking Assistance using technology: Statements indicating student-initiated efforts to solicit help from technology (i.e. heart rate monitors or pedometers).

Self-Evaluation: Statements indicating student-initiated evaluation of the quality or progress of their work (Zimmerman & Martinez-Pons, 1986). Also, when students compare monitoring information to a standard or goal (Zimmerman, 2000).

Seeking Information: Statements indicating student-initiated efforts to secure further task information from nonsocial sources when undertaking an assignment (Zimmerman & Martinez-Pons, 1986).

Self-Monitoring: Deliberate observation of covert and overt aspects of one’s performance outcomes on a given task. Self-monitoring of outcomes is essential for self-regulation because it produces corrective, cognitive, emotional, and behavioral reactive effects (Zimmerman, Bonner, & Kovach, 1996).

Self-Observation: Deliberate attention to one’s behaviors to include quality, rate, quantity, and originality (Schunk, 1990). A person’s tracking of specific aspects of their own performance, the conditions that surround it, and the effect that it produced (Zimmerman, 2000).

Self-Recording: Statements indicating student-initiated efforts to record events or results (Zimmerman & Martinez-Pons, 1986).

Self-Regulated Learners: Students who are metacognitively, motivationally, and behaviorally active participants in their own learning processes (Zimmerman, 1986, p. 4).

Task Goals: Students define success as mastering something new and they see effort as contributing to success (Middleton & Midgley, 1997).
CHAPTER 2

REVIEW OF LITERATURE

The purpose of this chapter was to provide a review of the literature on self-regulated learning strategy use with middle school students. This review informed the research questions and methodological concerns developed for this study. The review begins by providing a foundation from general education describing (a) self-regulated learning, (b) the three processes of the social cognitive theory: self-observation, self-judgment, and self-reaction, and (c) self-regulated learning strategies. The review then branches out to explain three selected self-regulated learning strategies: self-monitoring, seeking help, and goal setting. The research studies for these three strategies were first selected based on middle school populations. When studies were lacking from this population an expanded search was conducted to include high school and college populations. Whenever possible relevant studies from a physical education setting were included with the general education studies.

Self-Regulated Learning

Self-regulated learning (SRL) occurs when students use personal strategies to strategically regulate their behavior and immediate learning environment.
Self-regulated learning focuses on “how students personally activate, alter, and sustain their learning practices in specific contexts” (Zimmerman, 1986, p. 307). Students, who exhibit self-regulated learning qualities, organize and create advantageous learning environments, display initiative, and demonstrate personal responsibility for their learning (Zimmerman & Martinez-Pons, 1986). Self-regulated learners or strategic learners, plan, orchestrate, and manage their learning as well as utilize a variety of strategies to accommodate different learning situations (Weinstein, 1996).

Self-regulated learning can be understood as it relates to social cognitive theory. Self-regulated learning involves student self-observations, self-judgments and self-reactions (Bandura, 1986). Self-observations epitomize students’ deliberate attention to their own behavior. Self-judgments occur when students compare their behavior to previous performance or a standard. Self-reactions occur when a student evaluates their own progress. All three can be initiated by students and sustained through positive self-evaluations (Zimmerman, 1989).

Student self-observations are the first process relating Social Cognitive Theory to self-regulated learning. Student self-observations occur when students are aware of their actions, which is a prerequisite to regulating behavior. Students can observe their behavior for quality, rate, quantity and originality (Schunk, 1990). Self-observation by itself cannot sustain a student’s self-regulated learning, however when self-observation merges with self-recording, students can create meaningful and accurate assessments of their behavior and gather evidence of progress. Self-recording allows students to keep records of their performance therefore enabling
them to set accurate goals (Johnson & Johnson, 1999). Keeping records promotes
student awareness of their behavior when learning.

There are two criteria for students to self-record their behavior. First, students
must regularly record their behavior. For example, students need to record the time,
place, and duration of the behavior on a regular basis (Kim & Sugai, 1995). Kane,
Baltes, and Moss (2001) studied participants at a wrestling camp and their recorded
free-set (FS) goals. The study found a strong positive correlation ($r = .66$) between
preseason FS goal difficulty and preseason FS goal specificity. The difficulty and
specificity of the participants FS goals was associated with the participants'
performance at the wrestling camp. The implications for this study suggested that
participants should record goals, which include specific details.

A second criterion is proximity, which necessitates that students record the
behavior soon after it occurs. Waiting until the end of the day to record all of the
day’s events can lead to a misrepresentation of their behavior. Schunk (1983) found
students who self-recorded during a math task had higher self-efficacy and more task
persistence than students who did not record their behavior.

Student self-judgments are the second process connecting self-regulated
learning to the Social Cognitive Theory. Students make self-judgments regarding
their progress when they compare their performance to their peers, to the previous
day’s performance or to a standard or goal (Schunk, 1990, 1996; Zimmerman, 1989,
2000). Student self-judgments rely on personal processes of self-efficacy, knowledge
of the goal or standard, and goal setting. Chase (1998) found students ages 13 to 14
judged their self-efficacy in physical education based on three sources (a) when

13
others' praised them and provided encouragement, (b) when their performance was successful, and (c) when they were positively compared to others. Their self-efficacy judgments were impacted either positively or negatively based on these three resources of information.

Student judgments can also be affected by the value a student hold for an activity. If students do not value an activity, they could expend little effort to improve (Bandura, 1993). Ennis (1999) studied high school students and their failure to find physical education relevant or valuable. A majority of the students interviewed found physical education exhibited few connections to their lives outside of school. The students did not understand the personal educational benefits of the subject matter they were learning. The students also did not understand the relevance and/or benefits for the teacher’s curricular choices.

Chen (1996) also examined interest and meaningfulness of physical activities for students who had completed their secondary education. Findings showed that if students thought the activity was meaningful or valuable, they were more likely to be engaged in the activity. The study also found six dimensions that can affect meaningfulness and value for students during physical education classes. These dimensions included social bonding, cultural appreciation, challenge, tension release, fitness development, and self-expression.

Student self-reactions are the final process connecting self-regulated learning to the Social Cognitive Theory. Self-reaction implies an evaluation of one’s own progress and includes resetting goals, rehearsing information, and asking for assistance from peers or teachers. (Zimmerman, 1989). There are two categories of
self-reactions: personal and environmental. Personal self-reactions occur when students seek to enhance personal progress during learning. For example, Mitchell (1996) studied gender differences associated with intrinsic motivation and perceptions of the learning environment among middle school students. He suggested that students are more likely to participate when they perceive the learning environment as nonthreatening to their self-esteem and this can lead to increased learning. Findings showed significant gender differences with boys exhibiting more intrinsic motivation, perceived threat, and perceived competitiveness than girls.

Environmental self-reactions occur when students attempt to improve the environment to construct meaningful learning situations. Carlson (1995) examined the voices of junior high students to understand why they felt alienated during physical education. She found that the physical education environment contributed to student alienation through such factors as boredom, repetition, and lack of meaningful work. The students reported lack of choice and/or control during activities. Due to the lack of control, students reported using several adapted strategies during physical education classes. These strategies included hiding disillusion, being a spectator, becoming wallflowers, faking, and self-banishment. Three suggested implications for teachers were included: the activities need to be able to capture students' attention, provide students with a voice, and link the activities to real life situations. If teachers utilize these suggestions, students' decrease use of adaptive strategies (i.e. being a spectator) could occur, which could impact student learning.
Self-Regulated Learning Strategies

The literature focusing on self-regulated learning strategies was reviewed and it is presented through two sections. The first section comprises an overview of students’ use of self-regulated learning strategies. Self-regulated learning strategies “refer to actions and processes directed at acquisition of information or skills that involve agency, purpose, and instrumentality perceptions by learners” (Zimmerman, 1990, p. 5). The second section reviews literature involving self-handicapping strategies. Students who use self-handicapping strategies (i.e. procrastinating a task) deflect attention away from their lack of ability and towards their created circumstances. Both sections focus on participants from middle and high school populations.

Students’ use of self-regulated learning strategies plays an important role in their academic achievement. Researchers emphasize student’s use of self-regulated learning strategies enables them to reach desired academic outcomes (Pintrich, 1999; Pintrich & DeGroot, 1990; Schunk & Ertmer, 2000; Weinstein, 1996; Zimmerman, 1986). Some scholars claim that high self-regulated learners can be distinguished from low self-regulated learners by their frequent use of strategies to achieve their goals (Pintrich, 1999; Zimmerman, 1990).

Students use a range of self-regulated learning strategies to understand information in academic settings. Weinstein and Mayer (1986) reported eight categories of learning strategies, which “include behaviors that the learner engages in during learning that are intended to influence affective and cognitive processing” (p. 316). These learning strategies include both basic and complex strategies for
rehearsal, elaboration, organizational, and monitoring. Zimmerman & Martinez-Pons (1988) described 14 classes of self-regulated learning strategies from an inductive analysis of the interview data with high school students (see Table 2.1). Specific strategies used by self-regulated learners included to plan, organize, and monitor, set goals and then evaluate their progress, seek assistance and information, and display extraordinary effort and persistence during learning, (Schunk, 1986; Zimmerman, 1990; Zimmerman & Martinez-Pons, 1986). By using these strategies, learners are able to be focused, decisive, and aware of their learning (Weinstein, 1996; Zimmerman, 1990).

**Student Use of Self-Regulated Learning Strategies**

Scholars have identified differences between high and low self-regulated learners and between males and females when students use self-regulated learning (SRL) strategies (Sink, Barnett, and Hixon, 1991; Wolters & Pintrich, 1997; Zimmerman & Martinez-Pons, 1986).

Zimmerman and Martinez-Pons (1986) used a structured interview format to understand high school students' use of self-regulated learning strategies in multiple contexts. The participants included 40 tenth grade students from advanced achievement tracks and 40 tenth grade students from lower academic tracks. The advanced achievement track students used self-regulated learning strategies more often and relied more frequently on social sources of assistance from peers, teachers, and parents with peers retaining the highest percentage than lower tracked students.
<table>
<thead>
<tr>
<th>Categories of Strategies</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Self-evaluation</td>
<td>Statements indicating student-initiated evaluation of the quality or progress of their work.</td>
</tr>
<tr>
<td>2. Organizing and transforming</td>
<td>Statements indicating student-initiated overt or covert rearrangement of instructional materials to improve learning.</td>
</tr>
<tr>
<td>3. Goal-seeking and planning</td>
<td>Statements indicating student setting of educational goals, or subgoals and planning for sequencing, timing, and completing activities related to those goals.</td>
</tr>
<tr>
<td>4. Seeking information</td>
<td>Statements indicating student-initiated efforts to secure further task information from nonsocial sources when undertaking an assignment.</td>
</tr>
<tr>
<td>5. Keeping records and monitoring</td>
<td>Statements indicating student-initiated efforts to record events or results.</td>
</tr>
<tr>
<td>6. Environmental structuring</td>
<td>Statements indicating student-initiated efforts to select or arrange the physical setting to make learning easier.</td>
</tr>
<tr>
<td>7. Self-consequences</td>
<td>Statements indicating student arrangement or imagination of rewards or punishment for success or failure.</td>
</tr>
<tr>
<td>8. Rehearsing and memorizing</td>
<td>Statements indicating student-initiated efforts to memorize material by overt or covert practice.</td>
</tr>
<tr>
<td>9-11. Seeking social assistance</td>
<td>Statements indicating student-initiated efforts to solicit help from peers (9), teachers (10), and adults (11).</td>
</tr>
<tr>
<td>12-14. Reviewing records</td>
<td>Statements indicating student-initiated efforts to reread test (12), notes (13), or textbooks (14) to prepare for class or further testing.</td>
</tr>
<tr>
<td>15. Other</td>
<td>Statements indicating learning behavior that is initiated by other persons such as teacher or parents, and all unclear verbal responses</td>
</tr>
</tbody>
</table>

Table 2.1: Self-regulated learning strategies (Zimmerman & Martinez-Pons, 1986).
Implications for this research suggested that students will seek help from peers more than from the teacher and that higher achieving students will seek help more than lower achieving students.

Salisbury-Glennon, Gorrell, Sanders, Boyd and Kamen (1999) studied 114 sixth and seventh grade students from an urban middle school. Students reported using three self-regulated learning strategies more than others. Organizing and transforming information was the most used strategy, followed by seeking social assistance from the teacher, and then goal setting and planning. The three least used strategies were rehearsing and memorizing, reviewing records, and keeping records and monitoring.

Sink, Barnett, and Hixon (1991) studied 62 sixth grade students to understand two self-regulated learning strategies: planning and self-assessment. Results indicated students with better planning facilitated higher academic achievement. Student planning comprised goal setting, use of a variety of strategies, and consistent self-monitoring of performance. Student self-assessment occurred when students understood the difference between what had been mastered and what was poorly understood. Implications regarding this study suggested that students who plan during learning are better able to monitor and assess their performance.

Bouffard and Dunn (1993) studied developmental differences between 1st and 4th graders in their use of self-regulated learning strategies in a supra-memory-span movement sequence involving American Sign Language. Students used strategies such as observing, watching and mimicking behavior, and watching and rehearsing behavior. Findings indicated nine year olds used significantly more strategies than 6
year olds. Nine year olds also used a broader range of strategies than 6 year olds. As students aged they were more equipped to use strategies to enhance their learning. This finding suggests that older students would use more strategies than younger students.

*Gender Differences and Self-Regulated Learning Strategies.* Scholars have found that gender differences can affect the number and use of strategies used by middle school students (Ablard and Lipschultz, 1998; Niemivirta, 1997; Wolters & Pintrich, 1998). Girls were shown to use more strategies than boys. Niemivirta (1997) examined gender differences affecting self-regulated learning strategy use. Six hundred and twenty-seven seventh graders responded to a self-report questionnaire measuring goal orientation, perceived control and learning strategies. Results indicated learner oriented girls used significantly deeper learning strategies than learner oriented boys. Boys reported higher self-confidence however, they were significantly more inclined to have performance goals and shallow learning strategies such as rote learning and detailed memorizing than girls.

Ablard and Lipschultz (1998) examined the self-regulated learning strategies used by 222 high achieving seventh grade students. Students responded to the Patterns of Adaptive Learning Strategy (PALS; Midgley, Maehr, & Urdan, 1995) and the Self-Regulated Learning Interview Schedule (SRLIS; Zimmerman & Martinez-Pons, 1986). Students described using self-evaluation, organization, goal setting and planning, and seeking assistance from an adult more frequently than other self-regulated learning strategies. Results also indicated gender differences in which girls used SRL strategies more frequently than boys. These strategies included organizing...
and transforming, goal setting and planning, keeping records and monitoring, seeking assistance from peers and reviewing notes.

Wolters and Pintrich (1998) studied task value and efficacy beliefs with regards to self-regulated learning strategy use with 545 seventh and eighth grade students. Findings indicated differences between student task value and efficacy beliefs across three contexts: math, English, and social studies. Task value represented the greatest predictor of strategy use. Students who had a high task value also reported using more regulatory strategies than low task value students. Females reported higher task value and efficacy for English than in math or social studies. Males reported similar levels of efficacy across all subject areas however; they indicated a higher level of task value for mathematics over English or social studies. The relationship between self-efficacy and self-regulated learning strategy use demonstrated students with high self-efficacy beliefs had higher self-regulated learning strategy use.

To summarize, differences were found involving student use of self-regulated learning strategies with the types of strategies used by students and between males and females. High self-regulated learners used more strategies and sought help more from peers than low self-regulated learners. The two most commonly cited self-regulated learning strategies used were organizing information and seeking help. Differences were also found with females using more SRL strategies than males.

In the next several paragraphs, selective self-regulated learning strategies will be discussed. These strategies were selected based on their relevance and importance to the present study. These strategies include self-monitoring and self-evaluation, help
seeking, and goal setting. These strategies were first reviewed in the physical education literature and then in the general education literature. There was a lack of research found regarding help seeking in a physical education setting therefore, literature regarding help seeking behaviors was drawn from the general education literature.

**Self-Monitoring and Self-Evaluation**

The first self-regulated learning strategies reviewed were self-monitoring and self-evaluation. Self-monitoring and self-evaluation are two important strategies to promote student self-regulated learning. If students are to learn, they must first attend to the task, assess the degree of the task, and then modify the strategies to meet the demands of the task (Weinstein & Mayer, 1986). Self-monitoring requires students to pay specific attention to their behavior (Schunk, 1990). When students self-monitor, they “track specific aspects of their own performance, the conditions that surround it, and the effect that it produces” (Zimmerman, 2000, p. 19). Schunk (1997) cited three implications for self-monitoring by students.

1. Self-monitoring was a critical element for self-reflective practice.
2. Students needed training in self-monitoring and its appropriate use.
3. Teachers needed to design learning environments that included student understanding of their progress.
4. Teachers needed to teach students to set learning goals and then provide feedback on the set goals. (p. 16-18)

Self-monitoring one’s own behavior is a difficult skill. Zimmerman (1994) stated “if students cannot monitor their behavioral outcomes because feedback is
prevent self-regulation will be impaired” (p. 10).

Students can become disorganized or misinformed, if the information they collected about their behavior is inaccurate. In a physical education setting, this could resemble students who watch a model performing the skill incorrectly which could lead to them performing or practicing the skill incorrectly.

Three factors can affect students self-monitoring (Zimmerman, 2000). First, students must provide self-feedback. Delayed self-feedback can cause students not to correct their behavior at the opportune time. For example, students in a physical education setting need to provide self-feedback relative to their skill performance. If they are delayed with this feedback, their judgments might be incorrect and their behavior will not improve. Second, students’ feedback must be informative, which requires performing a skill in an authentic and structured setting. For example, students should learn how to serve in tennis on a tennis court not in a basketball arena. Finally, students must observe their performance for accuracy. Students who can accurately observe their behavior can make more precise judgments with regards to self-feedback. In physical education, this could occur when students analyze skill performance of an overhand throw to observe for a proper follow through. Precise judgments could assist the students to throw at a target with more accuracy.

Kinnunen and Vauras (1995) studied high and low achieving fourth graders and their monitoring during a reading task. Monitoring was assessed by changes in the students reading time and look-backs when confronted with obstacles with the text. Results showed that high achievers had more acts of comprehension monitoring than low achieving students. These results could possibly transfer into a physical

23
education setting. During skill practice students could be taught the importance of repetition. They could also be taught when it is necessary to ask the teacher for help and when they should persist on their own.

Shimabukura, Prater, Jenkins, and Edelen-Smith (1999) investigated the effects of self-monitoring of academic productivity for three males, one sixth and two seventh graders, with learning disabilities and hyperactivity disorders. The males were evaluated during reading, mathematics and written expression classes. A multiple baseline design across the three academic areas was employed to assess the males' self-monitoring behaviors. Results indicated that all three students completed more and were more accurate with their assignments in all three academic areas when they self-monitored. All three students also showed improvements with their on-task behavior during their independent seat work when they self-monitored.

Hall and Zentall (2000) studied the impact of self-monitoring with three middle school students who had chronic homework problems. A multiple baseline design across participants was utilized to understand students' completion and accuracy of math homework. Results indicated two of the three students improved during the intervention in the completion and accuracy of math homework when they self-monitored. The third student did not benefit from the intervention. Implications for this study, suggest that self-monitoring could improve middle school students completion and accuracy of math homework.

Self-evaluation is the comparison of self-monitored information with a standard or goal (Zimmerman, 2000). "Self-evaluations comprise both self-judgments of present performance by comparing it to one’s goal and self-reactions to those
judgments by deeming performance noteworthy and acceptable" (Schunk, 1996, p. 363). Positive self-evaluations can promote student progress, in which students are motivated to continue working. Schunk and Ertmer (2000) reported students who engaged in daily self-evaluations demonstrated higher self-efficacy, self-regulated motivation, and achievement. Self-evaluation can be connected to a physical education setting, when students compare their present performance to their goal. For example, when students practice a tennis serve from day to day and note their progress. They can make changes to their serve to become even more accurate.

Seeking Help

The second self-regulated learning strategy reviewed was seeking help. A review of the seeking help literature in general education was deemed necessary due to the lack of the seeking help literature in physical education. Studies reviewed for seeking help were organized by common findings: reasons to seek help, reluctance to seek help, self-esteem, gender differences, and differences between goal orientations. Whenever possible, connections are made to a physical education setting. A need to understand seeking help with middle school students was deemed necessary because seeking help was considered an important strategy used by self-regulated learners. It was assumed that seeking help would also be an important strategy in a physical education setting because of the positive findings found in a general education setting.

Reasons to Seek Help. One characteristic of high self-regulated learners was their ability to use others as a resource to gain a deeper understanding of academic material (Newman, 1994). Seeking help was regarded as an important self-regulated
learning strategy to improve student learning (Newman, 1994; Zimmerman and Martinez-Pons, 1988). Traditionally, help seeking was associated with lack of ability (Newman & Schwager, 1995). Studies have recently emerged to understand the importance of seeking help from teachers, peers, or other sources.

Kennedy (1997) cited two types of help seekers: executive help seekers and instrumental help seekers. Executive help seekers want the problem resolved for them rather than focus on the process of learning. In a physical education setting, executive help seekers may resemble students who want the outcome of a movement sequence told to them instead of attempting to comprehend it on their own. Instrumental help seekers want explanations of the process to aid in developing mastery of the material. For example, instrumental help seekers ask for clarification of instructions, demonstrate of a skill, or useful hints in which to complete a task. In a physical education setting, instrumental help seekers may want to understand the steps involved with performing the skill in order to learn how to successfully perform the skill.

Butler and Newman (1995) investigated the effects of task and ego goals for 80 sixth grade students' help seeking behaviors. Findings indicated that instruction encompassing task goals rather than ego goals encouraged more students to seek help. Several reasons students requested help were to gain mastery, to succeed, because of task difficulty, and to avoid effort. Several reasons students avoided help were to mask incompetence, seek independent mastery, or they did not need help. In a physical education setting, task goals could promote student help seeking because students are focused on their own progress while performing a skill instead of
comparing their ability with a classmate (Fry & Duda, 1997). Students in a physical education setting could also resort to masking their incompetence or avoiding effort if they do not believe they have the ability to perform the skill.

Salmon and Strobel (1996) examined help seeking behaviors for 330 students who ranged in age from 9 to 13. Data were collected using a help-seeking questionnaire, which covered 10 problem situations. The problem situations covered relationships with peers, adults, emotions and feelings, and academic difficulties. Students reported reasons for seeking help to include emotional support, instrumental assistance, informational advice, and companionship. Results indicated girls sought help significantly more for emotional (i.e. listen to and reassurance) and informational (i.e. explanation) reasons than boys. Low-performing students from low-income families sought significantly less help for informational and instructional types than high performing children. High performing students sought significantly more help from friends than low performing students. These results can be adapted to a physical education setting. Students could seek help for emotional support (i.e. someone who will listen to the student if he/she is having problems), instrumental assistance (i.e. a student who would help him/her practice the skill), informational advice (i.e. someone to explain how to perform the skill), and companionship (i.e. socialization with friends during skill practice)

Newman (1990) studied 177 students from Grades 3, 5, and 7 to understand their question asking and their help seeking from peers and teachers in a math context. Data were collected using the Mathematics Learning in the Classroom Questionnaire (MLCQ), which assessed student learning strategies, attitudes and
beliefs regarding help seeking, and perceptions of the classroom environment. Students also responded to an intrinsic/extrinsic orientation scale and perceived competence for children scale. He found no significant differences due to gender. This finding indicated that boys and girls had similar reported scores on the MLCQ. For seventh graders, positive and negative attitudes were significant with regards to seeking help. "The stronger the beliefs that help seeking was beneficial and the weaker the belief that it had associated costs, the greater the child's expressed likelihood of seeking help" (Newman, 1990, p. 76). Help seeking intentions for Grades 3 and 5 depended on challenges from the teacher and positive attitudes. For Grade 7, when the children were independent from the teacher and preferred challenge, they were more likely to seek help. An implication for this finding suggests that students could seek help when they are working on their own and performing challenging activities.

Meij (1990) examined 84 fifth grade students and how their prior knowledge affected the number and kinds of questions they asked. Students' prior knowledge was measured with the Stijnen Vocabulary test. There were 51 students with little prior knowledge and 33 students with much prior knowledge randomly selected from an original sample of 563 students. The experimental task contained 20 items from the Primary Mental Abilities test. Results indicated students' prior knowledge did not have an effect on the kind of information students wanted through question asking. There was a significant difference between students who asked specific questions and necessary questions. Students with little prior knowledge asked significantly more specific questions than students with more prior knowledge. Students with more prior

28

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
knowledge asked fewer unnecessary questions. These findings represented differences between high and low prior knowledge learners. Students who have low knowledge may ask more specific questions regarding how to do the task because they do not have the prior knowledge to complete the task.

To summarize, students asked questions for several reasons. Students asked questions to understand the content, to succeed in the task, or to gain emotional support. A task-orientated environment also prompted more questions from students than an ego environment. Students also sought more help from the teacher when challenging activities were presented.

Reluctance to Seek Help. Researchers have found that reluctance to seek help is an adapted strategy for self-regulated learning (Newman & Golden, 1990). Results found common differences between gender and students high and low self-efficacy beliefs.

Newman and Golden (1990) explored why children from grades 2, 4 and 6 may be reluctant to seek help during math and reading classes. Structured interviews were used to understand sixty-five children's perceptions of help seeking and why they might be reluctant to ask questions in class. The children's responses were rated on a five point Likert scale from 1 to 5 (not at all true for me to very true for me). Through an open-ended questionnaire, the children provided seven reasons regarding their reluctance to seek help: expectation, bother, shyness, negative perception, independence, unavailability of preferred helper and other (i.e. I don't know).

Three important findings were reported by sixth grade students with regards to reluctance to seek help. First, perceived need was the greatest predictor of reluctance
to seek help. For example, the greater the perceived need for help then the greater was the child’s reluctance to ask questions. Second, students reported needing more help with math than reading. Finally, in math, girls were more likely than boys to believe that the teacher will believe they were dumb when they asked a question. Implications suggest that girls may perceive math as threaten therefore they are more reluctant to ask questions as compared to boys.

Ryan, Gheen and Midgley (1998) recruited 516 sixth grade students in 63 math classes to explore individual and classroom influences on their reluctance to seek help. Several factors included in the study were avoidance of help seeking, academic self-efficacy, and classroom goal structure. Results indicated significant predictors of students’ avoidance of help seeking were students’ academic self-efficacy and gender. Students who reported a low self-efficacy regarding their schoolwork were more likely to avoid seeking help and boys were more likely than girls to avoid seeking help. Results also indicated, when students perceived the classroom to focus on mastery and understanding instead of competition, students were less likely to avoid seeking help. Implications for these results suggest that students with low self-efficacy beliefs were less likely to ask for help and girls were more likely to seek help than boys.

Kennedy (1997) examined 907 third graders fear of seeking academic help from their teachers. Results indicated that the girls were less likely to seek help than boys when they attributed success to self. Fear of seeking instrumental academic help from teachers was increased when teachers provided negative feedback.
Students' Self-Esteem and Seeking Help. Students' self-esteem also plays a role in their help seeking (Ryan & Pintrich, 1997). Students who have a high self-esteem were more likely to seek help than students with low self-esteem. Students who perform poorly in educational settings are also less likely to seek help. These low achieving students do not want to risk embarrassment in front of other classmates if they were to seek help. These findings influenced the present study to understand if there were differences between students' with high or low self-esteem and if this belief affected their help seeking in a physical education setting.

Ryan and Pintrich (1997) investigated seventh and eighth grade students' help seeking behaviors during a math class. Findings showed eighth grade students were less threatened from their peers seeking help than seventh grade students. This finding implies that seventh grade students' self-esteem was sometimes threatened when their peers asked for help. Also, students who exhibited high competence felt less threatened by their peers seeking help. Students who focused on ego goals were more likely to feel threatened by asking their teacher for help. In contrast, students who focused on task mastery were less likely to report feeling dumb or threatened by asking teachers for help (Ryan & Pintrich, 1997).

Gender Differences and Seeking Help. Scholars have identified gender as a significant factor contributing to student help seeking in academic settings (Kennedy, 1997; Ryan & Pintrich, 1997). Studies with elementary school children found girls were less likely to seek help in math and science courses than boys. Elementary school girls were also more concerned with being seen as incompetent than elementary boys.
Nelson-Legall and Glor-Scheib (1986) examined the relationship between help seeking behaviors and peer relationships during reading and math classes for 74 children in Grades 3 and 5. Data were collected using a sociometric assessment questionnaire to assess students' peer status. Each child's behavior and verbalizations were also observed for 100 minutes. Results showed that girls felt more competent in reading than boys. Results indicated no significant differences between boys and girls in their observed incidences of help seeking. Two hundred and seventy-five incidences were observed with children seeking help. Students sought help more frequently from peers than from teachers. In math, there was a negative correlation regarding excessive help seeking from peers. Excessive help seeking from peers was negatively associated with academic competence. When students asked for excessive help in math, other students perceived it was because that student lacked knowledge or lacked ability in math. Students who used excessive help seeking during math could be viewed by his/her peers as not being able to reciprocate help in the future.

Schonert-Reichl and Muller (1995) examined age and gender differences associated with seeking help for 221 adolescents ranging from 13 to 18 years of age. Data were collected using a help-seeking questionnaire. Regarding gender, a higher percentage of females (93%) than males (66%) sought help from friends. Also, 85% of the adolescents who reported not seeking help from a friend were male. Regarding age, help seekers were significantly older than non-help seekers and non-help seekers believed they had a lower locus of control than help seekers. Older adolescents were also more likely to seek help from professionals as compared to younger adolescents.
Downe and McDougall (1995) hypothesized that “students’ levels of attraction to and perceived acceptance by the classroom group would affect their willingness to receive help” (p.129). Participants included 252 sixth grade students from six middle schools. Data were collected using three measures: perceived acceptance by classmates, helper preferences, and student attitudes of interpersonal relationships with other students. Results showed girls were more willing than boys to receive help about participating in a school play. Boys and girls were also more willing to receive help from the same sex. Boys and girls also reported a willingness to receive help from an older person of the same sex.

**Goal Orientation and Seeking Help.** Scholars have identified differences between student help seeking behaviors based on learning or performance orientated classrooms. A learner orientated classroom promoted more help seeking from students than an ego orientated classroom.

Newman and Schwager (1995) examined help seeking among 118 students from grades 3 and 6 in a math context. During the study, students worked one-on-one with an adult to complete the math exercises. Students were randomly assigned to one of two conditions: learning and performance goals. In the learning goal condition, students worked on math puzzles and were told that it was important to understand how to do the puzzle. In the performance goal condition, students were told that working on the puzzles would help them get smarter and in the end they would be compared to other students in their class. Data were collected during three sessions with 10 days separating each session. During session one, students completed

33
computation problems, during sessions two and three students completed reasoning problems. During all sessions, students were encouraged to seek help when needed.

Results indicated that when students sought help they made five types of requests: (1) process related information, (2) confirmation of a final answer, (3) correct answer, (4) question indicating lack of understanding, and (5) non-task related information. Low achievers made significantly more process related requests than high achievers. Students in the learning goal condition asked more confirmation requests than students in the performance goal condition. There were very low distributions for the final three types of questions. However, sixth graders were less likely than third graders to request the answer. Sixth graders also were more likely than third graders to ask for process related hints. There was a link between goal orientation and student help seeking. Students were more likely to ask for the teachers' help when the environment was supportive and included learning or task goals.

Goal Setting

The third self-regulated learning strategy reviewed was student goal setting. The goal setting literature is divided into three sections. The first section focuses on a general overview of goal setting. The second section focuses on goal setting studies with students from middle school through college. The original intent was to focus only on studies involving middle school participants however, due to the lack of studies with this specific population a broader search was conducted to include high school and college level students. The third section focuses on performance approach and performance avoidance studies with middle school students.
Goal setting involves setting specific objectives to allow students to monitor their academic progress, to guide their cognition, and enhance their task performance (Pintrich, 2000; Schunk, 1990; Zimmerman, 2000). Locke and Latham (1984) stated goals “direct attention and behavior, mobilize energy and effort, increase persistence, and motivate the development of appropriate task strategies or subgoals” (p. 56). Bandura (1986) sited two purposes for setting goals (1) to guide learner efforts in a particular direction and (2) to evaluate one’s performance, which may be followed by intensifying effort or revising original goals.

Locke and Latham (1985) summarized several key findings of goal setting research. The key findings were specific goals were more effective than vague goals; challenging goals produced better performance than easy goals; goal setting only works if there was timely feedback regarding the accuracy and specificity of the goal; and setting goals was a means to focus one’s attention on the task.

A goal’s effectiveness depends on it specificity, proximity, and difficulty level (Locke & Latham, 1990). Niemivirta (1999) reported goals should be both specific and challenging which results in amplified student performance. Specific goals allowed for accurate student self-evaluations in which student’s progress is easier to judge (Schunk, 1990). Students who set proximal goals can judge their progress more than distant goals. Setting proximal goals allowed a student’s self-efficacy to be augmented during the learning process (Schunk, 1990). Goal difficulty allowed students to measure how much effort is required to attain the goal. Implications for these results suggested for students to set specific daily goals.
Martino (1993) suggested seven parameters to teaching goal setting with middle school students. These parameters included that goals must be specific and measurable; they must be attainable and within the control of the student; they must be meaningful to the student (i.e. something the student want to improve upon); they must have starting and ending dates; goals must be written down; there must be goal expectations (i.e. results); and students must be able to display their progress.

Goal setting can occur at any time during the self-regulated learning process. Students who use goal setting are “forced to analyze the demands of the task and plot the journey that leads to achievement” (Anderson, 1997, p. 33). Goal setters will contemplate the parts of the skill they will need to learn, the activities they need to practice, and what tools or strategies needed to make progress (Anderson, 1997). Self-regulated learners continually adjust their goals and strategies (Schunk, 1989). Changes in the task or environment can cause adaptation to their student goals. For example, when hitting a tennis forehand, students will need to adapt their goals as they become more proficient with tennis. Students will switch their goals from getting the ball over the net to placement of the ball in the service box.

When students begin to participate in learning activities they have goals such as “acquiring skills and knowledge, finishing work, and making good grades” (Schunk, 1996, p. 5). As the activity progresses, students begin to observe, judge and react to progress on their goals (Schunk, 1996). Students make judgments by comparing their goal to a standard and react positively or negatively to their progress. Their reactions set the stage for future observations.
There have been several studies regarding goal setting and its influence on cognitive processes in physical education (Boyce, 1990; Boyce & Wayda, 1994; Zimmerman & Kitsantas 1996; 1997). Student performance can be enhanced through goal setting by motivating them to focus their attention on their progress and performance during an activity (Locke & Latham, 1990).

Boyce and Wayda (1994) examined 252 female students in 12 college weight-training classes. Students were assigned to one of three conditions: assigned goals, self-set goals, and do your best. Results indicated students in the assigned goal group were significantly superior to the self-set and do your best conditions. Results also showed that after trial seven through retention, students in the assigned and self-set control groups were significantly superior to students in the do your best conditions. For this study, students in the instructor assigned goals condition had the greatest performance gains and the self-set had lower performance gains than the instructor assigned goals but higher than the do you best condition.

Zimmerman and Kitsantas (1996; 1997) studied 50 and 90 high school girls, respectively to understand the effects of goal setting and self-monitoring during a dart-throwing skill. Both studies measured girls' dart throwing skills, self-efficacy, self-reactions and intrinsic interest. The first study found girls, who adopted process goals and self-recorded these goals, enhanced their skill more than students who did not have process goals. The second study found girls, who focused on process goals and then switched to outcome goals, had strong self-efficacy beliefs regarding the
dart skill. Self-recording of the set goals enhanced the females’ self-efficacy beliefs and self-reactions during the dart skill.

Hall and Byrne (1988) randomly assigned 54 college students, males (43) and females (11), in a weight training class to one of four experimental conditions. The conditions included students long-term goals, long-term goals and experimenter-set intermediate goals, long-term goals and subject-set intermediate goals, and do best goals. Results indicated students in the experimenter set and self-set goals performed significantly better than the do best condition. However, the long-term goal group did not significantly perform better than the do best condition. Students in the experimenter set and self-set goals also set more new goals for themselves than in the do best condition.

Swain and Jones (1995) used a multiple baseline design to investigate goal setting with four varsity level college basketball players. The intervention focused on goal setting involving different components of basketball (i.e. offensive rebounds, defensive rebounds, steals, and turnovers). For three of the four players, their performance following the intervention improved. Implications for this research suggested that the use of goal setting as an intervention strategy could improve performance on the designated skill.

Fairall and Rodgers (1997) examined the goal setting methods of 67 college track and field athletes from the same university team. The athletes set practice goals, seasonal goals, competitive goals, and long term goals. Athletes were assigned to one of three conditions: self-set, assigned, and participative. Results indicated that the
self-set group reported significantly higher participation than the participative and assigned groups for all goal types but long-term goals.

Kyllo and Landers (1995) conducted a meta-analytic review of 19 studies of goal setting on sport and exercise performance. Their review explained the improvement in performance for students who set goals. Setting goals led to an increase in motivation during sport and exercise performance. Most of the research reviewed was testing the effectiveness of goal setting in sport and exercise but the research did not show how goal setting interacts with other variables such as gender, ability, or race. Future research needed to be conducted in this area.

Performance Approach and Performance Avoidance Goals. Urdan, Pajares, and Lapin (1997) studied 189 eighth graders and examined their task and ability goals in a mathematics context. Task goals focused on mastering the material and learning for learning sake. Ability goals focused on social comparison with other students. Setting ability goals had little effect on motivation and performance outcomes and was negatively related to GPA. Results related to task goals indicated a strong positive relationship between motivation and performance outcomes.

Middleton and Midgley (1997) studied performance-approach and performance-avoidance goals with 703 sixth graders. Performance-approach goals occurred when students demonstrated their ability relative to others and the self became prominent rather than the task. Performance-avoidance goals occurred when students avoided asking for help or looked unable to respond in the classroom. Results indicated performance-avoidance goals undermined intrinsic motivation and students with lower prior achievement were significantly more likely to adopt...
performance avoidance goals than students with higher prior achievement. Gender
differences were also found. Boys reported higher support for performance-approach
goals than girls.

Patrick, Ryan, & Pintrich (2000) examined goal orientation, self-regulated
learning strategy use and academic performance for 445 seventh and eighth grade
students. Results indicated a positive significant correlation between mastery goals
and self-efficacy and cognitive strategy use and use of self-regulated learning
strategies for both males and females. Extrinsic goals were negatively related to self-
regulated strategies for males. Also, extrinsic goals for males related negatively in
math and social studies context. This relationship did not occur for females.

Pajares, Britner, and Valiante (2000) studied 497 middle school students in
language arts classes to understand the relationship between self-efficacy and
achievement goals. Findings showed self-efficacy and performance avoidance goals
were negatively associated. Girls had stronger task goals and weaker performance
approach goals than boys. Students with lower achievement in writing espoused
performance avoidance goals.

Self-Handicapping Strategies

Midgley and Urdan (1995) examined the self-handicapping strategies used by
256 eighth grade students in general education classrooms. Students used self-
handicapping strategies to deflect attention away from their lack of ability and toward
the created circumstances. Examples of self-handicapping strategies in an educational
setting involved students deliberately not trying, procrastinating during a task, or
making excuses. Examples of self-handicapping strategies in a physical education
setting could include when students deliberately do not try, if they fool around during a skill practice session, or if they reduce their effort. Students could articulate these excuses to conceal their lack of skill. Midgley and Urdan (1995) found positive relationships between students' use of self-handicapping strategies and performance goals. If the students used self-handicapping strategies (i.e. not trying), they were also likely to have performance goals (i.e. compare their ability to another classmate). Findings also revealed boys reported using self-handicapping strategies more than girls and low achieving students reported using more of these strategies than high achieving students.

Midgley, Arunkumar, and Urdan (1996) examined self-handicapping strategies for 112 eighth grade students in a general education setting. Results indicated a significant relationship between students who used self-handicapping strategies and performance-oriented goals. They also found that performance-oriented goals and self-handicapping strategies were stronger for African American students than European American students. Implications for this study revealed that if students set performance goals they could also use self-handicapping strategies, which could lead to a decrease in their learning.

Midgley and Urdan (2001) examined relationships between achievement goals and self-handicapping strategies for 484 seventh grade students in a math context. Results indicated performance avoidance goals were a significant positive predictor of students using self-handicapping strategies and a task goal orientation was a negative predictor of students using self-handicapping strategies. Performance avoidance goals denote when students want to avoid looking unable and task goals
represent when students attribute their progress to their effort. Students with lower grades in math also reported using more handicapping strategies than students with higher grades. The researchers suggested that low achieving students would take measures to offer alternative explanations for their poor performance.

To summarize, students' use of self-handicapping strategies found common links between use of strategies and gender. Students' use of self-handicapping strategies were associated with performance-oriented goals. Females were found to report using fewer self-handicapping strategies than boys. The relationship between self-handicapping strategies and self-regulated learning strategy use revealed that students who use self-handicapping strategies could be less likely to use self-regulated learning strategies. The use of self-handicapping strategies could also negatively affect student learning.

Self-Regulated Learning Teaching Implications

Veenman, Beems, Gerrits, and Gabby Op DeWeegh (1999) suggested students are provided little opportunity to self-regulate their learning in school settings. Teachers are not trained how to construct learning environments to enhance student self-regulated learning strategy use. Teachers maneuver and guide students through the learning process in ways that do not promote student self-regulated learning strategy use (Boekarts, 1997). Teachers need to be educated to create learning environments that facilitate student use of strategies.

Talbot (1997) suggested teachers should mediate self-regulated learning strategy use with students. For example, teachers should explicitly model the self-regulated strategies they want their students to possess. Paris and Newman (1990)
provided two instructional approaches to assist teachers in developing student self-regulated learning strategies in their classes. One approach is to provide effective instruction that makes thinking public. Another approach is to promote active student participation and collaboration as part of instruction.

Pintrich, Roeser, and DeGroot (1994) provided three educational implications for promoting student self-regulated learning strategy use. These included:

1. Class work that was interesting and valued with intrinsic goals
2. Class work that allowed some choice and provided students with opportunities to work together.
3. Instructional activities that were based on children's real-life events

(p.158)

Butler (1998) suggested teachers should work collaboratively with students. Instruction should begin by “supporting students to analyze an assigned task, then to define criteria for successful performance, and finally set appropriate task-specific goals” (p. 695). VanZile-Tamsen (1998) suggested teachers should employ more strategy instruction to assist students to organize material and to include a motivational component in the lessons to help raise students' self-competence and promote task value.

Summary

Teaching students self-regulated learning strategies such as self-monitoring, seeking help, or goal setting could be a way to promote learning of physical fitness content in physical education for students. Student use of self-regulated learning
strategies could enable the physical education environment to become meaningful and relevant to students daily lives. For example, students who learn to self-regulate their physical education experiences could exercise their personal control and responsibility for learning as well as plan, self-monitor, and self-evaluate their learning experiences.

There were gaps in the literature regarding self-regulated learning strategy use in a physical education setting. The majority of studies reviewed were quantitative in nature and very few used mixed-methods. The literature regarding seeking help was abundant with middle school students in a general education setting but was lacking in the physical education setting. The self-monitoring literature again was abundant for middle school students, student with special needs, and in a general education setting but it was lacking with middle school physical education students. The literature regarding goal setting focused on high school and college students in physical education and/or athletic settings. This study is an attempt to fill the gaps found in the previous research by using a mixed-methods approach to understand self-regulated learning strategy use with middle school students in a physical education setting.
CHAPTER 3

METHODOLOGY

This research study examined urban middle school physical education students’ uses and perceptions of self-regulated learning strategies. Specifically, this study examined students’ use of strategies such as seeking help, goal setting, monitoring, and evaluating of goals. This chapter includes several sections: the theoretical framework, setting, participants, study design, data collection, and data analysis. The section on data collection includes two phases. Phase I describes the teacher training sessions and procedures used to educate the teachers regarding self-regulated learning strategies. Phase II describes the measures for student self-regulated learning strategy use.

Theoretical Framework

The social cognitive theory (Bandura, 1986) for self-regulated learning guided the design of this study. The relationship between social cognitive theory and self-regulated learning assumes students are not passive absorbers of knowledge but are “metacognitively, motivationally, and behaviorally active participants in their own learning processes” (Zimmerman, 1986, p. 308). Social cognitive theory views individuals as “neither driven by inner forces nor automatically shaped and controlled
by external stimuli” (Bandura, 1986, p. 51). Self-regulated learning occurs “to the degree that a student can use personal processes to strategically regulate behavior and the immediate learning environment” (Zimmerman, 1989, p. 330).

Three assumptions by advocates of the social cognitive theory were relevant to this study. The first assumption favors a triadic reciprocality, which implies an interaction of three processes of learning: behavior, cognitive, and environmental factors all influence a person's behavior (Bandura, 1986) (see Figure 1). Depending on the activities, circumstances, or environmental influences, the weight of the three variables will vary and can affect a student's engagement in the task (Zimmerman, 1989). For example, in an educational setting environmental influences may be stronger than personal or behavioral influences on student learning.

![Figure 1: Model of triadic reciprocality of Social Cognitive Theory](image)

The second assumption involves the relationship between learning and motivation. A student's performance and learning can be affected by their motivation regarding the task. Learning can occur by watching models, however learners may not always demonstrate what they have learned at the time it was learned.

---

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
Students may only demonstrate skills when they are motivated to perform them. Furthermore, students are more motivated to learn skills that they find valuable and interesting.

The third assumption of the social cognitive theory involves enactive and vicarious learning. "Learning is largely an information-processing activity in which information about the structure of the behavior and about environmental events is transformed into symbolic representations that serve as guides for action" (Bandura, 1986, p. 51). Enactive learning occurs when students learn by experiencing the consequences for their actions. Vicarious learning occurs when students are able to observe a model. By observing quality demonstrations of a skill, students can learn the components of a skill, which provides them with cues when they begin to perform the skill.

**Setting**

This study was conducted in three urban middle schools in the Lexington Public School District (LPSD) (pseudonyms are used throughout the study). There were 65,000 students enrolled in this district with 60% of the students on the free or reduced lunch program. The school district was on "academic emergency" because of poor student proficiency test scores. There were 26 middle schools in the district and 56% of the students were African American and 42% of the students were nonminority.

Buffalo Middle School (BMS) was one of three schools in the LPSD selected for this study and retained two physical education teachers. Six hundred and twenty-six students were enrolled at BMS and each student took physical education either
three times per week or two times per week each semester (see Table 3.1). Sixteen percent of the students enrolled at BMS were African American and 82% were nonminority students. Fifty-one percent of the students were on the free or reduced lunch program.

Maury River Middle School (MRMS) was the second school selected from the LPSD and retained two physical education teachers. Five hundred and thirty students were enrolled at MRMS and each student took physical education either three times per week or two times per week each semester. Eighty-six percent of the students enrolled at MRMS were African American and 11% were nonminority students. Sixty-eight percent of the students were on the free or reduced lunch program.

Highland Belle Middle School (HBMS) was the third school selected from the LPSD and retained two physical education teachers. Five hundred and thirty-eight students were enrolled at HBMS and each student took physical education either three times per week or two times per week each semester. Twenty-nine percent of the students enrolled at HBMS were African American and 69% were nonminority students. Eighty-four percent of the students were on the free or reduced lunch program.
Participants

The participants for this study included four middle school physical education teachers at three middle schools in the LPSD. Nine of the teachers’ classes encompassing 254 students were selected.

Teachers

The participants for this study included four middle school physical education teachers from the Lexington Public School District. There were three females and one male teacher all of whom were Caucasian (see Table 3.2). They ranged in age from 25 to 34 years of age and all had at least three years of teaching experience. These teachers were chosen to be participants for this study for two reasons. First, the teachers were recommended to the researcher by the Coordinator of the Lexington Public School District because the teachers had requested assistance on finding new ways to engage their students during the physical education classes. Second, each teacher had three years of teaching experience in a middle school setting. Fuller (1969) indicated that the teacher’s concerns about teaching change after about three
years of teaching experience as they begin to focus more on their students’ learning and less on management and basic instructional needs. However, for two of the teachers this was their first year in the Lexington Public School District and all of the teachers encountered basic management and instructional issues concerns related to the technology. This issue will be discussed in Chapter 5.

Three of each teachers’ physical education classes were purposefully selected for this study based on two criteria. First, the classes were either sixth or seventh grade classes. Second, the teachers of these classes must have participated in the training sessions regarding self-regulated learning strategy use, technology, and the Innovative Fitness Connections Curriculum.

<table>
<thead>
<tr>
<th></th>
<th>Mary Donald</th>
<th>Elsie Watts</th>
<th>Dorothy Galford</th>
<th>Thomas Allan</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>30</td>
<td>25</td>
<td>31</td>
<td>34</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td>Female</td>
<td>Female</td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td>Caucasian</td>
<td>Caucasian</td>
<td>Caucasian</td>
<td>Caucasian</td>
</tr>
<tr>
<td>Years Teaching Physical Education</td>
<td>4</td>
<td>3</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Years Teaching in Columbus Public Schools</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Owns Personal Computer</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Table 3.2: Demographics for the physical education teachers involved in the study.
Students

Data were collected from 254 students in nine classes at three different middle schools. Fifty-nine percent of the students were boys and 41% were girls. The average age of the students was 12.43 years with a range from 11 to 15 years of age. Forty percent of the students were African American, 56% were Caucasian, 2% were Hispanic, 1% were Native American, and 3% noted Other on the demographic form they completed.

Due to attrition, the number of students were reduced to 174 useable Learning Strategies in Physical Education questionnaires (LSPEQ)* and 180 useable Physical Activity Content Tests (PACT)* (*Students who had both a pretest and a posttest score were designated as having useable questionnaires or content tests.) There were 80 students with non-useable LSPEQ. Of these non-useable LSPEQs, 46 were from boys and 34 were from girls. Their average age was 12.80 and their ethnic backgrounds represented African Americans (25), Caucasians (52), Hispanics (1) and one student self designated as Other.

There were 74 students with non-useable content tests. Of these missing tests, 45 were from boys and 29 were from girls. Their average age was 12.81 and their ethnic background represented African Americans (29), Caucasians (43), and one student designated as Other.

The demographic information for the students who had complete data sets (i.e. both pre and post questionnaire) by instructional condition and school are presented in Table 3.3.
<table>
<thead>
<tr>
<th>Instructional Condition</th>
<th>BMS</th>
<th></th>
<th></th>
<th>MRMS</th>
<th></th>
<th></th>
<th></th>
<th>HBMS</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strat</td>
<td>Tech</td>
<td>Curr</td>
<td>Total</td>
<td>Strat</td>
<td>Tech</td>
<td>Curr</td>
<td>Total</td>
<td>Strat</td>
<td>Tech</td>
<td>Curr</td>
</tr>
<tr>
<td>N</td>
<td>15</td>
<td>16</td>
<td>26</td>
<td>57</td>
<td>27</td>
<td>13</td>
<td>19</td>
<td>59</td>
<td>11</td>
<td>18</td>
<td>27</td>
</tr>
<tr>
<td>Grade</td>
<td>7</td>
<td>6</td>
<td>7</td>
<td>N/A</td>
<td>6</td>
<td>6</td>
<td>7</td>
<td>N/A</td>
<td>7</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>67</td>
<td>25</td>
<td>73</td>
<td>57.9</td>
<td>44</td>
<td>69</td>
<td>42</td>
<td>49.2</td>
<td>73</td>
<td>56</td>
<td>85</td>
</tr>
<tr>
<td>Female</td>
<td>33</td>
<td>75</td>
<td>27</td>
<td>42.1</td>
<td>56</td>
<td>31</td>
<td>58</td>
<td>50.8</td>
<td>27</td>
<td>44</td>
<td>15</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>12.67</td>
<td>11.81</td>
<td>12.82</td>
<td>12.54</td>
<td>11.37</td>
<td>11.69</td>
<td>12.47</td>
<td>11.80</td>
<td>13.00</td>
<td>12.94</td>
<td>11.96</td>
</tr>
<tr>
<td>Range</td>
<td>14-12</td>
<td>13-11</td>
<td>14-12</td>
<td>-----</td>
<td>12-11</td>
<td>12-11</td>
<td>14-12</td>
<td>-----</td>
<td>14-12</td>
<td>15-12</td>
<td>13-11</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>26.7</td>
<td>12.5</td>
<td>12</td>
<td>15.8</td>
<td>74.1</td>
<td>92.3</td>
<td>82.2</td>
<td>81.4</td>
<td>45.5</td>
<td>27.8</td>
<td>33.3</td>
</tr>
<tr>
<td>Caucasian</td>
<td>73.3</td>
<td>81.3</td>
<td>88</td>
<td>82.5</td>
<td>18.5</td>
<td>7.7</td>
<td>15.8</td>
<td>13.6</td>
<td>45.5</td>
<td>66.7</td>
<td>66.7</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0</td>
<td>6.3</td>
<td>0</td>
<td>1.8</td>
<td>7.4</td>
<td>0</td>
<td>0</td>
<td>5.1</td>
<td>9.1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Native American</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5.6</td>
</tr>
</tbody>
</table>

Table 3.3: Demographics by school and learning condition
(Note: Strat = strategy instructional condition; Tech = technology instructional condition; Curr = curriculum instructional condition)
**Student Attrition for LSPEQ.** At Buffalo Middle School (BMS), 86 students completed the questionnaire. In the strategies instructional condition, 15 of the 25 questionnaires were useable. Ten of the questionnaires were not useable because the student either did not take the pretest or posttest. In this class, there were three students who relocated to another school, one student was placed in another class, five students were on a seven-week rotation, and one student had left the class when the posttest was administered.

In the technology instructional condition, 16 of the 24 questionnaires were useable. Five students were on a seven-week rotation, one student started late into the program, one student attended only on Mondays and Wednesdays, and one student was absent for several days when the questionnaire was initially administered.

In the curriculum instructional condition, 26 of the 36 questionnaires were useable. Three students started the program late, three students relocated to another school, two students were on a seven-week rotation, and the reasons are not known why two students did not take the questionnaire.

At Maury River Middle School, there were 64 students who completed the questionnaire. In the strategies instructional condition, 27 of the 28 questionnaires were useable. One student relocated to another class, therefore he was not able to take the post questionnaire. In the technology instructional condition, 13 of the 13 questionnaires were useable. In the curriculum instructional condition, 19 of the 23 questionnaires were useable. This condition contained four students who relocated to a different class during the study.
At Highland Belle Middle School, there were 102 students who completed either the pre questionnaire or post questionnaire. There were 55 useable questionnaires. It was not known why the number dropped from 102 to 55. Several rationales for missing pre or post questionnaires included: students who relocated to another class, missed a large number of class periods, and/or relocated to another school.

**Target Students**

There were six high, two average, and five low self-regulated learners selected for further investigation of their use of and perceptions involved with self-regulated learning strategy use. Five students each from BMS and MRMS and three students from HBMS were observed and interviewed during the course of the study. Table 3.4 presents the demographic information for each target student.

Students were selected based on their pre Learning Strategies in Physical Education Questionnaire scores. The LSPEQ contained four factors. Each student received a score for each factor. For example, the task goals factor contained ten items and had a low value of ten and high value of 60. The scores on each factor were calculated and their percentile scores determined. Students with three or more factors in the 75th percentile were classified as high self-regulated learners. Students with one or no factors in the 75th percentile were classified as low self-regulated learners.
<table>
<thead>
<tr>
<th>School</th>
<th>Student</th>
<th>SRL level</th>
<th>SRL Score</th>
<th>Gender</th>
<th>Age</th>
<th>Race</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMS</td>
<td>Keisha</td>
<td>H SRL</td>
<td>7</td>
<td>Girl</td>
<td>12</td>
<td>African American</td>
</tr>
<tr>
<td>BMS</td>
<td>Deb</td>
<td>H SRL</td>
<td>7</td>
<td>Girl</td>
<td>12</td>
<td>African American</td>
</tr>
<tr>
<td>MRMS</td>
<td>Stacy</td>
<td>H SRL</td>
<td>7</td>
<td>Girl</td>
<td>11</td>
<td>Caucasian</td>
</tr>
<tr>
<td>MRMS</td>
<td>Zoe</td>
<td>H SRL</td>
<td>8</td>
<td>Girl</td>
<td>11</td>
<td>African American</td>
</tr>
<tr>
<td>MRMS</td>
<td>Scott</td>
<td>H SRL</td>
<td>7</td>
<td>Boy</td>
<td>11</td>
<td>Caucasian</td>
</tr>
<tr>
<td>HBMS</td>
<td>Marlene</td>
<td>H SRL</td>
<td>9</td>
<td>Girl</td>
<td>13</td>
<td>Caucasian</td>
</tr>
<tr>
<td>BMS</td>
<td>Tom</td>
<td>A SRL</td>
<td>5</td>
<td>Boy</td>
<td>12</td>
<td>Caucasian</td>
</tr>
<tr>
<td>BMS</td>
<td>Stuart</td>
<td>A SRL</td>
<td>5</td>
<td>Boy</td>
<td>13</td>
<td>Caucasian</td>
</tr>
<tr>
<td>BMS</td>
<td>Kera</td>
<td>L SRL</td>
<td>2</td>
<td>Girl</td>
<td>13</td>
<td>Caucasian</td>
</tr>
<tr>
<td>HBMS</td>
<td>Ginny</td>
<td>L SRL</td>
<td>1</td>
<td>Girl</td>
<td>13</td>
<td>African American</td>
</tr>
<tr>
<td>MRMS</td>
<td>Alison</td>
<td>L SRL</td>
<td>0</td>
<td>Girl</td>
<td>11</td>
<td>African American</td>
</tr>
<tr>
<td>HBMS</td>
<td>Charlie</td>
<td>L SRL</td>
<td>0</td>
<td>Boy</td>
<td>13</td>
<td>African American</td>
</tr>
<tr>
<td>MRMS</td>
<td>Alex</td>
<td>L SRL</td>
<td>1</td>
<td>Boy</td>
<td>11</td>
<td>African American</td>
</tr>
</tbody>
</table>

Table 3.4: Demographic information for the selected target students.
(Note: H SRL = High self-regulated learner; A SRL = average self-regulated learner; L SRL = low self-regulated learner)
Study Design

Since random assignment of subjects to groups was not feasible, a quasi-experimental pretest-posttest design was selected. Using a quasi-experimental design allowed the researcher to increase external and ecological validity. In quasi-experimental research, there are at least two groups (i.e. experimental and control) and both groups are given a pretest and posttest. The groups are “naturally assembled collectives” such as educational classrooms in which the assignment of the treatment is assumed to be random (Campbell & Stanley, 1963). A quasi-experimental design can be used in real world settings while the researcher attempts to control as many threats to internal validity as possible. By using this design, threats existed for both internal and external validity (Campbell & Stanley, 1963).

There are ten threats to internal validity. Fraenkel and Wallen (2000) reported internal validity as the “degree to which observed differences on the dependent variable are directly related to the independent variable, and not some other variable” (p.665). Campbell and Stanley (1963) suggested that if these variables are not controlled “they might produce effects confounded with the effect of the experimental stimulus” (p.5). Campbell and Stanley’s eight threats to internal validity are explained below.

1. **History**, the specific events occurring between the first and second measurement in addition to the experimental variable.

2. **Maturation**, processes within the respondents operating as a function of the passage of time per se (not specific to the particular events),

56
including growing older, growing hungrier, growing more tired, and
the like.

3. Testing, the effects of taking a test upon the scores of a second test.

4. Instrumentation, in which changes in calibration of a measuring
instrument or changes in the observers or scorers used may produce
changes in the obtained measurements.

5. Statistical regression, operating where groups have been selected on
the basis of their extreme scores.

6. Biases, resulting in differential selection of respondents for the
comparison groups.

7. Experimental mortality, or differential loss of respondents from the
comparison groups.

8. Selection-maturation interaction, etc., which in certain of the
multiple-group quasi-experimental designs, such as Design 10, is
confounded with, i.e., might be mistaken for, the effect of the
experimental variable. (p.5)

When using a quasi-experimental pretest-posttest design there are two main
threats to internal validity, history and selection-maturation interaction. These two
threats were minimized by the researcher in several ways. To minimize the threat to
history, the researcher spoke with each of the teachers in the study to understand what
content had been presented to the students. The researcher also conducted regular
meetings individually with the teachers to make sure they were following each
lessons protocol. The study was also short enough in length so as to not be unduly
affected by the maturation of the students. There are two other threats to internal validity that were deemed relevant to this study.

Additionally, there were four threats to external validity. Fraenkel and Wallen (2000) explained external validity to be “the degree to which results are generalizable, or applicable, to groups and environments outside the research setting” (p.664). When using a quasi-experimental pretest-posttest design there is one main threat to external validity, reactive or interaction effect of testing. To minimize this threat to external validity, there was an eight-week time period between when the students were pretested and posttested. This time period was deemed long enough to account for the reactive effect of retesting the students. In addition to the eight threats to internal validity, Campbell and Stanley (1963) listed three other threats to external validity.

1. The interaction effect of selection biases and the experimental variable.

2. Reactive effect of experimental arrangements, which would preclude generalization about the effect of the experimental variable upon which persons being exposed to it in nonexperimental conditions.

3. Multiple treatment interference, likely to occur whenever multiple treatments are applied to the same respondents, because the effects of prior treatment are not usually erasable. (p. 6)

Nine classes from three schools were selected for this study. Dorothy and Elsie taught three classes each and Mary and Thomas team taught three classes.
teachers applied one of the three instructional conditions to each class. The
instructional conditions were designated as: strategies, technology, and curriculum.
The three instructional conditions were applied to the three classes in a random order
to avoid sequence effects across teachers (see Table 3.5). Sequence effects means that
as teachers teach the same content they become more confident with its delivery and
dissemination to their students. Therefore, it was necessary to have each teacher
teach each condition in a different order.

<table>
<thead>
<tr>
<th>Instructional Conditions</th>
<th>Buffalo Middle School</th>
<th>Maury River Middle School</th>
<th>Highland Belle Middle School</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategies</td>
<td>A</td>
<td>C</td>
<td>B</td>
</tr>
<tr>
<td>Technology</td>
<td>C</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>Curriculum</td>
<td>B</td>
<td>A</td>
<td>C</td>
</tr>
</tbody>
</table>

Table 3.5: Order of instructional conditions presented at each school.
(Note: A = first class taught during the day, B = second class taught during the day, C = third class taught during the day)

Three instructional conditions were implemented at each school. A total of
28.3% of the students were in the strategies instructional condition, 29.9% of the
students were in the technology instructional condition, and 41.7% of the students
were in the curriculum instructional condition. All students in the instructional
conditions received the same daily lessons, cognitive objectives, and participated in
the same invasion games.
The lessons were adapted from the Innovative Fitness Connections Curriculum (IFCC) (Nygard & Hopper, 1998). This curriculum was created to be used with middle and high school students. There were fitness activities incorporated within the curriculum. Each week had a cognitive conceptual focus with traditional and nontraditional fitness activities. The lessons from this curriculum were aligned with the NASPE content standards.

The instructional sequence for the daily lessons included (a) an introduction in which a questioning technique was used to cover the cognitive objectives for the day; (b) a warm-up game, (c) main event, and (d) cool down and review. An introduction occurred at the beginning of every class period. The cognitive objectives and questions asked of the students are listed in Appendix B. The teacher used a questioning method to present the content to the students. The questions were asked at the beginning of the class to prompt the students regarding the content that would be covered for the day. For example: students were asked ‘what does aerobic mean?’ then students were prompted to come up with answers. The introduction lasted approximately five minutes.

The warm-up game was linked to the cognitive concept discussed in the introduction. The warm-up games and their descriptions are listed in Appendix C. The warm-up game lasted approximately 10 minutes.

The main event included different invasion games such as ultimate frisbee, team handball, and floor hockey. The main event lasted approximately 25 minutes. The descriptions of these games are listed in Appendix D.
During the cool down and review, a debriefing session occurred. This session covered the same content and questions that were presented at the beginning of each class. The same questions were asked to check for student understanding. Described below are the differences between the three instructional conditions. See Table 3.6 for an overview of the differences.

<table>
<thead>
<tr>
<th></th>
<th>CO</th>
<th>ME</th>
<th>Tech</th>
<th>M</th>
<th>SH</th>
<th>GS</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategies</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Technology</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Curriculum</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3.6: Overview of treatments received by instructional condition. (Note: CO = Cognitive Objective; ME = Main Event; M = Student monitoring their activity with technology; SH = Student help seeking; GS = Student goal setting; E = Student evaluation of their goals)

Procedures for the Study Design

Students at Buffalo Middle School and Highland Belle Middle School participated in physical education three times per week for 21 days. Students at Maury River Middle School participated in physical education two times per week for 18 days. On Day One, students in all instructional conditions took the Physical Activity Content Test (PACT). Additionally, students in the strategies and technology instructional conditions received instruction on how to use heart rate monitors. On Day Two, students in all the instructional conditions took the Learning
Strategies in Physical Education Questionnaire (LSPEQ). Additionally, students in the strategies instructional condition received instruction regarding ways to seek help and self-monitor. On Day Three, students in all the instructional conditions participated in a warm-up game and an invasion game. Additionally, students in the strategies and technology instructional conditions reviewed how to use heart rate monitors. On Day Four, students in the strategies and technology instructional conditions reviewed how to use heart rate monitors and participated in a warm-up game and an invasion game.

**Strategies Instructional Condition**

Students in the strategies instructional condition (N = 55) received instruction on the curriculum lessons, four self-regulated learning strategies, and how to use heart rate monitors and pedometers. Appendix E and F presents the block plans for BMS/HBMS and MRMS, respectively in which the self-regulated learning strategy targeted, technology used, cognitive objective for the lesson, and main event are listed. Appendix G presents an example of a lesson.

Students in the strategies instructional condition were provided opportunities to monitor, seek help, goal set, and evaluate their goals. They were also provided opportunities to use technology (i.e. heart rate monitors and pedometers). Students were provided a folder in which to house their monitoring sheets. During the first four weeks of the intervention, students would monitor their heart rate using Heart Rate Monitors. The teacher would prompt the students to monitor their heart rate on three separate occasions: at the beginning of the class, before the main event, and at the end.
of the class period. At the end of each class period students answered two questions:
(a) Did you ask for help today? and (b) What did you learn today?

During the introduction, students were told that they could ask as many
questions as was deemed necessary to understand the content. Students were told that
they could ask questions of the teacher or another student if they did not understand.
They could also use additional resources (i.e. ask a parent or use a dictionary) to
assist them to understand the cognitive objectives.

During the final three weeks, students wore pedometers. At the beginning of
every lesson, students wrote their goal for the lesson on their goal-setting sheet (see
Appendix H). At the end of each lesson, students responded to four items on their
goal setting sheets: they evaluated whether they had reached their goal, by circling
yes or no, explained why or why they had not reached their goal, responded to ‘what
they had learned for the day’, and wrote down the pedometers steps they had
accumulated for the lesson.

*Procedures for the Strategies Instructional Condition.* The first nine days
were structured to incorporate three aspects (a) instructing students on physical
activity concepts (b) teaching students to seek help and self-monitor, and (c) how to
use heart rate monitors. Students were assigned partners, with each student wearing a
heart rate monitor every other day. Heart rate monitors assisted students to self-
monitor their heart rate readings during invasion games.

The last nine days were structured to incorporate three aspects (a) instructing
students on goal setting, (b) teaching students to evaluate their goals, and (c) how to
use pedometers. Students completed goal-setting sheets to assist with recording and
evaluating of their goals (see Appendix H). The pedometers assisted students to keep accurate measurements of their steps/miles during the invasion games. Students set goals based on the number of steps they believed they could accomplish in a class period. At the end of each class period, students evaluated the accuracy of their goals. All student work was collected and housed in individual student folders. These students took the PACT test during Session one and Session 21 and the LSPEQ during Session two and Session 22.

Technology Instructional Condition.

Students in the technology instructional condition (n = 47) received instruction from the curriculum lessons and learned how to use heart rate monitors and pedometers. Appendix I and J present the block plans for BMS/HBMS and MRMS respectively, in which the technology used, cognitive objectives for the lessons, and main event are listed. Appendix K presents an example of a lesson.

Procedures for the Technology Instructional Condition. The first nine days were structured to incorporate two aspects: (a) instructing students on physical activity concepts and (b) how to use heart rate monitors. Students were assigned partners, with each student wearing a heart rate monitor every other day. During session ten, students learned how to use pedometers. For the remaining nine sessions, students used pedometers when participating in the lessons. These students took the PACT test during Session one and Session 21 and the LSPEQ during Session two and Session 22.
**Curriculum Instructional Condition**

Students in the curriculum instructional condition (n = 72) received instruction from the curriculum lessons only. Appendix I and J presents the block plans for BMS/HBMS and MRMS respectively, in which the cognitive objectives for the lessons and the main event are listed. Appendix L presents an example of a lesson.

**Procedures.** Students received instruction from the curriculum lessons only. These students took the PACT test during Session one and Day 21 and the LSPEQ during Session two and Session 22.

**Data Collection**

This study had two phases. Phase I focused on teacher training. The goals and purposes for these training sessions are explained. Phase II focused on urban middle school physical education students and their uses and perceptions of self-regulated learning strategies.

**Phase I**

The four teachers were provided workshops addressing three topics: (a) knowledge of and strategies for implementing four self-regulated learning strategies with students in physical education classes, (b) the Innovative Fitness Connections Curriculum (IFCC), and (c) two forms of technology: heart rate monitors and pedometers.

**Teacher Training Procedures.** Three training sessions were conducted to align the four self-regulated learning strategies and technology resources with the Innovative Fitness Connections Curriculum lessons. During the training sessions, teachers were introduced to the research project, the Innovative Fitness Connections
Curriculum lessons, pedometers and heart rate monitors, and how to teach students to goal set, seek help, self-monitor, and self-evaluate.

The first training session (see Appendix M) began with the researcher explaining the research project. The participants were told the purpose of the study, an overview of the content for the training sessions, and the demands that would be asked of them during the study. This training session reviewed and discussed the goals and the content of the Innovative Fitness Connections Curriculum. A secondary purpose was for the teachers to learn how to use heart rate monitors. Teachers received a draft of the lesson plans for the first three weeks of the IFCC unit and a step-by-step guide on how to use heart rate monitors with students in these lessons. To provide teachers ownership with the lessons, discussions between the teachers and the researcher were initiated to critique the scope and sequence of the physical activity lessons.

The second training session (see Appendix N) reviewed the Innovative Fitness Connections Curriculum and how to use heart rate monitors. Following the review, the teachers learned about and discussed how and why to teach their students to seek help and to self-monitor.

The third training session (see Appendix O) provided information regarding goal setting and self-evaluation followed by a step-by-step guide on how to use pedometers with students in the IFCC curriculum lessons. Each teacher received a draft of the lesson plans for the final three weeks of the physical activity unit. The sample version aligned the Innovative Fitness Connections Curriculum with goal setting, evaluation, and pedometers. During this training session, a collaborative
effort between the researcher and teachers was utilized to modify the scope and sequence for the final three-weeks of the physical activity lessons.

**Phase II**

The second phase (Phase II) of the study was to gather data from students on their use of self-regulated learning strategies, their physical activity content knowledge, and student perceptions of self-regulated learning strategy use. During Phase II, data were collected for four measures of student self-regulated learning strategy use and one measure of student content knowledge.

*Learning Strategies in Physical Education Questionnaire.* The Learning Strategies in Physical Education Questionnaire (LSPEQ) was the first measure used to collect data regarding the learning strategies used by students in physical education in three instructional conditions (see Appendix P). Students were pretested and posttested using the questionnaire to assess their task goals, ability approach goals, ability avoidance goals, and help-seeking/persistence behaviors. Each teacher administered the LSPEQ during the first and last week of the study.

The Learning Strategies in Physical Education Questionnaire (LSPEQ) was adapted from the Self-Regulated Learning Questionnaire (SRLQ) developed by Naumann (In Press). The SRLQ has been shown to be a valid and reliable measure of self-regulated learning with college students. Cronbach’s alpha coefficients for the SRLQ included Self-efficacy (α = .9085), Control beliefs (α = .7841), Task goals (α = .8558), Ability Approach goals (α = .8969), Ability Avoidance goals (α = .7422), and Help-seeking (α = .8783).
The LSPEQ contains 35 items as compared to 200 items for the SRLQ. Several factors were excluded from the SRLQ. These factors included study strategies, task management, and time management. The factors were not deemed relevant to middle school physical education students or to the specific focus of the study. The LSPEQ contained six factors: self-efficacy, control beliefs, task goals, ability approach goals, ability avoidance goals, and help-seeking/persistence. A panel of experts reviewed the new version to test for face validity. The number of items for each factor and alpha levels are presented in Table 3.7. Reliability estimates (Cronbach’s alpha) were all above .70 as suggested by Nunnally & Bernstein (1994) except for ability avoidance goals (α = .6712).

<table>
<thead>
<tr>
<th>Factor</th>
<th>Number of items</th>
<th>Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task Goals</td>
<td>10</td>
<td>.8427</td>
</tr>
<tr>
<td>Help Seeking / Persistence</td>
<td>7</td>
<td>.8188</td>
</tr>
<tr>
<td>Ability Approach Goals</td>
<td>6</td>
<td>.7964</td>
</tr>
<tr>
<td>Ability Avoidance Goals</td>
<td>5</td>
<td>.6712</td>
</tr>
</tbody>
</table>

Table 3.7: Internal consistency for the four factors on the LSPEQ.

Student Interviews. The second measure used to collect data for student strategy use was through student interviews. Twenty percent of the students in the strategies instructional condition were selected to participate in two semi-structured interviews. Six high, two average, and five low self-regulated learners were randomly
selected based on their pre LSPEQ scores. Five students each from BMS and MRMS and three students from HBMS were interviewed. The interviews were used to gain additional information regarding student’s perceived use of self-regulated learning strategies in physical education. Specifically, the interview questions addressed perceived students’ use of seeking help, goal-setting, monitoring of information, self-evaluation and learning strategies used during the physical education sessions. The first interview questions focused on seeking help, monitoring information, and heart rate monitors (see Appendix Q). The second interview questions focused on seeking help, goal setting and pedometers (see Appendix R). Students at BMS and MRMS were interviewed twice with two follow-up interviews to clarify ambiguous responses recorded by the students. Students at HBMS were interviewed twice with one follow-up interview to clarify ambiguous responses. Only one clarification interview was accomplished at HBMS due to student time conflicts. The interviews were audiotaped and lasted approximately 15 minutes each.

*Self-Regulated Learning Observation Instrument.* The third measure used to collect data on student self-regulated learning strategy use was the Self-Regulated Learning Observation Instrument (SRLOI). The SRLOI utilized an event recording technique to gain frequency counts of students’ self-regulated learning strategy use (see Appendix S). Specifically, frequency data were collected regarding student’s seeking help and self-monitoring during their physical education classes. Event recording is a tactic used to collect information on the frequency of occurrence for particular behaviors (van der Mars, 1989). In order to use event recording, the
behavior must be a discrete event, which means the behavior must have a definite beginning and end.

For this study, events regarding student seeking help and self-monitoring were recorded. Seeking help occurred when students initiated efforts to secure further information from a teacher or peer. An example was when students asked for assistance from a teacher or peer regarding how to complete a drill. Self-monitoring occurred when students deliberately observed their performance on a given task. This can occur when students observe the quality, rate, and/or frequency of their performance. An example was when students' checked their pedometers or heart rate monitors to account for steps or heart rate readings.

There are several items recorded on the SRLOI data sheets. The data sheets collected information for procedural reliability, daily lesson plan information, behavioral data, and a daily summary. Twenty percent of the students from the strategies instructional condition were observed: six high, two average, and five low self-regulated learners. Students have been designated as high, average, and low self-regulated learners based on their LSPEQ pretest scores. Five students each from BMS and MRMS and three students from HBMS were observed. The target students were observed and their behavior coded (i.e. seeking help and monitoring with technology) during physical education lessons during the intervention. At BMS and HMBS, the target students were observed for 57% of the lessons (N = 12 lessons). At MRMS, the target students were observed for 67% of the lessons (N = 12 lessons).

The observation protocol to collect students seeking help and monitoring with technology occurred as soon as the lesson began until the end of lesson. The
introduction, warm-up, and cool down/review were all taught with students as a large group. During the main event the students were in teams. The teams were the same throughout the length of the study. Students were observed throughout the entire lesson to collect their seeking help with the teacher or another peer and their monitoring with the technology.

*Goal Setting Sheets.* The final measure of self-regulated learning strategy use was the collection of students' goal setting sheets (see Appendix H). These sheets allowed the researcher to calculate frequency and types of goals students set. The target students' goals set and goal evaluations were recorded on their goal setting sheets. The students recorded a goal for every lesson they wore pedometers. These goals were set at the beginning of each lesson. The teacher told the students to be specific with their goals. They were provided examples such as 'I'm going to do walk 1000 steps today.' or 'I'm going to learn what aerobic means on Monday.'

*Physical Activity Content Test.* To measure students' physical activity content knowledge, data were collected using the Physical Activity Content Test (PACT). Students were pretested and posttested using the PACT (see Appendix T). The PACT measured students' content knowledge of physical fitness, warm-up, muscular strength and endurance, cardiopulmonary endurance, aerobic and anaerobic fitness, and flexibility. The content for this test was adapted from the Innovative Fitness Connections Curriculum. The test includes thirty multiple-choice questions. The test was scored by awarding each student a point for every question answered correctly. Students could receive up to thirty points on the test. The teachers distributed the test to students and then read each question and all answer choices to the students. The
students took this test during the first and final week of the study. There was instructional alignment between the daily content that was covered and the multiple choice items selected from the curriculum.

The procedures for administering the PACT included students taking the test on the first day of the study and the second to the last day of the study. The students used scantron bubble sheets for all of their answers. The teacher guided the students through each question by reading every question and every response to the students. The students were instructed to answer every question even if they did not know the answer.

Data Analysis

The data collection procedures and data analysis methods were linked with the research questions in Appendix U.

*Learning Strategies in Physical Education Questionnaire.* The Statistical Package for the Social Sciences (SPSS) was used to run descriptive and inferential statistics for the LSPEQ. Descriptive statistics (i.e. means and standard deviations) were computed for both the pretest and posttest. SPSS was used to run MANOVAs for the LSPEQ to understand student learning strategies in physical education. School and condition served as the independent variables and the four self-regulated learning strategy gain scores: help seeking/persistence, ability approach goals, ability avoidance goals, and task goals, served as the dependent variables.

*Physical Activity Content Test.* The Physical Activity Content Test (PACT) was analyzed through the use of descriptive statistics and two-way ANOVAs.
School and condition served as the independent variables and gain scores on the
PACT test served as the dependent variable.

*Student Interviews.* The student interviews were analyzed through constant
comparative analysis (Glaser & Strauss, 1967). Common themes that emerged were
analyzed to understand middle school students’ perceptions of self-regulated learning
strategy use. Credibility of the data was established through data triangulation
(Lincoln and Guba, 1985). Data triangulation occurred through using multiple data
sources to establish trustworthiness of the data (Glesne, 1999). Three methods were
used to establish trustworthiness of the data for this study: triangulation of the data,
peer debriefing, negative case analysis. Triangulation of data sources included student
interviews, the observation instrument, student goal sheets, and the LSPEQ
questionnaire data. Peer debriefing allowed for an outside set of eyes to observe the
data and hold the researcher accountable for what was collected and also to test the
researcher’s biases. Peer debriefing occurred through sessions with my faculty
advisor at The Ohio State University. I also discussed disconfirming evidence that
was found within the interview data.

Ethical considerations throughout the study included confidentiality of
participants, pseudonyms, and consent forms. All of the information the participants
shared with me was kept confidential and all of the target students received
pseudonyms to mask their identity. Each of the teachers and their students signed a
Statement of Informed Consent (Appendix A) as requested by The Ohio State
University Institutional Review Board.
Self-Regulated Learning Observation Instrument. The Self-Regulated Learning Observation Instrument (SRLOI) was analyzed by tabulating the frequency and means for seeking help and student initiated monitoring for the target students during the physical education lessons. The frequency of student initiated monitoring with technology and seeking help was collected for each target student.
CHAPTER 4

RESULTS

The purpose of this study was to understand the uses and perceptions of self-regulated learning strategies used by urban middle school students during their physical education lessons. Four self-regulated learning strategies were targeted, seeking help, self-monitoring, goal setting, and self-evaluation. The chapter presents the results of the quantitative and qualitative data for each of the research questions.

RQ1. To what extent did the middle school physical education students self-regulated learning scores differ by instructional condition (i.e. strategies, technology, and curriculum instructional conditions)

The first question of this study resulted in no significant differences on the Learning Strategies in Physical Education Questionnaire (LSPEQ) between schools and students’ gain scores or conditions and students’ gains scores. Gain scores were calculated by subtracting the pretest from the posttest. The intervention did not significantly affect the students’ self-regulated learning strategy use as measured by their LSPEQ scores.

The research question was answered using data collected from the LSPEQ. The LSPEQ was administered to all students before and after the intervention. The teachers and their students at Buffalo Middle School (BMS) and Highland Belle Middle School (HBMS) were involved in the study on Mondays, Wednesdays, and
Fridays for 21 days. The teacher and their students at Maury River Middle School (MRMS) were involved in the study on Tuesdays and Thursdays for 18 days. Data were collected from 174 useable student questionnaires to answer this question. There were 57 usable questionnaires from BMS, 59 usable questionnaires from MRMS and 58 usable questionnaires from HBMS.

To ensure the LSPEQ was an accurate measurement of learning with middle school physical education students, an exploratory factor analysis was completed. This was deemed necessary because adaptations were made to the Self-Regulated Learning Questionnaire (SRLQ) (Naumann, In Press). Two adaptations were made: a different age group was completing the questionnaire and there was a reduction of items from the SRLQ. There were 35 items with three demographic questions included in the questionnaire. The first 23 items were rated on a six-point Likert scale from 1 to 6 (very strongly disagree to very strongly agree). The last 12 items were rated on a five-point Likert scale from 1 to 5 (never to always). An exploratory factor analysis was conducted on the 35 items with principal axis factoring and varimax rotation. The initial exploratory factor analysis extracted eight factors with Eigenvalues greater than one, 7.095 to 1.116. Hair, Anderson, Tatham, and Black (1998) reported a scree test is used to indicate the maximum number of factors for a questionnaire. A scree test assesses the shape of the curve by observing when the curve first begins to straighten out. The straightening out of the curve will indicate how many factors should be extracted. The factors beyond this point would be too large a portion of unique variance and these factors would therefore not be acceptable. Examination of the scree plot revealed a break in the slope of the line.
between the fourth and fifth points, illustrating four factors were more probable than
the original output of eight. The Eigenvalues for the four factors greater than one
ranged from 7.095 to 1.909. The first four factors accounted for 46.91% of the
explained variance. These factors were labeled as task goals, ability approach goals,
ability avoidance goals, and help seeking/persistence.

**LSPEQ Reliability Estimates**

Cronbach’s alphas for the Learning Strategies in Physical Education
Questionnaire were above .70 (Nunnally & Bernstein, 1994). The first factor was
labeled Task Goals. Ten items loaded on this factor with a Cronbach’s alpha
coefficient equal to .84. The Task Goals factor reflected beliefs about student interest,
importance, and task values related to physical education. The second factor was
labeled Help Seeking/Persistence. Seven items loaded on this factor with a
Cronbach’s alpha coefficient equal to .79. The Help Seeking/Persistence factor
reflected student beliefs about help seeking from a teacher or peer and persistence to
complete a task in physical education. The third factor was labeled Ability Avoidance
Goals. Six items loaded on this factor with a Cronbach’s alpha coefficient equal to
.67. This was the only factor where the Cronbach’s alpha coefficient was below .70
however; Hair et al (1998) reported that the lower limit of the Cronbach’s alpha may
decrease to .60 in exploratory research. The Ability Avoidance Goals factor reflected
student beliefs regarding worry or concern of what classmates might think when
he/she would perform a skill incorrectly in physical education class. The fourth factor
was labeled Ability Approach Goals. Five items loaded on this factor with a
Cronbach’s alpha coefficient equal to .82. The Ability Approach Goals factor
reflected student beliefs regarding demonstrating a skill better than a classmate.

Examples of the factors are listed in Table 4.1.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Factor Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task Goal</td>
<td>I feel most successful in physical education class when I learn something I did not know before.</td>
</tr>
<tr>
<td>Help Seeking / Persistence</td>
<td>I ask the teacher for help when I am struggling with a difficult skill.</td>
</tr>
<tr>
<td>Ability Avoidance</td>
<td>I worry about what other students might think if I ask a question in physical education class.</td>
</tr>
<tr>
<td>Ability Approach</td>
<td>I try to perform skills better than other students in my physical education class.</td>
</tr>
</tbody>
</table>

Table 4.1: An example of LSPEQ items for each factor.

*Missing LSPEQ items*

There were missing items on the Learning Strategies in Physical Education Questionnaire (LSPEQ) for individual students. The missing items were replaced by estimating a mean value for the specific items. Mean substitution is the most commonly used method, in which "mean substitution replaces the missing values for a variable with the mean value of that variable based on all valid responses" (Hair, Anderson, Tatham, & Black, 1998, p. 54). There are three disadvantages to using mean substitution. First, it can generate invalid variance values. Second, the distribution of the values can become distorted. Finally, the correlation can become depressed because the missing data is replaced with a constant value. Mean substitution was selected so missing cases could have complete data values.
An estimate mean value for each questionnaire item was calculated and the value was used to substitute for a missing item. Only missing data were replaced. Entire data sets, such as a student not having a pretest or posttest, were excluded from the analysis. The most missing data for any one item was four and the least was zero. Two hundred and fifty four students from three different schools completed the questionnaire. Once the missing data sets were excluded, there were 174 useable questionnaires. A usable questionnaire was defined, as one where a student had completed both a pre and post questionnaire with only select missing items.

*Learning Strategies in Physical Education Questionnaire*

There were four factors extracted for the Learning Strategies in Physical Education Questionnaire (LSPEQ). To compare the four factors, a total score was calculated by computing the mean of the items. For example, the total score for the Task Goals was calculated by summing the 10 items that loaded on this factor and dividing by 10. By calculating a mean for each factor, all of the factors could be on the same scale of measurement. Descriptive statistics for the LSPEQ are listed in Table 4.2. The descriptive statistics are organized by school, instructional condition, and factor. The LSPEQ results were presented for the pre and post questionnaire. Trends in the data for the LSPEQ are described below.

*Descriptive Statistics for LSPEQ*. An overall LSPEQ mean was calculated by combining the four factors: task goal (n = 10 items), ability avoidance (n = 6 items), ability approach (n = 5 items), and help seeking/persistence (n = 7 items) (see Table 4.2). This overall score was computed by totaling all four factors into one score.
Table 4.2: Descriptive statistics for the LSPEQ factors and PACT pretest and posttest by school and instructional condition. (Note: TG=Task goal; PAV = performance avoidance goal; PAP = performance approach goal; HSP = help seeking/persistence; PACT = Physical Activity Content Test; 1 = strategies instructional condition; 2 = technology instructional condition; 3 = curriculum instructional condition)
A mean was then calculated. Six of the nine classes increased from pretest to posttest on their overall scores. At BMS, students in the curriculum instructional condition had the greatest increase from pretest to posttest. At MRMS, students in the technology instructional condition had the greatest increase from pretest to posttest. At HBMS, students in the strategies instructional condition had the greatest increase from pretest to posttest.

On the pretest for Task Goals factor, students in the strategies instructional condition were significantly higher ($p < .01$) than students in the curriculum instructional condition but not for students in the technology instructional condition. Results for the Task Goals factor revealed five of the nine classes increased from pretest to posttest on the LSPEQ. Students in the curriculum instructional condition at BMS demonstrated the greatest increase from pretest to posttest. Students in the technology instructional condition at MRMS demonstrated the greatest increase from pretest to posttest. Students in the strategies instructional condition at HBMS demonstrated the greatest increase from pretest to posttest.

On the pretest for Ability Avoidance Goals factor, students in the strategies instructional condition had the greatest scores however, the scores were not significantly greater ($p = .83$) than students in the technology and curriculum instructional conditions. Results for the Ability Avoidance Goals showed a decrease from pretest to posttest on the LSPEQ for one of the nine classes. Students in the technology instructional condition at MRMS demonstrated a decrease from pretest to posttest. Very little change was exhibited from pretest to posttest for the other instructional conditions.
On the pretest for Ability Approach Goals factor, students in the strategies instructional condition had the greatest scores however, the scores were not significantly greater ($p = .34$) than students in the technology and curriculum instructional conditions. Results for the Ability Approach Goals showed an increase from pretest to posttest for six of the nine classes. At BMS and HBMS, students in the curriculum instructional condition demonstrated the greatest increase from pretest to posttest. At MRMS, students in the technology instructional condition demonstrated the greatest increase from pretest to posttest.

On the pretest for Help Seeking/Persistence factor, students in the strategies instructional condition had the greatest scores however, the scores were not significantly greater ($p = .12$) than students in the technology and curriculum instructional conditions. Results for the Help Seeking/Persistence factor increased from pretest to posttest for four of the nine classes. At BMS, students in the curriculum instructional condition showed the greatest increase from pretest to posttest. At MRMS, students in the strategies instructional condition showed the greatest increase from pretest to posttest. All of the instructional conditions at HBMS decreased from pretest to posttest for the Help Seeking/Persistence factor.

Table 4.3 provides the means, standard deviations, and bivariate correlations for the study variables. There was a positive correlation between task goals and ability avoidance goals ($p<.05$) and task goals and ability approach goals ($p<.05$). This correlation indicated students with an orientation for ability avoidance goals and ability approach goals were also likely to report an orientation for utilizing task goals. However, the correlation between task goals and help-seeking/persistence was $-.358$. 

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
(p<.01), indicating students who retained task goals were less likely to seek help. The correlation between ability approach goals and ability avoidance goals was .572 (p<.01), indicating if students reported having ability approach goals they were also likely to have ability avoidance goals. So while the students wanted to perform better than other students in the class, they also wanted to avoid looking unable.

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Task Goal</td>
<td>----</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Ability avoidance</td>
<td>.160*</td>
<td>----</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Ability approach</td>
<td>.178*</td>
<td>.572**</td>
<td>----</td>
<td></td>
</tr>
<tr>
<td>4. Help Seeking/Persistence</td>
<td>-.358**</td>
<td>.190*</td>
<td>.172*</td>
<td>----</td>
</tr>
</tbody>
</table>

Table 4.3: Means, Standard Deviations, and Bivariate correlations for study variables. (Note: *p>.05; **p>.01)

Table 4.4 presents the gain scores for the four factors: Task Goals, Ability Avoidance Goals, Ability Approach Goals, and Help Seeking/Persistence. On the overall gain scores, students in the curriculum instructional condition scored highest but they were not significantly higher (p = .47) than students in the strategies or technology instructional conditions. Results for the gain scores at BMS from pretest to posttest showed students in the curriculum instructional condition demonstrated the largest gain; at MRMS, students in the technology instructional condition demonstrated the largest gain; and at HBMS, students in the strategies instructional condition demonstrated the largest gain.
<table>
<thead>
<tr>
<th>Instructional Condition</th>
<th>BMS</th>
<th></th>
<th></th>
<th>MRMS</th>
<th></th>
<th></th>
<th>HBMS</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M(SD)</td>
<td>M(SD)</td>
<td>M(SD)</td>
<td>M(SD)</td>
<td>M(SD)</td>
<td>M(SD)</td>
<td>M(SD)</td>
<td>M(SD)</td>
<td>M(SD)</td>
</tr>
<tr>
<td>GainLG</td>
<td>-.33(10.48)</td>
<td>-.56(7.7)</td>
<td>1.27(10.86)</td>
<td>.11(7.45)</td>
<td>6.77(6.11)</td>
<td>3.26(7.48)</td>
<td>4.73(13.04)</td>
<td>-4.83(6.47)</td>
<td>-1.19(9.03)</td>
</tr>
<tr>
<td>GainPAV</td>
<td>.53(8.03)</td>
<td>1.13(4.99)</td>
<td>1.65(6.51)</td>
<td>.89(5.43)</td>
<td>-.92(4.11)</td>
<td>-.11(5.27)</td>
<td>1.00(6.72)</td>
<td>1.56(8.45)</td>
<td>.22(8.47)</td>
</tr>
<tr>
<td>GainPAP</td>
<td>-.60(6.67)</td>
<td>-.50(3.10)</td>
<td>1.65(6.77)</td>
<td>.78(4.19)</td>
<td>1.23(5.15)</td>
<td>-.11(3.21)</td>
<td>.09(6.66)</td>
<td>.72(5.27)</td>
<td>1.37(7.85)</td>
</tr>
<tr>
<td>GainHSP</td>
<td>.67(6.48)</td>
<td>-3.1(5.02)</td>
<td>1.42(3.88)</td>
<td>.037(6.81)</td>
<td>.23(7.91)</td>
<td>-.47(4.89)</td>
<td>-1.82(6.66)</td>
<td>-3.50(6.97)</td>
<td>-3.26(9.81)</td>
</tr>
<tr>
<td>GainAll</td>
<td>-.27(18.44)</td>
<td>-3.06(13.59)</td>
<td>6.0(16.01)</td>
<td>1.82(10.92)</td>
<td>7.31(16.25)</td>
<td>2.79(10.92)</td>
<td>4.00(18.72)</td>
<td>-6.06(9.14)</td>
<td>-2.85(17.71)</td>
</tr>
<tr>
<td>GainPACT</td>
<td>2.88(3.79)</td>
<td>3.50(4.17)</td>
<td>1.76(4.30)</td>
<td>4.63(3.00)</td>
<td>.92(3.64)</td>
<td>4.20(4.06)</td>
<td>4.09(4.46)</td>
<td>1.50(4.09)</td>
<td>1.36(4.31)</td>
</tr>
</tbody>
</table>

Table 4.4: Descriptive Statistics for LSPEQ Gain Scores and PACT Gain Scores by school and instructional condition. (Note: GainLG = gain for learning goal; GainPAV = gain for performance avoidance goals; GainPAP = gain for performance approach goals; GainHSP = gain for help seeking/persistence; GainAll = totaled gain scores for all factors; GainPACT = gain for the Physical Activity Content Test)
Inferential Statistics for LSPEQ. In quasi-experimental research, participants are not randomly assigned to conditions. Therefore, unlike experimental research, we cannot assume that all the groups were equivalent. For example, differences between groups in true experimental research would be due only to chance since participants were randomly assigned to each condition. However, in quasi-experimental research, we do not have the assurance that groups are equivalent.

To test for differences between the students' pretest LSPEQ scores, a two-way MANOVA was computed with school and condition as independent variables and the four pretest self-regulated learning factor scores (i.e., task goals, ability approach goals, ability avoidance goals, and help seeking/persistence) as the dependent variables. Results indicated a statistically significant difference due to school, Wilks' $\lambda = .815$, $F(8,330) = 4.321, p < .0001, \eta^2 = .097$, but a nonsignificant main effect for condition, Wilks' $\lambda = .918$, $F(8,320) = 1.755, p = .085, \eta^2 = .042$. Follow-up univariate analyses indicated significant differences for learning goals $F(2, 163) = 13.801, p < .0001, \eta^2 = .145$ and performance avoidance goals $F(2, 163) = 3.259, p = .041, \eta^2 = .038$. To further detect differences between schools, a post hoc difference test was used. Fisher's Least Significance Difference (LSD) post hoc test showed statistically significant differences between all the schools on the Learning Goals factor. Specifically, Highland Belle Middle School scored significantly higher than Buffalo and Maury River Middle Schools and Maury River Middle School scored significantly higher than Buffalo Middle School. Fisher's LSD showed
statistically significant differences for the Ability Avoidance Goals with Highland Belle Middle School scoring higher than Buffalo Middle School.

As was the case in examining changes over time, it was also necessary to make adjustments to students' LSPEQ scores prior to examining the influence of condition. Specifically, in order to more closely examine the influence of condition on students' strategy use, it was necessary to compute gain scores (Campbell and Stanley, 1969). The gain scores were computed by subtracting the posttest score from the pretest score.

Having computed the gain scores, students' LSPEQ gain scores were submitted to a two-way MANOVA with school and condition as the independent variables and the four SRL factor gain scores (i.e. learning goals, ability approach goals, ability avoidance goals, and help seeking/persistence) as the dependent variables. The results revealed nonsignificant main effects for school Wilks' $\lambda = .936$, $[F(2, 163) = 1.354, p = .216, \eta^2 = .033]$ and condition Wilks' $\lambda = .980$, $[F(2, 163) = .401, p = .920, \eta^2 = .010]$. Thus, it would appear that students' scores did not change significantly over time, regardless of the experimental condition.

RQ2. To what extent did the students knowledge of fitness content differ by instructional condition (i.e. strategies, technology, and curriculum instruction conditions)?

The second question for this study resulted in significant differences between instructional conditions and students' gains scores on the Physical Activity Content Test (PACT). Gain scores were calculated by subtracting the pretest from the posttest. Students who were in the strategies instructional condition displayed
significantly higher gain scores on the PACT than the technology and curriculum instructional conditions. However, no significant differences between schools and student gain scores were found on the PACT.

This question was analyzed using data collected from the PACT. This test contained 30 multiple-choice items. Data were collected from the useable forms of 180 students’ tests to answer this question. There were 65 usable tests from Buffalo Middle School (BMS) and 61 usable tests from Maury River Middle School (MRMS) and 54 usable tests from Highland Belle Middle School (HBMS).

Descriptive Statistics for the PACT

Descriptive statistics for the pretest, posttest (see Table 4.2), and gain scores (see Table 4.4) for each school and learning condition on the Physical Activity Content Test (PACT) were calculated. The technology instructional condition at BMS retained the greatest gains from pretest to posttest. The strategies instructional condition at MRMS and HBMS retained the greatest gains and from pretest to posttest, respectively.

The curriculum instructional condition at BMS and HBMS showed the lowest gains from pretest to posttest. The technology instructional condition at MRMS recorded the lowest gain from pretest to posttest.

Inferential Statistics for the PACT

Before the data were examined for significance, Z scores were computed to detect for student outliers on the PACT test results. Hair, Anderson, Tatham, and Black (1998) suggested data values be converted to standard scores to make comparisons between variables easier. The sample size for each condition was fewer
than 80 students, therefore the cases with Z scores above 2.5 were extracted. There were four cases that were outliers. These distinctive cases were random in that there was at least one outlier from each school and from each condition. Outliers were examined because data sets can be especially sensitive to outliers and can impact the Type I error (Hair et al, 1998).

To test for differences between the students’ pretest PACT scores, a two-way ANOVA was computed with school and condition as the independent variables and pretest scores as the dependent variable. The findings indicated main effect for schools. Specifically, the results indicated statistically significant differences between the schools \([F(2, 166) = 5.522, p = .005, \eta^2 = .062]\), but nonsignificant main effects were found between conditions \([F(2,166) = .527, p = .591, \eta^2 = .006]\). Fisher’s LSD post hoc test showed statistically significant differences with Buffalo Middle School scoring higher than Highland Belle Middle School.

To examine the influence of condition on student’s content knowledge, it was necessary to compute gain scores (Campbell and Stanley, 1969). The gain scores were computed by subtracting the posttest score from the pretest score. To test for differences between the students’ PACT gain scores, a two-way ANOVA was computed with school and condition as the independent variables and gain scores as the dependent variable. There was a main effect for condition. Results indicated statistically significant differences due to condition \([F(2,166) = 3.227, p < .05, \eta^2 = .037]\), but nonsignificant main effects due to school \([F(2,166) = .772, p = .464, \eta^2 = .009]\). To detect for differences between conditions a post hoc difference test was
used. Fishers’ LSD showed statistically significant differences with the strategies condition scoring higher than the technology condition, and the strategies also scoring higher than the curriculum instructional condition.

RQ3. To what degree did the target students use self-regulated learning strategies (i.e. seeking help, self-monitoring, goal setting, and evaluating) during their physical education classes?

This question was answered using data collected from daily observations and student goal setting sheets. These data collection resources were used to understand the target students’ uses of self-regulated learning strategies. Data were collected only from target students in the strategies instructional condition at each school. Results were presented from observations of the target students’ uses of seeking help, self-monitoring, goal setting, and self-evaluation during the intervention component of this study.

The results for the third research question showed that when the target students sought help, they asked mostly procedural questions. They also sought help more from the teacher than from their peers and girls sought more help than boys during the physical education sessions. Overall, students monitored their heart rate with the heart rate monitors more when the teachers prompted them. When students monitored their behavior with pedometers, there were more incidences of student initiated monitoring. The target students also set mostly psychomotor goals during the lessons.
Student Use of Self-Regulated Learning Strategies.

Observational data were collected for 12 days, seven days when students wore heart rate monitors and five days when the students wore pedometers. Specifically, observational data were collected on student help seeking behaviors (i.e. from the teacher and/or peers) and when students monitored their behavior with either heart rate monitors or pedometers. Data were also collected on students' goal setting, goal evaluation, goal achievement and students' accumulated pedometer steps.

Seeking help from teachers or peers. Observational data were collected on the frequency of student help seeking from the teacher or another student for 12 days during the intervention. The target students sought help from the teacher (M = 8.4) more than they did from other students (M = 5.3) (see Table 4.13). Stacy and Alison were the exceptions. Stacy sought help 14 times from a peer and nine times from the teacher. Alison sought help 21 times from a peer and only four times from the teacher. The high self-regulated learners sought help from the teacher (M = 20) more often than the low self-regulated learners (M = 5.2).
<table>
<thead>
<tr>
<th>School</th>
<th>Student</th>
<th>SRL</th>
<th>Help Seeking</th>
<th>Monitoring with HRMs</th>
<th>Monitoring with Pedometers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>T  S TI SI TI SI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMS</td>
<td>Keisha</td>
<td>H</td>
<td>20  3 21 3 10 33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMS</td>
<td>Deb</td>
<td>H</td>
<td>13  4 21 7 10 28</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MRMS</td>
<td>Stacy</td>
<td>H</td>
<td>9  14 21 16 10 42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MRMS</td>
<td>Zoe</td>
<td>H</td>
<td>16  8 21 15 10 34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MRMS</td>
<td>Scott</td>
<td>H</td>
<td>7  5 21 9 10 15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HBMS</td>
<td>Marlene</td>
<td>H</td>
<td>15  3 21 7 10 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMS</td>
<td>Tom</td>
<td>A</td>
<td>2  0 21 4 10 19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMS</td>
<td>Stuart</td>
<td>A</td>
<td>5  1 21 5 10 52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMS</td>
<td>Kera</td>
<td>L</td>
<td>3  3 18 0 10 36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HBMS</td>
<td>Ginny</td>
<td>L</td>
<td>9  6 21 6 10 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MRMS</td>
<td>Alison</td>
<td>L</td>
<td>4  21 21 7 10 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HBMS</td>
<td>Charlie</td>
<td>L</td>
<td>4  0 0 0 0 0</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>MRMS</td>
<td>Alex</td>
<td>L</td>
<td>2  1 21 8 10 23</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.5: Target students' frequency of seeking help and student monitoring with technology.
(Notes: T = help seeking from the teacher; S = help seeking from a student; TI = teacher initiated; SI = student initiated; *Charlie stopped wearing the technology after three days.)
**Student Initiated Monitoring with Heart Rate Monitors.** At BMS students wore heart rate monitors while participating in invasion games (i.e. ultimate frisbee) for nine days. Students did not record their heart rates for two days due to management issues (i.e. learning how to put on and use). Frequency data were collected on how often students monitored their heart rates using technology (see Table 4.13). Data were collected for seven of the nine days when students wore heart rate monitors. During each lesson with heart rate monitors, students were prompted three times by the teacher to record their heart rate. The students were prompted at the beginning of the class, after the warm-up and at the end of class.

At MRMS, students wore heart rate monitors for eight days. Frequency data on how often students monitored their heart rates using technology were collected for seven days. During the lessons, students were prompted by the teacher three times to monitor their heart rates.

At all three schools, frequencies of student initiated monitoring with technology were calculated. The target students monitored their heart rate with the HRMs three times a class period due to teacher prompting. The target students’ frequency of student initiated monitoring was lower as compared to monitoring prompts from the teacher. Two students, Kera and Charlie were never observed monitoring their own heart rate. Charlie stopped wearing the technology after the third day. Overall, the target students were more inclined to monitor and record their heart rates when prompted by the teacher (M = 21) as compared to self-initiated monitoring (M = 6.8).
Student Initiated Monitoring with Pedometers. At BMS and HBMS, observational data were collected for five of the nine days when students wore pedometers. At MRMS, observational data were collected for five of seven days when students wore pedometers. During the lessons with pedometers, students were prompted by the teacher two times, after the warm-up and at the end of class, to observe their steps. At the end of each session, students would record how many steps they accumulated during the class. Table 4.13 presents the frequency of monitoring with pedometers by the target students.

The data showed students monitored their steps more during student initiated prompting than during teacher prompting. Three exceptions included Marlene, Ginny, and Charlie. These students were more inclined to monitor their pedometer steps with teacher prompting. Charlie did not wear a pedometer after the first day. Alison demonstrated little student initiated monitoring (N = 3) as compared to teacher initiated monitoring (N = 10). Overall, the target students were more inclined to monitor their steps at their own volition (M = 23.8) more than with teacher prompting (M = 10).

Goal-Setting with pedometers. Students set goals at the beginning of each class session. Each student was provided a recording sheet (see Appendix H) which was stored in a folder. At BMS and HBMS students were provided opportunities to set goals on nine consecutive days. At MRMS, students were provided opportunities to set goals on five of seven days. One day of goal setting was lost due to a school wide special event in which of the 75% class attended and one day due to management concerns.
<table>
<thead>
<tr>
<th>School</th>
<th>Students</th>
<th>SRL</th>
<th>Goals Set</th>
<th>Goals Achieved</th>
<th>Goals Evaluated</th>
<th>Types of Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Psy</td>
</tr>
<tr>
<td>BMS</td>
<td>Keisha</td>
<td>H</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>BMS</td>
<td>Deb</td>
<td>H</td>
<td>9</td>
<td>5</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>MRMS</td>
<td>Stacy</td>
<td>H</td>
<td>5*</td>
<td>2</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>MRMS</td>
<td>Zoe</td>
<td>H</td>
<td>3*</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>MRMS</td>
<td>Scott</td>
<td>H</td>
<td>3*</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>HBMS</td>
<td>Marlene</td>
<td>H</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>BMS</td>
<td>Tom</td>
<td>A</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>BMS</td>
<td>Stuart</td>
<td>A</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>BMS</td>
<td>Kera</td>
<td>L</td>
<td>7</td>
<td>4</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>HBMS</td>
<td>Ginny</td>
<td>L</td>
<td>6</td>
<td>N/A</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>MRMS</td>
<td>Alison</td>
<td>L</td>
<td>1*</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>HBMS</td>
<td>Charlie</td>
<td>L</td>
<td>3</td>
<td>N/A</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>MRMS</td>
<td>Alex</td>
<td>L</td>
<td>3*</td>
<td>1</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td><strong>47</strong></td>
<td><strong>10</strong></td>
<td><strong>4</strong></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.6: Summary of the goals students set, achieved, evaluated and types when they were wearing pedometers.
(Note: *These students had five opportunities to set goals as compared to the other students who had nine opportunities to set goals.)
The number of goals recorded, achieved, evaluated and types of goals are listed in Table 4.14. All of the target students set goals. However, the average number of goals recorded was lower for the low self-regulated learners (M = 4) as compared to high (M = 4.2) and average self-regulated learners (M = 8). Marlene, who was a high self-regulated learner did not record a single goal during the nine opportunities to set goals. It is not known why she did not set goals as it was not discussed in her interviews.

Students recorded whether they had achieved their daily goals. High self-regulated learners recorded achieving fewer of their goals (M = 2.3) than the average self regulated learners (M = 8) but more than the low self-regulated learners (M = 2). Marlene did not set goals and so she did not record achieving any of her goals.

The target students evaluated their goals at the end of every class period. On average the low self-regulated learners evaluated fewer goals (M = .6) as compared to the high (n = 3.3) or average (n = 8) self-regulated learning target students. On average, the high self-regulated learners evaluated 3.3 of 4.2 goals that were set. Marlene was again the exception because she did not set any goals that could be evaluated. The average self-regulated learners evaluated 16 of the 16 goals that they set. However, Stuart recorded the same evaluation for all of his goals (i.e. “Because I was listening”). The low self-regulated learners on average set four goals per student but evaluated only two of these goals. Alex was the exception because he evaluated every goal he set.

The types of goals students set were predominately psychomotor goals. The target students set a high number of psychomotor goals (N=47) as compared to
cognitive goals (N=10) and affective goals (N=4). An example of a psychomotor goal was recorded by Deb “I would like to have more pedometer steps than last time”. A number of students recorded psychomotor goals pertaining to the number of steps they were going to take such as Keisha’s goal “to reach 1000 steps”. Most of the cognitive goals were recorded by high self-regulated learners. For example, Scott recorded “I want to learn the word of the day”. There was also one average and one low self-regulated learner who recorded cognitive goals. Tom recorded that he wanted “to learn a new game” and Alex recorded “I want to learn about my heart”. Only two students recorded affective goals. Deb recorded that she wanted “to put forth my best effort in today’s activities” and Kera recorded that she wanted to try “to be the best that I can be”.

RQ4. To what degree did the target students perceive their use of self-regulated learning strategies (i.e. seeking help, self-monitoring, goal setting, and evaluation) during their physical education classes?

This question was answered using data collected from student interviews. Two semi-structured interviews were used to understand the target students’ perceived uses of self regulated learning strategies. Data were collected only from the target students in the strategies instructional condition at each school. Several self-regulated learning strategies: seeking help, monitoring of information, goal setting, and evaluation were explored. Following the first and second interviews, I sought clarification of ambiguous responses. Due to scheduling conflicts, the target students at Highland Belle Middle School, Marlene, Ginny and Charlie, had only one clarification interview following the first interview.

96
The overall results for the fourth research question found high self-regulated learners reported using more strategies than low self-regulated learners during the physical education classes. Students also reported not seeking help for several reasons: they believed they did not need help or they did not want to feel embarrassed or stupid if they were to ask a question.

Several avenues to student help seeking were explored: seeking help from a teacher and students, rationales for why students would not seek help, and rationales for offering help to another student. Following interview data collected for seeking help, data collected on student monitoring of information, goal setting, and goal evaluation, are presented.

*Seeking Help from the teacher.* The target students reported seeking help from the teacher and other students. All but one of the target students reported asking the teacher for help. Kera was the discriminant case because she felt embarrassed when she asked the teacher for help. The types of questions the students asked the teacher were procedural. The students also asked questions of the teacher for several reasons: (a) to gain knowledge, which leads to learning, (b) to understand how to perform skills, and (c) to understand the consequence related to grades.

Types of questions asked by the target students during the physical education sessions were mostly procedural questions as they focused on understanding how to execute a game or drill. Most of the target students' questions focused on what to do and how to do it. Zoe asked “how do you do this or what is that word” (MRMS, Interview 1, 53). The students did not report asking questions beyond what or how to
do the activity except for Deb. Deb asked questions such as “what does it do or how does it help us” (BMS, Interview 1, 33-34).

Kera was the only student who did not like to ask the teacher questions. Her response to why she did not like to ask the teacher a question was because “it was embarrassing” (Kera, BMS, Interview 2, 117). She would rather ask one of her friends rather than the teacher if she did not understand. However, when she did feel compelled to ask a question, she would wait until the teacher was alone.

The target students reported asking questions of the teacher to gain general knowledge in physical education. Alex said “sometimes I ask questions when I don’t get something because I don’t want to get behind” (MMS, Interview 2, 44-46). Stacy wanted also to make sure she understood so that she could get it right. She said “Sometimes I ask questions in class because if I am lost, if I am stuck, or if there is something that I do not understand properly then I can get it right” (MMS, Interview 2, 107-109).

A second reason the target students asked questions focused on specific information related to skill development. The questions focused on skill procedures, which were related to the activity they were currently learning. Tom asked for help during a soccer lesson because he did not understand how to do the drill. Once the drill was explained and modeled, he was able to comprehend how to do the drill.

Like I needed help when we were passing because I didn’t understand what she meant, like she told us to kick the ball a couple of times and then pass it. I did not really understand it. Then she showed us and that’s how I understood. (Tom, BMS, Interview 1, 2-6).
Scott also reported seeking help from the teacher when he did not understand how to do a skill. He said “We were one time doing exercises and this one that did not say how to do this, it just showed us a stick person and we did not understand how to do the skill so we asked the teacher” (MRMS, Interview 1, 29-33).

A third reason students asked for help was because they cared about their own learning. Keisha believed when she asked a question she could show that she was smart and that she wanted to learn. She said she was entitled to learn what other students were learning. She said

If they know something then I feel like I should be able to know it too, cause some people learn slower than others and some people don’t know all the words that they be talking about. So you are suppose to ask question because maybe they found out what they know by asking questions too. (Keisha, BMS, Interview 1, 101-106). It is going to be sometimes when everybody is going to need to ask a question in their life. Somebody just laughs at you then they think that they are smarter than you. Then they just be stupid. They think they are the smartest person in the world and they think that nobody suppose to ask a question. I think if you ask questions then that shows that you are smart and that you care. (Keisha, BMS, interview 1, 23-39).

Another reason for seeking help was to assure correct performance of a skill which could led to getting a good grade. For example, Deb was motivated to ask the teacher a question if it would affect her grade, the grade held her accountable for learning the skill. Deb said “If we need those directions to participate in the activity and it depends on our grade then of course I don’t care if I ask her a hundred questions as long as I get it right” (BMS, Interview 2, 144-147).

*Help Seeking from Another Student.* All but one of the target students responded that they would ask another student a question if they needed help with a
skill. The target students also reported a preference for asking students of the same sex for help.

The target female students reported that they would ask other girls in the class if they needed help with a skill or to understand physical activity content. The female target students trusted other girls more while they believed the boys were wild and/or stupid.

I would ask more questions of girls. In this class the boys are wild. I think the girls are smarter than boys. Like put all the boys on one team and all the girls on another team and you would see more playing where the boys are at but they do not even know what they are doing. (Keisha, BMS, Interview 2, 81-89).

Kera did not like to ask questions but if she did ask a question it would be directed to a girl.

I would ask questions more to girls because boys are weird except for the ones that you go out with and stuff. They answer you with a dumb question especially Anton. They (boys) look at you funny and some of them act stupid like Anton. Some of them will laugh at you and tell you that you are stupid. (Kera, BMS, Interview 2, Line 84-88)

Two girls, Stacy, and Zoe, were discriminant cases because of the types of girls they would ask for help. They said that they would ask a female student for help if they know she was knowledgeable of the activity. Stacy said

I often ask my friend Kim for help. She usually understands a lot more than I do. She is also trustworthy and makes it easier for me to understand by how she puts it into words that I will understand (MRMS, Interview 2, 115-120).

The males students asked other boys for help because they believed boys listened more. Scott said he would ask boys if he needed help because “boys listen
more than girls, I mean some girls are always sitting down talking. I would ask the boys because maybe they would understand more" (MRMS, Interview 2, 90-94).

Two boys, Alex and Tom, did not differentiate between boys or girls when they asked for help. Gender did not matter to them, they would ask for help from someone in their group or on their team. Alex said “I ask both (boys and girls) because sometimes boys know it and sometimes girls know it” (MRMS, Interview 2, 50-52).

Deb was the discriminant case and would ask boys if she needed assistance or help. Deb directed her questions to boys because they participated more in the activities, and were more interested because they were playing ‘boys sports’, such as basketball. She also believed the boys had greater knowledge of the activity.

The boys are the ones that participate mostly cause we are doing boys activities, and they get more interested in it. Like when we play volleyball, they say that is a girls sport, so when we play boys sports they mostly know everything (Deb, BMS, Interview 2, 105-124).

Offering Help to Another Student. All but one of the target students said they would offer help to another student. The students reported they would offer help (a) if they felt confident in their ability to provide the correct answer, (b) for reciprocity, and (c) if they perceived their peers were afraid to ask the teacher for assistance.

Some students reported they would offer help if they felt confident they knew how to correctly perform the skill. Alison said “one time we were doing volleyball and she did not know how to hit the ball, and I helped to show her how” (MRMS, Interview 2, 82-83).
Several target students reported that they would offer help to a student because they knew there would be a time they would need help in physical education class. For example, Tom did not want to offer incorrect information regarding a skill so he would not offer help to a student if he did not understand the skill himself. Tom said “unless I don’t understand it. I would offer help because if I need help with something I would ask them and they would probably tell me” (BMS, Interview 2, 91-95). Stacy said “if I needed help and I asked them then when I needed help then they will probably help me to return the favor” (MRMS, Interview 2, 151-152).

Deb said she would also offer help if she perceived her peers were afraid to ask the teacher for assistance.

A whole bunch of them are scared to ask the teacher because what she might say. So I ask ‘do you understand it’. If they look at me then I will explain it to them the best that I can. (Deb, BMS, Interview 2, 155-158)

Alex also reported that he would offer help because “I am brave enough to go up there and ask a question, some people if they need help they don’t ask. Some people ask me and I will go and ask the teacher for them” (MRMS, Interview 2, 54-57).

Stuart was the discriminant case. He said that he would not offer help to another student because “they normally are not listening”. He believed that the students should listen to the teacher and if they did they would get the information.

Why Students Are Reluctant to Seek Help. The target students reported they would not ask for help for several reasons (a) if they could figure out how to do it on their own, (b) if they believed they had a strong knowledge base and understood what
to do, (c) because they did not want to be embarrassed, and (d) did not want to be considered stupid.

Several of the target students reported not asking for help because they wanted to determine what was needed to succeed on their own. Alex said that “I do not ask all the time because I like to try to do it myself first” (MRMS, Interview 1, 23). Stacy also reported that she sometimes would not ask for help. She said “It usually depends on the drill. If it is something simple I will try to sit there and work it out by myself but if it is something really hard then I will probably ask” (MRMS, Interview 1, 84-86).

A second reason the target students reported not asking for help was because they believed they already understood the material the teacher was discussing. Stuart did not ask help because “I already know the skills. Like if she tells us soccer or volleyball I already know the rules because we have played it before” (MRMS, Interview 1, 18-19).

A third reason target students reported not asking questions was due to the threat of embarrassment. Stacy and Tom did not want to be the only ones that did not know the answer. Asking questions made them feel vulnerable and had the potential to elicit criticism from their peers. The threat of being embarrassed outweighed their desire to know how to play the game. Stacy said

If we were talking about a sport that is new then I would ask a question if I don’t understand but if it is a sport that is old that everyone knows like earlier I asked what is this movie and Kim said ‘you don’t know what this movie is, you have not seen this movie, and just teasing me but if it is an old sport that everyone knows except me then I will not ask a question cause I don’t like to be embarrassed (MRMS, Interview 1, 70-76).
Tom did not want to feel embarrassed if he asked a question that some students already knew the answer. If it was something that was really easy to most students then I wouldn’t ask a question because I really don’t want to be embarrassed in front of everyone (Tom, BMS, Interview 1, 28-31).

Tom also responded he did not want to be the only one in the class who did not know the answer or how to play. In asking a question, he felt he would be admitting he did not know how to do the skill. The threat of embarrassment overshadowed his desire to know how to perform the skill.

Just as long as I know that I am not the only one that doesn’t know how because I don’t want to be alone when asking a question. Sometimes (I worry about what other students think) when I don’t know something and I figure that everyone else does so I kind of keep my hand down and sometimes I figure it out if I just think about it. (Tom, BMS, Interview 1, 35-41).

Kera avoided asking questions to reduce the risk of feeling stupid in front of her peers. Kera worried about what other students thought of her. She believed students would judge her as being stupid if she asked a question.

I am embarrassed to talk to another student. It makes you feel stupid. (Kera, BMS, Interview 1, 7-16). I just wait on someone to tell me the answer. Cause I feel stupid. I am afraid that people would think that I am an idiot (if I asked a question). (Kera, BMS, Interview 1, 20-25). I don’t want people to think that I am stupid because no one would like me if they think I am stupid (Kera, BMS, Interview 2, 102-107).

**Student Initiated Monitoring.** The target students were interviewed regarding their recording and monitoring during physical education class. Interview data were collected from the target students regarding (a) strategies they used to monitor their behavior, (b) their feelings regarding recording information in physical education, (c)
monitoring their behavior with pedometers, and (d) why they thought they were being asked to monitor.

The target students reported using a variety of strategies to understand the physical activity content or to learn how to perform a skill. All of the target students reported the need to practice a skill in order to learn how to perform the skill. The target students reported strategies to learn physical activity content such as to listen, to use a dictionary or the Internet, or to write the information down. The target students reported strategies to learn how to perform a skill such as to watch other students, to watch the teacher, to try hard, and to practice the activity over and over.

High self-regulated learners reported using more strategies than low self-regulated learners to monitor their learning during physical education class. High self-regulated learners reported using nine or 10 different strategies. Stacy used strategies such as

to ask someone else, look it up, or if you understand one part of the word. Like if you have two words and they were kind of like a compound word like hydrogen. Like hydro means water then you know the words has something to do with water (MRMS, Interview 1, 102-106).

Keisha reported using similar strategies such as having “to listen, watch and practice, to look it up in the dictionary or get on the computer and look it up” (BMS, Interview 2, 58-59).

Low self-regulated learners reported using between three to five different strategies. Kera reported three strategies she would use to help her to monitor her learning. She began by saying “I would wait until someone tells me the answer” (Kera, BMS, Interview 1, 21-22). She followed this statement in a later interview.

105
with “I would look it up in the dictionary, practice the activity, or write it down” (Kera, BMS, Interview 2, 50-52).

Tom, who was an average self-regulated learner, needed strategies to be linked together to assist his skill learning or increase his physical activity content knowledge. Tom preferred when the teacher provided an explanation and then provided time for him to practice.

I have to have it explained to me and then I have to try it and then maybe do an exercise that involved that or something. Then I might learn it. Like it helps me to learn what she is talking about like aerobic with air and I kind of understood that when we started to play an aerobic game (Tom, BMS, Interview 2, 36-40).

The target students reported their feelings about monitoring or recording information in physical education. The high self-regulated learners described benefiting from recording information more than the low self-regulated learners. The high self-regulated learners recorded information to remember the content for a test and/or information about an activity. Zayeera thought it was important to record information so she would not forget the information a few days later. She said Cause you can remember and you can look back on it like a couple of days ago at this time my heart rate was real high. Now it is real low. You do not have to remember it in your brain, you have it down on a piece of paper (MRMS, Interview 1, 110-113).

The target students believed recording information was useful because it helped them to remember the activity. Keisha recorded information because it made it easier to remember. Keisha said “If you don’t write it down then you might forget what you had and you might have to do something else” (BMS, Interview 1, 95-96).
There were two discriminant cases with regards to recording information for the high self-regulated learners. Stacy and Deb did not see the need to record information in physical education. Stacy did not like to record “because my hand hurts very easily after a lot of writing. I do not like writing at all” (MRMS, Interview 1, 118-119). Deb did not like to record information in ‘gym class’ because she did not understand the content and that made it difficult for her to write down what the teacher was telling her.

I don’t really like writing unless it is like my language arts and reading class because that is the one that I am basically good at writing in. Like gym if I don’t understand then I don’t have anything to write down. Cause all the stuff that we talk about I’m confused and I don’t know what to write about or sometimes I forget those big words that the teacher says. (Deb, BMS, Interview 1, 86-100)

The low self-regulated learners did not see the need to record information in physical education. They recorded information because the teacher had instructed them to write the information down. Kera found recording information useless. She said she recorded because “when the teacher gives us those forms we have to write stuff down but there is no use to do it because in PE class we are suppose to be in activity not writing” (Kera, BMS, Interview 1, 57-59). Alison reinforced this idea by saying “sometimes I just really don’t care. I just don’t like writing stuff down all the time” (MRMS, Interview 1, 59-60). Stuart, who was classified as an average self-regulated learner, did not feel he needed to record the information because he felt confident in his understanding of the activity. He said “I don’t need to write information down because I already know it” (BMS, Interview 1, 48-51).
The target students were asked why they looked regularly at their pedometers during physical education class. The target students monitored their pedometer steps for two reasons (a) to see how many steps they had accumulated and (b) to compare their steps to their goals. Stacy monitored her steps
to see how far I have gone. I look at the clock and then I look at the pedometer to see how many steps I have gone so far. Then about every five minutes or so I will do that again so that way I can figure how far I am moving every five minutes (MRMS, Interview 2, 201-204).

The target students also monitored their steps to examine how close they were to the goal they had set at the beginning of class. Tom monitored his steps so he could reach his daily goals. He said “I want to see how close I am to my goal. And if I see that I am real close then that way I know that I can bring it up more the next time” (Tom, BMS, Interview 2, 163-165). Stuart monitored his steps because he wanted to know how close he was to his goal so he would know if he needed to speed up.

I am always wondering where I am at. So like when I am doing the hard work and I stop to see how much I did for that thing to see if I need to work harder or slow down because I already got good. I am trying to see what I need to do for the next time like try harder or stay the same. To reach my goals (Stuart, BMS, Interview 2, 144-148).

There were two discriminant cases concerning why students monitored their steps with pedometers. Deb said she monitored her pedometer steps “because there was pressure from the teacher to get a lot of steps” (Deb, BMS, Interview 2, 334-335). Kera monitored her steps to compare her steps to her peers. She observed that “everyone else usually had 800 before the first game is over and I normally have 100 maybe 200 steps” (Kera, BMS, Interview 2, 188-189).
The target students were asked why they thought the teacher was asking them to monitor their activity in class. The students reported several reasons why they believed they were being asked to monitor in physical education. The reasons included: (a) to see if students understand and (b) to remember information. The target students believed the teacher was asking them to monitor their activity so she could distinguish between those students who were understanding the content and skills from those who were not. Deb believed it was “to make sure that we understand what all of this has to do with our health and how important it is” (BMS, Interview 1, 79-80). Alex believed the teacher was asking him to monitor his behavior “so that we will understand and so we will learn” (MRMS, Interview 1, 80). Tom believed he was being asked to record information so that the teacher “can look back a couple of months and see how everything has changed in class” (BMS, Interview 1, 81-85).

A second reason involved recording information so that the students could recall the information at a later date. Scott said he believed he was being asked to monitor because “he would remember it. If she gives a quiz of something and I have to know everything since I have written it down I can be studying” (MRMS, Interview 1, 86-88).

Kera and Charlie were the discriminant cases because they did not understand why they were being asked to record information.

Goal Setting. The target students were asked questions regarding the goals they set during physical education class. During their interviews, the target students were asked what goals they had set; why they had chosen certain goals; what goals they wanted to achieve; and what goals they thought the class should have set. The students reported several goals that they had set for themselves. The goals included: (a) to improve their skills, (b) to become physically fit, and (c) to learn new skills. The students believed that they were being asked to monitor their activity so that they could see if they were improving in these areas. Deb believed it was “to make sure that we understand what all of this has to do with our health and how important it is” (BMS, Interview 1, 79-80). Alex believed the teacher was asking him to monitor his behavior “so that we will understand and so we will learn” (MRMS, Interview 1, 80). Tom believed he was being asked to record information so that the teacher “can look back a couple of months and see how everything has changed in class” (BMS, Interview 1, 81-85).

A second reason involved recording information so that the students could recall the information at a later date. Scott said he believed he was being asked to monitor because “he would remember it. If she gives a quiz of something and I have to know everything since I have written it down I can be studying” (MRMS, Interview 1, 86-88).

Kera and Charlie were the discriminant cases because they did not understand why they were being asked to record information.

Goal Setting. The target students were asked questions regarding the goals they set during physical education class. During their interviews, the target students were asked what goals they had set; why they had chosen certain goals; what goals they wanted to achieve; and what goals they thought the class should have set. The students reported several goals that they had set for themselves. The goals included: (a) to improve their skills, (b) to become physically fit, and (c) to learn new skills. The students believed that they were being asked to monitor their activity so that they could see if they were improving in these areas. Deb believed it was “to make sure that we understand what all of this has to do with our health and how important it is” (BMS, Interview 1, 79-80). Alex believed the teacher was asking him to monitor his behavior “so that we will understand and so we will learn” (MRMS, Interview 1, 80). Tom believed he was being asked to record information so that the teacher “can look back a couple of months and see how everything has changed in class” (BMS, Interview 1, 81-85).
they set that were not recorded; and why they believed the teacher was asking them to set goals.

The target students were motivated to set goals for three different reasons (a) to build their physical activity capacity, (b) to learn about the physical activity content, and (c) to monitor their success. Target students set goals associated with their pedometer steps. Deb said “on my pedometer I try to get higher (steps) cause I am trying to run the most that I can to build my speed up so that I won’t get tired at track practice” (Deb, BMS, Interview 2, 239-241). Tom said “I try to get so many steps, if I can reach that then I know that I am going to be able to do a little more and a little more” (Tom, BMS, Interview 2, 132-133). Zoe said “each time I set a goal for the steps like I will make it more than that. Like I walked 2110 steps then I would make it for 2111 steps or more than that” (MRMS, Interview 2, 133-135). Tom set a performance goal in which he wanted to be more physically active during physical education class.

I wanted to be more physical and run around because I was not really physical last year. I did not do a whole lot of stuff. Kind of against my will. I wanted to be more athletic cause I started to play more sports over the summer and now I like them” (Tom, BMS, Interview 2, 139-142).

Some of the target students set goals related to the physical activity content. Scott set goals “to remember everything that the teacher is saying by the next gym class” (MRMS, Interview 2, 13-14). Keisha wanted to learn the words because she knew she was going to be tested on the information.

I set goals to learn the word of the day and to learn more about the sport that we are playing. Those goals, like the words of the day, I need to learn those
words because we are going to have a test (Keisha, BMS, Interview 2, 136-139).

Students also set goals to challenge themselves. Keisha reported setting a goal that was attainable yet challenging. She said

If I set my goal that I want to reach 1000 steps and in gym like I know that I have to move a lot but if I am over 1000 then I know I ain’t got to move that much. I set goals then try hard to reach them (Keisha, BMS, Interview 2, 161-165)

The target students were asked if they had set goals in physical education that were not recorded. The students said they set a variety of goals they had not recorded on their goal sheets. Their goals ranged from getting more pedometers steps to learning the physical activity content to being included in the game more. Kera’s goal focused on acquiring more steps than a peer. Zoe wanted to get more pedometer steps to “feel like I have accomplished something, or like I did it and now I can show people I can do it” (MRMS, Interview 2, 140-142).

Some goals students did not write down were focused on learning the physical activity content. Keisha said “I set goals like I want to know what this words means or know more about this word or more about sports” (Keisha, BMS, Interview 2, 151-152). Deb said “I usually have to say stuff over and over like with the definitions then I can say that I learned more about the definition” (Deb, BMS, Interview 2, 325-327).

Stacy set a goal that she did not write down, which was to make a larger contribution in the games. She said she wanted to get included into the game more. Usually I don’t reach the goals with the pedometer steps cause I am not included in the game cause I am off to the side. No one passes to me or really gives a care where I am. I am just in the way (MRMS, Interview 2, 241-245).
Three students reported that they had not set goals besides the ones they had recorded in physical education class. They did report setting goals in other classes. These goals focused on getting better grades.

The target students were asked why they thought the teacher was asking them to set goals. All of the target students but one believed they were asked to set goals to increase their learning or to learn how to set achievable goals. Deb believed the teacher had them set goals so that they could “learn it as we do it”. She said the teacher “wants us to give it our best. She doesn’t want us to just go out there and just do it” (Deb, BMS, Interview 2, 280-283). Stacy believed the teacher was asking her to set goals “so we can learn how to step and set goals that are in our grasp so we can achieve it. And to learn to achieve goals that are higher” (MRMS, Interview 2, 193-195).

Student Goal Evaluations. At the end of each class period, the target students would record on their goal sheet (see Appendix H) whether or not they had reached their goal and to explain why they were successful or not. The target students were also asked why they had chosen certain goals and how they knew they had reached these goals. Deb compared her day-to-day goals to improve her performance.

At the end of the class, I compared my steps like if I get over my last steps than I did in my last class then I compare those and say that I did better compared to the last time. Cause my mom always tells me to do better than the day before (Deb, BMS, Interview 2, 274-279).

Scott knew he had reached his goal by comparing his steps to another classmate. He said
one way is if I say how many steps that I want to set and I look at the pedometer and see how many steps I have taken and if I say I want to set a goal like to bet sometime in basketball or to go farther than someone else did all I have to do is ask them or watch them and pay attention to what they are doing (MRMS, Interview 2, 186-190).

Keisha reported setting goals related to the cognitive component of the class. Her goals included understanding the new words (concepts) presented in class and remembering them. She evaluated her goals because it was a way to measure how much she had learned.

If I set a goal to know what a words means like if I can say to myself what a words means to myself then I know what it means. If I write it down then I might know more about something if I know more than what I did before I wrote down my goals then I learned more. (Keisha, BMS, Interview 2, 151-155).

Some target students evaluated their goals by measuring the amount of steps they had taken during class. If they increased their number of steps, they believed they had attained their goals. Stacy said “I was able to look at the pedometer and I walked 1119 steps” (MRMS, Interview 2, 185).

Stuart was the discriminant case because he did not know why he was asked to set goals.

Summary

The results for this chapter were divided by research question. Overall, the intervention did not significantly impact the relationship between the schools and students’ gain scores or the conditions and students’ gains scores on the Learning Strategies in Physical Education Questionnaire. However, significant differences were found between the instructional conditions and students’ gain scores on the
Physical Activity Content Test. The intervention did have an effect on students who were in the strategies instructional condition because these students displayed significantly higher gain scores on the PACT test than the other two conditions. No significant differences between schools and student gain scores were found on the PACT.

Results for data collected through observations and goal setting sheets demonstrated that the target students asked mostly procedural questions when they sought help from a teacher or another student. During the physical education sessions, the target students sought help from the teacher more than from their peers and girls sought help more than boys. The target students also set mostly psychomotor goals during the sessions.

Results from data collected through student interviews showed high self-regulated learners reported using more strategies than low self-regulated learners. Students reported that they were reluctant to seek help if they believed they did not need help or when they did not want to feel embarrassed or stupid if they were to ask a question.
CHAPTER 5

DISCUSSION, IMPLICATIONS, AND RECOMMENDATIONS

The purpose of this study was to understand the uses and perceptions of self-regulated learning strategies used by urban middle school physical education students. There are four sections in this chapter: a discussion of the findings by research question, conclusions, implications, and recommendations for future research.

RQ1. To what extent did middle school physical education students self-regulated learning scores differ by instructional condition (i.e. strategies, technology, and curriculum instructional condition)?

Students' self-regulated learning strategy use did not significantly improve following the intervention. Two main findings were found regarding the Learning Strategies in Physical Education Questionnaire (LSPEQ). First, from the outset there were differences between schools on the LSPEQ with students at Highland Belle Middle School scoring the highest and with students at Maury River and Buffalo Middle Schools scoring second and third, respectively. Second, there were no significant differences found between the conditions for the LSPEQ gain scores. The non-significant findings are not consistent with previous studies in general education. Middleton and Midgley (1997) and Patrick, Ryan, and Pintrich (2000) found significant positive correlations between learning goals and use of self-regulated
learning strategies. This difference could be explained because the present study utilized a quasi-experimental design and the two cited general education studies were correlational studies.

Another possible explanation for these non significant findings may be the survey instrument chosen to collect data. The LSPEQ could be either an effective or an ineffective measurement tool. Since no significant differences were found, both avenues need to be explored. If the instrument was an effective measure then the finding of no significant difference was a valid outcome. The intervention did not significantly change student task goals, ability approach goals, ability avoidance goals, or help seeking/persistence. There were small changes in the students’ LSPEQ gain scores but the findings resulted in no significant differences between the conditions.

The instrument could also have been an ineffective measurement tool. First, the instrument could have been effective but the researcher failed to create a strong alignment between the instrument and the study’s intervention. Specifically, the factors associated with the questionnaire (i.e. task goals, ability approach goals, ability avoidance goals, and help seeking/persistence) did not align with the objectives of the study (i.e. to improve strategy use by middle school students). Improving task goals, ability approach, and ability avoidance were not the primary foci for this study, therefore if changes had occurred it could have been due to chance rather than the intervention. Second, the instrument was not sensitive enough to show differences between the conditions. The differences were so minuscule that the instrument could not sufficiently reveal them. Third, the instrument had been
modified from a different content area (i.e. general education to physical education) and population (i.e. college students to middle school students). The instrument may have been modified too much therefore creating an inaccurate measurement of middle school student task goals, ability approach, and ability avoidance goals.

RQ2. To what extent did students knowledge of fitness content differ by instructional condition?

Two main findings were found regarding the Physical Activity Content Test (PACT). The first finding showed students in the nine classes improved their content knowledge following the intervention. This improvement can be explained in two ways. First, every class received the cognitive objective at the beginning of each session and then was debriefed at the end of each session. The sessions were designed to focus on and reiterate the physical activity content to the students. Repetition of the information was one instructional method that could aid in student learning the content.

Second, this improvement could also be explained because of threats to internal (i.e. history) and external validity (i.e. reactive or interaction effect of testing) (Campbell and Stanley, 1986). An internal threat regarding history implies that events could have occurred between the pretest and posttest in addition to the treatment. For example regarding history, some students took proficiency tests during the intervention period. The proficiency tests are demanding and could have affected the students’ behavior. An external threat regarding reactive or interaction effect of testing could be that the pretest could have increased the students’ sensitivity to the
answers instead of the treatment. Since the students took the pretest, some of the students might have recalled the questions, which sparked their learning within the sessions.

A second finding regarding the PACT indicated significant differences between the instructional conditions and gain scores on the PACT ($p < .05$). The strategies instructional condition had the highest gain scores for the PACT, the curriculum instructional condition had the second highest gain scores and the technology had the lowest gain scores. A possible explanation for the students in the strategies instructional condition having higher gain scores could be that they were provided opportunities to monitor, seek help, goal set and evaluate their learning during the physical education lessons. Zimmerman (1990) stated that self-regulated learning strategies “refer to actions and processes directed at acquisition of information or skills that involve agency, purpose, and instrumentality perceptions by learners” (p.5). Using self-regulated learning strategies could have assisted students to be focused, decisive, and aware of their learning (Zimmerman, 1990). A second explanation could revolve around the physical activity content that was presented at the beginning of the class and during the debriefing sessions. During these sessions, students’ in the strategies instructional condition were encouraged to seek help if they did not understand. By encouraging students to ask questions it may have prompted them to view the physical activity content as important content to learn.

Students did improve and they were able to retain some of the information presented at each class session. However, these gains were small and consisted mostly of surface learning of the content. The students did learn what was presented...
however there was very little depth to student learning. This leads the researcher to
think that larger gains could have occurred if the students had physical education
everyday. During this study, students participated in physical education three times
per week at BMS and HBMS and two times per week at MRMS.

RQ3. To what degree did the target students use self-regulated learning strategies (i.e.
seeking help, self-monitoring, goal setting, and evaluation) during their physical
education lessons?

The target students did use self-regulated learning strategies during their
physical education lessons. Since the LSPEQ was based on student self-reports of
their self-regulated learning strategy use, an attempt to validate students’ actual
performance in a naturalistic setting was accomplished by observing students use of
three self-regulated learning strategies. Data were collected on students (a) seeking
help, (b) monitoring, (c) goal setting and (d) evaluating during selected physical
education lessons in the strategies instructional condition only.

Seeking Help

Students were observed seeking help more often from the teacher than from
their peers. Contradictory findings were found from Nelson-Legall and Glor-Scheib
(1986) who reported students sought help more frequently from peers than from
teachers. Two possible explanations could help clarify why students sought help more
from the teacher than from other students. First, the students were not allowed to talk
while the teacher was presenting information. They were to listen to the questions and
directions presented by the teacher. One student said he would wait until they were on
their teams to ask a peer if he did not understand. Teachers who use a direct teaching
style could prevent students from seeking help or assistance from peers. The teacher may perceive students to be off task if they are talking while the teacher is providing instruction. The use of a direct teaching style, which may be effective for keeping students on task, may not be the best approach for promoting self-regulated learning with students in a physical education setting.

A second explanation could entail the teacher’s presentation of the content. The teacher could have been communicating the content in an ambiguous way therefore students were seeking clarity of the content when they asked questions. For example if the teacher does not know the content in depth then he/she will only be able to present surface information to the students. It is important for the teacher to thoroughly know the content in order to anticipate student questions. The teacher must then be able to provide multiple explanations, which could aid all students in learning the content. If the teacher has only surface knowledge of the content then multiple examples may not be possible which could hinder student learning.

Gender differences with help seeking. Differences were observed in the frequency of help seeking by boys and girls. Girls were observed seeking help more than boys during the physical activity lessons. Newman (1990) and Nelson-Legall and Glor-Scheib (1986) reported no significant differences between boys and girls with regards to observed incidences of help seeking. One explanation for this finding for girls seeking help more than boys in a physical education setting could be that the girls in these classes felt confident in their physical activity content knowledge. However, it is not specifically known, why girls had more help seeking incidences
than the boys. Further research in this area is needed to understand differences between boys and girls help seeking behaviors in a physical education setting.

**Monitoring**

Student frequency of monitoring with heart rate monitors was higher with teacher prompts. The frequency of student initiated monitoring was lower than teacher initiated prompting. One explanation could be associated with the teachers' management when they taught students to use the HRMs. The teachers had more managerial problems with the HRMs than the pedometers. Sandholtz, Ringstaff, and Dwyer (1992) studied thirty-two teachers and their experiences with computers and found that even though the teachers had years of teaching experience when they implemented technology into the teaching environment their classrooms significantly changed. The teachers in Sandholtz et al study (1992) moved through three stages: survival, mastery, and impact, when implementing technology into their lessons. For the present study, the teachers stayed in the “survival stage” when they used heart rate monitors (HRMs). The survival stage was categorized by the teacher's ability to anticipate technological problems. One explanation could be that because the teachers were learning how to teach with heart rate monitors this could have affected how accurately the students understood how to use them. In other words, management issues interfered with the teacher's ability to focus on their instructional delivery.

In contrast, when students wore pedometers student initiated monitoring was higher than with teacher prompts to monitor. This outcome could be explained in two ways. First, the teachers had taught using technology for the previous three weeks.
and their comfort level had increased. These teachers were possibly moving into a ‘mastery stage’ (Sandholtz, Ringstaff, & Dwyer, 1992). A mastery stage occurs when the teacher feels confident enough to go beyond just using the technology to link the technology to student learning experiences. For the present study, the teachers were able to prompt the students to accumulate more steps during the sessions as well as help the students understand why getting more steps was important. When the teachers were teaching with heart rate monitors, their focus was on programming the watch or altering the transmitters and less on the students’ workload while using them. The implication of this finding is that when the teachers were able to feel more comfortable teaching with the technology they were able to go beyond technical issues and focus on promoting student learning.

Another explanation for the frequency of student initiated monitoring could be that the pedometers were easier for the students to use. They only had to click them onto the waistband of their pants and click one button to see the steps and miles they had accumulated. One explanation for students’ frequency of monitoring with pedometers to be higher than with heart rate monitors could be due to the simplicity of the pedometers. It may be necessary when teachers are attempting to develop self-regulated learning strategy use that the teachers begin with simplistic technological resources and then progress to more advanced resources.

Goal Setting

Three main findings regarding student goal setting were found. First, the students’ goals were self-set. Fairall and Rodgers (1997) examined college students’ goal setting and found that students in self-set groups reported significantly higher
participation than students in the assigned group (i.e. students goals were set for them). Students who self-set goals chose which goals they wished to achieve. For the present study, students set their own goals however the teacher did prompt them to set specific and measurable goals. Schunk (1995) suggested teaching students to set goals that were attainable and measurable could promote student learning.

One positive outcome for students using self-set goals was that they were able to determine goals they deemed important and the goals they set were also individualized to their specific needs. For the present study, a drawback to students self-setting goals could be that students set goals that were in their immediate focus and short-term. For example, the students set goals mostly related to increasing pedometer steps. Students set goals that were day-to-day goals. They did not set goals related to the long term of the unit (i.e. to learn the physical activity content to get a good grade on the test or to get so many steps by the end of the unit).

When working with middle school students, it may be beneficial for the teacher to assign students’ goals in the beginning of a physical education unit. Boyce and Wayda (1994) found that females in a college weight training class performed better when the instructor assigned goals than when students self-set their goals. For the present study, if the teachers had assigned goals to students, the students could have been encouraged to set a variety of goals beyond psychomotor goals. Students could also receive input regarding the appropriateness of the assigned goal before moving to self-set goals. Teachers could model goals, scaffold student learning regarding the goals, and then fade assistance as students develop appropriate goals (Boekaerts, 1997; Meyer & Turner, 2002).
A second finding for goal setting was that the students set more psychomotor goals than cognitive or affective goals. In particular, students set goals related to their pedometer steps. For example, “I try to get so many steps, if I can reach that then I know that I am going to be able to do a little more and a little more” (Tim, BMS, Interview 2, 132-133). One explanation for student goals focusing on the psychomotor domain could have been their use of pedometers. The pedometers focused the student’s attention on increasing their steps. The pedometers were a novelty for students as very few students had ever used them and none of the students had ever used them in a physical education setting.

The target students mostly set psychomotor goals. The target students’ goals were compatible with a traditional physical education environment, which focused on the psychomotor domain. The focus of this study was not on having students set a variety of goal types however, it would be interesting to see if a relationship exists between different types of goals set and student learning. Lemos (1996) reported sixth grade students set seven types of goals (i.e. working, evaluation, learning, complying, discipline, interpersonal relationship, and enjoyment goals). He found the majority of student goals came from the first three listed above. The goals they set were compatible with the traditional class environment in which the classroom was a place for students to work, meet evaluation criteria, learn, and follow the rules. A future research study could attempt to answer the question: could setting and evaluating different types of goals positively impact student learning of fitness content in physical education?
Third, the target students understood why they were being asked to set goals. The teachers' goals for the class were to help the students set specific and measurable goals related to their pedometer steps or the physical activity content. The majority of these students set goals that aligned with the teacher objectives for student goal setting. For example, Stacy believed the teacher was asking her to set goals “so we can learn how to step and set goals that are in our grasp so we can achieve it. And to learn to achieve goals that are higher” (MRMS, Interview 2, 193-194). Lemos (1996) findings contradicted findings from the present study. Lemos (1996) found sixth graders’ goals did not align with the teacher set goals. Students were concerned with evaluating their goals and the teacher was focused on learning goals.

Evaluation

For the present study, students evaluated the goals that they set. Students set goals mostly from the psychomotor domain with their evaluations based on increasing their steps. Schunk (1996) stated that self-evaluations are accompanied by comparing self-judgments to their present performance. Students provided reasons why they set certain goals. They wanted to compare their steps with their previous day’s performance. From the interviews, some of the target students were not worried about what their peers were doing because they believed their progress was the most important.

Some of the target students also compared their steps to other classmates. One explanation for why students evaluated their goals based on the performance of another classmate could be the highly competitive nature exhibited by most middle school settings. Barrett (1997) discussed the central issues adolescents incur as they
move through the middle school years. During this period, teenagers value competence and uniqueness and seek to outdo their friends through competition.

RQ4. To what degree did the target students perceive their use of self-regulated learning strategies (i.e. seeking help, self-monitoring, goal setting, and evaluation) during their physical education classes?

Although there were no significant differences between the conditions or schools based on the Learning Strategies in Physical Education Questionnaire (LSPEQ) gain scores, important findings were discovered through qualitative means. Patrick and Middleton (2002) reported that an “overreliance on survey methods could obscure other perspectives of self-regulated learning” (p.27). Limiting the data collection to one methodological approach could also mask the intricate picture regarding student self-regulated learning strategy use. Therefore, the target students in the strategies instructional condition were interviewed to triangulate with the LSPEQ findings. This question addressed students’ perceptions of (a) self-regulated learning strategies used in a physical education setting: help seeking, monitoring, goal setting, and evaluation of goals and (b) self-handicapping strategies.

**Self-Regulated Learning Strategies.**

Two main findings will be discussed: the types of strategies students reported using during physical education class and the number of strategies students reported using. First, the three most cited strategies reported by the physical education target students were skill practice repetition, help seeking, and recording information. Similar strategies from a general education setting were reported by Ablard and Lipschultz (1998). They described students using self-evaluating, goals setting and

126
planning, and seeking assistance from an adult more frequently than other strategies. One rationalization for why the target students reported these strategies more than others could be that they were exposed to these strategies previously. The students reported that they had been taught in previously physical education classes that practicing a skill was important to learn the skill. All of the target students reported using repetition as a strategy to learn a skill in physical education class. Students also reported seeking help and recording information, which happen to be two of the strategies that were targeted during the intervention.

It is interesting to note that even though goal setting and evaluation of goals were taught to the students they were not mentioned as strategies the target students would use to aid in their learning. The students may not have cited these strategies because they did not believe these strategies supported their learning. This assumption was made by the researcher because the students were not asked in the interviews how goal setting could be linked to their learning. This would be an area to elicit further exploration.

Second, differences occurred between high and low self regulated learners for the number of strategies reported. High self-regulated learners reported using nine or 10 different strategies whereas the low self-regulated learners reported using three to five strategies. Similar to findings by Zimmerman and Martinez-Pons (1986; 1990), higher achieving students reported using more strategies than lower achieving students to monitor their activity or knowledge gains. For the present study, the high self-regulated learning target students reported using strategies such as listening to the teacher, using a dictionary to understand the content, watching the teacher perform...
the skill, practicing the activity, asking the teacher questions, and writing the information down. Low self-regulated learners reported using strategies such as to listening to the teacher and practicing the activity. The low self-regulated learners did not report the use of help seeking or recording information as compared to the high self-regulated learners. One explanation could be that low-self regulated learners may not have found either of these strategies useful and therefore chose not to use them. Even though the high and low self-regulated learners strategies were similar, Pintrich (1999) noted that high self-regulated learners have more strategies to pull from which can increase their understanding of the task.

It must be noted that the number of strategies reported by students should not be associated with low levels of student learning. Ablard and Lipschultz (1998) examined high achieving math students and found that some of the students did not report using a single self-regulated leaning strategy. These students used other strategies (i.e. linking new information to their prior knowledge and listening attentively the first time information was presented to maintain their high performance). In a physical education setting, there is a need for further exploration to understand exactly what strategies students’ use and how they use them to improve their learning.

**Help Seeking**

Newman (1994) stated that high self-regulated learners use others as a resource to gain a deeper understanding of academic material. For this study, differences with regards to seeking help were reported between high and low self-regulated learners. Kera, a low self-regulated learner, reported that she would rather
have someone tell her the answer than ask for help. She demonstrated behavior similar to what Kennedy (1997) described as an executive help seeker, which is one who wants the problem resolved for them rather than focus on the process of learning.

Several of the high self-regulated learners reported they would ask both the teacher and peers for help regarding how to do a skill or to understand the lesson content. These students' demonstrated help seeking behaviors similar to what Kennedy (1997) described as an instrumental help seeker. This type of help seeker wants explanations of the process as they seek to develop mastery of the material. There is a need for further exploration due to the lack of research in a physical education setting regarding differences between executive and instrumental help seekers. Additional research could aid in understanding the differences between these two types of help seekers and present possible ways to assist teachers to accommodate these types of learners.

Reasons to Seek Help. The target students sought help during the physical activity lessons to gain additional information regarding physical activity content knowledge and to assure correct skill performance. Similar to findings in general education, Butler and Newman (1995) and Salmon and Strobel (1996) reported several reasons why middle school students sought help: to promote mastery, to succeed, task difficulty, and effort avoidance. For the present study, the target students sought help to promote mastery, which was related to their understanding of the physical activity content and to succeed, which was related to their accumulation of steps. Salmon and Strobel (1996) found 9 to 13 year olds sought help for instrumental assistance and informational advice. From the present study, one female
low self-regulated learner explained she sought help from the teacher for
‘informational advice’. She believed the teacher was the expert and therefore the
teacher could answer her questions.

One explanation for why student sought help during physical education could
be the utilitarian use of questioning. A relationship between learning goals and grade
improvement emerged from the interviews regarding students help seeking during the
physical education sessions. This relationship could be aligned with Doyle’s (1986)
performance grade exchange. The target students wanted to make sure they
understood how to perform the skill for grade purposes. Several of the target students
asked questions because if they did not understand the task it could affect their grade.
Most of the target students reported that they wanted to get a high grade in physical
education class.

*Reluctance to seek help.* The target students reported three reasons why they
were reluctant to seek help: to figure it out on their own, they already understood how
to do what was being asked, or because they did not want to be embarrassed or feel
stupid in front of their classmates. Similar to findings by Butler and Newman (1995),
students reported avoiding help to mask incompetence, independent mastery, or they
did not need help. Newman and Golden (1990) also reported several reasons students
were reluctant to seek help: expectation, bother, shyness, negative perception,
independence, and unavailability of preferred helper.

The first reason students reported they did not seek help was because they
wanted to ‘figure it out’ on their own. There could be positive and negative
consequences when students try to understand the task on their own. One theme that
emerged from the interview data for students not seeking help was associated with students wanting to try to accomplish the task on their own. The students believed it was more gratifying if they were able to successfully complete the task than if they would have had to ask for help. Another explanation for students wanting to understand a task without asking for help could be associated with persistence and learning. Duda (1992) found that some students persisted and sustained their performance in learning a physical skill until successfully accomplishing the task. The present study did not focus on student persistence however, it would be interesting to observe if there is a relationship between students who asked for help and their persistence towards learning in a physical education setting.

A problem can arise when students are practicing a task in an incorrect manner. They do not seek help because they believe they can figure it out. However, if the student does not realize the difference between correct or incorrect skill performance this could be detrimental to their learning. One recommendation for teachers is to provide guidance to middle school students on when they should get help and when they should continue to persist on their own. Another recommendation for teachers is to use a reciprocal teaching style or peer tutoring as instructional strategies in physical education to support learning of psychomotor skills.

A second reason students did not seek help was because they believed they had a strong knowledge of the activity. The students interviewed perceived their knowledge to be strong because they had participated in similar activities in previous years. However, there was a concern with students who had over estimated their knowledge of an activity or physical activity content. Stuart, who was a low self-
regulated learner believed he did not need to ask questions because he knew the content. However, his posttest test score revealed otherwise. He had seven answers correct out of 30 on the final posttest. A recommendation would be for teachers to constantly check for student understanding.

Third, the target students reported not seeking help because they did not want to feel embarrassed or stupid. Similar findings by Pintrich and Ryan (1997) reported low achieving students did not seek help because they did not want to risk embarrassment in front of other classmates. Students reported not seeking help because they did not want to be the only ones who did not understand the activity the teacher was explaining. The problem associated with students not seeking help for risk of embarrassment could potentially led to performing the skill incorrectly or they could be misinformed regarding the content. Over time these repeated setbacks could have ramifications for student learning in a physical education setting.

**Gender Differences and Help Seeking.** The present study found boys and girls were more willing to ask for help from someone of the same sex. This was similar to findings by Downe and McDougall (1995) and Newman and Schwager (1995). Girls reported they would seek help from other girls and boys reported they would seek help from other boys. The target female students said they sought help from other girls because they were more trustworthy and were less wild than boys. Boys reported seeking help from other boys because boys listened more. This finding can be explained because girls and boys rely and feel confident with individuals of the same sex during adolescence. Students at this age begin to rely more on their friends than their parents (Barrett, 1997).
Monitoring

Students were asked to monitor their heart rates and steps using either a heart rate monitor or a pedometer. Results indicated differences between high and low self-regulated learners in their need to record information. Monitoring can inform students regarding their goal progress (Schunk, 1997). Zimmerman (2000) stated that when students self-monitor, they “track specific aspects of their own performance, the conditions that surround it, and the effect that it produces” (p. 19). All of the high self-regulated learners reported benefits to recording information in physical education. They said that monitoring could help them to remember the content or that they could observe day-to-day changes in their heart rate. Students believed recording information to be meaningful because they received specific information regarding their skill performance. Zimmerman (2000) stated that monitoring allows students to pay specific attention to their own performance, which can lead to meaningful learning.

On the other hand, the low self-regulated learners did not like recording information. The low self-regulated learners did not enjoy recording information because the students did not find the information informative. Zimmerman (2000) stated that monitoring must be informative otherwise recording information becomes a meaningless task. For this study, these students could have perceived recording as a meaningless task. Similar findings in a physical education setting were found by Ames (1992), Carlson (1995), and Cothran and Ennis (1999) in which students who perceive the task as having no meaning will be less likely to become engaged in the task.
Goal-Setting

The target students were asked to set goals related to their pedometer steps or to the cognitive objectives for the class. Students were told their goals had to be specific, something they wanted to improve upon, and they must be written down. The criteria listed above were also suggested by Martino (1993) when teaching goal setting with middle school students.

The target students set goals related to their pedometer steps. Goal setting has been shown to allow students to direct their attention and behavior, to monitor their academic progress, and to guide their cognition (Locke & Latham, 1984; Pintrich, 2000; Schunk, 1990; Zimmerman, 2000). For the present study, goal setting was utilized to direct student attention and behavior to their steps and the cognitive objectives of the physical education sessions. The students reported that setting goals enabled them to have a feeling of accomplishment if they were to achieve their goal. Students stated that if they did not achieve their goal that they could revise the goal so that it could be achieved. In a physical education setting, Solmon (1996) and Theeboom, DeKnop, and Weiss (1995) found mastery oriented climates, in which students focus on their own progress, promoted positive outcomes for the students which led to a increase in participation in the activity. Bandura (1986) stated that one purpose of setting goals is to evaluate one’s performance, which may be followed by intensifying effort or revising original goals.

Self-Handicapping Strategies

The target students reported using several self-handicapping strategies during the physical education sessions. First, the most frequently reported strategy was to not...
ask questions mostly because they did not want to risk being embarrassed or feel stupid in front of their classmates. Second, one target student used ‘being a spectator’ during a team handball game. She had set a goal to get so many pedometer steps but she was not able to reach the number of steps because “I am not included in the game cause I am off to the side, no one passes to me, no one really gives a care where I am. They just think I am in the way.” (Stacy, Interview 2, 242-244). This student’s behavior resembled what Tousignant and Siedentop (1982) labeled the competent bystander. A competent bystander will attempt to look involved in an activity therefore negative attention will not be drawn to him/her by the teacher. ‘Being a spectator’ was a strategy this student used, which was also a strategy reported by Carlson (1995), due to the lack of control in a physical education setting. Students reported using adapted strategies such as hiding disillusion, being a spectator, becoming wallflowers, faking, and self-banishment. One explanation for Stacy using this strategy could be that she felt as though she had no control over her participation during the game.

Third, through field notes it was observed that there were times when students intentionally did not dress out. Midgley and Urdan (1995) cited similar self-handicapping strategies in a general education setting to include when students deliberately do not try, procrastinate during a task, or provide excuses. All occasions observed of students not dressing were with girls. Several explanations could account for why the girls might not have dressed. These include that they were not interested in the activity or they might have believed they lacked the skill to participate. These assumptions are made with caution because the researcher did not ask the girls why
they did not dress out. Further exploration needs to be completed in this area to understand what self-handicapping strategies student use, why they use them, and what teachers can do to alleviate these types of strategies.

Conclusions

Based on the findings from this study, four conclusions seem warranted. First, the specific intervention chosen for this study was not effective in improving the LSPEQ scores. The LSPEQ was not sensitive to the changes exhibited by students nor did it measure the changes I targeted. Second, holding students accountable on a daily basis for the physical activity content did on a minimal level improve student learning. This was evident as all classes improved their scores on the PACT from pretest to posttest. This finding can be supported by previous literature that suggests student academic achievement will improve by utilizing self-regulated learning strategies (Pintrich, 1999; Zimmerman, 1990). Third, target students sought help from the teacher more often than from other students. This finding does not support previous research in which students sought more help from other students than from the teacher (Nelson-Legall & Glor-Scheib, 1986). Fourth, the target students’ perceptions of self-regulated strategies used showed that high self-regulated learners used more strategies than low self-regulated learners. This finding was supported by previous research in that students who were high self-regulated learners utilized more strategies than low self-regulated learners (Schunk, 1999; Zimmerman, 1990).

The relationship between self-regulated learning use and student learning in physical education has not been answered in this study. However, the results of this
study provide a launching point to understanding middle school students’ self-regulated learning strategy use in a physical education setting. It may be possible for students in a physical education setting to improve both their skill level and cognitive development if they were to utilize self-regulated learning strategies.

Implications

The two implications presented here relate to how best to study self-regulated learning in a physical education setting. One goal of this study was to teach students self-regulated learning strategies and then provide them opportunities to use these strategies in a physical education setting. The hope was that the daily cognitive objectives and access to technology would allow students to explore physical education in new ways. However, the format of the lessons was a key limitation. The lessons were very structured and allowed little choice or control by the students due to the teachers’ use of a direct teaching style. The design of the lessons did not align with the underlying assumption of learning that promotes self-regulated learning by the students. The choice of strategies was designated by the researcher and even within the targeted strategies, students had little opportunity to develop the targeted self-regulated learning strategies. In order to promote self-regulated learning strategy use it may be necessary to choose teachers who have highly effective management systems and who also utilize a collaborative teaching style as compared to a direct or command teaching style.

A second implication involved the amount of information covered in the seven-week period. Students were presented with too many new stimuli for the short time period designated for the intervention. The students in the strategies instructional
condition were instructed on four self-regulated learning strategies (monitoring, seeking help, goal setting, and evaluation), how to use pedometers and heart rate monitors, and received daily instruction on physical activity concepts. Teaching students one of the strategies would have been sufficient. A possible ramification for presenting too much new information could have resulted in only surface level gains with regards to the improving middle school students’ self-regulated learning strategies used. Although, there was a lot of new information presented to the students, there were still positive strides made with regards to student learning of the physical activity content. Every class increased from pretest to posttest on the content knowledge test and the students also monitored their learning and learned to set realistic goals related to the pedometers.

Recommendations for Future Research

This study attempted to examine multiple self-regulated learning strategies in a physical education setting; therefore, three recommendations for future research will be discussed. These include: studying self-regulated learning strategies use by physical education students; gender differences regarding self-regulated learning strategies use; and the relationship between students motivational components (i.e. self-efficacy and task value) and self-regulated learning strategy use.

First, an extension of the present study to understand in more depth what strategies students’ use in a physical education setting is needed. Future research needs to include a rich, contextualized understanding of self-regulated learning strategy use in a physical education setting. This could be accomplished by probing students through semi-structured interviews regarding what, how, why and when they
used self-regulated learning strategies in physical education. These interviews should be aligned with observational data to connect the espoused and enacted views of middle school students.

Second, there is a need to explore differences between boys and girls help seeking in a physical education setting. Self-regulated learning strategy use differs by gender with boys using SRL more than girls within certain subjects (i.e. math, science) (Downe & McDougall, 1995; Newman & Schwager, 1995; Ryan & Pintrich, 1997). In the present study, differences were found between boys and girls help seeking behaviors with girls seeking more help from the teacher and peers than boys. Further research needs to focus on understanding specific differences between girls and boys help seeking behaviors in a physical education setting and the lessons for and implications of these differences for student learning.

Third, future research that focuses on motivational components such as task value and self-efficacy is needed. Motivational components and their relationship to self-regulated learning were not measured in this study however, motivational components have been shown to impact self-regulated learning strategy use (Zimmerman & Schunk, 1989). A student’s motivation can affect his/her effort to employ strategies. If students do not feel motivated to do so then they may not effectively engage in the strategies necessary to learn the task. Walling and Duda (1995), Duda (1996) and Treasure and Roberts (2001) have studied motivational climates and student perceptions regarding causes of success in a physical education setting. However, there is a lack of research on these issues in an urban physical education setting. Future research is needed to explore the relationship between
motivational components and self-regulated learning strategy use in a physical education setting.
REFERENCES


Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.


APPENDIX A

CONSENT FOR PARTICIPATION IN SOCIAL AND BEHAVIORAL RESEARCH

I consent to participating in the research entitled:

Developing Self-Regulated Learning Strategy Use With Middle School Physical Education Students

The purpose of the study, self-regulated learning strategies, and the teacher and student expectations that are required during the study have been explained to me. A description of the study's benefits has been explained.

If I have any questions or need additional information regarding the study, I am to ask and I will immediately be given the necessary information. I understand that I may withdraw or discontinue my participation in the study at any time. I understand that no prejudice will be shown or exhibited towards the students or me for doing so.

I have read and understand the consent form and willingly sign it. A copy has been given to me.

Date: ___________________________ Signed: ____________________________

(Principal)

Date: ___________________________ Signed: ____________________________

(Teacher)
## APPENDIX B

### COGNITIVE OBJECTIVES AND QUESTIONS

<table>
<thead>
<tr>
<th>Cognitive Objective</th>
<th>Questions to Students</th>
</tr>
</thead>
</table>
| Target Heart Rate Range | Why is important to know your target heart rate range?  
- So you’ll know if you’re working at the correct intensity while exercising.  
What do you think a rating of perceived exertion is?  
- Rating of Perceived Exertion, or called RPE, is a way to determine how hard you are working (intensity) by internally seeing how you feel. |
| Resting Heart Rate | What happens to your RHR as you begin to exercise?  
- Your heart rate will go up. It begins to beat faster to pump more blood and oxygen to your working muscles.  
What happens to your RHR as you continue to exercise regularly and strengthen your heart?  
- Your RHR will decrease. A stronger heart has to beat fewer times because with each beat it will be able to push more blood out to the working muscles. |
| Physically Fit and Warming-up | Why is being physically fit important?  
- You could potentially...1- have more energy 2- look better 3- feel better 4- have more confidence 5- be able to participate longer in activities  
What are some characteristics of a warm-up?  
- Rhythmic, continuous movements 2- large muscle involvement 3- low to moderate intensity  
What are some examples of low to moderate intensity?  
- walk to brisk walk to jog 2- side step to grapevine 3- walk to gallop to skip 4- low to moderate intensity sports movements  
Why is it important to warm-up?  
- 1- increases core body temperature 2- enhances muscle contraction 3- increases oxygen supply to muscles 4- helps to prevent injuries |
| Warm-Up and Cool Down from exercising | How long should your warm-up or cool down last?  
- It should last 5-10 minutes  
What are some physical signs that your body has warmed-up?  
- 1- You may have a light sweat on your brow or upper lip 2- your skin may feel warm to the touch 3- you should be breathing harder than normal 4- you should not be in your target heart rate range until the end of the warm-up |

You learned about Target heart rate zone a couple of days ago. When thinking in terms of heart rate, what heart rate do you think would indicate you have properly...
cooled down?

- Your heart rate should be 120 BPM or lower at the conclusion of your cool
down. If it is higher you should cool down more before stopping.

What can happen to your body if you don’t cool down enough?

- During high intensity workouts, your heart works very hard to supply the
working muscles in your arms and legs with blood and oxygen. If you stop
exercising without proper cool down, the blood can pool in the legs and can
cause you to feel light headed or can cause muscle soreness.

Cardiorespiratory Endurance

Cardio Workouts are very popular! (an example is Tae Bo or step aerobics) They
help to improve your cardiorespiratory endurance. What is cardiorespiratory
endurance?

- The ability of your heart and lungs to take in, transport, and deliver oxygen
to the working muscles.

Why do you think cardiorespiratory endurance is important?

- You’ll be able to participate longer in activities before tiring. You’ll feel
better, look better and have more energy.

In order for you to improve you cardiorespiratory endurance, what type of workout
should you do?

- Aerobic (cardiorespiratory) workouts such as walking, running, swimming
laps, biking, etc.

Aerobic Endurance

What does the term Aerobic mean?

- Aerobic means with oxygen. So in order to be aerobic, you would have to
do exercise and activities that require oxygen.

What are some examples of Aerobic activities?

- These are low to moderate intensity activities as biking, running,
swimming, dancing, step workouts, etc.

What are the energy sources for aerobic activities?

- Glucose (from carbohydrates) and fat (which requires oxygen in order to be
burned for energy in your body).

What are some physiological benefits of having good aerobic (cardiorespiratory)
fitness.

- 1- Increased stroke volume (more blood is pumped by the heart in one
beat.) 2- increased oxygen carrying capacity of red blood cells
(hemoglobin) 3- reduced heart rate (heart will contract fewer times per
minute) 4- improved recovery after exercise

What are some physical and other visible benefits of aerobic fitness?

- 1- improved appearance (less fat) 2- improved energy 3- improve self
confidence 4- improved concentration

Exercise Intensity

What does ‘exercise intensity’ mean?

- How hard your heart and/or muscles are working.

What intensity do you perform when participating in an aerobic activity?

- 60-80% or within your target heart rate range

To improve your aerobic endurance how many times should you exercise per week?

- 3 to 6 days per week

FITT Principle

What is the difference between frequency, intensity, time and type?

- Frequency = how often you workout
  Intensity = how hard you workout
  Time = how long you workout
  Type = the type of activity you do
<table>
<thead>
<tr>
<th><strong>Flexibility</strong></th>
<th><strong>Why is it important to be flexible?</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Less chance to become injured</td>
<td>(2) better performance in activities</td>
</tr>
<tr>
<td>(3) muscles will be looser</td>
<td>(4) less muscle soreness</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Muscular Endurance</strong></th>
<th><strong>What are the characteristics of a cardiorespiratory or aerobic workout?</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• I - continuous movement</td>
<td>2 - rhythmical movement</td>
</tr>
<tr>
<td>3 - large muscles in the body are involved</td>
<td>4 - working hard but not out of breath</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>What is muscular endurance important?</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• (1) you will be able to play longer before you get tired</td>
</tr>
<tr>
<td>(2) you will have more energy</td>
</tr>
<tr>
<td>(3) you can develop strong muscles</td>
</tr>
<tr>
<td>(4) you will have more confidence</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>How would you improve your muscular endurance?</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• You would exercise your muscles using a lot of repetitions with low weights.</td>
</tr>
<tr>
<td>(This means that you are not going to have bulky muscles.)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Muscular Strength</strong></th>
<th><strong>What does muscular strength mean?</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• when the muscles are working out to complete a maximum force against resistance</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Why is muscular strength important?</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• your will have strong muscles</td>
</tr>
<tr>
<td>(2) you will have an increase in metabolism</td>
</tr>
<tr>
<td>(3) you will have more energy when you play sports</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>How would you increase your muscular strength?</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• exercise your muscles using heavy weights with few repetitions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>What is progressive overload?</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• when you increase your exercise intensity?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Anaerobic</strong></th>
<th><strong>What does Anaerobic mean?</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Without oxygen</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>What are some examples of anaerobic exercise?</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• basketball, football, gymnastics, baseball, hockey</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>What are some characteristics of Anaerobic exercise?</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• explosive, high intensity exercise (intensity = how hard you are exercising.)</td>
</tr>
</tbody>
</table>
# APPENDIX C

## WARM-UP GAMES

<table>
<thead>
<tr>
<th>Warm-Up Game</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fitness Scramble</td>
<td>The students meet in their team area. Each team should be situated in an opposite corner of the instructional area with their Fitness Scramble Cards (These cards should be spread out and turned face down). Ask each team to begin by taking turns selecting a card (face down) and turning it over. If they turn over a letter, the next person on their team selects a new card to turn over. If they turn over card that has a task written on it, the entire team must do the task listed. The first team to turn over ALL of the game cards and put the letters in the correct order to spell the component of fitness should all raise their arms (like scoring a touchdown) indicating they have finished. The team should then perform two exercises that target the component of fitness they have just spelled out. If the day's cognitive objective is flexibility then the word should spell flexibility. (This game can also be accomplished as a review game when all of the components have been learned.)</td>
</tr>
<tr>
<td>Pass and Tag</td>
<td>Direct students to find a partner from their team. Each partner-team should then get a whiffle ball (or other lightweight ball) and begin slowly jogging (side by side) around the perimeter of the gymnasium while passing the ball back and forth to each other. When the music stops, whoever has the ball is &quot;it&quot; and should attempt tagging his/her partner with the ball. When the music resumes they are to begin jogging and passing the ball around the gymnasium to each other.</td>
</tr>
<tr>
<td>Quick Fit Game</td>
<td>Pass out game cards to students and instruct them to read the activity at the top of their card and act out that activity without making a sound. Explain that there are two students doing each activity. Their goal is to find the other person who is doing the same activity. (SRL group) Once they find their partner, they should get a piece of paper and read about what type of activity they were doing (aerobic or anaerobic)</td>
</tr>
<tr>
<td>Team Take Over</td>
<td>Have the teams form a line. Provide each team with a balloon. Each team should jog in a single file line around the perimeter of the gymnasium. The student at the front of each team's line will decide on any movement changes (slide, gallop, run, etc.) and pathway changes (zig-zag, curvy, straight, etc.) that the rest of the team must mirror. In addition to movement changes, the leader will tap (volley) a balloon to the person behind him or her, then that person tapes it to the next person in line, and so on until the balloon reaches the last person in line. The last person then holds the balloon and sprints to the front of the line. This person becomes the new leader, changes the movement/pathway, and taps the balloon to the next person behind him or her.</td>
</tr>
</tbody>
</table>
APPENDIX D

MAIN EVENT GAMES

<table>
<thead>
<tr>
<th>Game</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floor Hockey</td>
<td>Students will be on their teams and will be wearing a different color pinnie. Each team member will have a hockey stick. Each team will get two cones (to create their goal) and a puck. The objective is to score the most points.</td>
</tr>
<tr>
<td>Team Handball</td>
<td>Each team is assigned a goal to defend. The game begins when the whistle blows or the music starts. Each team is trying to score a goal in every other team’s goals. When they score a goal they get a token or flag from that team. Teams must score against all other teams before returning to the first team they scored against. The team that ends up with the most tokens or flags at the end of the playing session wins. (* This game can also be played with a soccer ball.)</td>
</tr>
<tr>
<td>Ultimate Frisbee</td>
<td>The objective is for a member of your team to catch the Frisbee across the goal line. Once a player catches the Frisbee they must stop where they are. If a player drops the Frisbee, then the other team gains possession. After a team scores, the team that did not score must walk to the opposite end and wait for a throw off.</td>
</tr>
</tbody>
</table>

*This game can also be played with a soccer ball.*
### APPENDIX E

**BLOCK PLAN: STRATEGIES INSTRUCTIONAL CONDITION**

Buffalo and Highland Belle Middle School

<table>
<thead>
<tr>
<th>Week 1*</th>
<th>Session 1</th>
<th>Session 2</th>
<th>Session 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 2</td>
<td>PACT Test and learn about HRMs</td>
<td>LSPEQ and Review HRMs</td>
<td>Monitor with HRMs CO: Begin Monitoring Heart with HRMs. ME: Ultimate Frisbee</td>
</tr>
<tr>
<td>Week 3</td>
<td>Review HRMs CO: Heart and exercise</td>
<td>Monitor with HRMs</td>
<td>Monitor with HRMs CO: Warm up and cool down after exercise ME: Ultimate Frisbee</td>
</tr>
<tr>
<td>Week 4</td>
<td>Monitor with HRMs CO: Aerobic</td>
<td>Monitor with HRMs CO: Exercise Intensity</td>
<td>Monitor with HRMs CO: Flexibility ME: Team Handball</td>
</tr>
<tr>
<td>Week 5*</td>
<td>GS with Pedometers CO: Aerobic</td>
<td>GS with Pedometers CO: Stretching</td>
<td>GS with Pedometers CO: Muscular Strength ME: Team Handball</td>
</tr>
<tr>
<td>Week 8</td>
<td>GS with Pedometers CO: Review day for all cognitive concepts</td>
<td>Post PACT</td>
<td>Post LSPEQ</td>
</tr>
</tbody>
</table>

* = only two physical education lessons during this week.; PACT = Physical Activity Content Test; LSPEQ = Learning Strategies in Physical Education Questionnaire; GS = Goal Setting; CO = Cognitive objective for the lesson; ME = Main event regarding the activity for the lesson.
## APPENDIX F

### BLOCK PLAN: STRATEGIES INSTRUCTIONAL CONDITION

Maury River Middle School

<table>
<thead>
<tr>
<th>Session 1</th>
<th>Session 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Week 1</strong></td>
<td>PACT Test and learn about HRMs</td>
</tr>
<tr>
<td><strong>Week 2</strong></td>
<td>Review HRMs</td>
</tr>
<tr>
<td>CO: Heart and exercise</td>
<td>CO: RHR</td>
</tr>
<tr>
<td>ME: Ultimate Frisbee</td>
<td>ME: Ultimate Frisbee</td>
</tr>
<tr>
<td><strong>Week 3</strong></td>
<td>Monitor with HRMs</td>
</tr>
<tr>
<td>CO: warming up and being physically fit</td>
<td>CO: warming up and cooling down after exercise</td>
</tr>
<tr>
<td>ME: Ultimate Frisbee</td>
<td>ME: Ultimate Frisbee</td>
</tr>
<tr>
<td><strong>Week 4</strong></td>
<td>Monitor with HRMs</td>
</tr>
<tr>
<td>CO: Cardiorespiratory Endurance</td>
<td>CO: Aerobic</td>
</tr>
<tr>
<td>ME: Ultimate Frisbee</td>
<td>ME: Ultimate Frisbee</td>
</tr>
<tr>
<td><strong>Week 5</strong></td>
<td>Monitor with HRMs</td>
</tr>
<tr>
<td>CO: Exercise Intensity/FITT Principle</td>
<td>CO: Flexibility</td>
</tr>
<tr>
<td>ME: Team Handball</td>
<td>ME: Team Handball</td>
</tr>
<tr>
<td><strong>Week 6</strong></td>
<td>GS with Pedometers</td>
</tr>
<tr>
<td>CO: Stretching</td>
<td>CO: Muscular Endurance</td>
</tr>
<tr>
<td>ME: Team Handball</td>
<td>ME: Team Handball</td>
</tr>
<tr>
<td><strong>Week 7</strong></td>
<td>GS with Pedometers</td>
</tr>
<tr>
<td>CO: Muscular Strength</td>
<td>CO: Anaerobic</td>
</tr>
<tr>
<td>ME: Team Handball</td>
<td>ME: Team Handball</td>
</tr>
<tr>
<td><strong>Week 8</strong></td>
<td>GS with Pedometers</td>
</tr>
<tr>
<td>CO: Review day for all cognitive concepts</td>
<td></td>
</tr>
<tr>
<td>ME: Team Handball</td>
<td></td>
</tr>
<tr>
<td><strong>Week 9</strong></td>
<td>Post LSPEQ</td>
</tr>
</tbody>
</table>

(Note: PACT = Physical Activity Content Test; LSPEQ = Learning Strategies in Physical Education Questionnaire; CO = Cognitive objective for the lesson; ME = Main event regarding the activity for the lesson; GS = Goal Setting)
APPENDIX G

STRATEGIES INSTRUCTIONAL CONDITION

Equipment needed:
- Frisbees
- Whiffle ball or some other type of small ball (one for every two students)
- 12 cones (use for sidelines for ultimate Frisbee courts)
- Radio and tape to play during pass and tag
- HRMs and student check out sheet
- Student HRM sheet
- Student monitoring sheet

*Students will be recording their Heart Rate four times each day.
* Periodically, prompt students if they understand or have any questions. You can ask questions of the students throughout the class to check for their understanding.
*Students will be filing out a monitoring sheet each day.
<table>
<thead>
<tr>
<th>Time</th>
<th>Lesson Focus</th>
<th>Instructional Sequence</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 to 6 minutes</td>
<td>Introduction</td>
<td>Review where to check their heart beat. (remind them that the artery is the carotid artery). HRM students check their heart beat with the watch. <strong>Student record HR</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Cognitive Objective</strong> To learn why it is important to be physically fit! To learn why it is important to warm-up!</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Q1: Why is being physically fit important? A: your can...1 - have more energy 2 - look better 3 - feel better 4 - have more confidence 5 - be able to participate longer in activities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Q2: What are some characteristics (or examples) of a warm-up? A: 1 - Movements with a rhythm 2 - continuous (non-stop) movements 3 - large muscle involvement 3 - low to moderate intensity (how hard you are exercising)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Q3: What are some examples of low to moderate intensity? A: 1 - walk to brisk walk to jog 2 - side step to grapevine 3 - walk to gallop to skip 4 - low to moderate intensity sports movements</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Q4: Why is it important to warm-up? A: 1 - increases core body temperature 2 - improves muscle contraction 3 - increases oxygen supply to muscles 4 - helps to prevent injuries</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Prompt students to ask questions if they do not understand. (Refer to chart.)</strong></td>
</tr>
<tr>
<td>2 mins</td>
<td>Safety</td>
<td>Be aware of where your classmates are during the pass and tag activity. Do not bend transmitter on watches</td>
</tr>
<tr>
<td>8 mins</td>
<td>Warm-Up Game</td>
<td>Pass and Tag <strong>Student Record HR at conclusion of pass and tag</strong></td>
</tr>
<tr>
<td>16 to 18 mins</td>
<td>Main Event</td>
<td>Ultimate Frisbee <strong>Student Record HR during Main event</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Student Record HR at conclusion of main event</strong></td>
</tr>
<tr>
<td>7 to 8 mins</td>
<td>Cool Down and Review</td>
<td>What are some characteristics of a warm-up? What is an example of a warm-up? Why should you warm-up? <strong>Student Monitoring</strong> While you are providing a review, students will be filing out the monitoring sheet</td>
</tr>
</tbody>
</table>

160

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
APPENDIX H

GOAL SETTING SHEET
NAME _________________________

<table>
<thead>
<tr>
<th>Your Goal for Today</th>
<th>Did you reach your goal?</th>
<th>Why or Why did you not reach your goal?</th>
<th>What did you learn today?</th>
<th>Pedometer Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>I want to learn what flexibility means.</td>
<td>Yes No</td>
<td>I was not listening when the teacher was talking about what flexibility meant!</td>
<td>I learned about warm-up and what aerobic means.</td>
<td>2450</td>
</tr>
<tr>
<td>Yes No</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes No</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes No</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes No</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes No</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes No</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 1**</td>
<td>Session 1</td>
<td>Session 2</td>
<td>Session 3</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
<td></td>
</tr>
<tr>
<td>PACT Test and learn about HRMs*</td>
<td>LSPEQ and Review HRMs*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Review HRMs*</td>
<td>Use HRMs*</td>
<td>Use HRMs*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO: Heart and exercise</td>
<td>CO: RHR</td>
<td>CO: Review Heart and RHR and exercise</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use HRMs*</td>
<td>Use HRMs*</td>
<td>Use HRMs*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO: warming up and being physically fit</td>
<td>CO = Warm up and cool down after exercise</td>
<td>CO = Cardiorespiratory Endurance ME = Ultimate Frisbee</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use HRMs*</td>
<td>Use HRMs*</td>
<td>Use HRMs*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO = Aerobic</td>
<td>CO = Exercise Intensity</td>
<td>CO = FITT principle ME = Ultimate Frisbee</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ME: Team Handball</td>
<td>ME: Team Handball</td>
<td>ME: Team Handball</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use Pedometers*</td>
<td>Use Pedometers*</td>
<td>Use Pedometers*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO = Flexibility</td>
<td>CO = Stretching</td>
<td>CO = Muscular Strength</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ME = Team Handball</td>
<td>ME = Team Handball</td>
<td>ME = Cardio Circuit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use Pedometers*</td>
<td>Use Pedometers*</td>
<td>Use Pedometers*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO = Muscular Endurance</td>
<td>CO = Review of Muscular Endurance</td>
<td>CO = Review of Anaerobic ME = Floor Hockey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ME = Team Handball</td>
<td>ME = Team Handball</td>
<td>ME = Floor Hockey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use Pedometers*</td>
<td>Use Pedometers*</td>
<td>Use Pedometers*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO = Review of Muscular Strength</td>
<td>CO = Anaerobic</td>
<td>CO = Review of Anaerobic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ME = Floor Hockey</td>
<td>ME = Floor Hockey</td>
<td>ME = Floor Hockey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use Pedometers*</td>
<td>Post PACT</td>
<td>Post LSPEQ</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO = Review day for all cognitive concepts</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ME = Floor Hockey</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX J

BLOCK PLAN: TECHNOLOGY AND CURRICULUM INSTRUCTIONAL CONDITION

Maury River Middle School

<table>
<thead>
<tr>
<th>Session 1</th>
<th>Session 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Week 1</strong></td>
<td><strong>Week 1</strong></td>
</tr>
<tr>
<td>PACT Test and learn about HRMs*</td>
<td>LSPEQ and Review HRMs*</td>
</tr>
<tr>
<td><strong>Week 2</strong></td>
<td><strong>Week 2</strong></td>
</tr>
<tr>
<td>Review HRMs*</td>
<td>Use HRMs*</td>
</tr>
<tr>
<td>CO: Heart and exercise</td>
<td>CO: RHR</td>
</tr>
<tr>
<td>ME: Ultimate Frisbee</td>
<td>ME: Ultimate Frisbee</td>
</tr>
<tr>
<td><strong>Week 3</strong></td>
<td><strong>Week 3</strong></td>
</tr>
<tr>
<td>Use HRMs*</td>
<td>Use HRMs*</td>
</tr>
<tr>
<td>CO: warming up and being physically fit</td>
<td>CO = Warming up and cooling down after exercise</td>
</tr>
<tr>
<td>ME: Ultimate Frisbee</td>
<td>ME: Ultimate Frisbee</td>
</tr>
<tr>
<td><strong>Week 4</strong></td>
<td><strong>Week 4</strong></td>
</tr>
<tr>
<td>Use HRMs*</td>
<td>Use HRMs*</td>
</tr>
<tr>
<td>CO = Cardiorespiratory Endurance</td>
<td>CO = Aerobic</td>
</tr>
<tr>
<td>ME: Ultimate Frisbee</td>
<td>ME: Ultimate Frisbee</td>
</tr>
<tr>
<td><strong>Week 5</strong></td>
<td><strong>Week 5</strong></td>
</tr>
<tr>
<td>Use HRMs*</td>
<td>Learn how to use Pedometers*</td>
</tr>
<tr>
<td>CO = Exercise Intensity/FITT Principle</td>
<td>CO = Flexibility</td>
</tr>
<tr>
<td>ME = Team Handball</td>
<td>ME = Team Handball</td>
</tr>
<tr>
<td><strong>Week 6</strong></td>
<td><strong>Week 6</strong></td>
</tr>
<tr>
<td>Use Pedometers*</td>
<td>Use Pedometers*</td>
</tr>
<tr>
<td>CO = Stretching</td>
<td>CO = Muscular Endurance</td>
</tr>
<tr>
<td>ME = Team Handball</td>
<td>ME = Team Handball</td>
</tr>
<tr>
<td><strong>Week 7</strong></td>
<td><strong>Week 7</strong></td>
</tr>
<tr>
<td>Use Pedometers*</td>
<td>Use Pedometers*</td>
</tr>
<tr>
<td>CO = Muscular Strength</td>
<td>CO = Anaerobic</td>
</tr>
<tr>
<td>ME = Team Handball</td>
<td>ME = Team Handball</td>
</tr>
<tr>
<td><strong>Week 8</strong></td>
<td><strong>Week 8</strong></td>
</tr>
<tr>
<td>Use Pedometers*</td>
<td>Post PACT</td>
</tr>
<tr>
<td>CO = Review day for all cognitive concepts</td>
<td></td>
</tr>
<tr>
<td>ME = Team Handball</td>
<td></td>
</tr>
<tr>
<td><strong>Week 9</strong></td>
<td><strong>Week 9</strong></td>
</tr>
<tr>
<td>Post LSPEQ</td>
<td></td>
</tr>
</tbody>
</table>

(Note: * = only with the Technology Instructional Condition; PACT = Physical Activity Content Test; LSPEQ = Learning Strategies in Physical Education Questionnaire; CO = Cognitive objective for the lesson; ME = Main event regarding the activity for the lesson)

164

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
APPENDIX K

TECHNOLOGY INSTRUCTIONAL CONDITION

Equipment needed:
- Frisbees
- Whiffle ball or some other type of small ball (one for every two students)
- 12 cones (use for sidelines for ultimate Frisbee courts)
- Radio and tape to play during pass and tag
- HRMs and student checkout sheet

<table>
<thead>
<tr>
<th>Time</th>
<th>Lesson Focus</th>
<th>Instructional Sequence</th>
</tr>
</thead>
</table>
| 3 to 5 minutes | Introduction | Today we will be learning about your heart. We will play two games that will cause your heart beat to go up and down. Show students how to use HRMs
- What strap, transmitter, and watch are
- Adjusting strap to fit each student
- How to put transmitter with strap
- How to wear watch
- Begin with time displayed on watch
- Push red button once at the beginning of class
- Turning sound off
- If heart beat not reading in watch (wet sensors) |

Cognitive Objective
Understanding your heart!!
1. Where would you go to measure your heart rate?
   - At your carotid or radial artery with your finger not your thumb (has a pulse)
2. What happens to your RHR as you begin to exercise?
   - Your heart rate will go up. It begins to beat faster to pump more blood and oxygen to your working muscles.
3. What happens to your RHR as you continue to exercise regularly and strengthen your heart?
   - Your RHR will decrease. A stronger heart has to beat fewer times because with each beat it will be able to push more blood out to the working muscles.
4. Would your heart beat faster during the 100 meter dash or jogging a 4-minute run? Why?
   - Your heart would beat faster after completing the 100 meter dash because you are having to get more blood to your muscles at a faster rate than after jogging for 4 minutes continuously.

<table>
<thead>
<tr>
<th>Time</th>
<th>Lesson Focus</th>
<th>Instructional Sequence</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 mins</td>
<td>Safety</td>
<td>During the activity be aware of where your classmates are.</td>
</tr>
<tr>
<td>20 to 25</td>
<td>Main Event</td>
<td>Ultimate Frisbee</td>
</tr>
</tbody>
</table>
| 5 to 7 mins| Cool Down and Review | 1. Where do you measure your heart beat?
2. What happens to your resting heart rate when you begin to exercise? |
APPENDIX L

Curriculum Instructional Condition

Equipment needed:
- Frisbees
- Whiffle ball or some other type of small ball (one for every two students)
- 12 cones (use for sidelines for ultimate Frisbee courts)
- Radio and tape to play during pass and tag

<table>
<thead>
<tr>
<th>Time</th>
<th>Lesson Focus</th>
<th>Instructional Sequence</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 to 5 minutes</td>
<td>Introduction</td>
<td>Today we will be learning about your heart. We will play two games that will cause your heart beat to go up and down.</td>
</tr>
<tr>
<td></td>
<td>Cognitive Objective</td>
<td>Understanding your heart!!</td>
</tr>
<tr>
<td></td>
<td>1. Where would you go to measure your heart rate?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- At your carotid or radial artery with your finger not your thumb (has a pulse)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. What happens to your RHR as you begin to exercise?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Your heart rate will go up. It begins to beat faster to pump more blood and oxygen to your working muscles.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. What happens to your RHR as you continue to exercise regularly and strengthen your heart?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Your RHR will decrease. A stronger heart has to beat fewer times because with each beat it will be able to push more blood out to the working muscles.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Would your heart beat faster during the 100 meter dash or jogging a 4-minute run? Why?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Your heart would beat faster after completing the 100 meter dash because you are having to get more blood to your muscles at a faster rate than after jogging for 4 minutes continuously.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Lesson Focus</th>
<th>Instructional Sequence</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 mins</td>
<td>Safety</td>
<td>During the activity be aware of where your classmates are.</td>
</tr>
<tr>
<td>10 mins</td>
<td>Warm-Up Game</td>
<td>Pass and Tag</td>
</tr>
<tr>
<td>20 to 25 mins</td>
<td>Main Event</td>
<td>Ultimate Frisbee</td>
</tr>
<tr>
<td>5 to 7 mins</td>
<td>Cool Down and Review</td>
<td>1. Where do you measure your heart beat? 2. What happens to your resting heart rate when you begin to exercise?</td>
</tr>
</tbody>
</table>
## APPENDIX M

### TEACHER TRAINING 1

**When:** January 14  
**How long:** 3 ½ hours

<table>
<thead>
<tr>
<th>Focus of Training</th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| * For physical education teachers to understand the basics of the Innovative Fitness Connections Curriculum (IFCC).  
* For physical education teachers to understand and demonstrate how to use heart rate monitors. |

| Task to be Accomplished during Training | 1. | Review first three weeks scope and sequence for Innovative Fitness Connections Curriculum  
2. Teach how to use Heart Rate Monitors with middle school students. |

| Training Outcome | 1. | Each teacher will have the first three weeks of the IFCC  
2. Each teacher will have a step-by-step guide on how to use heart rate monitors with their students. |
### APPENDIX N

#### TEACHER TRAINING 2

**When:** January 21  
**How long:** 3 hours

| Focus of Training | Review with the teachers the basics of the Innovative Fitness Connections Curriculum (IFCC).  
|                  | For physical education to understand how to teach seeking help and monitor to students. |
| Task to be Accomplished during Training | 1. Six weeks of lessons adapted from the Innovative Fitness Connections Curriculum will be taught and aligned with the goal setting.  
|                  | 2. Creating a final version for first three weeks. |
| Training Outcome | 1. At the conclusion of the training each teacher will have three weeks of lessons from the Innovative Fitness Connections Curriculum (scope and sequence).  
|                  | 2. Each teacher will know how to assist students to seek help and monitor. |
**APPENDIX O**

**TEACHER TRAINING 3**

When: February 18  
How long: 3 hours

<table>
<thead>
<tr>
<th>Focus of Training</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• For physical education teachers to understand goal setting and self-evaluation</td>
<td>For physical education teachers to understand goal setting</td>
</tr>
<tr>
<td>and how it is to be taught to middle school students.</td>
<td>and self-evaluation and how it is to be taught to middle</td>
</tr>
<tr>
<td>• For physical education teachers to understand and demonstrate how to use</td>
<td>school students.</td>
</tr>
<tr>
<td>pedometers.</td>
<td>For physical education teachers to understand and demonstrate</td>
</tr>
<tr>
<td>• Understand the final three weeks of the Innovative Fitness Connections Curriculum</td>
<td>how to use pedometers.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Task to be Accomplished during Training</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Review final three weeks of IFCC scope and sequence</td>
<td>2. Align IFCC lessons with goal-setting, self-evaluation, and</td>
</tr>
<tr>
<td>2. Align IFCC lessons with goal-setting, self-evaluation, and pedometers</td>
<td>pedometers.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Training Outcome</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Each teacher will know the scope and sequence for the final three weeks of</td>
<td>4. Each teacher will know how to use pedometers.</td>
</tr>
<tr>
<td>lessons from the Innovative Fitness Connections Curriculum.</td>
<td>5. Each teacher will know how to teach goal setting and</td>
</tr>
<tr>
<td>4. Each teacher will know how to use pedometers.</td>
<td>self-evaluation to their students.</td>
</tr>
<tr>
<td>5. Each teacher will know how to teach goal setting and self-evaluation to their</td>
<td></td>
</tr>
<tr>
<td>students.</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX P

LEARNING STRATEGIES IN PHYSICAL EDUCATION QUESTIONNAIRE
The following items are your BELIEFS about your Physical Education teachers teaching in the gymnasium. For each of the following items, please CIRCLE the response that best reflects what you think about that statement (VSA) Very Strongly Agree, (SA) Strongly Agree, (A) Agree, (D) Disagree, (SD) Strongly Disagree, (VSD) Very Strongly Disagree

<table>
<thead>
<tr>
<th>Item</th>
<th>VSA</th>
<th>SA</th>
<th>A</th>
<th>D</th>
<th>SD</th>
<th>VSD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. My teacher has a sense of humor.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2. My teacher encourages students to ask questions in this class.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>3. My teacher encourages student participation in physical education class.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>4. My teacher interacts with students in this class.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>5. My teacher takes an interest in me as a student.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>6. My teacher cares about how I do in this class.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7. My teacher cares about whether I learn what is being taught.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>8. My teacher praises students' when they work hard in this class.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>
This next part of this questionnaire looks at the BELIEFS you may have about yourself while participating in PHYSICAL EDUCATION CLASS. Please CIRCLE one of the following responses to best show what you think about the statement from (VSA) Very Strongly Agree, (SA) Strongly Agree, (A) Agree, (D) Disagree, (SD) Strongly Disagree, (VSD) Very Strongly Disagree

<table>
<thead>
<tr>
<th>Question</th>
<th>Very Strongly Agree</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Very Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. I expect to get good grades in Physical Education class.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. I can perform the skills the teacher asks in Physical Education class.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. My performance in Physical Education class will depend upon how much effort I put forth.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. I have some control over how well I do during Physical Education activities.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. I am able to perform the skills taught in Physical Education class.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. The grades I get in Physical Education class depend on how hard the teacher grades, not how hard I work.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. I know I can get good grades in Physical Education class if I work hard.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. My performance in Physical Education class depends on how well the teacher likes me.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. I can learn the skills taught in my Physical Education class.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. Getting a good grade in Physical Education class depends more on being naturally skilled than on how hard I work.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The following items look at the IMPORTANCE and INTEREST in the skills for PHYSICAL EDUCATION CLASS. Please CIRCLE one of the following responses to best shows what you think about the statement from (VSA) Very Strongly Agree, (SA) Strongly Agree, (A) Agree, (D) Disagree, (SD) Strongly Disagree, (VSD) Very Strongly Disagree.

<table>
<thead>
<tr>
<th></th>
<th>Very Strongly Agree</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Very Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>19. I like what I am learning in Physical Education classes.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>20. I feel I've succeeded when I keep busy in Physical Education class.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>21. I participate in Physical Education class because I want to get better at it.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>22. I worry about what other students might think if I ask a question in Physical Education.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>23. Even if I am having trouble learning a skill, I will not ask for help.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>24. When I perform a skill wrong in class I am most concerned about what my classmates think about me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>25. The skills taught in Physical Education class are interesting.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

173

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
The following items looks at the IMPORTANCE and INTEREST in the skills for PHYSICAL EDUCATION CLASS. Please CIRCLE one of the following responses to best shows what you think about the statement from (VSA) Very Strongly Agree, (SA) Strongly Agree, (A) Agree, (D) Disagree, (SD) Strongly Disagree, (VSD) Very Strongly Disagree).

<table>
<thead>
<tr>
<th>Statement</th>
<th>VSA</th>
<th>SA</th>
<th>A</th>
<th>D</th>
<th>SD</th>
<th>VSD</th>
</tr>
</thead>
<tbody>
<tr>
<td>26. I feel most successful in Physical Education class when I learn something I did not know before.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>27. The main reason I participate in Physical Education class is because we get graded.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>28. One of my main goals is to avoid looking like I can not do activities in physical education class.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>29. It is important for me to learn what is being taught in Physical Education.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>30. I like to show my classmates that I am highly skilled.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>31. I believe my classmates are more impressed with me, if I can do the skill without asking for help.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>32. I feel I've succeeded when I do the skill better than other students.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>33. Physical Education is interesting to me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>
The following items look at the IMPORTANCE and INTEREST in the skills for PHYSICAL EDUCATION CLASS. Please CIRCLE one of the following responses to best show what you think about the statement from (VSA) Very Strongly Agree, (SA) Strongly Agree, (A) Agree, (D) Disagree, (SD) Strongly Disagree, (VSD) Very Strongly Disagree).

34. I feel I've succeeded when I learn something interesting in Physical Education.

35. Other students in my class might think I am dumb if I ask a question in Physical Education.

36. The skills taught in Physical Education class are important to learn.

37. I participate in Physical Education class because I like to learn new skills.

38. The reason I participate in physical education class is so my teachers will not think I am less skilled than my classmates.

39. I participate in Physical Education class because it is required, not because I want to.

40. I'd like to show my teachers I'm more skilled than my classmates.

41. I always try to do skills better than other students in my Physical Education class.
<table>
<thead>
<tr>
<th>Question</th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>42. I work with other students to understand class material better.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>43. I practice Physical Education skills even when we are not in class.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>44. I ask the teacher for help when I am struggling with a difficult skill.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>45. I set goals for myself that I intend to achieve for each Physical Education skill.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>46. I do not ask for help in Physical Education, even if the skill is too hard to perform on my own.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>47. Even when Physical Education activities are boring, I work until I can do the task well.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>48. I ask questions in class to make sure I understand how to perform a Physical Education activity.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>49. During Physical Education class, I set goals for myself that I intend to achieve.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>50. Even if I need help performing a skill, I will not ask for help.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
How Often Do You Use This Strategy?

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>51. Even when Physical Education</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>activities are boring, I work until I can completely do them.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>52. I ask another student for help when I am struggling with difficult skill.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>53. I aim to earn a good grade on each Physical Education skill.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

54. Your Age: ________________

55. Your Gender (Please Circle One)
   A. Male
   B. Female

56. Your Race: (Please Circle One)
   A. African American
   B. Caucasian
   C. Hispanic
   D. Asian
   E. Native American
   F. Other ________________

©THANK YOU© for completing this Questionnaire

NAME ____________________________________________

177
APPENDIX Q

First Interview Questions
1. My favorite activity in physical education class is ___________________
   Because:

2. My favorite activity to do at home with my friends is ___________________
   Because:

3. My favorite thing to do by myself is ___________________
   Because:

4. Do you get help from a teacher when you do not understand something?
   No    Sometimes    Yes

5. Do you get help from another student when you do not understand something?
   No    Sometimes    Yes

6. Do you ask questions in PE class when you do not understand how to do a skill?
   No    Sometimes    Yes

7. Do you ask a question when you do not understand a word the teacher is saying?
   No    Sometimes    Yes

8. Do you write down information about your heart rate during PE class?
   No    Sometimes    Yes

9. Do you write down information about your activity in class?
   No    Sometimes    Yes

10. How do you feel about wearing heart rate monitors?
    😞    😊    ☹️

11. How do you feel about writing down information during PE class?
    ☹️    😊    ☹️
APPENDIX R

SECOND INTERVIEW QUESTIONS
2nd Student Interview Questions

Interest in PE
1. Do you like PE class? (What do you like? What do you not like?)
2. Do you find PE class interesting? Why?
3. Do you think it is important to learn skill in PE? Why?

Learning in PE
4. What do you have to do to learn something?
5. What do you do to help you learn something in physical education?
6. What can your PE teacher do to help you learn?
7. Are grades in PE important to you?
8. What have you learned in the past couple of weeks?

Help Seeking
9. Do you ask questions in class? Why or why not?
10. Who do you ask questions of? The teacher, female or male student?
11. Are you afraid of looking dumb if you ask a question in PE class?
12. Do you worry about what other students might think if you ask a question in PE class?
13. Are you afraid of asking for help from the teacher after she has already explained how to do the skill? Why or why not?

Self-Efficacy
14. In PE class do you believe you can do the skills the teachers asks? Can you give an example?
15. In PE class do you believe that you can learn the material the teachers are asking?
16. Do you worry about how well you are doing in physical education class?

Goal Setting
17. What goals have you set for PE? Why have you chosen these goals?
18. How can you tell if you have reached your goal?
19. Why do you think the teacher is asking you set goals?

Pedometers
20. How do you feel about wearing the pedometers?
21. Why do look at your pedometer?
APPENDIX S

SELF-REGULATED LEARNING OBSERVATION INSTRUMENT

182
<table>
<thead>
<tr>
<th>Teacher: ___________________________</th>
<th>Date: ___________________</th>
<th>School: _____________</th>
<th>Length of Observation: ________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Started: _____________________</td>
<td>Time Ended: ______________</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Procedural Reliability</th>
<th>Teacher Questioning</th>
<th>Teacher Prompts</th>
<th>Seeking Help Teacher S1</th>
<th>Seeking Help from Student S1</th>
<th>Student Mon w/Tech S1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduction</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Question 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Question 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Question 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Question 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Warm-Up</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Main Event</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Closure</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Question #1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Question #2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX T

PHYSICAL ACTIVITY CONTENT TEST
**Physical Activity Content Test**

1. Which of the following is NOT a part of health-related fitness?
   a. Cardiorespiratory endurance
   b. Muscular endurance
   c. Muscular strength
   d. Dieting
   e. Body composition

2. The term ‘Aerobic’ mean:
   a. Without oxygen
   b. With oxygen
   c. Use of small muscle groups
   d. Long periods of rest between body movements

3. Which of the following is NOT a characteristic of an Aerobic workout?
   a. Large muscles involved
   b. Continuous, non-stop exercise
   c. Movements that have a rhythm
   d. High intensity exercise

4. What happens to your Resting Heart Rate as you begin to exercise
   a. Your heart rate goes down
   b. Your heart rate stays the same
   c. Your heart stops beating
   d. Your heart rate goes up

5. What artery would you use to measure your heart beat?
   a. The carotid artery
   b. The brachial artery
   c. The femoral artery
   d. The aorta
   e. B and D

6. Why is being physically fit important?
   a. Have more energy
   b. Look better
   c. Feel better
   d. Have more confidence
   e. All the above
7. What is NOT a characteristic of a Warm-Up?
   a. Movements with a rhythm
   b. Continuous movements
   c. High intensity exercises
   d. Using large muscles
   e. None of the above

8. Why is it important to Warm-Up?
   a. Decreases core body temperature
   b. Helps to prevent injury
   c. Decreases oxygen supply to the blood
   d. Decreases muscle contraction
   e. None of the above

9. What are signs that your body has Warmed-Up?
   a. You have a slight sweat on your head or upper lip
   b. Your skin may feel warm to the touch
   c. Your breathing slows down
   d. A and B
   e. A and C

10. Cardiorespiratory (or Aerobic) endurance means:
    a. The ability of the heart and lungs to take in, carry, and use oxygen.
    b. An increase in resting heart rate.
    c. A decrease in one's stroke volume.
    d. A weak heart muscle.

11. Aerobic activities include:
    a. Sports like basketball, football, and gymnastics.
    b. Activities like biking, swimming, and jogging.
    c. Weight training.
    d. Sports like volleyball and bowling
    e. All the above

12. Why do you think Cardiorespiratory endurance is important?
    a. You will be able to play a sport for a longer period of time
    b. You will have more energy
    c. You will look better
    d. All of the Above
13. What are the benefits of having good Cardiorespiratory (or Aerobic) Fitness?
   a. increased oxygen in red blood cells
   b. increased resting heart rate
   c. faster recovery time after exercise
   d. A and B
   e. A and C

14. What does exercise intensity mean?
   a. How easy your muscles are working!
   b. How hard your muscles are working!
   c. The amount of exercise you are doing!
   d. The speed at which your muscles are working!
   e. None of the above

15. To improve your Aerobic endurance how many days per week should you exercise?
   a. 3 to 6 days per week
   b. 2 to 3 days per week
   c. 1 to 2 days per week
   d. Less than one day per week

16. The Frequency of your exercise is
   a. How long you exercise!
   b. What type of exercise you are doing!
   c. How hard you are exercising!
   d. How often you are exercising!
   e. None of the Above

17. To improve your Aerobic endurance, how long should you perform an activity?
   a. Less than one minute
   b. 1 to 5 minutes
   c. 5 to 10 minutes
   d. 10 to 15 minutes
   e. 30 to 60 minutes

18. If you are flexible, your muscles and joints will have
   a. A small range motion
   b. A large range of motion
   c. Trouble stretching very far
   d. All of the above
   e. None of the above
19. Why is it important to be flexible?
   a. Less chance to become injured
   b. Better performance in activities
   c. Muscles will be looser
   d. Less muscle soreness
   e. All the above

20. Which of the following should you do to stretch safely?
   a. Stretch cold muscles
   b. Stretch warm muscles
   c. Stretch really fast and hold the stretches for 1 to 2 seconds
   d. Stretch with bouncing or jerky stretching motions
   e. Stretch to the point of pain

21. What does muscular endurance mean?
   a. When a muscle or muscle group can work for a period of time
   b. When a muscle or muscle group is completing a one rep maximum
   c. When the muscles are working for a maximum force against resistance
   d. None of the above

22. Why is muscular endurance important?
   a. You will be able to play longer before you get tired
   b. You will have more energy
   c. You can develop strong muscles
   d. You will have more confidence
   e. All of the above

23. If you wanted to improve your muscular endurance, you would
   a. Exercise your muscles for a short period of time
   b. Exercise your muscles with heavy resistance
   c. Exercise your muscles using a lot of repetitions with low weights
   d. Exercise your muscles using few repetitions with heavy weights
   e. None of the above

24. What does muscular strength mean?
   a. When a muscle or muscle group can work for a long period of time.
   b. When a muscle or muscle group is completing a submaximal exercise
   c. When the muscles are working is completing a maximum force against resistance
   d. None of the above
25. Which one is NOT why muscular strength is important?
   a. You will have stronger muscles
   b. You will have an increase in metabolism
   c. You will have smaller and less defined muscles
   d. You will have more energy when playing sports

26. If you want to increase your muscular strength, you would
   a. Exercise your muscles for a long period of time
   b. Exercise your muscles with light resistance using weights
   c. Exercise your muscles using many repetitions
   d. Exercise your muscles using heavy weights with few repetitions
   e. None of the above

27. What is progressive overload?
   a. When you gradually decrease in exercise intensity
   b. When you decrease the time you are exercising
   c. When you gradually increase the exercise intensity
   d. When you decrease the frequency of your workouts
   e. None of the above

28. What does Anaerobic mean?
   a. Without oxygen
   b. With oxygen
   c. Use small muscle groups
   d. Low intensity activities
   e. None of the above

29. Anaerobic Activities include
   a. Sports like basketball, football, and gymnastics.
   b. Activities like biking and swimming
   c. A Tae Bo class
   d. Sports like running and in-line skating
   e. All the above

30. Which of the following is a characteristic of an Anaerobic workout?
   a. Low intensity activities
   b. Continuous, non-stop exercise
   c. Movements with rhythm
   d. Explosive, High intensity activities
APPENDIX U

Data Collection Methods Linked to Research Questions


### Linking Research Questions to Methodology

**Purpose:** The purpose of this study was to understand the uses and perceptions of urban middle school physical education students' self-regulated learning strategies used.

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Data Collection</th>
<th>Data Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To what extent did middle school physical education students’ self-regulated learning scores differ by instructional condition (i.e. strategies, technology, and curriculum instructional condition)?</td>
<td>1. LSPEQ</td>
<td>1. MANOVA (by factor)</td>
</tr>
<tr>
<td>2. To what extent did students’ knowledge of fitness content scores differ by instructional condition?</td>
<td>1. PACT</td>
<td>1. Mean, Standard Deviation, two-way ANOVAs</td>
</tr>
<tr>
<td>3. To what degree did the target students use self-regulated learning strategies (i.e. seeking information, self-monitoring, goal setting, and self-evaluation) during their physical education classes?</td>
<td>1. SRLOI, 2. Goal setting chart</td>
<td>1. Frequency counts of SI/A and SM; constant comparative analysis</td>
</tr>
<tr>
<td>4. To what degree did the target students perceive their use of self-regulated learning strategies (i.e. seeking help, self-monitoring, goal setting, and evaluation) during their physical education classes?</td>
<td>1. Interviews</td>
<td>Constant Comparative</td>
</tr>
</tbody>
</table>