EFFECTS OF A MOVEMENT INTEGRATION PROGRAM ON ELEMENTARY SCHOOL CHILDREN'S PHYSICAL ACTIVITY, FITNESS LEVELS, AND ON-TASK BEHAVIOR AND TEACHERS' IMPLEMENTATION EXPERIENCES

by

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A dissertation submitted to the faculty of
The University of Utah
in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

Department of Exercise and Sport Science

The University of Utah

May 2014

The University of Utah Graduate School

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ABSTRACT

Physical inactivity is an increasing problem among children and adolescents. The TAKE 10!® program, which integrates physical activity (PA) into academic subjects, was implemented in one elementary school in Magna, Utah to increase children's daily in-school PA. A three-study approach was used to examine: (a) effects of TAKE 10!® on elementary school students' PA and physical fitness levels, (b) effects of TAKE 10!® on elementary school students' on-task behavior, and (c) teachers' experiences in implementing TAKE 10!®. Two hundred thirteen students and 9 teachers from nine classes (3rd to 5th grades) participated in the project for 12 weeks (4 weeks baseline; 8 weeks intervention). Students wore pedometers and accelerometers for 4 days during week 1 (baseline), week 8 (mid-intervention), and week 12 (end-intervention) to examine their PA levels. Systematic observation was used to examine students' on-task behavior during weeks 1 to 4 (baseline) and weeks 8 to 12 (intervention). Teachers were interviewed regarding their experiences implementing TAKE 10!® at the end of the intervention and 5 months after the intervention. Results from the first study indicated that students' steps counts increased significantly by 672 steps from baseline to mid-intervention. Furthermore, students' average time spent in moderate to vigorous intensity PA and vigorous intensity PA increased significantly by

approximately 2 minutes from baseline to end-intervention. Results from the second study showed that there was a significant decrease in mean percentage on-task behavior from pre-no TAKE 10!® (91.2 ± 3.4) to post-no TAKE 10!® (83.5 ± 4.0) during baseline, whereas there was a significant increase in mean percentage on-task behavior from pre-TAKE 10!® (82.3 ± 4.5) to post-TAKE 10!® (89.5 ± 2.7) during intervention. The five major themes identified from the third study were: (a) barriers, (b) benefits, (c) what worked, (d) personal attributes, and (e) doing it in the present and in the future. In conclusion, the TAKE 10!® program is effective in increasing students' in-school PA levels and on-task behavior. Despite experiencing barriers to implementing TAKE 10!®, teachers were generally positive about the benefits of the program, and a majority of them reported implementing the program after the study had ended.

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ACKNOWLEDGEMENTS

This dissertation has been made possible by the contributions of many people who have helped and supported me in the completion of this project. This study would never have occurred if not for the support of the principal and teachers from Lake Ridge Elementary School in Magna, Utah. I want to especially thank the teachers who committed their time to implementing the TAKE 10!® program and also candidly sharing their experiences with me at the end of the study.

I would like to thank my committee members who have guided, supported, and encouraged me for many years from my doctoral project through to my dissertation. Dr. James Hannon, mere words cannot describe my heartfelt thanks to you for every moment you have contributed to my doctoral career. Thank you for the countless walk-in consultation sessions in your office and tireless answers to my constant questions that helped to direct my thoughts for this project. Thank you also for challenging me to undertake this project on a larger scale than I had initially planned. My confidence to complete the whole project grew as I took one step forward throughout the process. Most importantly, thank you for giving me the opportunity to grow as a graduate student and for inspiring me to pursue an academic career. Dr. Maria Newton, thank you for providing me with the opportunity to improve on my project through a class I took with you. I also want to thank you for your insightful comments during the initial stages of the dissertation proposal, which prompted me to execute the project as a three-study

approach. Dr. Leslie Podlog, thank you for providing insightful comments on drafts of the dissertation documents, which helped me to think critically on how I could improve this study. Dr. Wanda Pillow, having taken two qualitative classes with you provided me with valuable knowledge to execute this study. I truly appreciate your guidance in the formulation of the interview questions for the study. Dr. Collin Webster, though I could only communicate with you long-distance throughout the study, your support and guidance during the whole process is invaluable. Thank you for your insightful comments that helped me refine many aspects of the study. Each of you has truly been a role model and an inspiration to me.

I would also like to acknowledge a few people who had helped with data collection during the study. Dr. Timothy Brusseau, thank you for loaning the equipment and helping with the physical activity data collection during the project. Thank you also for your insightful comments during data analysis for the first study. Jessyka Larson, Mara Rabin, Mitchell Peterson, Noelle Whitaker, and You Fu, thank you for spending many hours observing students' on-task behavior with me during the study. You responded in the nick of time when I needed help with data collection and it has been a wonderful experience working with all of you. Thank you for your time and energy during the project.

Most importantly, the biggest thanks go to my husband, Chee Hoi. You shared this entire academic journey with me, and have helped me through it all. Thank you for your patience, support, and love. I would also like to thank my family. My parents, Albert and Diana Goh, though physically far away in Singapore, have been a source of encouragement for my academic pursuit. My mother-in-law, Doris Tay, was a great help

during the final writing stages of this dissertation. Thank you for taking care of our newborn, Gavin, during the initial months after his birth, which had given me the time and focus to complete my writing. Also, to my spiritual family in Salt Lake City, I truly appreciate your kindness and prayers for me during this challenging process.

I would also like to thank the AAHPERD Research Grant Program, which supported me with funds to successfully complete this project. On a final note, I want to express a heartfelt thanks to all the aforementioned people who have shared this challenging yet exciting journey with me throughout the dissertation process.

CHAPTER 1

INTRODUCTION

The "No Child Left Behind Act" was enacted in 2002 to close the achievement gap in public education through annual testing, annual academic progress, report cards, teacher qualifications, and funding changes (House of Representatives, 2002). This Act has been blamed for reducing schools' time and resources for physical activity (PA) because educators have focused more on test scores and academic work, especially in math and reading, to a point that some have called it the "No Child Left without a Big Behind Act" or "No Child Let Outside Act" (Finkelstein & Zuckerman, 2008). Reduced PA time is one of the leading causes of overweight and obesity in the United States. Approximately one-third of the American population is obese and two-thirds are overweight, and this trend has significantly increased among men over the past 10 years (Flegal, Carroll, Ogden, & Curtin, 2010). Childhood obesity is also becoming a concern, with approximately 17.1% of U.S. children and adolescents being obese and 33% overweight (Flegal et al., 2010; Ogden et al., 2006). The proportion of children who are overweight has more than tripled since the 1970s (McKenzie & Kahan, 2008). Eventually, overweight or obese youth will more likely become overweight or obese adults (U.S.

Department of Health and Human Services, 2001). They will also be at an increased risk for cardiovascular disease, diabetes, and cancer in their adulthood (McKenzie & Kahan, 2008). The main causes of obesity in children and adolescents are physical inactivity and poor dietary behavior (Carandente, Roveda, Montaruli, & Pizzini, 2009). Nationwide, less than one-third of all children ages 6 to 17 engage in vigorous activity and only 17.6% of children in Utah engage in daily, vigorous PA (Trust for America's Health & The Robert Wood Johnson Foundation, 2009).

School-based Physical Activity

Schools are target places to promote PA and combat the obesity pandemic because over 95% of youth attend schools (Lee, Wechsler, & Balling, 2006).
The comprehensive school physical activity program (CSPAP) was recently initiated to support the goals of the Let's Move in School campaign. The campaign was subsequently renamed as Let's Move! Active Schools in 2013. The goals of the campaign are to provide a variety of school-based PA opportunities for students and to provide coordination among the CSPAP components so that students will be fully equipped for a lifetime of PA (National Association for Sport and Physical Education, 2008). The five components of CSPAP are Physical Education (PE), PA during school, PA before and after school, staff involvement, and family and community involvement (National Association for Sport and Physical Education, 2008). Though PE is the foundation of CSPAP, students are not getting the recommended 60 minutes of daily PA through PE. Only 3.8% of elementary schools, 7.9% of middle schools, and 2.1% of high schools provide daily PE for the entire school year (Kyle et al., 2007). Furthermore, only 13.7%

of elementary schools, 15.2% of middle schools, and 3.0% of high schools provide PE at least 3 days per week for the entire school year (Kyle et al., 2007).

Movement Integration Programs

Students spend a majority of their sedentary waking hours in the classroom, yet less than 5% of their daily PA occurs in the classroom settings (Brusseau et al., 2011). Therefore, integrating movement into academic subjects like math and language arts is a recommended strategy to increase children's daily PA because classroom teachers have extensive access to children in that context (McKenzie & Kahan, 2008; Wechsler, McKenna, Lee, & Dietz, 2004). In the past, most PA promotion efforts in schools have focused on the addition or the enhancement of PE classes or activities, whereas the academic classroom setting is a relatively untapped area where PA can be promoted (Kohl, Moore, Sutton, Kibbe, & Schneider, 2001). In recent years, multiple programs have been developed to integrate PA in the classroom, such as Physical Activity across the Curriculum (PAAC), Texas I-CAN! (Initiatives for Children's Activity and Nutrition), TAKE 10!®, and Energizers. These programs, which emphasize integrating approximately 10-minute bouts of movement into academic subjects, such as math, science, and language, have been found to be effective in increasing students' PA levels during the school day (Bartholomew & Jowers, 2011; Donnelly et al., 2009; Erwin, Abel, Beighle, & Beets, 2011; Erwin, Beighle, Morgan, & Noland, 2011; Mahar et al., 2006; Stewart, Dennison, Kohl, & Doyle, 2004). It was also found that students' on-task behavior and focus improved during academic instruction following movement integration activities (Grieco, Jowers, & Bartholomew, 2009; Kibbe et al., 2011; Mahar

et al., 2006). Considering the benefits of movement integration activities to improve students' PA levels and on-task behavior, it is worth training teachers to effectively lead such activities (Mahar, 2011). Classroom teachers have expressed positive attitudes toward integrating movement with academic subjects and when they are given training to integrate movement, they reported positive changes in perceived competence over time (Gibson et al., 2008; Kohl et al., 2001; Parks, Solmon, & Lee, 2007; Tsai, Boonpleng, McElmurry, Park, & McCreary, 2009).

Statement of the Problem

TAKE 10!® was chosen as the intervention in this study, because the program integrates grade-specific academic learning objectives with age-appropriate physical activity. Overall, there are a number of studies that have examined the effects of TAKE 10!® on the PA levels of students. These studies focused on examining average time spent per week in PA through teachers' report (Williams, Kibbe, & Lombardo, 2008); a comparison of activity levels between TAKE 10!® and PE, recess, lunch, and after-school/weekend activities (Moore, Solmon, & Tuuri, 2007); and a comparison of PA duration between intervention and control schools (Liu, Hu, & Ma, 2008). This study will add to the literature by examining whether the TAKE 10!® program will increase students' in-school step counts and in-school moderate to vigorous intensity PA levels from baseline to end-intervention period of TAKE 10!®. In addition, there are no studies that have examined the effects of TAKE 10!® on the cardiovascular fitness levels of students. Until now, qualitative measures have been used to examine the effects of TAKE 10!® on the on-task behavior of students in the classroom. This project will add to the literature by

using a quantitative method—systematic observation—to examine the on-task behavior of students after they participate in TAKE 10!®. Finally, although teachers reported a willingness to implement TAKE 10!® activities in their elementary classrooms, the characteristics of teachers (e.g., teacher self-efficacy in PA, personal PA behavior, and TAKE 10! implementation patterns) who embrace the program to a greater extent are not yet clear (Kibbe et al., 2011). Therefore, a qualitative examination of teachers' experiences in implementing TAKE 10!® may help to illuminate teachers' attitudes toward the effectiveness of the TAKE 10!® intervention.

The Intervention

The TAKE 10!® classroom-based, PA promotion curriculum developed by the International Life Sciences Institute Center for Health Promotion (ILSI CHP) was used as the intervention program in this study. TAKE 10!® is a movement-integrated activity program that teaches children the importance of PA and energy balance while integrating PA into classroom lessons (http//www.take10.net). Academic areas within TAKE 10!® that integrate movement and learning include language arts, math, science, social studies, and general health. Specifically, this program consists of a variety of 10-minute activities that include an exercise, cool down period, and a series of questions related to health and nutrition. An example of a TAKE 10!® program is shown in Appendix A.

For this study, the classroom teachers' goal was to implement three 10-minute TAKE 10!® activities spread out during each school day of the intervention period. The teachers were trained to use TAKE 10!® before implementing it in the classroom. The training was approximately 45 minutes, which included information about the childhood

obesity epidemic and rationale for movement integration in the curriculum, followed by a hands-on experience of conducting and participating in the TAKE 10!® activities. Teachers were given a schedule that informed them of the weeks their classes would be assessed for PA and observed for on-task behavior. During the intervention period, teachers chose whichever activity from the TAKE 10!® program that complemented the curriculum they were teaching each day.

Study Purpose

This project undertook a three-study approach to examine: (a) the effects of TAKE 10!® on elementary school students' PA and physical fitness levels (Chapter 3), (b) the effects of TAKE 10!® on elementary school students' on-task behavior (Chapter 4), and (c) teachers' experiences in implementing TAKE 10!® (Chapter 5). A quantitative methodology was used in the first two studies and a qualitative methodology was used in the third study. Chapter 2 provides a literature review on PA intervention programs in schools and Chapter 6 provides a discussion of the three studies.

Significance

The lack of PA is a salient contributor to the obesity problem in youth (National Center for Health Statistics, 2011). Promoting PA in schools may prevent and stem the tide of obesity in youth and possibly, long-term health care cost consequences. Schools are not likely to lighten academic standards to allow teachers to address health-related activities in the classrooms (Langille & Rodgers, 2010). In addition, continued emphasis on standardized testing makes it challenging to implement PA interventions that do not

directly support academic instruction (Bartholomew & Jowers, 2011). Hence, movement integration with academic subjects, such as TAKE 10!® provides a means through which students can be physically active in schools. Additionally, movement integration has been shown to improve students' academic performance (Bartholomew & Jowers, 2011; Donnelly & Lambourne, 2011; Kibbe et al., 2011). Therefore, with the dissemination of the projected results of this project, it is hoped that there will be more support from school administrators to incorporate movement integration programs into the school curriculum. This project is also significant in that the TAKE 10!® program contributes to the nationwide call for CSPAP to increase PA during the school day. It is also important to study teachers' experiences in implementing the TAKE 10!® program because little is known about the characteristics of teachers who embrace the program. The value of any movement integration program ultimately rests on teachers' willingness to implement such programs into their curricula.

Definition of Terms

Moderate to vigorous intensity physical activity is any activity that requires a moderate to large amount of effort, and causes a noticeable substantial increase in heart rate and breathing.

Movement integration is incorporating movement into planned academic lessons to enable students to be physically active (Parks et al., 2007). Other terms used interchangeably are physically active academic lessons, classroom-based physical activity program, and in-class physical activity programs.

On-task behavior is any behavior in which a student is attentive to the teacher or actively engaged in the appropriate task, as assigned by the teacher (Grieco et al., 2009). Other terms used interchangeably are attention-to-task, classroom behavior, attention control, and time-on-task.

Physical activity is any bodily movement produced by the contraction of skeletal muscle that increases energy expenditure above a basal level (U.S. Department of Health and Human Services, 2008).

TAKE 10!® is a classroom-based, PA promotion curriculum developed by the International Life Sciences Institute Center for Health Promotion (ILSI CHP). The program consists of 10-minute physical activities integrated with language arts, math, science, social studies, and general health lessons (http//www.take10.net).

CHAPTER 2

LITERATURE REVIEW

Physical inactivity is one of the causes of the obesity epidemic in the United States (National Center for Health Statistics, 2011). About 61.5% of children aged between 9 and 13 years old do not participate in any organized physical activity (PA) during their nonschool hours and 22.6% do not engage in any free-time PA (United States Department of Health and Human Services, 2003). The PA levels of a sample of participants from the National Health and Nutrition Examination Survey was directly assessed with accelerometers (Troiano et al., 2008). It was found that only 42% of children aged 6 to 11 years and 8% of adolescents obtained the recommended 60 minutes per day of moderate intensity or greater PA (Troiano et al., 2008). These statistics indicate that most youth do not participate in sufficient levels of daily PA. Inactivity is more common among females than males and among minority youth than Caucasian youth (U.S. Department of Health and Human Services, 1996).

Unfortunately, obesity may lead to heart disease, diabetes, certain cancers, and weight-related health problems (National Center for Health Statistics, 2011). Moreover, overweight or obese youth are more likely to become overweight or obese adults than youth of normal weight (U.S. Department of Health and Human Services, 2001).

Therefore, an increase in PA levels is recommended to reduce diseases that are associated with obesity. PA not only decreases morbidity and mortality, it also contributes to overall wellness and has the potential for reducing rising health care costs and increasing employee productivity (Cardinal, 2004). Youth who perform moderate- and vigorous-intensity PA that accumulate 60 minutes or more each day will achieve substantial health benefits and have a better chance of a healthy adulthood (U.S. Department of Health and Human Services, 2008). Additionally, youth who are active when they are younger tend to remain active in their adulthood (U.S. Department of Health and Human Services, 2008). Therefore, it is pertinent to inculcate the importance of leading physically active lifestyles while youth are in schools. This literature review is organized into the following sections: (1) overview of school-based physical activity intervention programs, (2) comprehensive school physical activity program (CSPAP), (3) physical activity during the school day: movement integration, (4) physical activity and fitness levels through movement integration, (5) on-task behavior through movement integration, and (6) teachers' perspectives toward movement integration.

Overview of School-based Physical Activity Intervention Programs

Schools are attended by over 95% of youths and therefore are an optimum place to promote PA and combat the obesity pandemic (National Association for Sport and Physical Education, 2008; Wechsler et al., 2004). School-based PA can fight against obesity, because it targets early stages of pattern development and encourages lifelong participation in PA (Webster, Monsma, & Erwin, 2010). Many school-based PA interventions designed for kindergarten, primary grades, middle and high school students

aim to prevent childhood obesity in school settings. Most interventions focus on changing PA and nutrition behavior, while some interventions focus on decreasing television watching time, restricting drinking of carbonated drinks, or increasing physical education (PE) time in schools (Sharma, 2006). A systematic review of the effectiveness of interventions to promote PA in children and adolescents recommended that interventions including school and family or community involvement would help to increase PA levels in adolescents (van Sluijs, McMinn, & Griffin, 2008).

An intervention program, termed The Child and Adolescent Trial for Cardiovascular Health (CATCH), was designed in the 1980s to conduct research in cardiovascular disease prevention among youth (Perry et al., 1990). The CATCH program involved a large number of schools using a multicomponent behavioral health intervention for children of diverse communities (Perry et al., 1990). In one CATCH program, 56 schools participated in a 3rd through 5th grade intervention, including school food service modifications, enhanced PE, and classroom health curricula (Luepker et al., 1996). The researchers found that the CATCH intervention was able to modify the fat content of school lunches, increase moderate-to-vigorous PA in PE, and improve eating and PA behavior in children during 3 school years (Luepker et al., 1996). In another CATCH program, four intervention elementary schools and four control elementary schools in a lower-income, mainly Hispanic population community in Texas participated in the study (Coleman et al., 2005). Students who participated in the intervention program showed a significantly lower risk of becoming overweight compared with students in the control group (Coleman et al., 2005).

Another intervention program, termed Sports, Play, and Active Recreation for Kids (SPARK), was initiated in 1989 with a 7-year grant to San Diego State University from the National Institutes of Health to develop and evaluate a health-related PE program for upper elementary students (McKenzie, Sallis, & Rosengard, 2009). SPARK began as a research-based elementary PE program, which now also includes middle school and high school PE as well as specific programs for after school, early childhood, and coordinated school health (McKenzie et al., 2009). The SPARK program consists of a PE curriculum designed to provide ample amounts of PA in class, a behavioral self-management curriculum to promote PA outside of school, and extensive teacher training and support (McKenzie et al., 2009). It was found that the SPARK program was successful in increasing PA during PE (McKenzie, Sallis, Kolody, & Faucette, 1997; Sallis et al., 1997), physical fitness (Sallis et al., 1997), and academic achievement (Sallis et al., 1999).

Many other school-based PA intervention programs have shown benefits in improving youth's health outcomes and healthy behavior. For example, elementary children who participated in a PA intervention incorporating an 8-week exercise program, and 8 weeks of classes on nutrition and smoking were found to have improved cardiovascular disease risk profiles (Harrell et al., 1996). In another study, sedentary adolescent female students who participated in a school-based special PE class were found to have significantly increased their lifestyle physical activities and cardiovascular fitness (Jamner, Spruijt-Metz, Bassin, & Cooper, 2004). A 6-month nutrition education and PA intervention on Chilean primary school children showed an effect on the physical fitness on boys and girls, and decreased adiposity in boys (Kain et al., 2004).

Physiologically, high-intensity PA has a favorable effect on components of the insulin resistance syndrome in obese adolescents (Kang et al., 2002). Furthermore, a combined dietary-physical activity intervention also leads to increased bone strength in obese children during the critical period of bone development of childhood and adolescence (Nemet, Berger-Shemesh, Wolach, & Eliakim, 2006). An 18-month intervention designed to alter the school environment to prevent excess weight gain by making healthier eating choices and PA opportunities more available for African-American 6th-grade children had helped children decrease their percent of kilocalories consumed from total and saturated fat, while increasing carbohydrate intake and self-reported PA during the intervention (Newton et al., 2010). Another school-based PA intervention program, Promoting Lifetime Activity for Youth (PLAY), was also found to be effective in increasing PA levels among 4th-, 5th-, and 6th-grade students (Ernst & Pangrazi, 1999).

Several intervention programs have used pedometers as a motivational and educational tool for measuring accumulated PA levels in children and adults (Beighle, Pangrazi, & Vincent, 2001). For example, in a 4-week elementary school intervention that used the concept of integrating pedometer walking throughout the school curriculum, the researchers found that children who had initial lower activity levels increased their step counts during intervention weekdays (Oliver, Schofield, & McEvoy, 2006). In a 12-week intervention program using pedometers and daily step count targets, it was found that adolescent girls with low activity levels had increased step counts within 6 weeks (Schofield, Mummery, & Schofield, 2005). The researchers from another study found that adolescents who participated in a 3-week pedometer wearing and goal setting intervention program reported increased awareness and motivation toward health and PA

(Zizzi et al., 2006). This section provides an overview of school-based PA intervention programs that has been implemented in schools for the past 20 years. The next section will introduce the comprehensive school physical activity program, which is a recent initiative to promote PA in schools.

Comprehensive School Physical Activity Program

The comprehensive school physical activity program (CSPAP) was recently initiated by the American Alliance for Health, Physical Education, Recreation, and Dance (AAHPERD) to support the goals of the Let's Move in School campaign. Let's Move in School stems from the nationwide Let's Move campaign unveiled by First Lady Michelle Obama on February 9, 2010, to combat the challenges of childhood obesity. The campaign was subsequently renamed as Let's Move! Active Schools in 2013. AAHPERD aims to provide support to teachers, principals, superintendents, school boards, and parents to help youth become more physically educated and active in school through the Let's Move! Active Schools campaign. CSPAP is part of a larger school health framework, Coordinated School Health (CSH). The CSH framework that guides the planning and coordinating of school health activities is based on eight components: health education, physical education, health services, nutrition services, counseling, psychological and social services, healthy and safe school environment, health promotion for staff, and family/community involvement (Allensworth & Kolbe, 1987). Since the inception of CSH in 1987 (Allensworth & Kolbe, 1987), several researchers have taken this framework to promote PA and healthy living in schools. For example, a group of researchers used the CSH framework in a school, where direct intervention activities

were conducted for PE, health education, school environment, school health services, faculty/staff health promotion, and family/community involvement, to increase PA among high school girls (Felton et al., 2005). Qualitative data from that study indicated that the girls were more involved in PA, while quantitative data indicated that there was an increase in girls' moderate-to-vigorous PA and vigorous PA from 8th to 9th grade (Felton et al., 2005)

The goals of a CSPAP are to: (a) provide a variety of school-based PA opportunities that will enable students to participate in the nationally-recommended 60 minutes of moderate-to-vigorous PA each day; and (b) provide coordination among the CSPAP components to maximize understanding, application, and practice of the knowledge and skills learned in PE so that students will be fully educated and equipped for a lifetime of PA (National Association for Sport and Physical Education, 2008). The five components of a CSPAP are PE, PA during school, PA before and after school, staff involvement, and family and community involvement (National Association for Sport and Physical Education, 2008). A brief description of the five components will be provided in the following paragraphs.

PE is the foundation of a CSPAP. Certified physical educators provide instruction on movement knowledge and skills, PA and fitness knowledge and skills, and personal and social responsibility, so that students can value PA for its many benefits (National Association for Sport and Physical Education, 2008). Quality PE is at the core of CSPAP because it helps students gain knowledge and skills to become proficient movers and participants in a lifetime of PA (National Association for Sport and Physical Education, 2004). Within the CSPAP, certified physical educators not only teach PE classes, but also

serve as PA leaders in their schools and promote PA both within and beyond the regular school day (National Association for Sport and Physical Education, 2008).

PA during the school day is another opportunity to help students meet the recommended requirements of at least 60 minutes of PA each day. These PA opportunities, also sometimes called PA breaks, allow students to take a break from sedentary activities in the classroom during the school day (National Association for Sport and Physical Education, 2008). Bouts of PA should be interspersed between sedentary classroom activities by having movement integrated into the academic content (National Association for Sport and Physical Education, 2008). Recesses within the elementary school day are another opportunity for students to accumulate PA (Beighle, Morgan, Le Masurier, & Pangrazi, 2006; Mota et al., 2005). All elementary school children should be provided with at least one daily period of recess for a minimum of 20 minutes, which could enhance their physical, social, and academic development (National Association for Sport and Physical Education, 2006). Middle and high school students may spend their free time, such as during lunch or study hall, to participate in drop-in PA sessions, such as visiting a supervised fitness center (National Association for Sport and Physical Education, 2008).

PA opportunities before and after regular school hours, such as intramural and interscholastic programs, have shown potential for increasing overall daily PA levels of youth (National Association for Sport and Physical Education, 2002a, 2002b; Young et al., 2007). Examples of before school activities include large group PA sessions or a variety of small group PA of students' choice (National Association for Sport and Physical Education, 2008). Intramural programs, including sports (e.g., basketball and

soccer), self-directed activities (e.g., walking and jogging), classes (e.g., yoga, dance, or martial arts), and activity clubs (e.g., hiking, jump rope, and fitness) offered within the school environment, can provide PA opportunities that will meet the needs, interests, and abilities of all students (National Association for Sport and Physical Education, 2008). Interscholastic sports programs can also be offered to more skillful middle and high school students as another source to increase students' PA levels (National Association for Sport and Physical Education, 2008).

Staff involvement is another important component of CSPAP. School employee wellness programs are effective to improve staff health and increase their PA levels (Eaton, Marx, & Bowie, 2007). Implementing activities, policies, and incentive programs for faculty and staff members to encourage participating in a healthy lifestyle will inspire school leaders to be personally committed to good health practices and to serve as positive role models for students' participation in PA (National Association for Sport and Physical Education, 2008). Ways to support efforts in the CSPAP include increasing the number of teacher/coach volunteers and providing incentives for extra standard duties for school staff that assumes various roles, such as volunteer sponsor, planner, and supervisor of activity-based events and programs (National Association for Sport and Physical Education, 2008).

Family and community involvement is the final component that makes up the CSPAP. Collaboration with the families and community members can help increase PA levels of the students. Because parents play an important role in students' lives and can impact their PA levels (Ornelas, Perreira, & Ayala, 2007), activities that include families, such as family fun/fitness nights, after school classes for families, and use of facilities for

family active participation after school and on weekends, are encouraged (National Association for Sport and Physical Education, 2008). Sharing information about PA and PE on a regular basis through a variety of written, web-based, and event media outlets can help inform parents on the importance of PA and strategies to promote their children's PA opportunities outside of school (National Association for Sport and Physical Education, 2008). PA opportunities can also be made available to students through school collaboration with community-based providers of PA (Jago & Baranowski, 2004). Collaborations can include the use of school facilities for community recreation, the use of community facilities and programs for promoting student/family PA, and the sharing of other resources to help provide more PA opportunities (Pate et al., 2006).

This section summarizes the five different components in CSPAP. The next section describes the focus of this dissertation project, which is promoting PA during the school day. Specifically, movement integration, where PA is integrated into curriculum, was used as an intervention in this project.

Physical Activity during the School Day: Movement Integration

Although schools are a potential place to promote PA, the school structure poses barriers to PA promotion, which is a result of legislation requiring schools to achieve high academic standards, where classroom teachers and administrators are required to increase standardized test scores (House of Representatives 1804, 1994). Because of the emphasis on curriculum, many elementary schools had decreased PE and recess programs with children spending a majority of their school day in academic classrooms. In fact,

only 9 states (18%) require elementary schools to provide students with recess (National Association for Sport and Physical Education & American Heart Association, 2012). Additionally, only 58.9% of districts required and 32.4% recommended that elementary schools provide students with regularly scheduled recess (Lee, Nihiser, Fulton, Borgogna, & Zavacky, 2013). Although students spend most of their school day in the classrooms, less than 5% of their daily PA occurs in the classroom settings (Brusseau et al., 2011). In addition, children are required to sit quietly for the majority of the day, approximately 6 hours, to receive academic lessons in a typical school day (Donnelly et al., 2009). In general, U.S. children are spending large amounts of time sitting or being sedentary, particularly related to school activities (Sturm, 2005). Conversely, reducing time spent sitting, regardless of the type of activity, may improve the metabolic consequences of obesity (Patel et al., 2010).

PE is the foundation of the CSPAP. A quality PE program should include daily PE, with at least 150 minutes per week for elementary and 225 minutes per week for middle and high schools (National Association for Sport and Physical Education, 2004). From the recent School Health Policies and Practices Study 2012, it was found that 78.3% of districts specify time requirements, such as minutes per week for elementary school PE (Lee et al., 2013). However, 46.9% of these districts had adopted a policy describing reasons that elementary students may be exempted from PE (Lee et al., 2013). The 2012 Shape of the Nation Report indicated that only 16 states (31%), 18 states (35%), and 10 states (20%) have established mandated minutes per week for elementary, middle, and high schools PE participation, respectively (National Association for Sport and Physical Education & American Heart Association, 2012). In the 2006 School Health Policies and

Programs Study, the researchers reported that 3.8% of elementary schools, 7.9% of middle schools, and 2.1% of high schools provided daily PE for the entire school year (36 weeks) for students in all grades in the school (Kyle et al., 2007). In addition, 13.7% of elementary schools, 15.2% of middle schools, and 3.0% of high schools provided PE at least 3 days per week or its equivalent for the entire school year for students in all grades in the school (Kyle et al., 2007). Considering that the only source of PA often comes from PE for many youth (Hannon, 2008), these statistics indicate that our children and youths are not receiving enough daily PA from PE. Most PA promotion efforts in schools have focused on the addition or the enhancement of PE classes or recess activities, whereas the academic classroom setting, where most of a school child's sedentary waking hours are spent, is a potential educational and behavioral opportunity for PA promotion (Kohl et al., 2001).

Incorporating PA during the school day, a component of the CSPAP could help youth increase their daily PA in schools. Strategies to increase PA during the school day include recesses, classroom-based PA breaks, PA integrated into classroom lessons, and drop-in PA opportunities (National Association for Sport and Physical Education, 2008). PA integrated into classroom lessons, also known as movement integration, is a potential strategy to help students with different learning styles learn better in the classroom based on the theory by Dr. David Kolb. Dr. Kolb suggests that learners who are "doers" favor active experimentation and participation in learning (Kolb, 1984). Teachers could offer PA opportunities in the classroom as part of planned lessons that teach mathematics, language arts, and other academic concepts through movement (Wechsler et al., 2004). Teachers could also provide kinesthetic learning opportunities, such as building, touching,

experiencing, and collecting materials, as well as create lessons that require students to stand or move in the classroom to increase their PA levels.

There are many benefits to implementing movement integration in schools. For instance, movement integration has been found to increase students' PA levels during the school day (Bartholomew & Jowers, 2011; Erwin, Beighle, et al., 2011; Kibbe et al., 2011; Mahar et al., 2006; Stewart et al., 2004). Additionally, movement integration has been shown to improve students' on-task behavior and focus during academic instruction in the classroom (Bartholomew & Jowers, 2011; Grieco et al., 2009; Kibbe et al., 2011; Mahar et al., 2006). Integrating PA programs in the school day has also been found to enhance academic performance (Bartholomew & Jowers, 2011; Donnelly & Lambourne, 2011; Sallis et al., 1999; Trudeau & Shephard, 2008). Specifically, it was found that children's 2-week retention of spelling was enhanced following the use of active rather than sedentary lessons (Bartholomew & Jowers, 2011). A PA integrated approach to teaching curriculum can also help teachers create opportunities to draw relationships between different subject areas (Buchanan et al., 2002; Miller, 2002). Of particular interest in this dissertation project is the effects of movement integration on the PA and fitness levels of children, which will be reviewed in the next section.

Physical Activity and Fitness Levels through Movement Integration

There are several movement integration programs that have been used to examine students' PA levels, changes in body mass index (BMI), and energy expenditure upon implementation of the programs. These programs are the Physical Activity across the Curriculum (PAAC), Texas I-CAN! (Initiatives for Children's Activity and Nutrition),

Energizers, TAKE 10!®, and other in-class activities. An overview on the effect of each program on students' PA levels will be described in the following paragraphs.

PAAC is a movement integration program aimed at increasing children's PA levels in schools. In a 3-year longitudinal study, 24 elementary schools were cluster randomized to the PAAC intervention group or to the control group (Donnelly et al., 2009; Gibson et al., 2008). Children in 2nd and 3rd grades were followed to 4th and 5th grades in this study (Donnelly et al., 2009). The goal of PAAC was to promote 90 minutes per week of moderate to vigorous intensity, physically active academic lessons delivered by classroom teachers (Donnelly et al., 2009). A sample of children (n=77 PAAC, n=90 control) was randomly selected to wear accelerometers (ActiGraph) over 4 consecutive days (Thursday–Sunday) in the spring semester of each year (Donnelly et al., 2009). The researchers found that children in PAAC schools had greater PA (13%) compared to children in control schools. Additionally, children in PAAC schools had significantly greater levels of PA during the school day (12%) and on weekends (17%) and also exhibited greater levels of PA on weekdays (8%, p=0.05) compared to children in control schools (Donnelly et al., 2009). Overall, students who participated in the intervention reported higher enjoyment in classroom-based lessons (Gibson et al., 2008). The PAAC intervention was also able to elicit a level of energy expenditure that prevented excessive weight gain in children (Honas, Washburn, Smith, Greene, & Donnelly, 2008).

Another program, Texas I-CAN! was initiated to train elementary school teachers to implement physically active academic lessons (Bartholomew & Jowers, 2011). A committee of teachers from bilingual schools was formed to develop a set of active

lessons across K-5th grades and across subjects for the Texas I-CAN! program (Bartholomew & Jowers, 2011). This committee was formed in response to the researchers' original efforts to provide teachers with sample lessons in three elementary schools with minority and low socioeconomic status students (Bartholomew & Jowers, 2011). Though the teachers supported the concept, lack of planning time and available resources was a significant barrier to implementation (Bartholomew & Jowers, 2011). Initially, the researchers made use of the TAKE 10!® program to minimize barriers to implementation, but teachers considered the lessons as lacking integration within their curriculum and with activity merely "tacked on" to an overly basic lesson (Bartholomew, 2011). Therefore, the committee developed the Texas I-CAN! program and it was subsequently implemented by 22 teachers in K-5th grade classes in one school within a period of 4 weeks. The impact of lessons on PA was examined through 1 week of pedometer counts comparing 2 days with and 2 days without lessons following the 4-week implementation (Bartholomew & Jowers, 2011). The intervention resulted in a significant increase of approximately 1000 steps for all grades, with no difference in the increase between Hispanics and Caucasians (Bartholomew & Jowers, 2011). The researchers approximated 1000 steps to 10 minutes of moderate-to-vigorous PA, which accounted for 7–8% of the total number of steps recommended for children of this age (Tudor-Locke & Bassett, 2004). In this study, only step counts were collected, but not moderate-to-vigorous time in PA. Because these data were limited to a single school, the researchers implemented Texas I-CAN! across eight schools (four intervention and four control schools) with 3rd-grade children, which is a high stakes testing grade in Texas, where passing scores on the standardized math and language arts exams are required for

promotion into 4th grade (Bartholomew & Jowers, 2011). Texas I-CAN! lessons were implemented on 4 of 5 school days per week (one lesson per day on average). The researchers found that intervention students increased activity by more than 300 steps, whereas control students reduced their steps by nearly the same number (Bartholomew & Jowers, 2011). In addition, a subsample of 200 students wore the ActiGraph GT1X accelerometers and the researchers found that approximately 20% of the lessons were spent in moderate-to-vigorous PA (Bartholomew & Jowers, 2011).

Another movement integration program, Energizers, consists of classroom-based physical activities that last approximately 10 minutes, which integrate grade-appropriate learning materials, involve no equipment, and require little teacher preparation (Mahar et al., 2006). A total of nine intervention classes (N = 135 students) and six control classes (N = 108 students) from K-4th grades participated in the study to examine students' in-school PA levels and on-task behavior (Mahar et al., 2006). To assess the PA levels, the students wore Yamax pedometers (SW-200) for 5 days, where all students of the same grade level wore pedometers during the same week (Mahar et al., 2006). Intervention classes performed an Energizers activity every school day, whereas the control classes did not perform any Energizers activity (Mahar et al., 2006). The researchers found that students in the intervention group took significantly more in-school steps (5587 ± 1633) than control-group students (4805 ± 1543), and the size of this difference was moderate (ES = 0.49) (Mahar et al., 2006). However, the intensity of PA accumulated during the activities could not be provided because only pedometers were used in this study (Mahar et al., 2006). Therefore, future research should use accelerometers to assess PA during

classroom-based programs to determine whether in-class activities will result in moderate-intensity PA (Mahar et al., 2006).

TAKE 10!® is another classroom-based, PA promotion curriculum developed in 2001 by the International Life Sciences Institute Center for Health Promotion (ILSI CHP) (Peregrin, 2001). The program provides teachers with grade-specific 10-minute activities linked to core curriculum objectives in mathematics, science, social studies, language arts, and health education. A study using the TAKE 10!® program to examine students' energy expenditure was conducted in a convenience sample of three elementary classrooms in DeKalb County, Ga., which was already implementing TAKE 10!® during the spring semester of 2001 (Stewart et al., 2004). One class each of 1st, 3rd, and 5th grade participated in the study for a total of three classrooms and 71 students (Stewart et al., 2004). Each class was evaluated for 5 days, which included eight to nine activity sessions per class (Stewart et al., 2004). During each activity, 5 students rotated to wear the CSA accelerometers, while the remaining students wore electronic pedometers (Walk4Life) (Stewart et al., 2004). From the CSA data, the researchers discovered that participants achieved exercise intensities in the moderate to vigorous range and were able to maintain these levels throughout the activity sessions (Stewart et al., 2004). However, participants in individual sessions only burned approximately 25 to 37 Kcal per 10-minute session (Stewart et al., 2004). There were no significant differences in caloric expenditure between adjacent grades, but there was a difference between grades 1 and 5, due to the higher body weights of 5th-grade students (Stewart et al., 2004). Measured pedometer step counts per session ranged from 644-931 in 1st grade, 659-1,376 in 3rd grade, and 1,002-1,041 in 5th grade (Stewart et al., 2004). Limitations of this study included the use

of a convenience sample of three classrooms from one school, and only a small percentage of the more than 30 activities in TAKE 10!® was implemented in the classroom (Stewart et al., 2004). In another study, it was found that activity levels of students during TAKE 10!® were higher than activity levels accumulated during PE, lunch, and after school or weekend activities (Kibbe et al., 2011). However, there were no significant difference in activity levels between TAKE 10!® and recess time (Kibbe et al., 2011).

In another pilot study that used movement integration program, the researchers examined the effects of integrating PA with mathematics content in elementary students (Erwin, Abel, et al., 2011). Students from the classrooms of two 4th- and two 5th-grade teachers from a K-5 elementary school participated in this 18-day study (5 baseline school days and 13 school days incorporating PA integration) (Erwin, Abel, et al., 2011). Five math classes were taught without PA integration (baseline) followed by 13 math classes that integrated PA (Erwin, Abel, et al., 2011). Seventy-five students aged 8 to 12 years wore pedometers (Walk4Life, MLS-2505) and 11 selected students wore accelerometers during math class and throughout the school day to track PA (Erwin, Abel, et al., 2011). Because, math classes were scheduled for 60 minutes per day in 4th grade and 90 minutes in 5th grade, the researchers calculated steps per minute to examine differences in PA (Erwin, Abel, et al., 2011). Overall, students performed significantly more PA on school days and in math classes during the intervention (Erwin, Abel, et al., 2011). In addition, students accumulated more steps per minute during PA integration math classes compared with baseline math classes (Erwin, Abel, et al., 2011). The researchers suggest that future studies include the use of a control group to compare PA

levels and to study the impact of classroom PA on youth at high risk for chronic disease, such as those who are overweight or obese or come from low-income families (Erwin, Abel, et al., 2011). Although the researchers attempted to collect PA levels using accelerometers, only seven of them functioned for data to be assessed. As with many studies examining PA levels of movement integration, only step counts were collected as a form of PA measurement.

In a low-cost, teacher-directed classroom intervention program, the researchers determined the effect on the PA levels of elementary children during the school day (Erwin, Beighle, et al., 2011). Data was collected from 106 3rd- to 5th-grade students from two elementary schools (1 control and 1 intervention) in a southeastern US city (Erwin, Beighle, et al., 2011). The students wore pedometers (Walk4Life, LS 2500) for 12 days over three monitoring periods during the school year (baseline, follow-up, post follow-up) to assess the effectiveness and the sustainability of the intervention (Erwin, Beighle, et al., 2011). Students recorded their data on a data sheet when prompted by their teacher or a researcher (immediately before recess, immediately after recess, and immediately before leaving school for the day) (Erwin, Beighle, et al., 2011). The teachers self-reported the frequency of activity breaks conducted during the school day (Erwin, Beighle, et al., 2011). Teachers (n = 5) who complied with the recommended one activity break per day had students who recorded approximately 33% more mean school steps/day at follow-up (approximately 1100) and post follow-up (approximately 1350) compared to the control group (Erwin, Beighle, et al., 2011). Teachers (n = 4) in the intervention who did not comply with the recommendation of one activity break per day had students who reported similar mean school steps/day as the control group (Erwin, Beighle, et al., 2011).

Similarly in this study, the researchers did not measure moderate-to-vigorous intensity PA levels of students. Step counts were the only form of measurement of PA levels.

Based on previous literature, movement integration programs have a positive effect on students' PA levels. Particularly, students' step counts increased upon the participation of Texas I-CAN!, Energizers and other movement integration programs (Bartholomew & Jowers, 2011; Erwin, Abel, et al., 2011; Erwin, Beighle, et al., 2011; Mahar et al., 2006). In addition, students in the PAAC program performed more moderate-to-vigorous intensity PA compared to students in control groups (Donnelly et al., 2009). Students also demonstrated moderate-to-vigorous intensity PA while participating in TAKE 10!® (Stewart et al., 2004). However, students' in-school steps counts and in-school moderate to vigorous intensity PA during the participation of TAKE 10!® is not known. Therefore, study one extends previous studies by further examining whether TAKE 10!® will increase students' step counts and moderate-to-vigorous intensity PA levels during the school day.

Another aim of study one is to examine effects of TAKE 10!® on students' fitness levels, particularly cardiovascular fitness and body mass index (BMI). One previous study demonstrated that there was a significantly less increase in BMI from baseline to 3 years in students who were exposed to more than 75 minutes of PAAC lessons per week compared to students exposed to less than 75 minutes of PAAC per week (Donnelly et al., 2009; Donnelly & Lambourne, 2011). In another study, female students who participated in the Happy 10 intervention (a TAKE 10!® program implemented in China) were found to have a smaller change in weight (2.4 kg intervention vs. 4.6 kg control) compared to control students (Kibbe et al., 2011).

Additionally, it was found that the prevalence of overweight and obesity in the intervention group decreased by 0.4% to 5.6%, as compared with an increase of 0.6% to 4.5% in the control group (Kibbe et al., 2011). There are no other known studies that examine the effects of TAKE 10!® on body weight and cardiovascular fitness. Due to the dearth of research on the effects of movement integration programs on students' fitness, the aims of study one were to fill the gap in the literature by examining whether TAKE 10!® will improve students' fitness levels (i.e., cardiovascular fitness and body mass index).

On-task Behavior through Movement Integration

Long periods of instructional time without a break may cause students to become less on-task and thus become counterproductive to academic performance (Mahar et al., 2006). This section reviews literature on the effects of movement integration program on students' on-task behavior.

Energizers are short classroom-based PA led by classroom teachers, developed for K to 5th grades that provide opportunities to increase daily PA in school. To examine the effectiveness of Energizers on students' on-task behavior, 62 elementary school students from two 3rd-grade (n=37) and two 4th-grade (n=25) classes were recruited for the study (Mahar et al., 2006). Data collection lasted 12 weeks and a multiple baseline across classrooms design was used, where baseline lasted 4 weeks for two classes and 8 weeks for the other two classes (Mahar et al., 2006). During the baseline, no Energizers activity was carried out. Students were observed 30 minutes before and 30 minutes after the Energizers activity was conducted during the intervention period. The observation

procedures were 10 seconds observe and 5 seconds record, rotated among 6 students in the class. A two-way (time [pre-observation vs. post-observation] × period [baseline vs. intervention]) repeated measures ANOVA was conducted to compare differences in on-task behavior. The researchers concluded that there was a significant improvement in on-task behavior after students performed an Energizers activity (ES = 0.62), whereas there was no significant change in on-task behavior during baseline when no Energizers activity was performed (ES = -0.20) (Mahar et al., 2006). These results suggest that movement integration programs can improve students' on-task behavior in the classroom. Additionally, improvement in on-task behavior was strongest for students who were the least on-task at baseline (Mahar et al., 2006). For the two classes that began the Energizers intervention at week 5, an improvement in on-task behavior after the Energizers activity was evident for every week for the 4th-grade class and for 7 out of the 8 weeks for the 3rd-grade class, whereas for the classes that began Energizers activities at week 9, the students' on-task behavior improved to a slightly lesser extent (Mahar et al., 2006).

Another study that used the Texas-I-CAN classroom-based intervention program was conducted to examine the effects of physically active classroom lessons and body mass index (BMI) on time-on-task (Grieco et al., 2009). Third-grade students (n=97) participated in an active lesson and in an inactive control lesson in this study. The momentary time sampling method was used to assess time-on-task of students, using 5-second observation intervals. Students were observed for a total of 15 minutes before and after the lessons. The researchers reported that there was a small, nonsignificant improvement in time-on-task following the active lesson for all BMI categories (ES

ranged from 0.13 to 0.26), whereas there were significant decreases in time-on-task for students in all BMI categories following the inactive control lesson (Grieco et al., 2009). Specifically, time-on-task dropped from approximately 83% at pre-inactive control lessons to approximately 72% following inactive control lessons, whereas time-on-task was approximately 86% prior to the active, academic lessons, and increased to 89% post active lessons (Bartholomew & Jowers, 2011). Although improvements in time-on-task following a physically active academic lesson were not statistically significant in the study, the beneficial effect of physically active academic lessons was shown to be more apparent for overweight than for normal weight students (Grieco et al., 2009). The researchers also stated that observation for only 15 minutes following the active lesson was a limitation that could underestimate the effects of a physically active lesson on time-on-task (Grieco et al., 2009).

Studies have also been carried out to determine the effectiveness of TAKE 10!® on classroom behavior. In an unpublished study, 38 classes were observed in a variety of school settings and K to 5th elementary grade levels following the TAKE 10!® intervention (Kibbe et al., 2011). A systematic observation instrument that used a duration (time) recording system was developed and field tested, with observers trained for interobserver reliability. A mean duration of 25.13 minutes was observed in the classroom before the TAKE 10!® lessons and a mean of 23.01 minutes observed following the lessons. The mean time for the TAKE 10!® lessons was 9.26 minutes and the sampling intervals during the TAKE 10!® segments were 15 seconds, to allow for all students to be observed, and to reflect the faster pace of those segments. There was a reduction of more than 20% in off-task and other inattentive behavior following the

activity segment, which suggest that the TAKE 10!® lessons had a positive effect on students' behavior (Kibbe et al., 2011). Researchers from another study conducted with predominantly Hispanic school children (N = 840) over 1 school year, reported that both teachers and students indicated that participating students were able to concentrate better on the academic lesson after a TAKE 10!® session (Tsai et al., 2009). Conclusions about students' behavior were made through qualitative methods such as observations during the program and interviews with student and 29 teacher participants at the final session, as well as teachers' opinions about TAKE 10!® through open-ended questions on a written survey completed after the final session (Tsai et al., 2009). In a third study, the researchers found that majority of the 26 teachers reported in the Classroom Environment Survey that TAKE 10!® improved the classroom environment and their classes required less disciplinary intervention (Barry, Mosca, Dennison, Kohl, & Hill, 2003). In summary, previous studies suggest that TAKE 10!® has the potential to improve students' on-task behavior in the classroom.

Another study used the Physical Activity across the Curriculum (PAAC) program to examine the program's effectiveness on students. At the beginning of the study, many of the 79 teachers voiced concerns during focus group discussions about the possibility of students getting wild and out of control due to the intervention (Gibson et al., 2008). At the end of the study, the teachers indicated that PACC had actually helped with behavior management, stopped the fidgeting, and made the students more alert and focused in the classroom (Gibson et al., 2008).

Overall, there is a lack of studies using systematic observations to determine whether movement integration programs will improve on-task behavior of students. Only

two studies that implemented the Energizers and Texas-I-CAN programs have used observational methods to examine students' on-task behavior. Systematic observation of students in the classroom is a valid and reliable strategy to measure students' on-task behavior (Mahar, 2011). In a study that implemented the TAKE 10!® program, only teachers' report were used to examine the effects of the program on students' on-task behavior. Therefore, study two extends previous studies by using systematic observation to examine students' on-task behavior upon the implementation of the TAKE 10!® program.

Teachers' Perspectives toward Movement Integration

The previous sections review literature on the effectiveness of movement integration programs on students' PA and fitness levels, and on-task behavior. This section reviews literature on teachers' perspectives toward movement integration, PA promotion, and PE.

Researchers have studied the perspectives of teachers and students toward the TAKE 10!® program. Twenty-seven schools (803 classrooms, approximately 20,000 children in K to 5th grades) participated in a 10-week pilot evaluation study in 2000 (Kohl et al., 2001). In this study, a random sample of teachers participated in an evaluation to assess their implementation patterns, program effectiveness, and program acceptance (Kohl et al., 2001). Out of 43 responses (52% response rate), 60.5% of teachers reported conducting a TAKE 10!® activity lesson at least once per day and 30.2% reported conducting it two or more times per day (Kohl et al., 2001). A majority of the teachers (90%) reported agreeing or strongly agreeing that the curriculum tool materials were age

appropriate and their responses were constant across grade levels ($p = 0.10$). The top reason teachers reported using the program was to promote health (67.4%) followed by the motivation of students (60.5%), and 82% of teachers revealed that they would continue to use the program (Kohl et al., 2001).

Another TAKE 10!® study evaluated children (3rd to 5th grades) regarding their attraction to PA and classroom environment (Barry et al., 2003). Two classes each from 3rd, 4th, and 5th grades were randomly chosen as the control and intervention class at each grade level from four schools. The intervention classes participated in a 10-week TAKE 10!® program. A total of 269 children were administered the Children's Attraction to Physical Activity (CAPA) questionnaire at baseline and at completion. The Classroom Environment Survey was administered to 26 participating teachers. Overall CAPA scores were significantly higher for boys than for girls ($p = .0003$), which indicates that girls display a lower interest and enjoyment of PA (Barry et al., 2003). Additionally, CAPA scores decreased in control classes and increased in classes that used the TAKE 10!® program (Barry et al., 2003). In another study, qualitative data were obtained from 29 teachers who responded to a written survey regarding their opinions about the TAKE 10!® program (Barry et al., 2003). The majority of the respondents reported positive opinions about the program and its effectiveness on students. Though the teachers reported implementing the program 30-50 minutes per week, they indicated that ''time crunch'' and class interruptions were the main barriers to implementing the program (Tsai et al., 2009). The observation and interview data revealed that students enjoyed the TAKE 10!® program and it also increased student attraction to PA (Tsai et al., 2009). In addition, teachers' attitudes about the program changed from resistance at the beginning

to active involvement because of the program's effectiveness on their students' concentration in the classroom (Tsai et al., 2009).

The following paragraphs describe teachers' perspectives toward other movement integration and PA promotion programs. Qualitative and quantitative process evaluation data on the 3-year elementary school-based PAAC program were collected from 24 schools (14 intervention and 10 control) during the first year of implementation. Data collection included tracking teacher training issues, challenges and barriers to effective implementation of PAAC lessons, initial and continual use of program specified activities, and potential competing factors, which might contaminate or lessen program effects (Gibson et al., 2008). Across the school year, approximately 84% of teachers responded to the weekly online teacher self-report questionnaire. The majority of teachers indicated that they incorporated PA into language arts (73%) and math (22%), whereas other subjects such as science, social studies, art, and music were used less often (Gibson et al., 2008). Most teachers (63%) reported no barriers to incorporating PA into the classroom curriculum, whereas some teachers (26%) reported time constraints caused by standardized testing, field trips, and substitute teachers as barriers to implementing PAAC lessons (Gibson et al., 2008). Very few teachers (<1%) indicated the need for additional help from PAAC staff, and most teachers reported high levels of confidence to demonstrate and incorporate PA into their lesson plans (Gibson et al., 2008). Additionally, the majority of teachers gave very high ratings on the importance of encouraging children to become more physically active, and most teachers indicated moderately high levels of support from other teachers, parents, and school administrators (Gibson et al., 2008). Results from the focus group discussions with 79 out of 135 teachers at the end of the

school year, with approximately 13 participants in each group, indicated that one of the best features of PAAC lessons was that they provide a great teaching strategy that helps break up the monotony of the class (Gibson et al., 2008). The teachers indicated wanting more lesson demonstrations from the PAAC staff to gain additional ideas about how to incorporate PA into a regular lesson, and several teachers wanted a forum to share and learn about creative lessons that worked well in other classrooms (Gibson et al., 2008). Additionally, teachers indicated that the active lessons encouraged them to be more creative, and helped students learn concepts better and improved their memorization skills (Gibson et al., 2008). Furthermore, many teachers reported that the active lessons are the only PA the students get during most days because they stand around during recess, and PE classes have been reduced to twice per week (Gibson et al., 2008).

One study used collective efficacy as a framework to examine elementary teachers' and principals' perceptions about integrating PA into classroom academics (Parks et al., 2007). The researchers argued that teachers are implementing little to no movement integration into their classrooms because of the nationwide focus on standardized testing and accountability in schools, which had impacted children's opportunities for PA in the elementary classroom (Parks et al., 2007). Considering that there is very little research examining willingness of teachers to implement movement integration in the classroom, the researchers recruited 314 in-service elementary teachers and 38 elementary school principals from 44 elementary schools to participate in the study (Parks et al., 2007). Participants completed a four-page survey that asked them for their biographical information, their beliefs in keeping children active, willingness to integrate movement, tendencies to be active (wellness and moving survey), role

preparedness for movement integration, and their individual and collective efficacy toward movement integration (Parks et al., 2007). Results indicated that majority of the teachers and principals believe that PA is important for children and they are willing to implement movement integration into the classroom 3 to 5 days per week into one or two lessons a day (Parks et al., 2007). The participants also reported that they were not well prepared for the role to integrate movement into academics and would need support in order to implement it successfully (Parks et al., 2007). In addition, participants reported that willingness to integrate movement was related to individual and collective efficacy, but personal involvement in PA was not. Overall, their previous mastery experiences were most influential in predicting individual efficacy, whereas institutional environment was the strongest predictor of collective efficacy (Parks et al., 2007). The researchers also suggest that teachers need substantial training to develop adequate integration skills across disciplines and understand ways that PA can be incorporated in their classes to effectively promote PA in schools (Parks et al., 2007).

In another study conducted during the 2006-2007 school year, the objective was to determine the feasibility of school staff implementing strategies to deliver health-promotion messages to primary and middle school students during the school day (Rogers & Motyka, 2009). The researchers provided resource kits with strategies for promoting PA and healthy eating through the use of the 5-2-1-0 message (encouraging more than five servings of fruits and vegetables daily, limiting screen time to less than 2 hours per day, promoting more than 1 hour of PA daily, and avoiding sugar-sweetened beverages) to 7 primary schools and 2 middle schools in southern Maine (Rogers & Motyka, 2009). Teachers and administrators voluntarily implemented resource-kit

strategies in schools and completed surveys at the end of the school year that examine their level of awareness of the project, ease of implementation, and perceived usefulness of the resource kit (Rogers & Motyka, 2009). Parents were also given handouts from the resource kit. Small discussion groups with students were carried out to assess their level of awareness of and attitude toward the 5-2-1-0 message (Rogers & Motyka, 2009). Results indicated that most administrators and teachers and half of the parents reported being more aware of the 5-2-1-0 message (Rogers & Motyka, 2009). Most students also responded positively to the messages (Rogers & Motyka, 2009). Overall, 80% of the teachers reported that the resource kit was easy to use and 90% of the teachers reported that they would be willing to continue implementing these strategies in the future (Rogers & Motyka, 2009). However, time constraints such as not having enough time to review the resource kit to tie it into the curriculum and to implement the 5-2-1-0 strategies in their classrooms were reported to be the biggest barrier to project implementation (Rogers & Motyka, 2009).

The last few paragraphs review literature of teachers' perspectives and attitudes toward PE. PE is one of the strategies to promote PA in schools, and hence it is important to also understand teachers' perspectives toward PE. One study was conducted to understand elementary classroom teacher's attitudes and perspectives toward elementary PE (Barney & Deutsch, 2009). In this study, 219 elementary classroom teachers (205 females and 14 males) from 18 elementary schools in three states (North Dakota, Oklahoma and Utah), completed a survey comprised of seven statements (Barney & Deutsch, 2009). The results revealed that classroom teachers reported PE is important for students throughout their lives and PE plays an important role in students' academic

education, including helping students learn better after returning from PE (Barney & Deutsch, 2009). However, when asked if there is no PE teacher in their school, a majority of classroom teachers in Oklahoma and North Dakota felt that they could not teach an effective PE lesson, whereas half the number of classroom teachers in Utah replied that they could teach an effective PE lesson (Barney & Deutsch, 2009). Overall, the researchers concluded that a majority of elementary classroom teachers have positive attitudes and perspectives toward elementary PE (Barney & Deutsch, 2009).

Another study examined the relationship between teachers' curriculum preferences in primary school and the relative value they place on PE compared to other key learning areas (KLAs) of the primary curriculum (Morgan, 2008). The six KLAs throughout primary school include English, Mathematics, Science and Technology, Human Society and its Environment, Creative and Practical Arts, and Personal Development, Health and Physical Education. Quantitative data were collected from 422 preservice and 63 in-service classroom teachers via the administration of these questionnaires: the Toulmin Elementary Physical Education Attitude Scale designed to measure students' feelings and attitudes about PE, the Primary School Curriculum Ranking Scale designed to determine respondents' perceptions of importance for all KLAs of the primary curriculum, the Subject Preference Inventory modified to focus on PE, the Pre-Service Teacher Education and Physical Education adapted for in-service teachers to indicate the quality and quantity of their current PE program (Morgan, 2008). Results revealed that most respondents considered PE to be a relatively valuable KLA but indicated they would prefer to teach other KLAs rather than PE (Morgan, 2008). Barriers to delivery of PE programs most commonly cited were insufficient time, followed by

inadequate resources and lack of expertise (Morgan, 2008). Most respondents reported they believed that teaching PE may lead to favorable short- and long-term benefits for students in physical, social, and mental health domains (Morgan, 2008; Morgan & Hansen, 2008b). Generally, PE was considered an important component of the curriculum, which was ranked fourth behind English, Math, and Human Society and its Environment (Morgan, 2008). However, most teachers preferred to teach other KLAs than PE and preferred specialist teacher involvement in the implementation of PE programs in the primary school (Morgan, 2008). Respondents who had more positive attitudes to teaching PE and preferred to teach PE to other KLAs also believed it was an important KLA and that PE was beneficial for students (Morgan, 2008). The researchers suggested that the quantitative data could be supplemented by qualitative data collected through in-depth interviews with a representative sample from each group (Morgan, 2008).

One qualitative study was conducted to examine Toronto teachers' perspective on barriers to implementing PA guidelines in the health and physical education (HPE) curriculum that was introduced in 1998 (Dwyer et al., 2003). A total of 45 teachers from five Toronto elementary schools where generalist classroom teachers provide PE classes, participated in focus groups in which a moderator facilitated each session (Dwyer et al., 2003). Participants reported that children were not engaged in moderate or vigorous PA daily for the recommended amount of time (Dwyer et al., 2003). Inductively generated themes from the data revealed three categories of barriers to implementing the curriculum guidelines: lower priority for HPE, lack of performance measures for PA, and lack of sufficient infrastructure (Dwyer et al., 2003). The participants reported that the new

curriculum expectations for other subjects were demanding and hence there was little time remaining to focus on PE (Dwyer et al., 2003). Additionally, they felt that resource support for the HPE curriculum was not sufficient and that PE specialists were unavailable to implement the curriculum. Like many studies, participants in this study felt accountable to both government and parents for high student performance on standardized tests in subjects that are of higher priority (Dwyer et al., 2003). Finally, the participants reported inadequate facilities and equipment, use of portables for classrooms, cancelling PE to have events in the gymnasium, and unavailability of teachers to supervise off school PA as barriers to implementing curriculum (Dwyer et al., 2003). Overall, the researchers argued that participating teachers perceive PE as a low priority in the educational system that resulted in the difficulty to meet the HPE curriculum expectations (Dwyer et al., 2003).

Another study looked at classroom teachers' perspectives regarding the cost, benefits, and barriers to teaching developmentally appropriate physical education (DAPE) (Sherman, Tran, & Alves, 2010). Behavior choice theory was used as a framework to guide the study of teacher choices that influence their students' PA behavior (Sherman et al., 2010). Eight classroom teachers who were undergoing phases three or four of the CATCH professional development program were purposefully selected to participate in this study (Sherman et al., 2010). The interview was structured to guide the classroom teachers to respond to their experiences related to the costs and benefits of, and barriers to, delivering DAPE (Sherman et al., 2010). Analyzed interview transcriptions yielded 187 meaning units and 23 themes. The classroom teachers indicated that costs of delivering PE include instructional time (e.g., finding time within the school day to conduct PE),

outside of class time (e.g., time spent preparing for PE lesson), during class time (e.g., getting and setting up equipment), and school costs (e.g., purchasing space to store PE equipment) (Sherman et al., 2010). Barriers to implementing PE included prohibitive environment, equipment, coordination and collaboration, lack of uniformity among teachers, no PE support person, parents, student characteristics, and PE education as a low priority subject (Sherman et al., 2010). Lastly, benefits of delivering PE included specific benefits to students, benefits to teachers, and overall benefits related to having a PE program (Sherman et al., 2010). Specifically, the classroom teachers reported that students not only benefitted from just the fitness and psychomotor components, but also benefitted from a broader scope such as increased PA time, positive characteristics gained from DAPE that transfer to the classroom, opportunities for positive role modeling (teacher and peers), and social and affective benefits for special populations (Sherman et al., 2010).

Two reported studies examined: (a) perceptions of classroom teachers regarding benefits and outcomes of PE, and (b) perceived barriers of classroom teachers toward successfully delivering PE programs and the impact of these barriers on the type and quality of PE programs delivered (Morgan & Hansen, 2008a, 2008b). A mixed-model design was used in this study that included interviews with 31 classroom teachers and completed questionnaires from 189 classroom teachers from 38 schools in New South Wales, Australia (Morgan & Hansen, 2008a). Overall, teachers believed PE provides children with opportunities to improve fitness and to actively counter obesity trends, impacts positively on learning and behavior in the classroom, helps children improve social skills, and provides opportunities to experience success in the PE learning

environment (Morgan & Hansen, 2008b). However, the five prominent barriers teachers reported to delivering PE were mainly institutional, rather than teacher-related, which are out of their control (Morgan & Hansen, 2008a). Examples of institutional barriers were other teaching priorities, amount of time, equipment availability, quality of facilities, level of departmental assistance or professional development, school executive attitudes towards PE, available funds, and class size (Morgan & Hansen, 2008a). Examples of teacher-related barriers were confidence teaching PE, interest or enthusiasm for PE, PE content knowledge, personal school experiences in school, attitudes toward PE, perceptions of value of PE, and expertise or qualifications (Morgan & Hansen, 2008a). These barriers negatively impacted the delivering of PE in terms of reduced time spent teaching PE and delivering PE of doubtful quality (Morgan & Hansen, 2008a).

A review of literature on teachers' perspectives toward movement integration, PA promotion, and PE revealed that a majority of teachers believe in the positive benefits of PA for students. However, across the studies, time constraints appear to be a major barrier in implementing movement integration, PA promotion programs, and PE in schools. Particularly, teachers reported willingness to implement TAKE 10!® activities in their elementary classrooms, but cited lack of time as a barrier to implementing the program (Tsai et al., 2009). Specifically, emphasis placed on standardized testing and accountability in schools had impacted children's opportunities for PA in the elementary classroom (Parks et al., 2007). Therefore, the purpose of study three was to expand on previous literature to further examine teachers' experiences in implementing TAKE 10!®, which may help to better understand teachers' attitudes toward the effectiveness of the TAKE 10!® intervention.

This chapter reviews literature on the effects of movement integration programs on students' PA, fitness, and on-task behavior. In addition, teachers' implementation experiences and perceptions of movement integration programs, PA promotion programs, and PE were also reviewed. This dissertation project addresses gaps in the literature by specifically examining the effects of TAKE 10!® on students in-school PA, fitness levels, and on-task behavior. Furthermore, teachers' experiences in implementing TAKE 10!® was qualitatively examined. If teachers do not see the value of implementing TAKE 10!® or find it difficult to do so, then it is unlikely to be integrated into the class curriculum regardless of any PA or on-task benefits that may accrue from its implementation. The following three chapters provide three studies that examined the effectiveness of TAKE 10!® on students' PA, fitness levels, and on-task behavior, as well as teachers' experiences in the implementation of TAKE 10!®.

CHAPTER 3

STUDY 1: EFFECTS OF A MOVEMENT INTEGRATION PROGRAM ON CHILDRENS' PHYSICAL ACTIVITY AND FITNESS LEVELS

Introduction

Increasing physical activity (PA) levels of children is the goal of many school-based PA promotion programs. In fact, children should accumulate at least 60 minutes of PA per day that are within moderate to vigorous intensity levels for enhanced health benefits (U.S. Department of Health and Human Services, 2008). However, only 42% of children aged 6 to 11 years obtained the recommended 60 minutes per day of moderate or greater intensity PA (Troiano et al., 2008). Incorporating movement integration programs in schools is an effective strategy to increase students' PA (Bartholomew & Jowers, 2011; Donnelly et al., 2009; Erwin, Abel, et al., 2011; Erwin, Beighle, et al., 2011; Mahar et al., 2006). Students' PA intensity levels were also found to be higher when they participate in movement integration programs. For example, students who participated in the Physical Activity Across the Curriculum (PAAC) program were found to accumulate more PA in the moderate to vigorous intensity levels over 2 week days and 2 weekend days compared to students in the control group (Donnelly et al., 2009). In another study, it was

found that approximately 20% of the Texas I-CAN! lessons were spent in moderate to vigorous intensity PA levels (Bartholomew & Jowers, 2011).

Several studies have investigated the effects of TAKE 10!® on students' PA. For instance, students who participated in the TAKE 10!® program were found to accumulate PA in the moderate intensity levels during the 10-minute activity (Stewart et al., 2004). In another study, teachers reported that students accumulated an average of 26.8 minutes per week of PA through a 36-week TAKE 10!® program (Williams et al., 2008). Additionally, students' activity levels over a continuous 7-day period during TAKE 10!® (2775.0 counts/minute) were higher than those accumulated during physical education (1813.7 counts/minute), lunch (1371.5 counts/minute), and after school/weekend activities (1480.4 counts/minute) (Moore et al., 2007). However, TAKE 10!® activity levels compared to those during recess time (2169.7 counts/minute) were not significantly different (Moore et al., 2007). In another study, it was found that there was an increase in PA duration (3.3 hours versus 2.8 hours) among students in the intervention school where a Happy 10 program (a TAKE 10!® program implemented in China) was piloted, whereas there was a decrease in PA duration in the control school (Liu et al., 2008). To our knowledge, there are no studies that examined the effects of TAKE 10!® on students' in-school step counts and PA intensity levels. This present study will add to the literature by examining whether the TAKE 10!® program will increase students' in-school step counts and PA intensity levels.

Health-related physical fitness, such as cardiovascular fitness and body composition, are important components of good health. Body mass index (BMI) provides information on the appropriateness of the weight relative to the height (The Cooper

Institute, 2010). In one study, it was found that there was a significantly smaller increase in BMI from baseline to 3 years in students who were exposed to more than 75 minutes of the PAAC lessons per week compared to students who participated in less than 75 minutes of the program (Donnelly et al., 2009; Donnelly & Lambourne, 2011). In another study, female students who participated in the Happy 10 program were found to have a smaller change in weight compared to control students (2.4 kg intervention versus 4.6 kg control) (Kibbe et al., 2011). Considering the importance of physical fitness, very little is known about the effectiveness of movement integration programs on the cardiovascular fitness and BMI of children. Therefore, besides examining the effects of TAKE 10!® on students' in-school PA, this study also examined the effects of TAKE 10!® on students' cardiovascular fitness and BMI. Specifically, changes in elementary school students' in-school PA levels from baseline to mid-intervention and end-intervention periods of TAKE 10!® were examined in this study. In addition, we examined if elementary school students' cardiovascular fitness and BMI can be altered from baseline to end-intervention within the 8-week intervention period.

It was hypothesized that elementary school students would have statistically significant increases in their in-school PA levels from baseline to mid-intervention period and would be sustained through to the end-intervention period of TAKE 10!®. In addition, it was hypothesized that elementary school students would have statistically significant increases in their cardiovascular fitness and decrease in BMI from baseline to the end-intervention period of TAKE 10!®. We also examined differences in in-school PA, cardiovascular fitness, and BMI between sex and grades. It was hypothesized that there

would be statistically significant differences in in-school PA, cardiovascular fitness, and BMI between sex and grades.

Methods

Participants and Setting

A total of 219 elementary school students and 9 classroom teachers from three 3rd-grade, three 4th-grade, and three 5th-grade classes were recruited as participants from one elementary school in the city of Magna, Utah. By the end of the study, 210 students remained as participants because 6 students moved out of the school during the course of the study and 3 students did not complete the PA measurement protocol. Initial contact was made with the principal to conduct the research and approval to conduct the study was granted by the school district research office. Approval from the university's Institutional Review Board (IRB) was also obtained to conduct this study. Total enrollment in the school is approximately 750 students K-6th. The ethnicity demographics are 57% Caucasian/White; 35% Hispanic/Spanish; 5% Pacific Island; and 3% Other. The sample size comprised 91 boys and 119 girls. The specific inclusion criteria for this study were: (a) students aged 8-12 years; (b) students from 3rd through 5th grade; and, (c) teachers from 3rd through 5th grade. These grade levels were chosen because high stakes standardized testing begins at 3rd grade in the elementary schools and the TAKE 10!® program is available through to the 5th grade. The exclusion criteria for this study were students who have serious health conditions, injuries, or illnesses that may limit PA participation.

Physical Activity and Fitness Levels Measures

The participants' daily PA levels was measured by pedometers (Yamax, CW-600 Digiwalker) to determine whether daily in-school step counts would differ during baseline, mid-intervention and end-intervention of the TAKE 10!® program. The purpose of collecting three separate pedometer measurement points (baseline, mid-intervention, and end-intervention) was to track students' PA levels throughout the study. Pedometers are considered an inexpensive, valid, and reliable measurement of students' PA in school settings (Crouter, Schneider, Karabulut, & Bassett, 2003; Schneider, Crouter, & Bassett, 2004). Students' daily step counts were used as the outcome variables through pedometers. Students wore the pedometers for 4 consecutive days (Monday to Thursday) during the baseline, mid-intervention, and end-intervention periods of the study. Four days of pedometer wearing is an acceptable period to obtain a valid estimate of daily step counts among youths (Craig, Tudor-Locke, Cragg, & Cameron, 2010).

ActiGraph accelerometers were used in a subsample of 72 students (25 3rd grade, 23 4th grade, and 24 5th grade) to determine their in-school moderate to vigorous intensity PA levels during baseline, mid-intervention, and end-intervention. A subsample of students wore accelerometers because of the limited number of accelerometers available. Placement of the accelerometers was standardized at the hip for accuracy in measurement (Nilsson, Ekelund, Yngve, & Sjostrom, 2002). Accelerometer output was interpreted using cutpoints for sedentary, light, moderate, and vigorous activity levels. Specifically, cut-points of 0 - 25, 26 - 573, 574 – 1002, and > 1003 counts per minute set at a 15-second epoch was used to represent sedentary, light, moderate, and vigorous intensity, respectively (Evenson, Catellier, Gill, Ondrak, & McMurray, 2008). These cutpoints

were used because of acceptable classification accuracy for all four levels of PA intensity and performed well among children of all ages (Trost, Loprinzi, Moore, & Pfeiffer, 2011).

The students' health-related physical fitness was measured via the FITNESSGRAM test. The FITNESSGRAM is a valid and reliable battery of assessments used to test muscle fitness, aerobic capacity, and body composition in children (The Cooper Institute, 2010). In this study, participants' health-related physical fitness was measured by the PACER (Progressive Aerobic Cardiovascular Endurance Run) and BMI tests to examine changes in their aerobic capacity and body composition, respectively. The objective of the PACER test was for the students to run as long as possible back and forth across a 15 meter space at a specified pace that gets faster each minute. In addition, the students' BMI was calculated by measuring their height and weight. Height was measured (to the nearest 0.1 cm) using a portable free-standing stadiometer. Weight was determined (to the nearest 0.1 kg) using a portable medical scale. The PACER tests were administered by the physical education teacher, while the height and weight was measured by the researcher during the physical education classes. The PACER and BMI tests were conducted once during baseline and once at the end of the study.

Data Collection and Study Procedures

Informed parental consent forms and child assent forms were obtained in accordance with the University Institutional Review Board and school district requirements prior to data collection. All classroom teachers were trained to use the TAKE 10!® program before implementing it in their classes. Before data collection, the

researcher went into each class and demonstrated the proper wearing of the pedometers/accelerometers. Students were given hands-on experience in wearing the pedometers/accelerometers, while the researcher walked around to check that students had securely attached the pedometer/accelerometer to their pants or belts.

Data collection spanned a period of 12 weeks in fall 2012. Weeks 1 to 4 was the baseline period where the classroom teachers did not implement TAKE 10!®. Weeks 5 to 12 was the intervention period where the teachers implemented TAKE 10!®. Baseline PA levels was collected over 4 consecutive days of week 1. Mid-intervention PA levels was collected over 4 consecutive days of week 8. End-intervention PA levels was collected over 4 consecutive days of week 12. Mondays to Thursdays was designated as the PA data collection days because the school had shorter hours on Fridays. During the PA data collection period, the researchers assigned a pedometer and/or an accelerometer to each student. Each pedometer and accelerometer had a number that matched the students' ID number. At the beginning of the school day, the researchers handed each classroom teacher boxes that contained the pedometers and/or accelerometers. Instructions were provided for teachers to supervise the students on the proper wearing of the pedometers/accelerometers on their pants or belt securely at the midline of their thigh.

At the end of the school day, the researcher collected the pedometers and accelerometers from the classroom teachers. Students' step counts were recorded from the returned pedometers. Data from the returned accelerometers were downloaded and analyzed with ActiLife software version 6.0 (ActiGraph, Pensacola, FL). All data were recorded using anonymous confidential identification numbers, and students were not identified by name after the data had been collected. The data were kept confidential.

Data and records were stored in a locked filing cabinet and on a password protected computer located in the researcher's work space. Only the researcher had access to this information.

Data Analysis

Data were entered and results generated using SPSS (Version 18.0, Chicago, IL). Daily in-school PA levels were quantified as the average number of steps recorded, average time spent in moderate intensity PA, average time spent in vigorous intensity PA, and average time spent in moderate to vigorous intensity PA during the school day at baseline, mid-intervention, and end-intervention. Step counts of students who wore the pedometers for at least 1 day out of the 4 days at baseline, mid-intervention, and end-intervention were kept for analysis. One day of pedometer wearing provides a good representation of steps per day relative to the whole week in terms of both reliability and validity (Craig et al., 2010; Prewitt, Hannon, & Brusseau, 2013). Consistent with other research examining students' step counts using pedometers, values below 1,000 and above 30,000 were treated as outliers and deleted (Rowe, Mahar, Raedeke, & Lore, 2004). Similarly, students with at least 1 day of accelerometer wearing during baseline, mid-intervention, and end-intervention were considered to be in compliance with the accelerometer protocol and hence were used in the data analysis. Cardiovascular fitness measured from the PACER test was quantified by the number of laps completed and BMI was quantified by a number calculated using a formula (weight in kilograms/height in meters^2). A repeated measures ANOVA was used to determine differences in the students' in-school PA levels between the baseline, mid-intervention, and end-intervention period

of the study. A paired sample t-test was used to determine differences in the students' cardiovascular fitness and BMI between the baseline and end-intervention period of the study. An alpha level of 0.05 was used for the statistical tests.

Results

During the intervention period, teachers conducted one to three TAKE 10!® activities per school day. In other studies, the majority of the teachers were also able to conduct one movement integration activity a day (Kohl et al., 2001; Mahar et al., 2006).

Physical Activity

In-school step counts. A total of 210 students from three 3rd-grade, three 4th-grade, and three 5th-grade classes completed at least 1 day out of the 4 days of pedometer wearing during baseline (week 1), mid-intervention (week 8), and end-intervention (week 12). Descriptive data for the students in 3rd through 5th grades are displayed in Table 3.1. There was a significant effect of time on students' daily in-school steps ($P < 0.001$, *partial* $\eta^2 = .20$). Overall, students accumulated approximately 672 more daily in-school steps during mid-intervention compared to baseline. The difference in students' daily in-school steps between mid-intervention and baseline was statistically significant ($P < 0.001$). However, there was a decrease in students' daily in-school steps of approximately 152 from baseline to end-intervention. Nevertheless, the difference in students' daily in-school steps between baseline and end-intervention was not statistically significant ($P = 0.22$).

Table 3.1

Mean Daily In-school Steps Taken by Students ($N = 210$)

	Baseline	Mid-Intervention	End-Intervention
Mean	5629	6301	5477
SD	1232	1500	1417
Minimum	2526	1901	2138
Maximum	8808	10479	9376

Daily in-school steps taken during baseline, mid-intervention, and end-intervention were evaluated by grade level. Table 3.2 displays the mean values of daily in-school steps per grade level. Across the three grade levels, there was a general pattern of an increase in daily in-school steps from baseline to mid-intervention and a decrease in daily in-school steps from mid-intervention to end-intervention. The 4th- and 5th-grade students accumulated approximately 685 and 697 more daily in-school steps, respectively, compared to 3rd-grade students across the three periods, and the difference was statistically significant ($P = 0.001$).

Table 3.2

Mean Daily In-school Steps Taken by 3rd-, 4th-, and 5th-Grade Students

	Baseline ($M \pm SD$)	Mid-Intervention ($M \pm SD$)	End-Intervention ($M \pm SD$)
3rd Grade ($N = 73$)	5175 ± 1198	6039 ± 1631	4839 ± 1373
4th Grade ($N = 69$)	5695 ± 1272	6615 ± 1396	5799 ± 1308
5th Grade ($N = 68$)	6048 ± 1068	6263 ± 1415	5835 ± 1349

Daily in-school steps taken during baseline, mid-intervention, and end-intervention were also evaluated by sex. Table 3.3 displays the mean values of daily in-school steps for male and female students. Both male and female students displayed an increase in daily in-school steps from baseline to mid-intervention and a decrease in daily in-school steps from mid-intervention to end-intervention. Male students accumulated approximately 728 more daily in-school steps compared to female students across the three periods, and the difference was statistically significant ($P < 0.001$).

In-school PA intensity levels. Of the 72 students who wore accelerometers from the beginning of the study, 64 students (36 females and 28 males; 25 3rd grade, 20 4th grade, and 19 5th grade) were in compliance with the accelerometer protocol guidelines. The missing data consisted of 1 student who moved out of the school during the course of the study, 1 student who was injured during the mid-intervention period, 2 students who were not in compliance with the accelerometer protocol guidelines (i.e., absent for 4 days during the mid-intervention data collection), and four ActiGraph accelerometers that malfunctioned during data collection. Students with at least 1 day of accelerometer data at baseline, mid-intervention, and end-intervention were used in data analysis.

Table 3.3

Mean Daily In-school Steps Taken by Male and Female Students

	Baseline ($M \pm SD$)	Mid-Intervention ($M \pm SD$)	End-Intervention ($M \pm SD$)
Male ($N = 91$)	6098 ± 1376	6710 ± 1761	5837 ± 1600
Female ($N = 119$)	5270 ± 971	5988 ± 1180	5202 ± 1194

Descriptive data for the students in 3rd through 5th grades are displayed in Table 3.4. Results indicated that there was no significant change in students' average time spent in moderate intensity PA from baseline (18.6 ± 4.4) to end-intervention (18.7 ± 4.1). Students' average time spent in moderate-to-vigorous intensity PA increased significantly ($P = 0.008$) from baseline (33.4 ± 8.8) to end-intervention (35.4 ± 7.6). Students' average time spent in vigorous intensity PA increased significantly from baseline (14.8 ± 5.5) to mid-intervention (15.2 ± 4.9), and to end-intervention (16.7 ± 5.0). The difference of average time spent in vigorous intensity PA between baseline and end-intervention was statistically significant ($P < 0.001$), and the effect size is considered large (*partial* $\eta^2 = .24$). Additionally, the difference of average time spent in vigorous intensity PA between mid-intervention and end-intervention was statistically significant ($P = 0.01$), and the effect size is considered large (*partial* $\eta^2 = .13$). Overall, students accumulated approximately 2 minutes more of vigorous intensity PA at end-intervention compared to baseline.

Table 3.4

Average Daily In-school PA Levels of Students ($N = 64$)

	Baseline ($M \pm SD$)	Mid-Intervention ($M \pm SD$)	End-Intervention ($M \pm SD$)
MI PA (min)	18.6 ± 4.4	17.2 ± 4.8	18.7 ± 4.1
MVI PA (min)	33.4 ± 8.8	32.5 ± 8.0	35.4 ± 7.6
VI PA (min)	14.8 ± 5.5	15.2 ± 4.9	16.7 ± 5.0

M = Mean: *SD* = Standard deviation; MI PA = Moderate intensity PA; VI PA = Vigorous intensity PA; MVI PA = Moderate-to-vigorous intensity PA.

Figure 3.1 illustrates the average time spent in vigorous intensity PA for 3rd-, 4th-, and 5th-grade classes during baseline, mid-intervention, and end-intervention periods. Overall, there was an increase in average time spent in vigorous intensity PA for 3rd-, 4th-, and 5th-grade students from baseline to end-intervention. The difference in average time spent in vigorous intensity PA between the 3rd-grade and 4th-grade students was statistically significant ($P = 0.017$), as well as between the 3rd-grade and 5th-grade students ($P < 0.001$).

Figure 3.2 illustrates the average time spent in vigorous intensity PA for male and female students during baseline, mid-intervention, and end-intervention periods. There was an increase in average time spent in vigorous intensity PA from baseline to end-intervention for male and female students. Female students demonstrated an increase of approximately 3 minutes of average time spent in vigorous intensity PA from baseline.

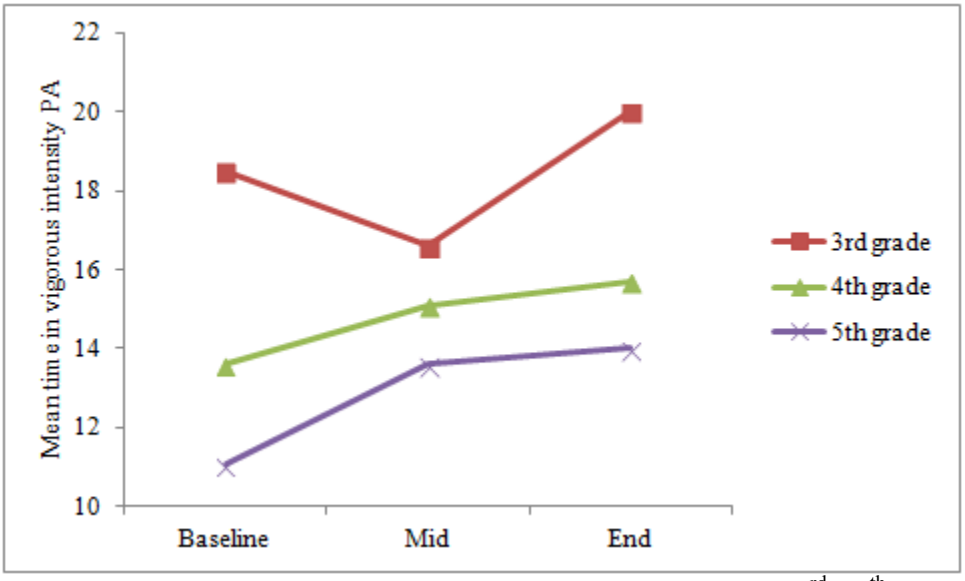


Figure 3.1: Average Time Spent in Vigorous Intensity PA for 3rd-, 4th-, and 5th-Grade Classes during Baseline, Mid-Intervention, and End-Intervention Periods.

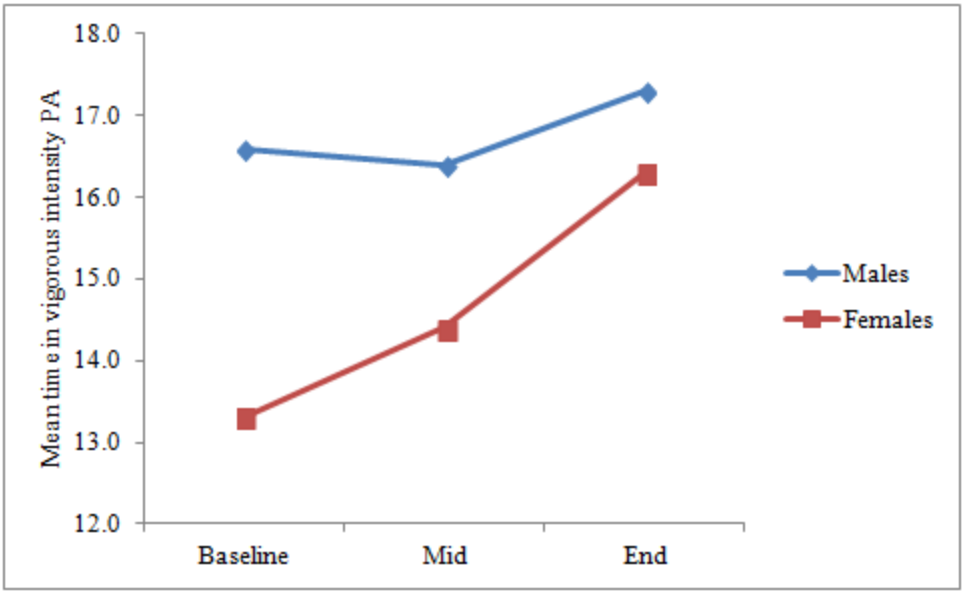


Figure 3.2: Average Time Spent in Vigorous Intensity PA for Male and Female Students during Baseline, Mid-Intervention, and End-Intervention Periods.

Physical Fitness

A total of 183 students (67 3rd grade, 56 4th grade, and 60 5th grade) completed both the BMI measurements and PACER tests at baseline and at end-intervention. Of the 183 students, 105 were female students and 78 were male students. Descriptive data for the students from 3rd grade through 5th grade are displayed in Table 3.5. There were no significant changes in the students' BMI measurement and number of laps run between baseline and end-intervention. Physical fitness measurements were also evaluated by grade level and sex. Table 3.6 displays the mean values of BMI and laps run per grade level at baseline and end-intervention. Table 3.7 displays the mean values of BMI and laps run for male and female students at baseline and end-intervention. Overall, there were no significant changes in the male and female students' BMI measurement and number of laps run between baseline and end-intervention for each grade level.

Table 3.5

Mean BMI and Laps of Students who Completed the Tests ($N = 183$)

Physical Fitness	Baseline		End-Intervention	
	BMI	Laps	BMI	Laps
Mean	18.7	12.4	18.7	12.5
SD	3.7	6.6	3.7	6.2
Minimum	13.6	3	13.6	2
Maximum	33.5	45	33.6	36

Table 3.6

Mean BMI and Laps of 3rd-, 4th-, and 5th-Grade Students

Physical Fitness	Baseline ($M \pm SD$)		End-Intervention ($M \pm SD$)	
	BMI	Laps	BMI	Laps
3rd Grade ($N = 67$)	17.8 ± 2.7	10.5 ± 4.7	17.8 ± 2.8	10.2 ± 3.5
4th Grade ($N = 56$)	18.4 ± 3.5	11.7 ± 4.2	18.5 ± 3.7	12.8 ± 6.5
5th Grade ($N = 60$)	19.9 ± 4.3	15.2 ± 9.1	19.8 ± 4.3	14.7 ± 7.3

Table 3.7

Mean BMI and Laps of Male and Female Students

Physical Fitness	Baseline ($M \pm SD$)		End-Intervention ($M \pm SD$)	
	BMI	Laps	BMI	Laps
Male ($N = 78$)	19.2 ± 4.0	13.5 ± 8.0	19.3 ± 4.1	13.3 ± 6.9
Female ($N = 105$)	18.3 ± 3.4	11.6 ± 5.4	18.2 ± 3.3	11.9 ± 5.5

Discussion

This study was designed to examine the effects of TAKE 10!® on students' PA levels (i.e., in-school step counts and in-school intensity PA levels) and physical fitness levels (i.e., cardiovascular fitness and BMI). It was hypothesized that elementary school students would have statistically significant increases in their in-school PA levels from baseline to mid-intervention, and to the end-intervention of TAKE 10!®. This hypothesis was partially supported in that students' in-school vigorous intensity PA levels increased significantly from baseline to mid-intervention, and to end-intervention, whereas students' daily in-school step counts increased significantly from baseline to mid-intervention, but decreased at end-intervention. In addition, it was hypothesized that elementary school students would have a statistically significant increase in their cardiovascular fitness levels and decrease in BMI from baseline to the end-intervention period of TAKE 10!®. This hypothesis was not supported because there were no significant changes in students' cardiovascular fitness levels and BMI at end-intervention.

A closer look at the pedometer data indicated that students accumulated approximately 672 more daily in-school steps during mid-intervention compared to baseline. Consistent with past research, students' daily in-school steps in the Energizers intervention classes increased approximately by 782 compared to the control classes (Mahar et al., 2006). Other research has shown that classroom PA breaks of about 10 minutes can provide students with approximately 1000 more steps per day (Bartholomew & Jowers, 2011; Erwin, Abel, et al., 2011; Erwin, Beighle, et al., 2011).

Students' step counts in this study were found to decrease from mid-intervention to end-intervention. Although there was a decrease in students' mean in-school steps of

approximately 152 from baseline to end-intervention, the difference was not significant. One possible explanation for the decrease in step counts from baseline to end-intervention is the change in seasonal climate. Baseline (week 1) and mid-intervention (week 8) pedometer data were collected during the fall season months of September to November, whereas end-intervention (week 12) pedometer data were collected during the winter season month of December. There were several days in week 12 where students were kept in-class playing sedentary computer games during recesses because of the snow and cold weather. Having the opportunity to participate in outdoor recesses is important because an extra 15 minutes of outdoor recess can provide students with 1,250 steps (Beighle et al., 2006). The physical education teacher also reported anecdotally that students were more active during outdoor physical education lessons in the fall season compared to indoor physical education lessons in the winter season, which could provide an explanation for the changes in step counts from mid- to end-intervention (i.e., between the two seasons). In particular, elementary school students have been found to spend more time sitting, and less time standing, walking, and engaged in moderate to vigorous intensity PA during indoor physical education (McKenzie et al., 1995). In general, students are more active during the fall season when the weather is suitable for outdoor PA and less active during the winter season when the temperatures are much lower (Beighle, Erwin, Morgan, & Alderman, 2012; Brusseau, Kulinna, Kloeppel, & Ferry, 2012). Besides providing movement integration programs, such as TAKE 10!®, other alternative sources of indoor PA should be provided in school to help students maintain or increase their PA levels during the winter season.

A subsample of students from one 3rd-, one 4th-, and one 5th-grade class wore accelerometers along with pedometers to determine their in-school PA intensity levels. Though students' average time spent in moderate intensity PA remained the same at the end of the intervention, there was an increase in students' average time spent in moderate to vigorous intensity PA and vigorous intensity PA from baseline to end-intervention. Particularly, there was a significant increase of approximately 2 minutes of moderate-to-vigorous intensity PA and vigorous intensity PA at end-intervention (week 12) compared to baseline (week 1). Children who are involved in vigorous PA have demonstrated the greatest benefits in academic performance. For example, it was found that elementary school students who performed vigorous activity during physical education had significantly higher academic grades ($P < 0.05$) than students who performed no vigorous PA or moderate PA (Coe, Pivarnik, Womack, Reeves, & Malina, 2006). Further examination of the data indicated that the 4th- and 5th-grade students demonstrated an increase in vigorous intensity PA across the three periods when compared to the 3rd-grade students. Female students also demonstrated an increase in vigorous intensity PA when compared to male students. One explanation for the difference in PA levels between the 3rd- and the 4th/5th-grade students could be because the 4th/5th-grade students were developmentally and physically more mature than the 3rd-grade students, and hence able to move more intensely. Though the PA intensity among the subsample of students increased from baseline to end-intervention, their step counts dropped. One possible explanation is that the subsample of students engaged in vigorous activity through the participation of TAKE 10!® in the classrooms to compensate for the lack of outdoor recesses and outdoor physical education during the end-intervention period. In support of

this interpretation, it has been found that students' activity levels during TAKE 10!® were higher than those during physical education (Moore et al., 2007).

Although it was hypothesized that the students would have increase in their cardiovascular fitness levels and decrease in BMI from baseline to the end-intervention period of TAKE 10!®, it was found that there were no significant changes in the students' number of laps run and BMI measurement between baseline and end-intervention. One possible explanation may be that 10-minute bouts of exercise, on average once per day is an insufficient amount of PA, regardless of intensity, to change BMI. Another explanation for the lack of change in students' BMI could be due to insufficient time (i.e., 12 weeks) to detect change in BMI. In a previous study, a 3-year PAAC program was implemented to examine changes in students' BMI from baseline to 3 years (Donnelly et al., 2009). It was found that the change in students' BMI from baseline to 3 years was significantly influenced by exposure to the PAAC program, which could suggest that a longer period of time is necessary to see changes in students' BMI. Particularly, schools with more than 75 minutes of PAAC per week showed significantly less of an increase in BMI compared to schools that had less than 75 minutes of PAAC (1.8 ± 1.8 versus 2.4 ± 2.0) (Donnelly et al., 2009). Another explanation for the lack of change in students' cardiovascular fitness levels is that the PA provided by the classroom teachers in the TAKE 10!® program was not intense enough to enhance pacer performance. The classroom teachers were allowed to choose and modify the TAKE 10!® activities to fit their curriculum. Therefore, teachers may have chosen to implement activities that enhanced muscular strength and endurance, rather than cardiovascular endurance. A range of cardiovascular activities can be provided to control the likelihood of teachers

choosing activities that would not improve results on the PACER test. A fourth explanation could be the lack of motivation in students' PACER performance, regardless of whether their cardiovascular fitness has improved. The end-intervention PACER tests were administered during the winter season and the tests were conducted outdoors. Anecdotal observations indicated that students were wearing heavy snow boots during the tests and the ambient temperature was very low. Therefore, due to the cold, the students may have showed lower motivation in the PACER test, thus quitting the test before reaching exhaustion.

Although this study addresses a gap in the literature regarding the effectiveness of the TAKE 10!® program on students' in-school PA levels, it is not without limitations. One limitation is that a repeated measure design with one intervention group and no control group was used in this study. In addition, the results of this study may not be generalizable to elementary school students outside of this school. Weather changes in Utah may have also influenced the PA levels of the students. It was assumed that the students had adhered to the instructions on the proper wearing of the pedometers/accelerometers and not tampered with the instruments for measuring their PA levels during the school day. In addition, it was assumed that students had participated with effort in the cardiovascular fitness assessment.

Future research could include a control group to further examine the effectiveness of the TAKE 10!® program on students' in-school PA levels and physical fitness levels. In addition, future research could consider implementing the program during the spring semester to minimize the impact of a seasonal effect on students' PA and fitness levels. Future research could also include other components of physical fitness, such as muscular

strength and endurance assessments to examine if these fitness components would improve in the students after the intervention. In addition, using the skinfold measurement would be a more reliable method compared to BMI in determining body composition because skinfold measurement estimates the percent of body fat (The Cooper Institute, 2010). Another suggestion would be to standardize the PACER tests in an indoor condition and to have the teacher or researcher remind the students of the need to put forward their best effort in the tests. Lastly, future research could also examine the sustainability of the program by investigating whether students' PA and fitness levels would be maintained after the study has ended.

CHAPTER 4

STUDY 2: EFFECTS OF A MOVEMENT INTEGRATION PROGRAM ON CHILDRENS' ON-TASK BEHAVIOR

Introduction

Elementary school children who go through prolonged periods of academic instruction often become more fidgety or restless and experience reduced concentration (Pellegrini & Davis, 1993). Off-task behavior, inattention-to-task, or fidgety behavior, may also be related to academic performance (Mahar, 2011). Moreover, students who display persistent disruptive behavior lose valuable time in academic lessons, are a distraction for classmates, and cause stress for teachers (Burke, Oats, Ringle, Fichtner, & DelGaudio, 2011). Direct observation in the classroom is the best strategy to measure students' on-task behavior, but such behavior is typically more difficult to measure because of the cost, burden placed on the observers, and time required for recording the observation (Mahar, 2011). Additionally, measurement of on-task behavior is often time intensive and demanding, which requires substantial training and retraining of observers to obtain credible data and maintaining a good working relationship with the school staff (Mahar, 2011).

Studies on the effectiveness of in-class activities on the on-task behavior of students in the classroom are limited. Only two published studies (Grieco et al., 2009; Mahar et al., 2006) used direct observational strategies to code students' behavior in the classroom and three published studies (Barry et al., 2003; Gibson et al., 2008; Tsai et al., 2009) used qualitative methodology or survey measures to examine students' on-task behavior. Results from the two studies that used direct observational strategies indicated that the Energizers and Texas I-CAN! programs are effective in improving students' on-task behavior (Grieco et al., 2009; Mahar et al., 2006). In one qualitative study, teachers reported that the Physical Activity Across the Curriculum program helped with behavior management and the students were more focused in the classroom (Gibson et al., 2008). In another two studies that implemented the TAKE 10!® program, qualitative data revealed that students were able to concentrate better (Tsai et al., 2009) and classes required less disciplinary intervention (Barry et al., 2003) after students participated in the TAKE 10!® activities. Results from the qualitative studies can be further strengthened by using direct observational strategies to quantitatively code students' on-task behavior in the classroom to examine the effectiveness of the TAKE 10!® program. Therefore, the purpose of this study was to examine the effectiveness of the TAKE 10!® program by coding students' on-task behavior using quantitative measures.

Researchers in the two quantitative studies used different direct observational procedures in observing students' on-task behavior in the classroom. For instance, six students were observed in each observation period in the study by Mahar et al. (2006), whereas the whole class was observed in the study by Grieco et al. (2009). Furthermore, Mahar et al. (2006) observed each student for 10 seconds, whereas Grieco et al. (2009)

observed each student for 5 seconds. Observing each student for shorter durations of about 5 seconds has been considered more reliable than 10 seconds per student (Gardenier, MacDonald, & Green, 2004). Longer observations can result in missing the behavior in other children in the classroom (Grieco et al., 2009). One limitation, however, from the Grieco et al. (2009) study was that interobserver reliability could not be determined because two observers were observing different sets of students during the 15-minute observation period. Therefore, the present study adapted the protocol by Grieco et al. (2009), by employing two observers observing the same set of students, using a 5-second interval between each student for a 30-minute period. This procedure allowed the tabulation of interobserver reliability between the two observers. The purpose of this study was to examine the changes in elementary school students' on-task behavior from baseline to intervention periods of TAKE 10!®. It was hypothesized that elementary school students would have significantly greater on-task behavior during the TAKE 10!® intervention period compared to the baseline period.

Methods

Participants and Setting

A total of 219 elementary school students and 9 classroom teachers from three 3rd-grade, three 4th-grade, and three 5th-grade classes were recruited as participants from one elementary school in the city of Magna, Utah. By the end of the study, 213 students remained as participants because 6 students moved out of the school during the course of the study. The principal gave approval to conduct the research. Approval from the university's Institutional Review Board (IRB) was also obtained to conduct this study.

Total enrollment in the school is approximately 750 students K-6th. The ethnicity demographics are 57% Caucasian/White; 35% Hispanic/Spanish; 5% Pacific Island; and 3% Other. The sample size comprised of 91 boys and 119 girls. The specific inclusion criteria for this study were: (a) students aged 8-12 years; (b) students from 3rd through 5th grade; and, (c) teachers from 3rd through 5th grade. These grade levels were chosen because high stakes standardized testing begins at 3rd grade in the elementary schools and the TAKE 10!® program is available through to the 5th grade. The exclusion criteria for this study were students who have serious health conditions, injuries, or illnesses that may limit PA participation.

On-task Behavior Measurement

The participants' on-task behavior was measured using a direct observational strategy. On-task behavior is considered verbal or motor behavior that follows class rules and is appropriate to the learning situation (Grieco et al., 2009). Off-task behavior may include students gazing off, placing their head on the desk, yawning, reading or writing inappropriate or unassigned material, talking to or looking at other students when not part of a given assignment, and leaving the desk without receiving permission from the teacher or teacher's aide. The momentary time sampling procedure was used to record the students' on-task behavior. In such a procedure, the observation occurs at the end of each interval, immediately after the observer marks the behavior on the coding sheet (van der Mars, 1989). The interval used in this study was 5 seconds.

Data Collection and Study Procedures

Informed parental consent forms and child assent forms were obtained in accordance with the University Institutional Review Board and school district requirements prior to data collection. Data collection spanned a period of 12 weeks in fall 2012. Weeks 1 to 4 was the baseline period where the classroom teachers did not implement TAKE 10!®. Weeks 5 to 12 was the intervention period where the teachers implemented TAKE 10!®. All classroom teachers were trained to use the TAKE 10!® program before implementing it in their classes. The 4-week baseline and 8-week intervention procedure was chosen because this design is often used in behavior-modification studies to demonstrate causality by systematically observing whether the average on-task behavior for the class increases after the intervention is applied to the classroom (Katz & Singh, 1986; Mahar et al., 2006; Shimabukuro, Prater, Jenkins, & Edelen-Smith, 1999).

To examine students' on-task behavior, one primary observer observed each class once a week during the 4-week baseline period and once a week during weeks 9 to 12 of the intervention period. Observations were not carried out during weeks 5 to 8 to allow teachers to become familiar with implementing the TAKE 10!® program in their classrooms. The principal investigator (PI) was the primary observer for all the observations and five student volunteers were trained to be secondary observers for this study. Secondary observers were recruited to minimize the limitation of having the PI as the primary observer, which may potentially result in observer bias. Observer bias is the expectations and knowledge observers have about the participants and the experiment that may influence the objectivity of the observations (Pellegrini, 2004). During

observations, the PI may have expected students to have better on-task behavior after they have participated in the TAKE 10!® program. Therefore, having secondary observers to tabulate interobserver reliability for agreement in observations was one strategy to minimize observer bias. At a single observation session, there was either one primary observer, or one primary observer and one secondary observer. For the purpose of estimating interobserver reliability, secondary observers observed 50% of all the classes.

In a previous study, two observers observed half the class for 15 minutes and a limitation of the study was that they could not tabulate interobserver reliability between the observers within one class setting (Grieco et al., 2009). Therefore, a 30-minute observation period was used in this study where both observers observed every student in the class and interobserver reliability was calculated between the two observers to ensure agreement. Interobserver reliability was calculated by dividing the number of agreements on occurrences of on-task and off-task behavior by the total number of observation intervals, and then multiplied by 100 to obtain an agreement percentage between observers. To enhance agreement, the observers were given detailed definitions of on-task and off-task behavior. Interobserver reliability is considered accomplished when there is an 80% agreement between the observers. See Appendix A for the observation form.

Before observation, the primary and secondary observers established the order of sequence to observe the students. The observers observed an individual student for 5 seconds before moving on to another student, until all students in the class were observed. The observers repeated this sequence for the remainder of the observation

period. Five seconds was chosen as the length of observation because longer observations can result in missing the behavior in other children and observations longer than 5 seconds is considered less reliable (Gardenier et al., 2004; Grieco et al., 2009). The observers listened to a prerecorded audio file via headphones that signals the 5 second intervals throughout the observation. Upon hearing the 5 second signals, the observers observed and recorded the behavior of the observed student as on-task or off-task, then move on to the next student. The observers repeated this sequence for the entire observation period set at 30 minutes. For example, with 360 observations per 30-minute period, each student was observed approximately 14 times for a class of 25 students. The observers observed the class 30 minutes before and 30 minutes after teachers implemented TAKE 10!® during the intervention period. During the 4-week baseline period, the teachers carried out their lessons as usual with no TAKE 10!® intervention. The observers observed the class 30 minutes, then waited for 15 minutes, and observed the class for another 30 minutes.

Teachers were given an instruction sheet with guidelines of the date on which they should begin the intervention in their classroom. They were also informed of the day of the week and the time of the day the observers would be in their classroom. They implemented the TAKE 10!® activities when the observers were observing the class during intervention. Observations were carried out as much as possible on the same day and time each week to ensure consistency in academic instruction. There were a few instances where observations were carried out on a different day due to teachers' absences.

Data Analysis

Data were entered and results generated using SPSS (Version 18.0, Chicago, IL). A two-way (time [pre vs post observation] × period [baseline vs intervention]) repeated-measures analysis of variance was used to compare on-task behavior between observation periods. The number of intervals in which on-task behavior occurs during each 30-minute observation period was summed and divided by the total number of intervals and then multiplied by 100 to produce the mean percentages of on-task behavior for each class. This resulted in four means of on-task behavior for all nine classes: pre-no TAKE 10!® and post-no TAKE 10!® during the baseline period, and pre-TAKE 10!® and post-TAKE 10!® during the intervention period. Mean differences were generated between: (a) pre-no TAKE 10!® during the baseline versus post-no TAKE 10!® during the baseline, and (b) pre-TAKE 10!® during the intervention versus post-TAKE 10!® during the intervention. Significance levels were adjusted for multiple comparisons with the Bonferroni procedure in SPSS. Graphs of on-task behavior were developed and visually interpreted to examine if implementing TAKE 10!® would increase students' on-task behavior. Mean percentages of on-task behavior for the class were plotted for pre-no TAKE 10!® and post-no TAKE 10!® during the baseline, and pre-TAKE 10!® and post-TAKE 10!® during the intervention. Mean percentages of on-task behavior for each grade level was tabulated to examine differences between grade levels. Mean percentages of on-task behavior for each observation was tabulated to examine differences between each observation.

Results

The teachers conducted on average one TAKE 10!® per school day during the intervention period. A total of nine classes were observed for on-task behavior in children. Each class was observed once a week during baseline (weeks 1-4) and once a week during intervention (weeks 8-12), totaling nine classroom observations per week. Seventy-two observations (36 during baseline and 36 during intervention) were made within a period of 12 weeks. Mean percentages of on-task behavior for all nine classes were calculated for pre-no TAKE 10!® and post-no TAKE 10!® during the baseline period and for pre-TAKE 10!® and post-TAKE 10!® during the intervention period (averaged across all baseline or intervention weeks). For group comparisons, mean percentages of on-task behavior of all classes ($N = 9$) were combined over all baseline or intervention periods.

Descriptive data of the classes that were observed for on-task behavior are displayed in Table 4.1. The two-way repeated-measures ANOVA revealed a significant time × period interaction [F (1, 8) = 103.0, $P < 0.001$]. There was a significant decrease ($P = 0.001$) in mean percentage on-task behavior from pre-no TAKE 10!® (91.2 ± 3.4) to post-no TAKE 10!® (83.5 ± 4.0) during the baseline period. Conversely, there was a significant increase ($P = 0.001$) in mean percentage on-task behavior from pre-TAKE 10!® (82.3 ± 4.5) to post-TAKE 10!® (89.5 ± 2.7) during the intervention period. In summary, there was a mean percentage decrease of on-task behavior by 7.7% during the baseline period and a mean percentage increase of on-task behavior by 7.2% during the intervention period.

Table 4.1

Mean Percentages of On-task Behavior of all Classes ($N = 9$)

On-Task Behavior	Baseline Period		Intervention Period	
	Pre-no TAKE 10!®	Post-no TAKE 10!®	Pre-TAKE 10!®	Post-TAKE 10!®
Mean	91.2	83.5	82.3	89.5
SD	3.4	4.0	4.5	2.7
Minimum	88.6	80.4	78.9	87.4
Maximum	93.8	86.6	85.8	91.6

The baseline period was when the teachers were not implementing TAKE 10!®. Between pre-no TAKE 10!® and post-no TAKE 10!®, teachers carried out their lesson as usual. The intervention period was when the teachers implemented TAKE 10!®. Between pre-TAKE 10!® and post-TAKE 10!®, teachers implemented a TAKE 10!® activity.

Table 4.2 displays the descriptive data of the 3rd-, 4th- and 5th-grade classes for on-task behavior. Across the three grade levels, there was a decrease in on-task behavior during the baseline period, whereas there was an increase in on-task behavior during the intervention period. Figures 4.1 and 4.2 illustrate the mean percentages of on-task behavior for all classes during each observation in baseline and intervention periods, respectively. During the baseline period, mean percentage of on-task behavior for all classes was consistently lower at pre-no TAKE 10!® compared to post-no TAKE 10!® each week. Conversely, during the intervention period, mean percentage of on-task behavior for all classes was consistently higher at post-TAKE 10!® compared to pre-TAKE 10!® each week.

Table 4.2

Mean Percentages of On-task Behavior of 3rd-, 4th-, and 5th-Grade Classes

On-Task Behavior	Baseline Period ($M \pm SD$)		Intervention Period ($M \pm SD$)	
	Pre-no TAKE 10!®	Post-no TAKE 10!®	Pre-TAKE 10!®	Post-TAKE 10!®
3rd Grade ($N = 3$)	94.9 ± 1.3	87.5 ± 0.6	85.2 ± 6.7	91.8 ± 1.7
4th Grade ($N = 3$)	87.4 ± 0.2	82.0 ± 4.2	79.6 ± 2.3	87.2 ± 2.8
5th Grade ($N = 3$)	91.3 ± 1.3	81.0 ± 3.1	82.1 ± 2.7	89.3 ± 1.8

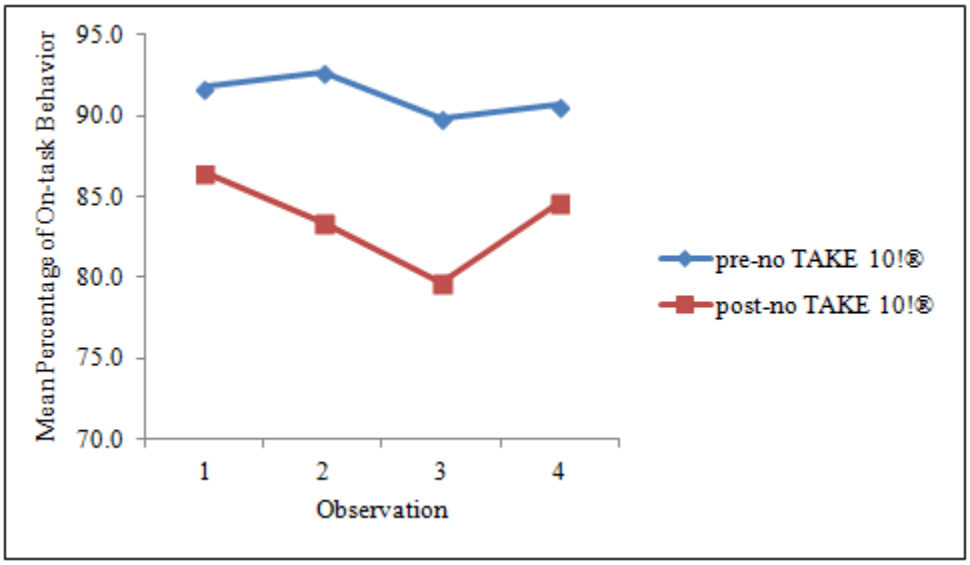


Figure 4.1: Mean percentage of On-task Behavior for all Classes during each Observation in Baseline Period.

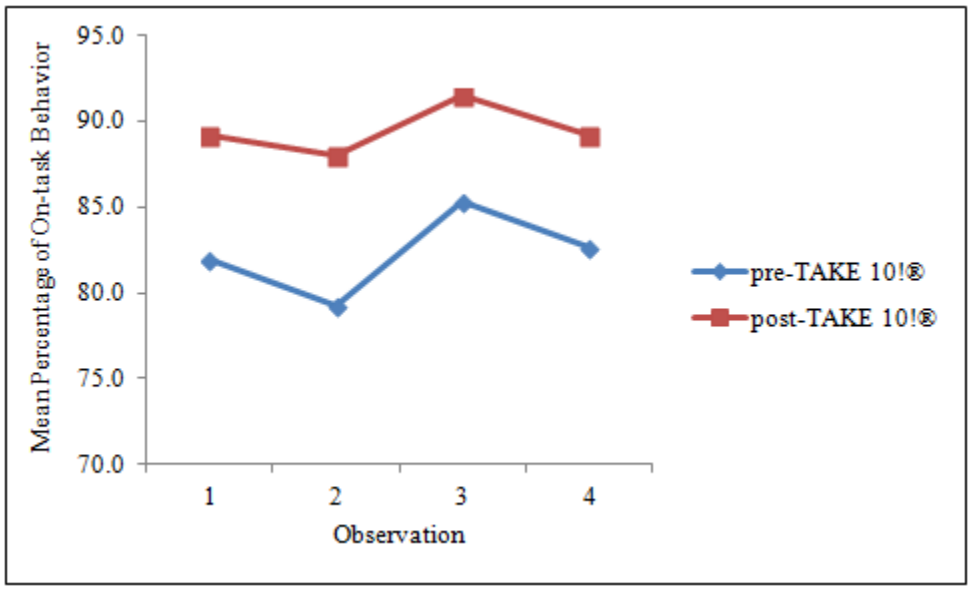


Figure 4.2: Mean percentage of On-task Behavior for all Classes during each Observation in Intervention Period.

Discussion

This study was designed to examine changes in elementary school students' on-task behavior from baseline to intervention periods of the TAKE 10!® program. It was hypothesized that elementary school students would have significantly greater mean percentage of on-task behavior during the TAKE 10!® intervention period compared to the baseline period. Overall, it was found that students' on-task behavior decreased significantly during the baseline period, where they sat for a prolonged period of time with no breaks between observations. Conversely, students' on-task behavior improved significantly during the intervention period after they participated in a TAKE 10!® activity. Specifically, the percentage of students' on-task behavior decreased by 7.7% during baseline, whereas it increased by a similar percentage during the intervention. The increase in on-task behavior following a TAKE 10!® activity is evident across the three grade levels (3rd-, 4th-, and 5th-grade levels). In addition, the decrease and increase in

students' on-task behavior are consistent during all baseline and intervention observations, respectively.

The results of this study are consistent with two other studies that used direct observational strategies to examine students' on-task behavior following a movement integration activity. Particularly, it was found that 3rd- and 4th-grade students' on-task behavior increased significantly by approximately 8% following a 10-minute activity using the Energizers program (Mahar et al., 2006). In addition, it was found that students' on-task behavior decreased significantly after a traditional inactive lesson, whereas implementation of a physically active Texas I-CAN! lesson was found to prevent this reduction and provide a small increase in on-task behavior (Grieco et al., 2009). Though a small increase in on-task behavior following the Texas I-CAN! lesson was demonstrated, the researchers did not specify if the increase was significant (Grieco et al., 2009). This study adds to the literature by demonstrating that participating in a TAKE 10!® activity significantly improved students' on-task behavior after prolonged engagement in academic work. Previous studies (Barry et al., 2003; Tsai et al., 2009) used qualitative procedures to study the effect of TAKE 10!® on students' on-task behavior and found that students' on-task behavior improved following a TAKE 10!® activity. To extend these qualitative studies, the present study used a direct observation strategy, which Mahar (2011) suggested as the best method to observe students' on-task behavior but is lacking in research due to time, cost, and effort placed on the observers.

The results of this study also indicated that the students' on-task behavior decreased significantly during the baseline period with no TAKE 10!® activity. These results are in contrast with the study by Mahar et al. (2006), who found that there was no

significant difference in students' on-task behavior during the baseline period. A possible explanation could be that the students' mean percentage on-task behavior (91.2 ± 3.4) during pre-no TAKE 10!® in this study was much higher compared to the students' mean percentage on-task behavior (71.3 ± 16.3) during pre-Energizers in the study by Mahar et al. (2006). In the study by Grieco el al. (2009), the average percentage on-task behavior of students was approximately 85% and the students demonstrated a significant decrease in on-task behavior following an inactive lesson. Therefore, the students' initial higher percentage of on-task behavior could provide room for more reduction in on-task behavior following prolonged sitting at their desks.

The average percentage of agreement for on-task behavior between the primary observer and secondary observers were 96% in this study. The interobserver reliability in this study is similar to other studies: 94% in the study by Mahar et al. (2006) and 94% in the study by Grieco et al. (2009). Though the percentage of agreement between the primary and secondary observers was considered high, Mahar et al. (2006) believes that the observers were unbiased to the intervention condition. This study adds to previous literature by having two observers observing the whole class for 30 minutes to tabulate interobserver reliability within one class, whereas tabulation of interobserver reliability was limited to measurements in separate classrooms at the beginning, middle, and end of the Grieco et al. (2009) study. This study also extends the literature by having observers observe the whole class in one classroom setting compared to the study by Mahar et al. (2006), who observed 6 students in one observation setting and another 6 students in another observation setting. The procedure used in the present study ensures the consistency of the classroom environment during each observation period.

Although this study addresses a gap in the literature regarding students' on-task behavior following a TAKE 10!® activity, it is not without limitations. One limitation of the study is that the results may not be generalizable to elementary school students outside of this school. Another limitation is that teachers may be different in their ability to manage the class. For example, the students' on-task behavior in the 4th-grade classes was generally lower than the students' on-task behavior in the 3rd-grade class. Nonetheless, both grade levels demonstrated an increase in students' on-task behavior following a TAKE 10!® activity. It is also assumed that the elementary school students will not be affected by the presence of the observers in the classrooms during on-task behavior observations. In this study, the observers made an effort to enter and leave the classroom discreetly without distracting the students during the observations. Furthermore, the primary observer observed all the classrooms and hence the students were familiar with the primary observer.

Considering the positive effect of physical activity on constructs related to academic achievement, the effect of movement integration activities have been rarely examined through experimental designs (Howe & Pate, 2012). Therefore, future studies should examine the relationship of physical activity and on-task behavior with respect to academic performance. Particularly, these relationships should be measured directly in future research to examine if students' on-task behavior is integral to learning and academic performance. Furthermore, additional information on the effectiveness of movement integration programs on academic performance, such as standardized tests and grades can provide a stronger rationale for policy changes to require more physical activity during the school day (Mahar et al., 2006). Another suggestion for future

research is to examine the effect of movement integration activities on the on-task behavior of middle and high school students. So far, studies on students' on-task behavior have been conducted with elementary school children, because most movement integration programs have been designed for elementary curriculum. Future research should design activities that are suitable for middle and high school students because we believe that students in these age categories will also benefit from classroom activities. Given that there is a paucity of studies addressing the effect of classroom activities on students' on-task behavior using direct observation strategy, there is a need for more studies in this area. Consequently, this will help promote physical activity during the school day, which has the potential to have tremendous impact on a large number of students. One final suggestion is to examine whether TAKE 10!® can be easily implemented by teachers and their perceptions of the program.

CHAPTER 5

STUDY 3: CLASSROOM TEACHERS' EXPERIENCES IN IMPLEMENTING A MOVEMENT INTEGRATION PROGRAM

Introduction

Children and adolescents are not engaging in the recommended 60 minutes of physical activity (PA) per day. Only 42% of children aged 6 to 11 years and 8% of adolescents obtained the recommended amount of moderate intensity or greater PA each day (Troiano et al., 2008). Schools are attended by over 95% of youths and therefore are an optimum place to promote PA (Wechsler et al., 2004). The comprehensive school physical activity program was recently launched to increase students' PA in schools. Particularly, PA during the school day can be promoted through classroom-based movement integration programs. Classroom teachers have access to students in the classroom contexts, and hence are ideal PA promoters of movement integration programs.

Previous studies that examined teachers' experiences and perspectives toward movement integration have found that classroom teachers were positively disposed toward implementing movement in the classroom. Teachers who experienced

implementing the Physical Activity Across the Curriculum and TAKE 10!® programs believed in the importance and value of movement integration to increase students' PA levels in schools (Gibson et al., 2008; Kohl et al., 2001; Tsai et al., 2009). Teachers who had yet to experience implementing movement integration programs reported a willingness to implement these activities in the classroom (Parks et al., 2007). Tsai et al. (2009) reported that teachers who were resistant at the beginning toward movement integration changed to become more actively involved after they had experienced the program's effectiveness on their students' concentration in the classroom. However, teachers have also reported that the main barrier to implementing movement integration programs is the lack of time because of the focus on standardized testing and accountability in schools (Cothran, Kulinna, & Garn, 2010; Gibson et al., 2008; Parks et al., 2007; Tsai et al., 2009).

Time constraints are the biggest and most common barrier to implementing PA programs and physical education (PE) in schools (Rogers & Motyka, 2009; Sherman et al., 2010). In further examination, teachers cited lower priority for Health and Physical Education (HPE), lack of performance measures for PA, and lack of sufficient infrastructure as barriers to conducting programs (Dwyer et al., 2003). Teachers also reported that barriers to delivering PE stem mainly from the institution, which are out of their control (Morgan & Hansen, 2008a). Examples of institutional barriers included other teaching priorities, amount of time, equipment availability, quality of facilities, level of departmental assistance or professional development, school executive attitudes towards PE, available funds, and class size (Morgan & Hansen, 2008a). Similarly, teachers stated barriers to implementing PE included a prohibitive environment,

equipment, coordination and collaboration, lack of uniformity among teachers, no PE support person, lack of parental support, student characteristics such as low self-esteem, and PE as a low priority subject (Sherman et al., 2010).

Overall, there are a number of studies that examined teachers' experiences and perspectives in PA promotion in schools using quantitative measures such as evaluation surveys (Kohl et al., 2001; Parks et al., 2007; Rogers & Motyka, 2009), qualitative measures such as interviews and focus groups (Dwyer et al., 2003; Sherman et al., 2010; Tsai et al., 2009), and mixed-method strategies using both quantitative and qualitative measures (Gibson et al., 2008; Morgan & Hansen, 2008a, 2008b). However, there is limited research examining teachers' attitudes toward the effectiveness of TAKE 10!® (Stewart et al., 2004) and their competency to implement the TAKE 10!® program (Kibbe et al., 2011). Particularly, if teachers do not believe in the effectiveness of or do not feel competent to implement TAKE 10!®, they are unlikely to implement the program. Therefore, the purpose of this study was to qualitatively examine teachers' experiences in implementing TAKE 10!®, which may help to illuminate teachers' attitudes toward the effectiveness of the TAKE 10!® intervention, their competency in implementing the program, and barriers they encountered during the program. In addition, characteristics of teachers who embrace the TAKE 10!® program to a greater extent are relatively unknown (Kibbe et al., 2011). Therefore, this study also examined the characteristics of teachers (e.g., teacher self-efficacy in PA, personal PA behavior, and TAKE 10! implementation patterns) who implemented the program. Field observations in addition to interviews were carried out to qualitatively examine these questions. In addition, teachers completed a weekly questionnaire during the intervention period to answer questions regarding the

number of times they were able to implement the activities each day and their experiences on implementing TAKE 10!®. It was assumed that the teachers would answer the interview and survey questions openly and honestly during the study.

Interpretive Paradigm

A researcher's ontological, epistemological, methodological, axiological, and rhetorical beliefs shape how he or she sees the world and acts in it (Creswell, 2007; Denzin & Lincoln, 2005). Collectively, these beliefs may be termed the paradigm or the interpretive framework that grounds a study. Ontology considers the nature of reality; epistemology questions the relationship between the inquirer and the unknown; methodology examines how a person gains knowledge from the world (Denzin & Lincoln, 2005). Axiology questions the role of values that the researcher brings to the study and rhetoric considers the language that is used in the research (Creswell, 2007). Qualitative researchers often believe in a relativist ontology in which multiple realities are constructed, maintain an interpretive epistemology where the researcher and the researched interact with one another, work within a naturalistic methodology whereby data are collected in the field or in a natural setting, carry a value-laden axiology and use a personal voice rhetoric (Creswell, 2007; Denzin & Lincoln, 2005).

Most qualitative researchers work within a constructivist-interpretive, critical, or feminist-poststructural paradigm (Denzin & Lincoln, 2005). Because the goal of this study is to fully understand teachers' experiences in the implementation of movement-integrated lessons in the classroom, I adopted the interpretive paradigm in analyzing the collected data. The interpretive paradigm enables researchers to understand the

phenomenon where reality is subjectively constructed (Lather, 2006). The goal of my study then was to rely as much as possible on the participants' views of the situation, which are often formed socially and historically (Creswell, 2007). Interpretive researchers also make an interpretation of the data, which is shaped by their own experiences and background and the researcher's intent is to interpret the meaning others have about their world (Creswell, 2007).

Methods

Participants and Setting

The participants were 9 elementary school classroom teachers (three 3rd grade, three 4th grade, and three 5th grade) from one elementary school in the city of Magna, Utah. Teachers from these grade levels were chosen because high stakes standardized testing begins at 3rd grade in the elementary schools and the TAKE 10!® program is available through to the 5th grade. The gatekeeper to gaining access to the participants was the principal of the elementary school, who had given approval to conduct the study. The university's Institutional Review Board (IRB) reviewed the study and determined the study to be in the exempt category. The study spanned a period of 12 weeks (4 weeks baseline and 12 weeks intervention). The classroom teachers carried out their lessons as usual during the baseline period. They implemented the TAKE 10!® program in their respective classrooms during the 8-week intervention period.

Data Collection and Study Procedures

Informed consent forms with the classroom teachers were obtained in accordance with the University Institutional Review Board. To examine the teachers' experiences in the implementation of TAKE 10!®, I carried out: (a) semistructured interviews with the teachers, (b) participant observations at the school site, and (c) questionnaires that were completed by the teachers during the intervention. The purpose of using various data sources is to ensure the credibility of the study (Marshall & Rossman, 2011). Semistructured interviews with the teachers who were involved in the TAKE 10!® program were carried out after the study. Participant observations took place during weeks 1 to 4 (baseline period) and during weeks 9 to 12 (intervention period). There were no observations carried out during weeks 5 to 8, so as to allow the teachers to become familiar with the implementation of the TAKE 10!® program. Though observations were not carried out during weeks 5 to 8, interactions with the teachers outside the classroom were recorded to increase the data source. Questionnaires were administered during the intervention period to further explore the teachers' experiences in the implementation of TAKE 10!®.

Semistructured interviews. To examine the teachers' experiences in implementing the TAKE 10!® program, individual face-to-face semistructured interviews were conducted at a place and time convenient for them at the end of the program. Particularly, teachers were interviewed to determine their attitudes, competency, barriers, as well as characteristics in implementing the program. A total of nine interviews were carried out with the teachers who implemented the program. Each interview lasted between 30 to 60 minutes in length, and was digitally recorded and transcribed verbatim.

A semistructured interview method using open-ended interview questions was used because it allows for flexibility to follow up on any of the open responses that is relevant to the study (Fontana & Frey, 2005).

Before starting the interview, I briefed the participants on the purpose of the interview and asked for their permission to use the voice recorder (Kvale, 1996). Questions were structured into three categories that asked about their attitudes and competency, their experiences, and barriers in implementing the TAKE 10!® program. One main question with seven to eight probe questions for each category was posed to the participants during the interviews. In closing, I asked several questions pertaining to their beliefs in PA promotion programs in schools and their personal PA behavior. The interview ended with a question asking if they had anything to bring up or share about the study. The sequence of questions from the interview protocol posed to the teachers was flexible in that I followed up with the next question based on the teacher's previous answers.

A postreview of the interview was carried out immediately after each interview ended. The purpose was to record how each interviewee responded to the questions, reflect on how well I fared in asking the questions, examine my rapport with each interviewee, evaluate what problems occurred during the interview, and what could be done to improve on the process. The time after the interview is a critical time of quality control that guarantees that data collected will be useful and authentic (Patton, 2001). Five months after the intervention program ended, I conducted follow-up interviews with the teachers to examine the sustainability of the program. See Appendix B for the interview protocol.

Participant observation. Participant observation is a good strategy to capture nuanced responses of the participants toward the intervention program. Additionally, participant observation is grounded in the establishment of rapport between the researcher and participants, and the researcher is immersed in the everyday lives of the participants (Creswell, 2007; Denzin & Lincoln, 2008). As a participant observer, I interacted with the teachers daily while I was in school to build a rapport with them. In addition, I would sometimes participate in the TAKE 10!® activities together with the students in the classroom. Visual observation and verbal interactions with the participants was documented in my field notes. I focused my field note taking on the teachers' response toward the TAKE 10!® program through my observations and interactions with the teachers. In addition, I noted the students' response in their participation of the TAKE 10!® activities in the classrooms. Particularly, I was looking at whether students were enjoying the 10!® activities and if their on-task behavior improved after the activities.

Participant observations are often used in applied research such as evaluation of programs (Jorgensen, 1989). Observations begin the moment the observer makes contact with the field setting. Initially, the researcher carries out unfocused observations to become familiar with the insider's world so as to refine and focus subsequent observation and data collection (Emerson, Fretz, & Shaw, 2011; Jorgensen, 1989). Preliminary note taking begins with mundane facts of the setting that would otherwise go unnoticed, such as the physical surroundings and characteristics of the participants (Emerson et al., 2011; Jorgensen, 1989). Once the researcher becomes familiar with the setting, focused observations begin, which concentrate on answering the research questions. Focused

observations lead to greater involvement with the participants in the settings and specifically to informal conversations and casual questioning (Jorgensen, 1989).

Writing field notes is not merely passively copying "facts"; it involves active processes of interpretation on the part of the researcher (Emerson et al., 2011). Field notes should also be written immediately to avoid generality and detailed descriptions of the processes of interactions should be documented quickly and fully (Emerson et al., 2011). While in the field, I documented what I observed visually and also the verbal interactions between the participants as well as interactions between the participants and me. I recorded my observations and feelings by pen and paper unobtrusively and quickly. Noting down feelings, hunches, and impressions during the study is useful in judging the course of inquiry and developing future courses of action in the field (Jorgensen, 1989).

Questionnaires. Written feedback in the form of closed and open ended questions was administered to examine the number of times teachers were able to implement the activities each day and their experiences during the implementation of the intervention program. One purpose of the questionnaire was to ensure and assess teacher fidelity (e.g., how many times a day do the teachers implement TAKE 10!®) throughout the program of study. Another purpose was to allow teachers to provide comments on their experiences implementing the program. Teachers completed a weekly questionnaire reporting the number of times they implemented TAKE 10!® each day, ease of implementation, students' PA intensity, and students' enjoyment of the program. See Appendix C for questionnaire. Questionnaires also provided another data set to further examine the participants' experiences and served as a form of triangulation with the semistructured interview and participant observation data.

Data Analysis

The process of data analysis began when I transcribed the interview data verbatim into a word document. Analysis begins during transcription, which is a key phase within qualitative methodology (Bird, 2005). I believe that by transcribing the data personally, I was able to immerse myself in the data fully and become more familiar with it. When transcribing the data, grammar in natural conversations may be atrocious and sentences are sometimes incomplete and interrupted by new thoughts (Patton, 2001). Regardless, it is important to transcribe such information accurately in order to analyze the data properly. While I transcribed the data, I noted key words and quotes that were useful to answering my research questions. To aid in the transcription process, I used a digital voice editor software to start and stop the audio tapes while I listened and typed the interviews in a word document.

After the interviews have been transcribed verbatim into a word document, I immersed myself in the data through reading and rereading the interview transcripts and field notes. Through careful reading of the data, words and phrases that identify specific analytic dimensions and categories in the transcripts were written in a "comment" field in a word processing program (Emerson et al., 2011). This process is known as open coding or line-by-line coding. During the coding process, there is no regard for how or whether ideas and categories will be ultimately used, or how they will fit together (Emerson et al., 2011). Examples of open codes from the transcripts were "fit it in," "awareness for the kids," and "testing." The next step of the analysis was selecting core themes by categorizing the open codes. Themes were identified by "bringing together components or fragments of ideas or experiences, which often are meaningless when viewed alone"

(Leininger, 1985, p. 60). Priority was given to themes for which a substantial amount of open codes had been identified or what seems significant to the participants (Emerson et al., 2011). Next, selected themes were considered and how they are related to other themes. Themes that are unrelated can be reincorporated as "subthemes" under general themes (Emerson et al., 2011). After a set of core themes were identified, the transcripts and field notes were sorted on the basis of these themes (Emerson et al., 2011). A word processing program was used to sort the data in the transcripts and field notes. After the core themes were decided, and the transcripts and field notes were sorted accordingly, the final step is focused coding. Focused coding is a fine-grained, line-by-line coding of selected notes and elaborating interesting themes by connecting data and delineating subthemes within the broader topic (Emerson et al., 2011).

Trustworthiness

Trustworthiness or goodness of qualitative data has historically been linked to reliability, validity, objectivity, and generalizability in quantitative research (Marshall & Rossman, 2011). Alternative constructs that are currently used to describe trustworthiness in qualitative research are credibility, dependability, confirmability, and transferability (Marshall & Rossman, 2011). "Being trustworthy as a qualitative researcher means at the least that the processes of the research are carried out fairly, that the products represent as closely as possible the experiences of the people who are studied" (Ely, 1991, p. 93). To maintain trustworthiness in this study, I engaged in the technique of triangulation. Triangulation is "the use of complementary methods, data or investigators in the research, and it is intended to compensate for any one-sidedness or distortion that may result from

an individual method, theory, database or researcher" (Steinke, 2004, p. 185). For the purpose of triangulation, I gathered data from multiple sources; semistructured interviews, participant observations, and questionnaires.

Peer debriefing is another method I used to establish trustworthiness. I consulted with my committee members on the processes of generating the interview guide, collecting data, and engaging their assistance to confirm and question the initial themes that I was primarily responsible for generating through this study. Peer debriefing also ensures that analyses are grounded in the data, which will increase the credibility of the study (Marshall & Rossman, 2011).

Researcher as Instrument

The researcher is the primary instrument in qualitative studies and her presence in the lives of the participants is fundamental to the methodology (Lofland & Lofland, 1995; Marshall & Rossman, 2011). Because the researchers' own experiences and background could influence the interpretation of the data (Creswell, 2007), the study should include some information of the researcher and any personal information that may affect data collection, analysis, and interpretation (Patton, 2001). Openly interrogating the researcher's own postures, views, and practices is one way to maintain the credibility of the study and this is known as reflexivity (Olesen, 2005). Reflexivity takes on a significant role in the production of research, with the "interpretive turn" in the social sciences, where the objectivity of research is brought under question and issues of power in research relations begin to be acknowledged (Pillow, 2003). Reflexivity also means that the qualitative researcher is conscious of the biases, values, and experiences that he

or she brings to a qualitative research study (Creswell, 2007). The way researchers write is a reflection of their interpretations based on the cultural, social, gender, class, and personal politics that they bring to the research (Creswell, 2007). Being reflexive also heightens ethical concerns of the research.

It is therefore imperative to inform readers of my personal background experience with the topic, assumptions, and biases because of the interpretive paradigm I adopted for this study. I am an Asian of Chinese descent, born and raised in Singapore. Currently, I am a PhD student in the Exercise and Sport Science Department, majoring in Sport Pedagogy. Before moving to the United States, I worked as a physical education (PE) teacher in a Singapore public school for 5 years. My personal experience as a PE teacher and the opportunity for this study led me to studying about teachers' and students' experiences in movement integration. Personally, I believe in the importance and benefits of movement integration with curriculum in elementary schools. I believe that movement integration is a potential strategy to increase students' PA levels and on-task behavior in the classroom. I am confident to carry out this study because of the training I received in three graduate-level quantitative classes, and three graduate-level qualitative classes. In addition, I completed a similar study examining preservice classroom teachers' experiences in movement integration program as part of my doctoral project. I also engaged the support of my diverse group of committee members who are well-versed in quantitative and qualitative research methodology. My personal bias toward this study is that most teachers will be receptive toward movement integration in their classrooms and most students will enjoy participating in movement integration. Furthermore, I believe

that students' on-task behavior will improve following a short movement integration activity.

Being reflexive goes beyond recognition of the self, it includes the recognition of the other (Pillow, 2003). Although I have been a PE teacher in the past, I recognize that I am not in the position to fully understand the experiences of the elementary classroom teachers from an insider's perspectives. Furthermore, I did not undergo my elementary education in the United States, so I recognize that my past experience as a school student may not translate to the experiences of the American children and teachers I seek to study. Nonetheless, I believe in establishing rapport and building a trusting relationship with the participants in the study, because this is one way to gain support for their participation and enhance the richness of the study (Marshall & Rossman, 2011). Reflexivity is an ongoing process where researchers maintain an ongoing critique of all their research attempts that would continue to challenge and acknowledge the political need to represent and find meaning of the participants (Pillow, 2003).

Results

The major themes identified from the analysis of the data were: (a) barriers, (b) benefits, (c) what worked, (d) personal attributes, and (e) doing it in the present and in the future. Each theme and subthemes is discussed in detail through quotations gathered from the transcribed interviews. A pseudonym was provided for each participant to maintain anonymity of the participants' identities. Table 5.1 presents the major themes and subthemes for this study.

Table 5.1

Major Themes and Subthemes

Major Themes	Subthemes
Barriers	One More Thing to Fit in Sedentary Kids Movement Integration is a Problem Limited Classroom Space
Benefits	Awareness of the Need for a Break Benefit the Teachers Holistically Benefit the Students Holistically Physical Activity Integrated Curriculum
What Worked	Separating Physical Activity from Curriculum Less than 10 Minutes Once or Twice a Day Sticking to the Same Activities Prepare Ahead and Give Clear Instructions Teachers Setting an Example to Encourage the Students The TAKE 10!® Book as a Useful Resource Teachers Modify Lessons
Personal Attributes	Attitudes toward Implementation of TAKE 10!® Competency in Implementing TAKE 10!® Teachers' Personal Physical Activity Behavior
Doing it in the Present and in the Future	Children like TAKE 10!® Encouraged by Other Teachers Doing it Continue to Do it Sustainability of TAKE 10!®

Barriers

The teachers talked about the barriers they experienced while implementing the TAKE 10!® activities. The subthemes that emerged from this major theme were: (a) one more thing to fit in, (b) sedentary kids, (c) movement integration is a problem, and (d) limited classroom space.

One more thing to fit in. Some teachers commented that implementing the TAKE 10!® activities was one more thing they had to do beyond their duties as teachers. For example, Alice said: "It's one more thing for me to do, really and one more thing for me to keep track of in a job that I already feel like I'm not doing enough with the kids." Another teacher, Betty concurred:

> There is another thing to do. And there are already so many things I have to do during the day, so it's hard. I mean it's important to get kids up to move, but 10 minutes is a long time too, for them to move and, it became like: "Oh no, another thing I have to do" and to make sure it gets in and that was hard to do that.

Several teachers commented that it was difficult to fit in the TAKE 10!® activities within the school day. Alice said: "It's hard to fit it in. It's really hard to fit it in during the day." Another teacher, Helen concurred: "Try to figure out when I was going to be able to do it 'cause our days are packed, so that was more of my concern, is when I'm going to fit it in." Carol also said: "I thought how am I going to fit it in 'cause there's a lot of things to do. How am I going to fit it into the schedule . . . one more thing that I have to do." Time constraint was the biggest issue that teachers faced to fit in the TAKE 10!® activities. At the beginning of the project, Alice wrote in the questionnaire: "It seemed to take forever and the kids balked." She added: "With all the demands on our time, this (Take 10) is extremely difficult to do." Additionally, Jamie indicated:

> It was a huge time issue 'cause I feel like I can't get in what I need to get in anyway and . . . to take that 10 minutes to practice it, and now we are going to be farther behind everything else we need to do 'cause they need to learn this new concept, so I think the hardest part is the time having to take that long to do the activity.

Henry commented in the questionnaire: "Often difficult to find time to fit it in while trying to introduce and teach new concepts or working on individual and group projects, etc." When asked what other teachers would think about TAKE 10!®, Rachel said:

> It depends on whether they have the time, but I think that is the biggest issue. I think that is the biggest drawback 'cause it is time consuming and I know for sure that in the upper [grades] when they have to teach science on top of math and they're tested on that and we think they feel like they don't have enough time even to teach everything they need to teach, so how do I have time to give Take 10, even 5 minutes a day because I have such little time and in fact, they also in the upper grades, they have music and other different activities that they are being pulled out to do. That even makes teachers feel like they have less time, you know, I can tell them that it's beneficial and that they should be, I mean, I think this would be a good idea for you to implement especially when you have kids that have low engagement or whatever but, ultimately it comes down to how they feel about their time and whether they have enough time to actually implement it. I think that's the bottom line.

A few teachers also commented that mandatory district testing made it difficult to fit in the TAKE 10!® activities. For example, Henry mentioned: "Some days we're doing a lot of computer testing, you know, district testing, so that made it hard to fit in." Another teacher, Paul concurred:

> The days that I have computer lab, I have these tests to do, we have 2 days to get all the tests done, it was hard to do them 'cause how much they put on us and how much we have to do, and then we run out of time with being behind in math and trying to get kids to understand concepts, it has slowed us down on some of the Take 10 because we had to focus on getting the other stuff done.

Due to the lack of time, some teachers mentioned that it was difficult to implement the TAKE 10!® activities three times within a school day. Paul mentioned:

"It's harder to get the 3 times in a day with everything else and with all the testing, so we did two 15 [minutes]." Jamie concurred in the questionnaire: "We didn't get any in today due to testing." During the interview, Jamie also said:

> Sometimes even if I had it in my planner 'cause I always plan 3 times a day, but there were some days, it depends on what happen, I just wasn't able to do any, you know, and so we would just say: "Ok, we are going to do this really quick". But it wasn't really a Take 10, it was just do some kind of movement, you know. And so, erm . . . just trying to get the 3 in a day was probably the biggest difficulty that I had about the program.

Jamie reiterated in the questionnaire: "This week was hard. 3 times a day is taking up a lot of time and I felt like we are getting behind in curriculum. I'm trying to get caught up before the holiday." Some teachers mentioned that they had a hard time remembering to do the TAKE 10!® activities during the school day. For instance, Alice said: "I have to remember to do it and it's hard. It's hard sometimes 'cause you're so caught up in what you're doing in class." When asked what the difficulties to conducting the activities were, Henry mentioned: "Just forgetting to get in. I'm always bad that way." Casey also said: "Sometimes just remembering, you know, I have found that I'll set a time and when my timer goes off in the afternoon . . . I just have to have reminders 'cause I don't remember anything."

In this subtheme, the teachers discussed about the difficulties of fitting the TAKE 10!® activities into their daily schedule. The main barrier was due mainly to the lack of time to complete core curriculum for the students' end of the year Criterion Referenced Tests (CRTs).

Sedentary kids. The teachers mentioned that some children in their classrooms posed as barriers to implementing the TAKE 10!® activities. Some teachers commented that their students were sedentary and did not like to move during the TAKE 10!®

activities. For example, Carol said: “Some of them got a little lazy, wanted to lean against the table or the counter, or something like that.” Paul also commented: “About 5 of my students complain the whole time ‘cause it actually made them do something. The bigger, lazier ones didn’t like to do . . . they don’t like it. They didn’t want to get up and move.” A few teachers commented that the sedentary nature in their students was attributed to the increase in screen time among children. Helen commented on a student in her class, as she said: “He’s just lazy. I think he spends his whole time playing video games and never does anything.” Another teacher, Casey mentioned: “It’s really hard because they’re very sedentary. I think about the technology that we have today and what do they do when they go home. They go home and they pushed the computer, play video games.” Casey continued: “I think you can really work up to 10 minutes [but] they are very sedentary. This generation has gotten to be very sedentary and I don’t think they are used to moving for that long.” Paul noticed: “When we were trying to work on the web quest, we did it here on the computers; they didn’t want anything to do with the Take 10! because they wanted to work on the computers.” Betty commented: “Some are like, ‘I don’t want to do this,’ so they are like faking it. Some of them really don’t get it and some of them are really lazy, very lazy in exercise.”

Some teachers mentioned that their students were not able to sustain physically for 10 minutes during the TAKE 10!® activities because they were not physically fit or active. For example, Helen said: “I had some who really had a hard time doing more than 5 minutes because they just don’t have the health ability to do it. They have a hard time sustaining movement for that long.” Henry also mentioned: “A lot of them are just standing around. I don’t think they are as active outside.” Some teachers were also

amazed that their students could not perform the movements properly. For example, Casey commented: "It's amazing to me that these kids don't know how to do some of these stuff. They don't know how to do jumping jacks." Another teacher, Henry observed: "Some of the girls couldn't jump rope." Helen concurred:

> I have a couple who don't like to jump. They are the ones who can't skip and who can't jump rope. I have a few who cannot physically jump rope. They just can't get the whole arms and feet and jumping and pretending to jump rope, they still struggle. I was watching a few of them, so their feet won't get off the floor so they do the arm actions but they wouldn't lift their feet up. They're the ones who can't skip and they can't jump rope.

Paul also noted:

> We tried to do the jump rope and they just couldn't figure out how to do that. And so, imaginary jump rope, none of them would do it. They would jump really high or stomp their feet and try to do like a running thing. Just doesn't work [laugh]. They just could not understand how to do it even when I showed them. It still didn't make much sense to them. Like some of the kids just physically couldn't do the lunges. They just were 'uncomprehendable' sometimes.

The teachers observed that the students' attitudes could be a reason why they were reluctant to do the TAKE 10!® activities. For example, Casey said: "My boys will really get into it and my girls sometimes, they act too cool. I have some girls in here that I think are emotionally a little higher and they just think that, 'I'm not jumping in front of people or doing things.'" Henry also commented:

> Some of them like it and some hated it. I think like if it's in 6th grade, they'll go like: "I don't want to do that." Sometimes, the girls have attitudes: "no, I don't want to jump around." They didn't want to, like reluctant, kind of have to prod them. Get them to start moving.

In my field observation, I noticed that the girls in Carol's class were not moving as much as the boys during the TAKE 10!® activities. She also mentioned during the interview: "At first I noticed the girls were more shy or not so willing. They didn't think it was cool to do but then as more times we did it, they were like, 'Oh, ya, ok, I can do

this now.'" I talked to Carol during one field observation toward the middle part of the project and she commented that the girls in her class were getting better at moving and their attitudes had gotten better. Alice also concurred that her students were eventually more willing to do the activities. She said: "Eventually, even my reluctant ones do it with us 'cause they thought they were too cool or it's too babyish or too silly to do." Another teacher, Rachel described her students' behavior toward the activities. She said: "I was getting after the students who won't participating appropriately, who were either not participating at all or being a goof ball, you know, and not doing it correctly." She continued: "Some of the kids who didn't like it, it was just kind of boring to them, you know, the repetitive. There were some kids, you probably notice that I've had to say, 'C'mon you got to get up, you got to do this.'" Paul talked about some students who got bored with the activities, as he said: "Some of them started to want to do it less, maybe got tired of it. The novelty wore off. Sometimes, I have to think of creative ways to keep them interested." Overall, the teachers felt that it was a challenge to motivate sedentary students to be interested in participating in the TAKE 10!® activities. In addition, the teachers noticed that some students were not physically fit to sustain the 10-minute activity. Some teachers also described their students' negative attitudes toward TAKE 10!® and also students who had problems coordinating their bodies while performing the activities as barriers.

Movement integration is a problem. A few teachers mentioned that it was difficult to combine curriculum with the activities because the students could not handle both at the same time. Betty said:

> I notice that it was difficult for the kids to do both things at the same time, like answer questions while they're marching and trying to listen to me, because when

> they start moving they get louder. And so they have a hard time listening to me and I have a hard time keeping control. It's too much for them, it's too over stimulating.

Betty reiterated her point in the questionnaire, as she wrote: "I think it is too much to have them move while doing another task, like answering questions. I have found they get out of control and can't handle it." Alice noted: "It was better when I was just doing the movement with them than integrating the academics. I seem to be able to pull them back quicker and they seem to enjoy it more, which was interesting to me." Another teacher, Casey concurred: "I think it's hard for them to sometimes to think and to move at the same time." Paul also mentioned: "They struggled really bad trying to think and do it as they exercise and listen to what I'm saying." He continued: "They'll stop walking 'cause it's harder for them to focus while they are doing the exercise." Helen described the behavior of her students during one TAKE 10!® activity. She said:

> My class had a very hard time doing something with the activity. They do great if they do a physical activity and then they get right back on task but I have some hyperactivity issues and some autism. They can't handle doing like times table with another activity. They have a hard time doing the academic part with the physical activity. They do great with the physical activity and then they settle back and work. If I incorporate both together, I have a few who fall apart. I've one student biting another and they don't do well with that.

A few teachers discussed that it was difficult to control and manage the class during and immediately after the TAKE 10!® activities. One teacher, Carol mentioned: "I think sometimes the level of excitement was harder to control after the classroom [activities]. It was harder for them to listen to me as a teacher." Betty also shared her experience, as she said: "They seem out of control and they seem almost obnoxious . . . they get loud, and so they don't listen to me and they don't like to listen to each other and you got this kid yelling, and this kid, you know, this kid can't hear me." Paul also

commented: “Whenever time we did it, they would talk, so that was the biggest problem we have.” The teachers also discussed about the difficulty for the students to refocus and settle back to their academic work immediately after the TAKE 10!® activities. For example, Betty said: “Sometimes, it’s very hard to get them back from what we are doing before the break.” Alice mentioned: “It takes them a while to settle back down ‘cause they all want to get a drink, they all want to go do this, so it takes a while . . . it disrupts the flow.” Another teacher, Paul shared his experience, as he said: “They get too side track like when we will do math and we’re teaching a math lesson and then we would stop and do it (Take 10), we had to go back and teach the entire lesson because most of the kids lost all their focus.” Rachel also mentioned:

> It sometimes took a little bit for them to calm down because they were excited about doing it. It took a little bit longer after Take 10 and it wasn’t normal transition of just the regular, you know. When they are moving around in the room or whatever because some of them are really “puff puff” [panting], you know: “can I get a drink?” you know, those sorts of things.

Jamie also shared the same experience:

> I actually felt it was more distracting for them because it will take them a long time to come back to me, to get ready to do the next thing. So take me time to settle them down, to move on to the next thing ‘cause they have been moving, so I thought that was kind of a down fall of the program. I think I have really good classroom management and I even felt like sometimes it was hard for me to bring them back to be ready to do the next thing, so instead of just 10 minutes, it ended being 15 minutes because I have to take 5 minutes to get them to settle down, so that was hard sometimes to bring them back to what we were supposed to be doing.

Some teachers felt that stopping what they were teaching to do the TAKE 10!® activities was disruptive. For instance, Alice said: “When I’m teaching and I’m in the middle of a math lesson, they’re getting it, the last thing I want to do is stop, take a break when we’re on a roll.” Another teacher, Henry commented: “Some projects, like

especially computer lab, you have to stop what you are doing 'cause sometimes, you don't want to stop. It could break in to projects that we are working on." Helen suggested:

> The break has to be between two different lessons, otherwise they can't get back to the lesson that they were doing. They have a really hard time so it's a good piece to use in a transition before you move on to do something else, but it's not really good to use at least when we were right in the middle. I had a hard time getting them back.

In this subtheme, the teachers indicated that the concept of integrating PA with curriculum posed a challenge because some students could not perform both components at the same time. Hence, some teachers suggested doing both components separately during the TAKE 10!® activities.

Limited classroom space. The classroom also posed a barrier to the teachers implementing the TAKE 10!® activities. Specifically, 2 teachers explained that the lack of space in the classroom made it difficult to conduct the TAKE 10!® activities. For example, Henry said: "We did some things with our arms, but sometimes it's the space that's the problem. We may hit each other, so I kind of tailor their movement so that they will not get out of control, which is at this age, I have to control them." Another teacher, Paul concurred: "With the computers in here, I just don't have room to do some of the stuff. You've seen that, so it's hard to get all of the stuff in when I don't have the room to do it." The temperature in the classroom also made it difficult to motivate the students to participate in the activities. For instance, Alice wrote in the questionnaire: "It was so hot in my room." Additionally, Henry commented in his questionnaire: "Hot in room." A few teachers revealed that the classroom setting posed a barrier to implementing the TAKE 10!® activities because of the lack of space, and the heat during the end of the summer season.

For the major theme, barriers, the teachers discussed about the challenges they experienced while implementing the TAKE 10!® activities in their classrooms. Barriers that the teachers encountered were fitting the TAKE 10!® activities into their daily schedule, dealing with the behavior of sedentary students, getting the students to move and think academically at the same time, and using the limited space in their classroom.

Benefits

Despite the various barriers that teachers experienced in implementing the TAKE 10!® activities described in the previous section, teachers discussed the benefits of the activities in this theme. The subthemes that emerged from this major theme were: (a) awareness of the need for a break, (b) benefit the teachers holistically, (c) benefit the students holistically, (d) physical activity integrated curriculum.

Awareness of the need for a break. Being part of the TAKE 10!® project created awareness among teachers and students about themselves. Some teachers commented that they became more aware that their students need a break after prolong classroom seat work. For example Betty said:

> I think it's a great opportunity for me to be aware of when the kids need to get up and how long they can sit before they start turning themselves off. I think it's great to be aware of when they need to get up and move and be given that opportunity during the day because as an adult, I struggle sitting all day long.

Henry concurred: "It was good reminder that sometimes we do too much sit down work, 'cause you forget that the kids this age, probably not the best to have too much sit down work. They are not used to it (sitting) and they get antsy." Another teacher, Alice commented that her students are more aware of themselves, participating in the TAKE 10!® activities. She said:

> I think it makes the kids more aware of, when they were moving, that they were happier 'cause they were sitting for too long. Like you know, [name of a student], the big heavy girl, when she moves, she's happier. It's quite apparent like her response to you. Even, like [name of a student], you know, the little boy with the curly hair sitting in front, he has to move. I mean that's just part of his life, he has to move also. He's become real aware of that, you know, some of these kids need to get up and move around, so I think it's given them more awareness 'cause I talked to them about it, 'cause I notice a big change in some of them which is good.

A few teachers also talked about the fact that the TAKE 10!® activities made teachers more aware of their own bodies. For instance, Carol said: "It makes you much more aware of your own body and what muscles you are using or not using. In this case, so, ya, you have to remember that I can do this simple exercise at home here or whenever. Just to take a 10 minute for me is good." Alice also mentioned:

> To make teachers who don't move or don't let their kids move aware of how important it is. I think that's the benefit overall because we get teachers in this building who do not move. And to make them more aware of it 'cause if they were to do it with them, they might start feeling better too.

Overall, the teachers felt that the TAKE 10!® activities created awareness among teachers and the students on the importance of movement during the school day. The teachers also agreed that sitting down for too long at their seats is detrimental for the students' attention.

Benefit the teachers holistically. Many teachers commented that by participating in the TAKE 10!® activities had made them feel physically and mentally better. It also helped them realized that they need a break as much as the students. For example, Betty said: "I think it's good for me to take a break too [laugh]. It's good for me to just, to be like, 'ok, half way point, let's take a break, regroup.'" Alice concurred: "Sometimes I need a break." Two teachers commented that the activities helped them feel physically better. For instance, Paul mentioned: "I like it. I have fun doing it . . . if I was feeling up

to it; I will do the same exercise as the kids. We will do squats together, we would do the jumping jacks, and we would do any of that." Another teacher, Carol commented:

> Well, when I was doing it, ya, I mean your heart pumping and you get out of breath, get hotter and a lot is changing. When I would do my squats, my legs would hurt, you know, but it's because I was not working at that. It's a good thing to have and do throughout the day, especially for us teachers who stay late, you know, we're tired by the end of the day.
> A few teachers also mentioned that the activities helped them feel mentally better.

For instance, Rachel said: "I definitely think it's beneficial for mental health as I said, I can even tell that I'm not, erm . . . I mean, I'm more irritated and I'm a little bit more uptight when I don't exercise myself, I mean, you do need your break." Another teacher, Alice commented about the importance of being active and staying fit. She said: "They'll (Teachers) be a lot happier. We had so much stress. It's a great stress reliever." She continued:

> If you don't [exercise], you become part of a group of complainers, you know. There are many people who just complain and complain and complain and complain and it's hard, it's really hard. And we had one teacher last year who exercise and she was a hundred times happier than she was this year and this year, she's not exercising and she's gained a lot of weight back and she's grumpy.

Helen concurred:

> We feel better. I know when I exercise, I feel much better, even if I just go for a 20-minute walk, I feel better and so, if I feel better, I'm a better teacher and the kids notice that difference, you know. Even see now, last year, I broke my ankle pretty severely and it was awful. I couldn't move, I couldn't do . . . it drove me crazy because I couldn't get out and do anything. I had a hard time just getting from here to the parking lot because of the pain and so, it makes a big difference if you're up and you're moving around and you're doing things, the kids notice a difference.

In this subtheme, the teachers discussed the benefits of personally participating in the TAKE 10!® activities with the students. Besides feeling physically better participating in the activities, the teachers also revealed that they felt mentally better.

Benefit the students holistically. Many teachers commented on the benefits of the TAKE 10!® activities on their students. The benefits included students being able to focus better and improvement in the students' fitness, academic test scores, self-esteem, and behavior in the classroom. Rachel talked about her belief in providing movement breaks for her students. She said: "I really have always known that kids having breaks and being active and rejuvenating their brain and having some movement during the day is definitely good for engagement and having everybody, you know, paying attention." She continued: "I really think it is good routine to be in, just all the way around to, erm . . . for reengagement and just to get them thinking again, you know, because they do lose interest if it's too hard for them." In the questionnaire, Betty wrote about her beliefs: "In the end, the kids need the break from sitting. It's beneficial to give them that opportunity."

In my field observations, before the teachers implemented the TAKE 10!® activities, I noticed that the students were more restless and fidgety. During one math lesson in the classroom after lunch, Alice talked to a student: "[name of a student], are you with me? Don't fall asleep." In Paul's classroom, I noticed that students were not paying attention to the teacher, and some students were doodling or drawing pictures. Likewise, I observed students were fidgety in Betty's classroom, as she said to a student: "[name of a student], sit down." Additionally, during one reading lesson, Rachel reprimanded one student, as she said: "Stop. [name of a student], you are not following along". She added: "You two boys . . . you don't need to sit in class and horse around." Shifting her attention to another student, Rachel exclaimed: "[name of a student], why are you out of your chair? Walk all the way around and sit at your chair." In another observation, Rachel called out to a student: "Please stop tapping . . . you need to stop and

get on with the work, [name of a student].” In another field observation, I noticed Casey kept asking the students to keep quiet. She said: “Shh . . . this table, you’re too noisy.” Likewise, students were talking continuously in another classroom and the teacher, Jamie had to ask them to keep quiet. Jamie told the students: “Shh . . . I’m not going to remind you again. This is individual work. If you talk again, I’m going to make you stop and sort.”

The teachers commented that after they implemented the TAKE 10!® activities, the students focused better. For instance, Helen commented:

> Well, obviously some of them who don’t ever move during the day, it’s good for them to get up and they have to move around because it helps your brain better and it helps them refocus better and kind of wake up. I have one girl who, if she can sit and read all day long, she would sit and read all day long and never get out of her chair and it forces her to get up and then when she does it, she’s more apt at paying attention to what’s going on in class instead of having me to take her book away and tell them to pay attention, so, it gets them moving and they need that. And they need to recharge and, you know, move around and do things.

In my field observations, I noticed that some of the misbehaved boys in Carol’s class were more on-task after they participated in the TAKE 10!® activities. Carol concurred in her interview: “If they are physical especially if they are willing, so you might as well wear them out to get their brain moving, so that their blood is pumping through their brain and their bodies are more focused on what they’re doing.” Similarly, I noticed that 2 students in Rachel’s class who were off-task before the TAKE 10!® activity, were more on-task after they participated in the activity. Henry also commented: “It (activities) probably did help those who are kind of antsy. Those who kind of have trouble sitting still, it probably help them I think.” In one field observation, Jamie commented to her class after they have participated in a TAKE 10!® activity: “Wow, that’s a very on-task class.” Some teachers also mentioned that the activities helped their

students worked better academically in the classroom. For example, Rachel said: "It (activities) got them to do their work for a little while so that's good." Paul observed: "The kids seem to enjoy it and they worked a lot better after they exercise." Casey talked about a student in her class, as she said:

> My [name of a student], he, you know, he just at the beginning of the year, he was very very lethargic and very not wanting to do anything and he just has lightened, he just had light radiating from him and you notice that when he sits down, what is he doing, he's smiling, you know, and he's got a good attitude and I think he, it has helped his academics because I was really struggling with him in getting any work turned in and right now, he's doing everything he's supposed to do.

A few teachers mentioned that the activities also helped in improving the students' test scores. For instance, Carol observed: "What I've noticed with my kids after doing Take 10 or taking a break of physical activity and coming back to it, they do better on the test performance." One teacher, Paul noticed that his students' attitudes toward tests improved as well. He said:

> When you did the Take 10, for the next hour or so after, the kids were more focused on the work. They have more energy, before we would take tests and the kids, most of the test scores went up because their bodies are more alert. They're up moving and it's not, they're just sitting at their desks being lazy and so, we did one test where we did right in the middle of it, we stopped and did a Take 10, and then they sat down and it seem like they finish the test a lot better, instead of dragging their feet trying to finish. So, better attitude with the tests.

He continued:

> When I would give a paper test, we stopped halfway through and people will do the Take 10 and then they would get back to it and it seem that they remember more and were able to do more . . . the kids were able to find better answers on the test, instead of just simple one word answer. They were coming out with more answers. They focus better on what they were doing.

A number of teachers also mentioned that the TAKE 10!® activities made their students physically fitter and active over time. For example, Rachel said:

> In the beginning, in the first few weeks, they didn't like to do the pushups at all. We would like say: "ok, do some pushups", and I did find that some of the heavier kids wouldn't do the pushups the way they were supposed to [laugh], but I think that as the weeks progress, that the faster they were able to finish the activities too. I'm thinking of the countdown one of the days of the good health and how fast they do the activities count "1,2,3,4,5," you know, move along through the activities a lot faster, so I think their fitness levels definitely improved and increased.

Alice concurred: "At first, 10 full minutes was killing us, like the kids were dying but you saw last time, they did 10 minutes and they made it through and so, yeah, their stamina got way better." She also mentioned about their behavior during walking recess, as she said:

> They are able to complete more laps during walking recess 'cause before, they had to do two laps to get their little things from Mrs. Grey (principle). Every month, she gives them a little token. We moved to three. I had many complete four in November and they shoot for five in December [in] 13 minutes. Five and a quarter lap is a mile out there. So if we get them out on time, they should be able to do five. At the beginning, they were doing two and some wouldn't even doing that, they were just rolling around.

Paul made the same observation, as he said:

> I would say half of the kids has decided to do more at walking recess even without the pedometers, they would actually run and walk during walking recess, and so they would try to get at least two laps of running in or three laps of jogging or something like that. I've seen probably half the class improved outside.

Teachers not only noticed that the students' physical fitness improved, they also commented that the students' mental health improved. For instance, Alice said:

> It's (Activities) a big stress reliever. The other thing I noticed too like when the kids will goof off. Initially they would get mad and shut down and then they were able to laugh at themselves too, that they were doing something, so that's a good thing, to be able to go, "Oh mess up . . . not a big deal," "Oh I messed up. Now I must stop and that's ok." Messed up like academically like counting numbers or spelling their words while they are moving, it would shut them down at first and they would just laugh and keep going. So, that's good.

Another teacher, Casey said:

> I think self-esteem too because there're not the only kids that doesn't know how to do jumping jacks, "I'm not the only one," you know. There're not the only ones that can't touch their toes yet and a lot of times, you know, they feel that way and I guess, you know, I'm wondering if we're doing this, if it will help with any bullying issues. I know my [name of a student] gets bullied because of his weight and I just think if I can get him moving, maybe a pound or two here will help him, you know, so that he isn't bullied later on.

Paul concurred:

> My biggest one is starting the morning off like that because I'm one who start my morning off doing stuff and getting out and being active and so it helps you like wake up, helps you feel better during the day and I see most of the kids feel better when we did them . . . It's just a huge difference on the kids, so seeing it in here every day and seeing in the other classes do it, I think made a big impact on some of the kids' life because they are more interested in doing it and they feel better and the ones that I could pick out, they feel better are the ones who are going to continue.

A teacher, Casey noticed that 2 of her students are getting were less shy about doing the activities, as she commented:

> I'm watching my little [name of a student], she's you know, she's coming out of her shell, I think as we do these movements, so things like that. And I don't know if they would have been doing this if we have not been doing the movement so that's what I'm observing and seeing kids, you know, kind of stepping up a little bit and they tend to do a little bit more. Same with [name of a student], she's really, she's stepping out of her little quiet shell and she's being, you know, more vocal and being able to do things as we do these things, as I watched her, she's involved. She does it all. She's kind of, "Oh . . . I'll do them."

In this subtheme, the teachers discussed about the benefits of participating in the TAKE 10!® activities for the students. Many teachers consistently agreed that the students focused better after they participated in the activities and some teachers commented that the students worked better during tests. Additionally, the teachers observed that the students got fitter over time, participating in the TAKE 10!® activities. The teachers also noticed that students felt emotionally better.

Physical activity integrated curriculum. Several teachers commented that they liked the concept of PA integrated with curriculum. For instance, Betty said: "I think the integrated with learning, I think that's good. It runs better to give it a purpose even if you are doing math, like I think it's good to figure out the math problem and stand up and do the mini jumping jacks." Jamie concurred: "It was fun to try to incorporate movement, action with learning. I like the concept of taking time out to exercise and incorporate learning with it." Rachel also commented: "I do believe the integrated [curriculum] is more beneficial all the way around." One teacher, Casey felt that this concept provides students with a different form of learning style. She said:

> I think these kids need to experience the curriculum in all kinds of different ways, you know, I was, erm . . . we practice our multiples and I was listening to my little [name of a student] and they learned how to skip count in 3rd grade using songs and I hear singing the songs, you know, and she's doing the skip counting with it.

She continued about the advantage of the PA integrated curriculum:

> I think they (teachers) need it integrating curriculum, you'll have more people that will say, "ok, I could do this" instead of "I don't have time enough as it is to get all my curriculum and to do this" 'cause that's the big thing that's going on right now and I hear that a lot from teachers, you know, I hardly have enough time as it is to get things done and you're asking me to do more. As a teacher, since we're all focused on the CRT and the curriculum probably want to do the Take 10.

Another teacher, Carol also agreed that teachers will embrace the concept of PA integrated curriculum, especially for teachers who were on a "time crunch" to complete their curriculum. She said:

> Some people who would say, "I don't know where I could fit it in and it takes a lot time and I can't see that happening," but I think if they see that if it's 10 minutes here and maybe first, you know, you could spread it apart but it doesn't take that much time once you get going, once they know how to do it. Their first response is, "Ah, I just don't have time for this" [laugh], but you cannot . . . you have to make time for it. These kids want to do it. As long as it integrates the curriculum, you're not wasting any time. You are using whatever you already have to do the physical activity and kids need change. I mean for this age, and for

> 7 years, I stick to the same routine and I worked with this group of kids, and this week, I changed some of our routine and they love it.

Henry commented that PA integrated curriculum is advantageous for reviewing basic concepts in learning, as He said:

> I like integrating something into movement. I think it'll help some better [who are] not as good with book work and learning . . . for the basic concepts, it's kind of find a way to practice and review [like] multiplication and division and especially spelling, they seem, some of them seem to have fun.

In this subtheme, the teachers revealed that they liked the concept of integrating PA with curriculum. Some teachers indicated that it provided a different way for the students to learn the subjects and teachers may be more open to this concept because they can make better use of their time to teach curriculum while doing physical activities.

In this major theme, benefits, the teachers discussed the benefits of implementing the TAKE 10!® activities in their classroom. Benefits included helping teachers and students become more aware of the need for breaks during the school day, and benefitting both the students and teachers holistically. Additionally, the teachers commented that the concept of integrating PA with curriculum helped some students in their learning of academics.

What Worked

During the interviews, the teachers discussed the ways they make the TAKE 10!® activities work in their classrooms. The subthemes that emerged from this main theme were: (a) separating physical activity from curriculum, (b) less than 10 minutes, (c) once or twice a day, (d) sticking to the same activities, (e) prepare ahead and give clear

instructions, (f) teachers setting an example to encourage the students, (g) the TAKE 10!® book as a useful resource, and (h) teachers modify lessons.

Separating physical activity from curriculum. Though the teachers consistently agreed that they liked the concept of PA integrated curriculum, they noticed that some students were not able to handle both PA and curriculum concurrently. Hence, the teachers suggested that during the 10-minute break, the students do the PA and the curriculum separately. For instance, Betty said:

> I like the thought of having them exercising and then stop to take a little rest because it's hard for them to move for that much time and then like intensely too, and so to stop and answer questions, and then do another 30 seconds and stop answer questions. That just seems to work better for me and my class.

She continued: "It works best to kind of separate the two. Like do some exercises and answer basic questions, or here's your questions, think about it while you do these exercises, stop, what's the answer?" Helen concurred:

> I have one student attack another student. He got so wound up that he could not control himself and so that's when I quit doing the academic with the physical and just did my physical stuff because they just, they could not get it all together. I had some who would, and I'm sure you saw a few that would just sit or not sit, they would stand, barely move, they would do the academic activity but they wouldn't do the physical part and then I had some who would do the physical part and so, they had a hard time doing the two things at one time, getting their brains working that way. It was very difficult but they do very well doing a physical activity and then refocusing, so I found that to work a lot better.

She continued:

> I've used some of the academic part without the physical part. I've used the physical part without the academic part. And the ideas are good, I just . . . it might just be this group of children, they can't handle both together but in the other group of children, it could be totally different. The class I had last year would have been fine and the class I had the year before that, probably would not have been able to do both together, so just kind of depends on the grouping, the kids and what we end up with.

In this subtheme, a few teachers revealed their experiences trying to incorporate both physical activities and curriculum concurrently. They felt that students could not handle both components concurrently, and thus suggested doing either the PA component or the curriculum component separately.

Less than 10 minutes. A number of teachers suggested that 10 minutes was a long time to implement the TAKE 10!® activities. For example, Alice wrote in the questionnaire: "It's hard to do 10 full minutes." Additionally, Betty commented: "I'll still keep doing it and give them the breaks but probably not 10 minutes at a time and probably modify it to what we are doing and what we need." Rachel also said: "I would say between 7 to 10 minutes every time. I mean I don't know that it was exactly 10 minutes every time, but I know it was definitely more than 5 to 6 minutes, so between 7 and 10 for sure, definitely." Casey pointed out her view:

> I think 10 minutes is a long time and I like to do it until I see their interest waning and it's been more of a discipline. You have to get going, you know, even if it's for 5 minutes or 7 minutes. I think, you know, as long as I have high interest with it and high involvement, I think it's good though. When it start to kind of go down the other way, it's ok: "You can sit down and do this" 'cause I don't want to fight with them to do it. So, the 10-minute, I think it's a good idea [to] Take 10 'cause it makes sense but if it's only Take 5, Take 7, then I think that's what, that's what needs to be in.

Helen also agreed on the amount of time for the activity, as she said: "I think 10 minutes is too long. I like 5. I think 5 is good. 10 is almost too hard to get them back on track, so it seem a little too long for me." She continued: "If it's 5 minutes, they get right back on track and it's easier to get them back together easier." Henry also thought that 10 minutes was too long, as he said:

> Sometimes 10 minutes seem pretty good. Sometimes I did it a little bit shorter. So, sometimes like, try to be pretty intense, those 10 minutes seem almost too long.

> Sometimes when they are doing all the jumping and they would get tired very fast. I'm pretty active myself.

In this subtheme, the teachers discussed the amount of time that was appropriate to implement the TAKE 10!® activities. Most teachers felt that 10 minutes for the activities was too long because it was difficult to sustain the students' interest and physical ability for that long. Additionally, 1 teacher commented that she could get students back on track to academic work if the duration was about 5 minutes.

Once or twice a day. The teachers were asked to implement three TAKE 10!® activities per day at the beginning of the study. At the end of the study, most teachers commented that it was difficult to fit three TAKE 10!® activities within a school day, and hence suggested that implementing once or twice a day is more feasible. Results from the weekly questionnaires also revealed that the teachers were able to implement on average, one TAKE 10!® activity each school day. From the interviews, Betty said: "I really just [did it] one time a day except for short day, short days I didn't do it at all." A number of teachers also reflected in the questionnaires that it was difficult to implement the TAKE 10!® activities on short days, which are typically Fridays. For instance, Jamie commented in the questionnaire: "Today was a short day, so we only got one in." During the interview, Jamie shared her experience, as she said: "My average is probably like one and a half, so if you think of it that way, then it's like 15 minutes a day. Think if I do it three times a day for 5 minutes. That will be way more doable than doing 10 minutes three times a day." Jamie also wrote in the questionnaire: "It will take some getting used to, to do this three times per day. I may not always get it in." Rachel mentioned: "I did it on average twice a day." Casey concurred: "We do it at least twice. I make sure that we do it at least twice and then, depending on what day." Henry also agreed: "One or two [a day]."

Another teacher, Carol also commented: "I think three is too many. I think one might be feasible. I have always been doing one every day but I think you could do one every day." Alice shared her goal for implementing the TAKE 10!® activities. She said: "I shot for 10 times a week . . . 10 times . . . if you see I did pretty good. At first, I just totally forgot about it and then we . . . and I've done a lot of 2s [a day] and that's what I shoot for, and these early out days, it's hard to do one." Finally, Paul mentioned: "We started every morning off with the Take 10 and we did them at 9 o'clock and it helped the kids. I just did two 15 [minutes], so it came out to 30 minutes."

In this subtheme, the teachers shared that it was difficult to implement three TAKE 10!® activities a day. Many teachers consistently agreed that implementing the activities once or twice a day was feasible. In addition, they commented that it was more challenging to implement the activities on short days when school finished earlier.

Sticking to the same activities. Some teachers felt that implementing the same activities regularly worked better with their students. Jamie shared her experience, as she said:

> I tried to do new activities, but they seem to be confused and I didn't have a lot of time to instruct them on how to do a Take 10. See that was the other problem is that I was already taking 10 minutes out of my day to do a Take 10 and I didn't have another 10 minutes to instruct them how to actually do the Take 10 and then do the Take 10, you know what I mean. And so, once they learn how to do [it] one way, then that's the way we've been doing Take 10. For that day, when you saw us doing the spelling and they always did it the same because that's what I have taught them and I instructed them how to do that and it didn't take the time out to teach them to do it in a different way in something else.

Another teacher, Rachel, also agreed:

> I only stuck with about three to four [activities] in each one, in language arts and in math. And I would rotate them and the kids definitely have the ones that they like the best [laugh] and always wanted me to do. I didn't try all of them but I did

> have, like I said, three to four [activities] from each area, so at least six to eight [activities] that I did tried out of the book.

Rachel continued: "I found that having a good routine and only using three to four [activities], like I said, of the same ones so that we can get right into the routine and get into the physical fitness part of it quicker and longer was better for me and my routine." She added: "I'm sure you know with learning that you need to have repeated exposure to the same information before it's truly embedded. So, you know, the more times you can repeat it the better." Another teacher, Casey, concurred:

> I chose to concentrate on just my kids on the times table, so that's why we are doing the skip counting and I figure if I can do that then . . . and I noticed that they are getting better at it. Then, I can implement another one, do that one time, and then do another one another time.

In this subtheme, the teachers commented that it was easier to implement TAKE 10!® by using the same activities regularly. Some teachers explained that using the activities saved them time to reinstruct and train the students to perform the new activities.

Prepare ahead and give clear instructions. A few teachers mentioned that it was easier to implement TAKE 10!® if they prepared the activities ahead of time and also gave clear instructions to the students while they were doing the activities. For example, Jamie said:

> You have to instruct, you can't just be like, "ok we're going to do this," and then expect them to know how to do it . . . to really instruct it from beginning to end to exactly what I want you to do , these are the benefits , this is the objectives of why we are doing it, this is the purpose. And so you have to go through all of that too.

Rachel concurred:

> I think you have to definitely like prepare before you do a Take 10. You can't just flip through the book and then all of a sudden, you know, be able to instruct the kids. It's something that you have to at least, have read through and process, "ok, how is this going to work?" before you implement it, but once you do it the first time and how it's supposed to work needs to be taught to the kids for it to be

> really effective in my opinion . . . kind of envisioning how it's going to go with the kids, knowing your kids, knowing which activities to choose, to implement with your kids and then being able to explicitly teach the steps and then the process of how it works because if you're not really explicit and the kids don't know what they're doing, it's not going to be effective. They are going to be goofing around and not really understand.

Jamie also shared her experience. She commented:

> It's really hard for 10 minutes for the kids to think of nouns, you know. I mean that's way too long for them to have to think of nouns, so I have to be a lot more specific and say, "Ok, think of people," "Ok, think of things," because they can't, it's too broad, it's too long for a period of time for them to think of nouns.

In this subtheme, some teachers suggested that they had to be very clear in giving instructions to the students before they performed the TAKE 10!® activities. They also commented that it was important to prepare the TAKE 10!® lessons ahead of time, and with good preparation, it would minimize students misbehaving during the activities.

Teachers setting an example to encourage the students. A number of teachers suggested that by doing the activities with their students or motivating them verbally, the students would be more likely to do the activities. For example, Casey commented: "The minute I get involved, like when I stand up when we do the windmills or touch your toes, things like that . . . then they are more willing to do it than other times." Carol also observed:

> Kids like to see their teachers doing the things they do. They don't like it [if] we're so much up here as adults, they're down here. If you bring it down a little bit, keep the respect, as teacher adult, have fun with them. This is where the fun takes place. It's not supposed to be another chore or something else you have to do. When you make it fun and they're doing it with you, you know, I'm jumping up and down, I look silly . . . I know I do. It doesn't matter but I'm like, "Ok, c'mon we got to do it." And then they realize: "Hey, you know, she can connect with me." And the kids at this age, they just, they look up to you, they want to do everything you do.

Paul concurred:

> I think it's setting an example, if you're willing to do it, the kids will be willing to do it but where if, "Oh, I don't want to do this," the kids wouldn't want. Same things go with reading, when you read a book, if the kid can see you read, they're going to enjoy reading. If they don't see you read then they are going to realize: "Oh, you don't like reading, why do I have to read?" I think the exercise went along the same point . . . If you want to set the example for the students, then it changes the students' whole point of view.

Carol observed that if she monitored the students during the TAKE 10!® activities, the students would be more willing to do the activities. For instance, she said:

> I noticed if I continue [to] walk around and watch them, that was better than me standing there and you have to know: "ok, if I stand by them, [name of a student] gonna do this" or if I stand by [name of a student], he's gonna do this, so sometimes it helps.

In this subtheme, a few teachers suggested that setting an example by doing the TAKE 10!® activities with the students motivated the students to do the activities as well. Additionally, 1 teacher noticed that walking around to supervise the students during the activities increased the students' likelihood to perform the activities.

The TAKE 10!® book as a useful resource. Some teachers commented that they appreciated having the TAKE 10!® book as a useful resource to help them implement the activities. For instance, Rachel said: "The book did put together activities that help us. From the book, I used the math one most often and in language arts, I modified more to be on whatever grammar, parts of speech we were doing, like the adjectives or it was contractions." In response to whether she came out with her own activities or use the TAKE 10!® activities, Rachel continued: "Take 10 exercises . . . because then I don't have to come out with my own ideas." Helen concurred: "No, I'm not that smart [laugh]. I do it a lot easier to use the book . . . because then I don't have to think. It's just right there." In addition, Alice commented: "I like it [the book] 'cause it gave me, 'ok, do this for a minute and a half, do this . . . ', and so it kept the kids more engaged." Casey was

appreciative of having the book as a useful resource, as she said: “In all the years I have taught, I look at them and they have implemented so many programs and they’ve given us nothing. They say do this, and then find your own resources and I think that’s hard, and I appreciate having a tool when I can’t think of something.” Carol commented that she liked how the book was divided into various levels of difficulty, as she said: “I like how it was very specific and then you can change the levels: beginner, intermediate, advanced [flipping through the binder]. At first, the first 8 weeks, you start here (beginner) and then you can move up and then they can get to this point.” Another teacher, Jamie, who found the book useful, commented that she liked to implement the activities in math, as she said: “For me, math time was the best ‘cause it was the easiest way to incorporate doing the Take 10 and so, during math, when I was teaching the lesson, we would get up and do Take 10. They would stand behind their desk and do certain things.” The teachers found the TAKE 10!® book as a useful resource to implement the activities. Some teachers commented that they did not have to create their own lessons and one teacher mentioned that she liked the different difficulty levels (i.e., beginner to advance) that the lessons in the book provided. Many teachers also mentioned that they implemented the TAKE 10!® activities most frequently in language arts or math lessons.

Teachers modify lessons. Though many teachers liked the lessons provided in the TAKE 10!® book, some of them mentioned that they modified the activities to suit the lessons they were teaching in the classrooms. For example, Rachel said: “I took some of the lessons that are put together and then just kind of put my own twist of what we were learning to help them better engaged.” Carol commented: “You can change it up, but you have to know, “ok, I’m going to take Take 10 today and this is what we’re going to do”

And then, you don't have to do it exact word for word, you can change it up." Jamie concurred: "I pretty much ended up just adapting it (the book) to work for me, and what we were working on 'cause sometimes [what] we are working on wasn't covered in the book and so I just had to adapt it." Henry also mentioned: "I like to tailor it to what I want to do, so I was kind of finding a way to implement it. Try to fit what we are doing. So it's kind of fun." A teacher, Paul, commented that he preferred to come out with his own exercises. He said:

> The ones in the book were scripted; they (students) didn't like those as much as just coming up with exercises on their own to do. And so, like our football players, I have 5 kids play football in here and they loved to come out with exercises and it's the same stuff they did it at training and most of the kids loved doing it. Where if we try to do the scripted stuff out of the book, they just didn't have much interest, so it was hard, but you know, they still did it [laugh].

Carol provided a suggestion for the TAKE 10!® book to be converted into electronic lessons. She mentioned:

> I have to write them (the Take 10 activities) on the board, so it would be nice probably to have these lessons [from Take 10], I want to say, like on board, or PDF or something that you can just get on to your computer. We have created a generation the last decade who's sedentary and doesn't, you know, exercise as much as we should, so having this kind of activity and having that complements a new generation of kids that can be both technical and physical at the same time. If it's in PDF, we could pull it up easier instead of a book. It's nice and they last a long time and I can change it a little bit. Show on the screen while we are doing the exercise at the same time, so wouldn't have to write the words down or I could open a video of . . . if I did this next year, this is my class doing this activity last year and this is what they did. Trying to think, does it makes sense so that they can see and go, "ok" and then turn it off and then say: "ok now, let's do it together," so you have a visual demonstration because kids are more visual now and they're still kinesthetic learners.

In this subtheme, the teachers commented that they modified the lessons provided by the TAKE 10!® book to fit the lessons that they were teaching. One teacher mentioned that he allowed his students to come out with their own activities, which empowered the

students to perform the activities. Another teacher suggested that if electronic versions of the lessons were available, it would make teaching more effective with the new generation of students who are frequent computer users.

In this major theme, what worked, the teachers described their experiences of implementing the TAKE 10!® activities. The teachers gave suggestions on what worked for them in their classrooms, which included separating PA from curriculum, implementing the activities less than 10 minutes once or twice a day, using the same activities regularly, preparing ahead and giving clear instructions, setting an example by performing the activities with the students, using the TAKE 10!® book as a useful resource, and modifying the lessons from the TAKE 10!® book.

Personal Attributes

The personal attributes of teachers who implemented the TAKE 10!® activities in the classroom is discussed in this main theme. The subthemes that emerged from this main theme were: (a) attitudes toward implementation of TAKE 10!®, (b) competency in implementing TAKE 10!®, and (c) teachers' personal physical activity behavior.

Attitudes toward implementation of TAKE 10!®. When the teachers were approached to implement the TAKE 10!® activities in their classroom, their initial attitudes was neither positive nor negative, and many were willing to give it a try. For instance, Casey indicated: "It wasn't like, 'No, I don't want to do it' or 'yeah, I want to do it.' It's like, 'ok, I'll try it.' So, it wasn't . . . I didn't have a negative or positive feeling about it. It's like, 'ok, let's see what this is and see what we can get going with the kids.'" Likewise, Helen said: "We'll give it (Take 10) a try and see how it works. It

wasn't, you know, I wasn't afraid of anything else." Henry commented: "I was confused at first with exactly what it was but I thought, you know, could be the idea for younger kids, maybe 3rd through the 2nd, through 4th grade." He continued: "I thought it (Take 10) would be interesting, something different. See how it work, whether I like it or not." Two teachers mentioned that being part of the project made them felt more accountable to implementing the activities. For instance, Alice said: "I know I wasn't that consistent but I try to do this when I was held accountable." Casey concurred:

> I like the fact that there was an accountability to do it and, you know, what I really think that makes a huge thing if there's accountability . . . put it in so that we as teachers can be accountable for it then we'll do it and it becomes more of a "have it" than "not" and that's what it needs to be.

In this subtheme, a few teachers commented that they neither had a positive nor a negative attitude toward implementing the TAKE 10!® activities in their classroom at the beginning. Many teachers also indicated that they were willing to try the activities and some mentioned that being part of the project made them more accountable to implementing the activities.

Competency in implementing TAKE 10!®. Some teachers commented that they were not very confident in implementing the activities at the beginning, but their confidence levels increased over time. For example, Betty said: "I wasn't like super confident [at the beginning] but it was fine. Casey concurred: "I wasn't confident because it took me out of my comfort zone, but I thought, 'Ok, I said I'll do this, so I better make it my comfort zone and get a nice little cushion around it,' so I'm not going, you know, feeling awkward doing it." Another teacher, Carol, mentioned: "Not really [confident], I mean, yes and no. I mean, I can read the instructions and do it but at the same time, it was kind of hard to do it and know what I'm doing until the second [time] would be better

'cause I have to do it first to know how to do it." Carol also indicated that once she became confident with implementing the activities, she did not need to focus on the activity. Rather, she focused on helping the students perform the exercises, as she said:

> I'm like: "ok, now we're just going to do and not have to read what the lesson is." Just say: "ok, now, the same exercises, let's implement these words." It's like different but it's the same type of thing and then once you feel confident about that, then walking around and seeing this person is doing that, that person needs help with this and repeating some of the things again helps the kids 'cause they remember.

Some teachers indicated that implementing the TAKE 10!® activities took them out of their comfort zone. For instance, Casey commented:

> We as teachers, we get into this rut that we are so comfortable with and how everything works and then, for us to step out of it, it takes us out of our comfort zone and you know, I noticed that, you know, young teachers will grab things a lot faster than older teachers will because it's hard.

Helen commented on why other teachers may not want to implement the TAKE 10!® activities. She said:

> Because they (other teachers) are not comfortable with it, because they maybe, they wouldn't see how to get implemented it into their day. We have some who just don't want to try new things and so, they're not going to try something new because they don't want to try something new . . . more of a personality involved. Ya, some people just don't. They don't want to be told . . . they don't want to try something new.

Despite being taken out of their comfort zone, several teachers commented that they were confident from the beginning and the training they received on implementing the activities was useful. For example, Jamie revealed: "After we had the training and we got together and we talked about it, I thought this isn't maybe that hard." Alice said: "I feel confident . . . Even after the little training that we had, we can just kind of do it, and then just adjusted to what we are doing in class."

The teachers consistently agreed that implementing the TAKE 10!® activities several times from the beginning and having the TAKE 10!® training increased their confidence in implementing the activities. Some teachers commented that though implementing the activities took them out of their comfort zone, having these activities implemented in their classroom was valuable.

Teachers' personal physical activity behavior. Teachers' non-PA behavior that may influence their willingness to implement the TAKE 10!® activities was brought up during the interviews. For instance, Paul commented: "You see some of the teachers who just don't care and you tell in the classroom which ones they are and they don't want to do physical activity at all." Jamie also mentioned:

> If you see most of the teachers, most teachers here are overweight. I think to be a teacher, you have to [have] energy and you have to be patient and if you don't feel like good, your patience is really short and limited and I think that not all, but I would say, most of the really effective teachers are the ones who take better care of themselves.

Another teacher, Rachel, commented:

> I think that there are teachers who are not physically active are the ones that are sitting at their desks, that they're not instructing the way they should be instructing. They're definitely not having proximity and making sure that every student is engaged. How can that happen when they are sitting at their desks or not being active in their classroom, you know. I think they're doing their students a disservice by not at least moving around the classroom, so I mean, yes, that's my opinion and I know there're teachers out there that just sit at their desks or whatever you know, that aren't moving around and being active.

One teacher, Alice, who has strong beliefs in the benefits of PA, indicated:

> Oh, I feel I try my darn-est . . . the benefits of it . . . but I'm a physically active adult. We have so many who are not physically active, that they don't see the benefits of it, so they don't model it. I think we could be [role models] 'cause kids take anything their teachers said to heart. They go home and tell their parents: "well, my teachers said this," 'cause my own kids do that.

Alice continued:

> 'Cause if you're [a] sedentary teacher, you're not going to teach your kids to value this. We've got a good group of us who are pretty active here and it's like we are either one extreme or the other, really active or really sit a lot. That's just like . . . one teacher when we did the pedometer thing with just teachers, she'll get 2500 steps a day and think that was great . . . that's bad . . . it's horrible.

Helen also commented that physically active teachers will influence their students to be physically active as well. She said:

> I think they (teachers) can [be role models] if they're physically active. Like [name of a teacher], erm . . . [name of a teacher], [name of a teacher], [name of a teacher], we have teachers all over that go to the gym or run or do something daily and . . . their students are more active, whereas the rest of us who maybe don't go to the gym daily or, you know, don't have an exercise regime and don't talk about it, then the kids don't because they don't see that. They use us as role models for everything, so you know, I know [name of a teacher] talks about exercising and going and doing things and talks to her class about it, so they know she does these things and my own child who is in there is more active because of that, you know, she has try really hard this year, whereas I could never get her to exercise, she did "Girls on the run," she's done different things and she like it, so I think [name of a teacher] had a big part in that, so ya, it does make a difference.

Alice also agreed that teachers who are physically active will influence the students' behavior as well. She said:

> So you know, my level is up here and on this hall way, it's [name of a teacher] and me who are the 2 active ones, I would say. When we go out for recess duty and then they (teachers) stand in one spot and they don't move, so that's what the kids see us as, you know . . . frustrating. If I rule the world, I'll change it . . . I think I am a role model whether I choose or not. I think all teachers are role models whether they choose to be or not. We just don't get paid as much as basketball stars.

In this subtheme, the teachers talked about whether teachers' PA behavior would determine their willingness to implement the TAKE 10!® activities. Some felt that teachers who are sedentary and tend to sit a lot in their classrooms would be more unwilling to implement the activities. They also commented that teachers are role models to their students and that their personal PA behavior would play a role in influencing their students to be physically active.

In this major theme, personal attributes, the teachers discussed about their attitudes toward the implementation of TAKE 10!®. Most teachers were willing to implement the activities in their classrooms from the beginning. The teachers also disclosed that they were not very confident in implementing the activities at the beginning, but their confidence levels increased through the weeks as they implemented the activities. Lastly, many teachers believed that being physically active is an important behavior that will also influence their students' PA behavior.

Doing It in the Present and in the Future

In this theme, the teachers talked about their personal experience implementing the TAKE 10!® activities in the classroom and whether they would continue implementing them in the future. The subthemes that emerged from this main theme were: (a) children like TAKE 10!®, (b) encouraged by other teachers doing it, (c) continue to do it, and (d) sustainability of TAKE 10!®.

Children like TAKE 10!®. Overall, the teachers noticed that their students enjoyed doing the TAKE 10!® activities. For example, Rachel commented:

> I think the majority of them were liking and really engaging and becoming more active and able to do the activities for longer period of time and stuff like that. I think that, you know, 80 % did enjoy that and wanted to do the Take 10 activities, and whenever I say Take 10, and they were excited.

Henry concurred: "Some of them did like, you know, a chance to stand up, especially if they are tired of sitting, they seem like they are more into it. And you have higher percentage involved in doing it, which is nice to see more participation." Additionally, Paul said: "Even the ones who aren't very active still enjoy doing the Take 10. They got tired quicker, but they were still willing to do it." In the week one

questionnaire, Jamie wrote: “The kids seemed to really enjoy it!” Subsequently, in the week 8 questionnaire, Jamie wrote: “The kids seemed to work harder this week, maybe because they knew it was the last week.” Rachel concurred in her questionnaire: “The kids had fun.” The teachers also mentioned that their students would ask to do the TAKE 10!® activities. For instance, Betty described:

> I think it’s funny even today and the last couple weeks . . . but today, “Ok you guys need a break” and they’re like: “Yes!” I think they’re starting to look forward to the break. So which is good, like they would like: “Yes, it’s time.” So, I think some kids were even: “Can we take a break?” and they look forward to it. And they would ask and I think it’s ok to ask. I mean for a group of adults and if we have a whole day meeting and we’ll ask: “Can we have a break?” And they can ask and I think it’s ok for them to ask too for a break and they are ready to refocus.

Another teacher, Jamie, shared her experience, as she said:

> They seem to like it from beginning to end and they would ask me sometimes, “Are we going to do a Take 10 today?” ‘cause they would generally do it at the same time every day, and if we didn’t, sometimes we wouldn’t do it ‘cause we would run over because of an assembly, or something going on and so, they would ask me.

Alice concurred: “The students were begging me to do it. ‘When are we going to move?’.” In one field observation, when Carol told the students that they were going to do a TAKE 10!® activity, I noticed that the students exclaimed: “Yay!” In another field observation, I noticed the students were getting restless, and they asked the teacher, Jamie: “Are we taking a break?” During the TAKE 10!® activity, I noticed that the students were very enthusiastic. In Rachel’s class, I observed that she told her students: “Guess what we are going to do next?” The kids replied: “Take 10. Yay!” A teacher, Paul, was absent for a few days and his students did not do the TAKE 10!® activities with the substitute teachers. He described the students’ behavior as he said: “When we missed them or when

I wasn't here, the kids would complain about it because they were missing them (Take 10) and they didn't get what they needed." Carol also commented:

> It's been fun. At first, I had my doubts, not that it wasn't fun, but the attitudes have changed for the students. It's less work and more fun, so they're asking for it instead of me. At the beginning, it was I who initiated it. Now, they are saying, "let's do this, let's do that." This Take 10, they're asking for it.

Carol reiterated in the questionnaire: "The kids are reminding me about Take 10." Rachel forgot to implement the activities one day and she wrote in the questionnaire: "Completely forgot. Kids missed it!" However, some teachers experienced a change in the students' interest in the TAKE 10!® activities during the project. For example, Paul described: "At first, they were all excited and then they took a little down spell where they just don't want to get up and they bounce back up toward the end, so kind of little roller coaster there." Additionally, Helen indicated:

> When we started, they were a little more excited, erm . . . the newness of it, the newness of wearing the pedometers, things like that. At the beginning, they were really excited. More toward the end, they were not, so their interest kind of wane but it also depends on what activity we chose to do.

In this subtheme, many teachers shared that their students enjoyed participating in the TAKE 10!® activities and the students requested to do the activities. During my classroom observations, I also noticed that the students were enthusiastic when they were participating in the activities. Some teachers commented that their students were more interested in the activities at the beginning, but most teachers mentioned that their students were excited about the activities all through the project.

Encouraged by other teachers doing it. A few teachers mentioned that they were encouraged when they knew that other teachers were also implementing the TAKE 10!® activities. For example, Casey said: "I hear them (students) in the hall doing it and I think

it's, you know, they're doing it, so I think it's successful and the kids seem to be, you know, moving and they're loud so it sounds good." Carol concurred:

> I knew when they (students) were doing Take 10 'cause you could hear the counting of the times table or whatever it was, cute, I loved it. I loved walking by and see there being so much physical movement coming from all the different teachers at different times of the day, you know, see it. I come back from lunch and sat there and do math or something, and I hear, "1, 2, 3 . . . " [laugh] I knew that [name of a teacher] was across the hall doing it.

Another teacher, Alice, mentioned that she and another teacher had shared ideas of how to implement the TAKE 10!® activities in their classroom. She said:

> [Name of another teacher] and I talked about it at lunch . . . and when we started chanting the words, that help and we chant the shapes of the words, like here's "friends" . . . "F-R-I-E-N-D-S," like a cheerleader, you kind of jump while you are doing it, so it helps to give us something more meaningful to move to.

In this subtheme, a few teachers commented that they were encouraged when they heard other teachers implementing the TAKE 10!® activities in their classrooms. Additionally, 1 teacher revealed that she and another teacher shared ideas on how to implement the activities in their classrooms.

Continue to do it. The teachers consistently mentioned that they would continue to implement the TAKE 10!® activities after the project has ended. For instance, Betty said: "I will still continue to have them get up and move for sure. So especially now they're trained to do it, so they're like, 'It's time for a break,' you know." Rachel concurred: "I will absolutely keep doing it in math because I do notice that the kids need a little break to reengage." Another teacher, Casey mentioned:

> Even when I turn 60, hopefully not far beyond 60, I can . . . will do it, because it's something that's important, so that's what I said it, I learned to take this curriculum and put it into these activities. I will have those and I will have what we need to do, so that we can be successful.

Additionally, Paul indicated:

> I'll keep doing it the whole year throughout the mornings because I think it's great in the morning. In the afternoon, it was a lot harder for them to concentrate and they would just get tired. So, the afternoon, I might cut out, but the morning, I would definitely do it, because I think it just gives them that break and wake up time. That's what some of them need because half of them show up. Well, I have about 4 of them who show up late every day, and so that gives them a chance to wake up and get their body moving and I think it's good in the morning.

In this subtheme, the teachers talked about their experience implementing the TAKE 10!® activities and shared that they would continue to implement the activities in the future. Furthermore, 1 teacher mentioned specifically the time of the day he would implement the activities.

Sustainability of TAKE 10!®. I contacted the teachers for a follow-up interview, 5 months after the project was completed to examine the sustainability of the TAKE 10!® project. Six of the 9 teachers agreed to meet with me for a face-to-face interview. The remaining 3 teachers opted to complete an open-ended questionnaire that was comprised of questions I would ask during the interviews. Through the follow-up interviews and questionnaires, it was revealed that 7 teachers implemented actual and/or modified versions of the TAKE 10!® activities after the project has completed. Three of the 7 teachers implemented the TAKE 10!® activities regularly as part of their planned classroom schedule. The other 4 teachers implemented the activities on an ad hoc basis—whenever the students asked for it or when they felt there was a need for a TAKE 10!® activity. The 2 teachers who did not implement the TAKE 10!® activities cited the need to focus on teaching the curriculum as a reason for not doing TAKE 10!®. For instance, Helen wrote in the questionnaire: "This year has been overwhelming with all the new curriculum and I have been busy teaching it." Another teacher, Alice commented in the questionnaire that she was involved in another project, as she wrote:

> I didn't even think about doing them because I was working to teach the core and to try to get through everything I need to and I thought I was done with Take 10. We also did the step express program in the spring, which is a 4th-grade program from Select Health.

Of the 4 teachers who implemented the TAKE 10!® activities on an ad hoc basis, Carol commented that she did not implement the actual PA integrated lessons from TAKE 10!®. Instead, she used the movements from the TAKE 10!® book and had the students perform some physical activities for a short period of time before the Criterion Referenced Tests (CRTs). She said: "I have used from Take 10!. I wouldn't call it 10 minutes, but I have done jumping jacks, maybe some jogging in place and some pushups . . . not so much sit ups because we don't have enough room." She also indicated that the students were still enthusiastic about doing the TAKE 10!® activities, as she continued: "There is still a lot of interest in the kids . . . [I would say], 'let's do some Take 10!. Can we do some Take 10!?' So the kids do ask for it. I've just been focused on other things that I couldn't implement it as much as I should have, so it's my fault." When I asked her if she implemented the TAKE 10!® activities when the students asked for it, she replied: "Sometimes not, because there is something else going on, but sometimes it wouldn't be 10 minutes, so I'll just say, '25 jumping jacks,' but it wouldn't be 10 minutes, and it probably wouldn't be curriculum based. It would just be physical." At the end of the interview, she concluded:

> I feel bad that I haven't done as much. I just think that sometimes there's so much on our plate. It's not like we don't want to, just to have other things, you know, to do . . . I look at [it] as one more thing I need to do . . . if I can get it to be part of my routine, then it'll be easier.

Another teacher, Carol indicated that she would implement the TAKE 10!® activities with her new 3rd-grade class next year. She said:

> Next year when I teach 3rd grade, I won't have the computers in my classroom, so I think it's a little easier to move the desks out of the way. That would be an advantage and also I hope I have a carpet area, just like in here, so that also helps. And I think that they also seem more enthusiastic at that age, but they are physically not changing as much as they are in 5th grade when they get a little lazier, and when they get older, they'll be like: "eh . . . that's not cool, I don't want to do that."

During my interview with Rachel, who also implemented the TAKE 10!® activities on an ad hoc basis, she commented:

> We just have such little time especially when we are preparing for CRTs, we were the first one to take the CRTs, so we have to start preparing in March. We just don't have a whole lot of time . . . so, I didn't do a whole lot of Take 10. I just did it once in a while, the kids would ask: "Can we do a Take 10?" and if we have enough time, we would do it.

During the interview with Henry, another teacher who implemented the TAKE 10!® activities on an ad hoc basis, he said: "I would do it occasionally, especially with Math facts." When asked how often he did the activities, he replied: "After the project, maybe just 5 to 10 times in total . . . 5 to 10 minutes." He also commented that he would continue to do the activities with his new 5th-grade class, as he said: "Probably, with basic Math facts . . . I like it mostly with the Math facts." Another teacher, Casey, who implemented the activities occasionally, wrote in the questionnaire: "We would do them once in a while. Maybe once a week." She also commented: "When the kids were dragging, we get up and did our activity. Not sure about the length of time." When asked if she used the book, she wrote: "I used mostly Math things because that's when they were dragging." She also indicated: "They had fun and always were positive." In an unrecorded conversation with her, she said that she would continue to implement the activities with the new 4th-grade class next year.

There were 3 teachers who implemented the activities regularly as part of their planned schedule. One of the teachers, Jamie, during the follow-up interview, commented that the activities had become a routine in her schedule and it was a lot faster to implement than when she started implementing at the beginning. She said: "They're so used to it now too that they just go and do it and then they are done. They seem engaged, I guess. After they do the spelling Take 10, it's time for them to do the seat work . . . they seem fine." When asked if she managed to implement it for 10 minutes each time, she replied: "Ya." Furthermore, she mentioned that she used the TAKE 10!® book, as she said: "I did at the beginning [use the book] but I started modifying more." When asked if she would implement the TAKE 10!® activities with her new 3rd-grade class next year, she replied: "Ya, probably the spelling one is probably the only one I'll do consistently 'cause it's easy to train them to do. They like it. It's a good technique for them to be doing the movement with spelling word." In conclusion, Jamie mentioned: "The book is nice. It's good to see like different ways you can still be teaching and they can be moving and getting some physical activity. I have to look at it this summer."

During the follow-up interview with Betty, another teacher who implemented TAKE 10!® regularly, she mentioned that she consistently implemented the activities regularly. She said:

> Ya, in the morning with the song. While they are singing, it just seem to wake them up and get them ready for the day, so, and I also use it when they are lacking or falling asleep in the afternoon and they like to do it. Well, I don't know if they like to do it, but I like them to do it 'cause it makes them more alert, more awake, it feels like and usually I don't do 10 minutes. It's more like 5 minutes, but it just seems to wake them up, so they can keep going.

When asked if she find the TAKE 10!® book useful, she replied:

> Not really. I think it's too involved for them, 'cause I would try to teach a lesson out of them and I think it was too much for them to do. I know it's good to have them move and think, but it seems like it was too much and too chaotic for me, so I just use those exercises and pull those out.

When asked if she would do the activities with her new class next year, she replied:

> Ya, for sure and it's fun 'cause after a while, I would lead . . . starting out, I would lead the exercises, but now they like to lead them. So, now I would pull a kid out every day and they lead the exercises . . . and they loved that.

During the follow-up interview with Paul, who also implemented the activities regularly, he replied on whether he had implemented the TAKE 10!® activities this semester:

> Usually in the morning . . . When we did it in the afternoon, the kids just lose focus. We would do them in the morning when they first came in. We would start them off pretty good and make it till lunch. Then after lunch, once they ate, they were just tired and don't want to do anything. So even when we try them after lunch, they just, no desire . . . they did great in the morning, right at 9 o'clock, they will be fantastic. We try to do it at least 2 to 3 times a week . . . between 10 and 20 minutes, and once we got to testing time, we just kind of lost that . . . during winter when we were inside, we did a lot there. And then even when it was raining outside, we would do it."

When asked if he used the book, he replied:

> I used some of the stuff out of the book, like we did a lot with the spelling stuff and it would helped a lot with the spelling, when we would be exercising and doing the spelling words and playing games, but some of the things in the book, the kids got tired. They're like: "eh, we don't want to do it," so there were days when I'll let the kids make up whatever they wanted to, as long as they are moving during that 10 minutes, it worked really well, until testing came in . . . it's hard when they require everything for testing, we were a whole unit behind for Math, so we had to finish our Math before we took our test, so it was a hard push toward the end on the curriculum.

When asked if he would implement the activities with his new 4th-grade class next year, he replied: "uh huh, ya, for sure 'cause some of them will do good in the morning. We'll see how good they'll do in the afternoon next year, we'll see if it'll help them." He

added: “In the morning when they did it, they are more responsive and they focus better on the language arts stuff . . . in the morning, they enjoyed doing it.” In conclusion, he said: “I enjoyed doing it. I think it’s important for the kids to move and I’m a supporter of that . . . they don’t have a lot of activity. Half of them just go home and sit. At least they are up and moving part of the day, which was good.”

Overall, the teachers appeared positive toward the TAKE 10!® activities. The teachers who did not implement TAKE 10!® cited the lack of time to complete the core curriculum as a reason for not implementing the activities. The teachers who implemented TAKE 10!® found it difficult to implement the activities due to the urgency to complete the curriculum before the end of the year testing. The teachers who implemented TAKE 10!® regularly, such as Jamie, Betty, and Paul, were able to fit the activities into their schedule as part of their daily classroom routine. For instance, Betty and Paul built the activities into their morning schedule as a first thing the students would do when they came into the classrooms. They felt that the exercises would wake the students up and keep them alert for the school day. Jamie built the TAKE 10!® spelling activity into her language arts lesson during the project, and she found it easy to keep this routine after the project. The teachers who implemented TAKE 10!® indicated that they would continue to implement the activities when they took over a new class next year. Some teachers also suggested that if TAKE 10!® were built into their daily or weekly routine, it would be easier for them to remember to implement the activities in the future.

In this major theme, doing it in the present and in the future, the teachers shared their experiences implementing the TAKE 10!® activities during and after the project. Many teachers indicated that their students enjoyed participating in the TAKE 10!®

activities and would request for the teachers to implement them. Some teachers were encouraged to implement the activities in their own classroom when they heard other teachers implementing the activities in their classrooms. During the interviews at the end of the project, many teachers mentioned that they would continue to implement the activities after the project has concluded. At the follow-up interviews 5 months after the project concluded, the majority of the teachers shared that they were still implementing the activities either occasionally or regularly.

Discussion

The purpose of this study was to examine teachers' experiences in implementing TAKE 10!® using qualitative measures. Particularly, teachers' attitudes toward the effectiveness of the TAKE 10!® intervention, their competency in implementing the program, and barriers they encountered during the program were examined in this study. In addition, this study also examined the characteristics of teachers who implemented the program. Data for this study were collected through semistructured interviews, participant observations, and questionnaires. The five major themes identified from the analysis of the data were: (a) barriers, (b) benefits, (c) what worked, (d) personal attributes, and (e) doing it in the present and in the future.

The subthemes of the major theme, barriers, were: (a) one more thing to fit in, (b) sedentary kids, (c) movement integration is a problem, and (d) classroom. Specifically, the teachers revealed that they encountered difficulty in fitting the TAKE 10!® activities into their daily schedule due to the lack of time, motivating sedentary students to move during the activities, getting the students to move and think academically at the same

time, and using the limited space in their classroom. From the qualitative data, it appeared that time constraints was a pertinent problem for the teachers to implement the TAKE 10!® activities. The time issue is exacerbated by the need to complete core curriculum so as to prepare the students for the mandatory end-of-year Criterion Referenced Tests (CRTs). The barriers toward implementing the TAKE 10!® activities experienced by the teachers in this study are consistent with other studies, in which other teachers also faced barriers such as lack of time and priority placed on other teaching subjects (Gibson et al., 2008; Parks et al., 2007; Tsai et al., 2009). In addition to the time constraints to implementing the TAKE 10!® activities, the teachers in this study also indicated that students in their classroom posed as barriers. Particularly, students who were sedentary or physically unfit to sustain the activities for 10 minutes were not participating with as much effort as other students. A few teachers also noticed that students' attitudes toward the activities acted as barriers, such as some girls who thought they were too "cool" for the activities. Generally, girls display a lower interest and enjoyment for physical activities (Barry et al., 2003). Some teachers observed that their students who could not coordinate their bodies to perform movements such as jumping jacks was also a barrier. To a certain extent, the concept of integrating movement to curriculum posed as a barrier because teachers commented that students could not focus on doing both components at the same time. Rather, teachers preferred to have the students do the two components separately during the 10-minute period. In addition, some teachers also revealed that the activities can be disruptive to their teaching and their students get too excited after they have done the activities. Similarly, teachers from another TAKE 10!® study also found the activities interruptive (Tsai et al., 2009). Lastly,

the teachers indicated that the classroom setting posed a barrier to implementing the activities, because of the lack of space due to computers in the classrooms of 4th grade and higher.

The subthemes of the major theme, benefits, were: (a) awareness, (b) benefit the teachers holistically, (c) benefit the students holistically, (d) physical activity integrated curriculum. The teachers revealed that being part of the TAKE 10!® project has created awareness among the students and teachers that they need breaks during the school day. They also consistently agreed that it is not beneficial for students and teachers to be seated for a prolonged period of time in the classrooms. Additionally, the teachers recognized that participating in the TAKE 10!® activities personally with the students had benefitted themselves physically, mentally, and emotionally. The teachers also discussed the holistic benefits of participating in the TAKE 10!® activities for the students. Many teachers consistently agreed that the students focused better after they participated in the activities and some teachers commented that the students' tests performance improved. Similarly, in other studies, it was found that movement integrated activities helped students to be more on-task (Grieco et al., 2009; Mahar et al., 2006), learn concepts better, and improve their memorization skills (Gibson et al., 2008). Furthermore, the teachers observed that the students became fitter over time while participating in the TAKE 10!® activities. The teachers also indicated that the concept of integrating PA with curriculum was beneficial, as it provided a different way for students to learn the subjects. Likewise, teachers from another study indicated that movement integrated curriculum provided creative lessons for teachers to teach in the classrooms (Gibson et al., 2008). Teachers who were concerned with time constraints to complete core curriculum before the

Criterion Referenced Tests (CRTs) may be more positive toward the concept of movement integrated curriculum, because they can implement both physical activities and curriculum at the same time.

The subthemes of the major theme, what worked, were: (a) separating physical activity from curriculum, (b) less than 10 minutes, (c) once or twice a day, (d) sticking to the same activities, (e) prepare ahead and give clear instructions, (f) teachers setting an example to encourage the students, (g) the TAKE 10!® book as a useful resource, and (h) teachers modify lessons. A few teachers commented that their students could not handle both PA and curriculum components at the same time. Hence, they suggested doing the PA component or the curriculum component separately during the 10-minute period. During the interviews, the teachers also shared that the TAKE 10!® activities would be effective if they were less than 10 minutes. Reasons for implementing the activities for a shorter duration were to keep the students interest up, to get students back on track to what they were doing before, and to enable the students to sustain physically through the activities. Teachers also shared that it was feasible to implement the TAKE 10!® activities once or twice a day. Similarly, in another TAKE 10!® study, it was found that majority (60.5%) of the teachers reported conducting an activity lesson approximately once per day (Kohl et al., 2001). Additionally, teachers who implemented the Energizers program also indicated conducting the activities once per day (Mahar et al., 2006). A few teachers commented that it was easier to implement the same TAKE 10!® activities regularly, because they could save time from reinstructing and training the students to perform new activities. Furthermore, some teachers suggested that preparing the TAKE 10!® lessons ahead of time, giving very clear instructions to the students before the

TAKE 10!® activities, and walking around to supervise the students would minimize students misbehaving during the activities. The teachers also found the TAKE 10!® book as a useful resource, because they did not have to create their own lessons and the lessons in the book provided different difficulty levels (i.e., beginner to advanced). The majority of teachers in this study indicated that they incorporated physical activities into language arts and math most often, which is consistent with another study (Gibson et al., 2008). Lastly, though the teachers liked having the TAKE 10!® book as a useful resource, they recommended modifying the lessons provided by the book to effectively adapt to the lessons that they were teaching.

The subthemes of the major theme, personal attributes, were: (a) attitudes toward implementation of TAKE 10!®, (b) competency in implementing TAKE 10!®, and (c) teachers' personal PA behavior. During the interviews, teachers shared that they neither had a positive nor a negative attitude toward implementing the TAKE 10!® activities at the beginning of the study. Many teachers also indicated that they were willing to implement the activities and that being part of the project made them more accountable to implementing the activities. Consistent with another study, participants reported positive opinions about the TAKE 10!® program and its effectiveness on the students (Barry et al., 2003). Specifically, teachers' attitudes toward TAKE 10!® changed from resistance at the beginning to active involvement because of the program's effectiveness on their students' concentration in the classroom (Tsai et al., 2009). Likewise, a majority of the teachers and principals believed that PA is important for children and they were willing to implement movement integration into the classroom (Parks et al., 2007). In terms of competency in implementing TAKE 10!®, many teachers did not feel confident at the

beginning, but consistently agreed that their confidence levels increased as they implemented the TAKE 10!® activities. In another study, very few teachers indicated the need for additional help from the project staff, and most teachers reported high levels of confidence to demonstrate and incorporate PA into their lesson plans (Gibson et al., 2008). Lastly, the teachers revealed that teachers' PA behavior would determine their willingness to implement the TAKE 10!® activities. Most felt that teachers who were active would be more willing to implement the activities in their classrooms. Some also commented that teachers are role models to their students and that their personal PA behavior would influence their students to be physically active.

The subthemes of the major theme, doing it in the present and in the future, were: (a) children like TAKE 10!®, (b) encouraged by other teachers doing it, (c) continue to do it, and (d) sustainability of TAKE 10!®. During the interviews, many teachers shared that their students enjoyed participating in the TAKE 10!® activities and the students requested to do the activities. Furthermore, during my classroom observations, I noticed that the students were enthusiastic when they were doing the activities. In other studies, it was found that students enjoyed participating in the TAKE 10!® activities (Barry et al., 2003; Tsai et al., 2009). A few teachers commented that they were encouraged when they heard other teachers implementing the TAKE 10!® activities in their classrooms. They shared that the students appeared to be enjoying the activities from the "noise" that were coming from the other teachers' classrooms. Many teachers also indicated that they would continue to implement the activities in the future. Some teachers mentioned specifically the time of the day and subjects they would implement the activities. During the follow-up interviews 5 months after the project had concluded, a majority of the

teachers shared that they were still implementing the TAKE 10!® activities. To our knowledge, there are no studies that followed the teachers through to examine the sustainability of a TAKE 10!® project. Some teachers cited the lack of time to complete the core curriculum before the end-of-year testing as a challenge to implement the activities. Three teachers who implemented the activities regularly were able to fit them into their daily classroom routine. A majority of the teachers also indicated that they would continue to implement the activities when they take over new classes the following year.

Limitations and Future Directions

This study provides a qualitative examination of classroom teachers' experiences implementing the TAKE 10!® program. Particularly, teachers' attitudes toward the effectiveness of the TAKE 10!® program, their competency in implementing the program, barriers they encountered during the program, and the characteristics of teachers who implemented the program were examined in this study. Although this study addresses a gap in the literature regarding teachers' experiences implementing the TAKE 10!® program, it is not without limitations. One limitation of the study is that the findings are limited to the perceptions of a small number of teachers. Future research could include a survey with a Likert scale that is devised based on the findings of this study and use the survey on other samples of classroom teachers. For example, findings in this study (i.e., barriers and benefits) can be presented to other samples of teachers to investigate if there are consistent patterns in the barriers and benefits identified by this group of classroom teachers and to add other constraints not included in this study. A second limitation of the

study is that each teacher engaged in only one face-to-face interview after the project had concluded and one face-to-face follow-up interview and/or questionnaire. Multiple focus groups with 3 to 4 classroom teachers would have added richer and more in-depth data as well. A third limitation of the study is that only one 45-minute training was provided for teachers. Future intervention need to spend more time with teachers to make them more competent, such as through teacher continuing education. More training on good instructional and good management behavior might help to prevent some of the problems, such as students' misbehavior that emerged from this study. Additionally, to optimize the effectiveness of the TAKE 10!® program for future research, modifying the goal for teachers to implement one activity per school day instead of three would be feasible. Short breaks of less than 10 minutes might also be beneficial to improve students' on-task behavior. Due to a dearth of research examining the sustainability of movement integrated intervention programs in schools, this study provided a perspective in that context. Future research could also include the perspectives of school administrators (i.e., principals and office staff) to examine their attitudes toward movement integrated intervention programs. Having the support of school administrators could influence the attitudes of classroom teachers toward the program.

Conclusions

In view that children are not getting enough daily PA (Trust for America's Health & The Robert Wood Johnson Foundation, 2009), movement integration programs such as TAKE 10!® is a potential strategy to increase children's PA during the school day. Furthermore, movement integration programs are found to be effective in improving

students' on-task behaviors, academic learning capability and academic performance (Bartholomew & Jowers, 2011; Donnelly & Lambourne, 2011; Kibbe et al., 2011). It is challenging for teachers to implement PA interventions that do not directly support academic instruction due to continued emphasis on standardized testing (Bartholomew & Jowers, 2011). Besides, schools are not likely to lighten academic standards to allow teachers to promote physical activities during the school day (Langille & Rodgers, 2010). Therefore, teachers who cited the lack of time and priority placed over academic subjects as barriers to promoting physical activities in schools may be more inclined to use movement integration programs that incorporate movement in the classroom while teaching the curriculum content. It is also important to garner support for teachers from administrators (i.e., principals and staff) to implement the programs. Schools also need support and direction from higher level policies (Langille & Rodgers, 2010), which may encourage accountability among teachers to implement the program.

Results from this study revealed that the TAKE 10!® program not only benefitted the students but also the teachers. Therefore, when training teachers to implement the program, trainers may present the benefits of the program for teachers. For example, teachers in this study suggested that they felt physically and emotionally better after they participated in the TAKE 10!® activities with the students. In the process, it may encourage teachers to be more physically active, and perhaps more willing to implement the TAKE 10!® program. Teachers in this study also indicated that modified lessons that fit into their curriculum are more effective than actual lessons from the TAKE 10!® program. Hence, it may be helpful for trainers to encourage teachers to implement modified lessons from the TAKE 10!® program to fit into their curriculum, rather than

using actual lessons. Results from this study also suggested that the TAKE 10!® program was sustainable after the project has concluded, which is a desirable outcome of PA intervention programs in schools.

CHAPTER 6

CONCLUSION

The purpose of this dissertation was to examine the effectiveness of a movement integration program on elementary school students and teachers' experiences implementing the program. The TAKE 10!® program that integrates academics with physical activities was used as the intervention in this dissertation. Teachers (3rd to 5th grades) from one elementary school implemented a variety of 10-minute lessons from the TAKE 10!® program during an 8-week intervention period. A three-study approach was used to examine: (a) effects of TAKE 10!® on elementary school students' physical activity (PA) and physical fitness levels, (b) effects of TAKE 10!® on elementary school students' on-task behavior, and (c) teachers' experiences in implementing TAKE 10!®. A quantitative methodology was used in the first two studies and a qualitative methodology was used in the third study. The following section presents a summary of each study and implications of the three studies.

Summary

Study 1

Study 1 was designed to examine the effects of TAKE 10!® on students' PA levels (i.e., in-school step counts and in-school PA intensity levels) and physical fitness levels (i.e., cardiovascular fitness and body mass index). Elementary school students (3rd to 5th grades) from one school participated in the TAKE 10!® program for 12 weeks (4 weeks baseline and 8 weeks intervention). Two hundred ten students wore pedometers and a sample of 64 students wore accelerometers for 4 days during week 1 (baseline), week 8 (mid-intervention), and week 12 (end-intervention). 183 students participated in the Fitnessgram PACER tests and body mass index measurements at the start and end of the project. Results from the pedometer data indicated that students' daily in-school steps counts increased significantly by 672 steps from baseline to mid-intervention. However, there was a decrease of approximately 152 steps from mid-intervention to end-intervention. One explanation for the decrease is due to the reduction in PA during the winter season when data were collected for end-intervention. Results from the accelerometer data revealed that students' average time spent in moderate to vigorous intensity PA and vigorous intensity PA increased significantly by approximately 2 minutes from baseline to end-intervention. The increase in PA is more apparent in 4th- and 5th-grade students, as well as for female students. Finally, results from the Fitnessgram data did not reveal any changes in students' cardiovascular fitness from the PACER tests and body mass index. One explanation could be that a longer period of intervention is needed for physiological changes in children. Overall, the TAKE 10!® program is effective in increasing students' PA intensity. This is significant because of

the need to increase children's PA in schools to combat physical inactivity among this population.

Study 2

Study 2 was designed to examine the effects of TAKE 10!® on elementary school students' on-task behavior. 213 students (3rd to 5th grades) from one elementary school participated in the TAKE 10!® program for 12 weeks (4 weeks baseline and 8 weeks intervention). The students' on-task behavior was measured using a direct observational strategy. One primary observer and five secondary observers used the momentary time sampling procedure with a 5-second interval to record the students' on-task behavior. Observations were carried out once a week in weeks 1 to 4 (baseline) and weeks 8 to 12 (intervention). Results from this study indicated that there was a significant decrease (P = 0.001) in mean percentage on-task behavior from pre-no TAKE 10!® (91.2 ± 3.4) to post-no TAKE 10!® (83.5 ± 4.0) during the baseline period, whereas there was a significant increase (P = 0.001) in mean percentage on-task behavior from pre-TAKE 10!® (82.3 ± 4.5) to post-TAKE 10!® (89.5 ± 2.7) during the intervention period. In summary, there was a mean percentage decrease of on-task behavior by 7.7% during the baseline period and an increase by 7.2% during the intervention period. The average percentage of agreement for on-task behavior between the primary observer and secondary observers was 96%, which is considered high. Overall, the TAKE 10!® program is effective in improving students' on-task behavior in the classroom. Hence, getting the students to participate in the TAKE 10!® activities during the school day limits them from prolonged sitting at their desks, which could result in off-task behavior.

Study 3

Study 3 was designed to qualitatively examine teachers' experiences in implementing the TAKE 10!® program. Specifically, teachers' attitudes toward the effectiveness of the TAKE 10!® intervention, their competency in implementing the program, barriers they encountered during the program, and characteristics of teachers who implemented the program were examined in this study. Nine classroom teachers (three 3rd grades, three 4th grades, and three 5th grades) participated in the study. The classroom teachers carried out their curriculum as usual during the baseline period (weeks 1 to 4). They implemented the TAKE 10!® program in their respective classrooms during the 8-week intervention period (weeks 5 to 12). Data were collected through semistructured interviews, field observations, and weekly questionnaires. Follow-up interviews and/or questionnaires were conducted 5 months after the program has concluded to examine the sustainability of the program. The five major themes identified from the analysis of the data were: (a) barriers, (b) benefits, (c) what worked, (d) personal attributes, and (e) doing it in the present and in the future. In summary, the teachers indicated that the lack of time was a major barrier in implementing the program. Nonetheless, the teachers consistently agreed that the program benefitted both the teachers and students, physically and psychologically. The teachers also gave suggestions on what worked for them in the classroom, which included implementing the program for shorter than the 10-minute duration and planning ahead to incorporate the activities into their curriculum. Furthermore, the teachers mentioned that they gradually gained confidence in implementing the program through the teachers' training at the beginning of the study and implementing the program frequently over time. They also commented

that the students enjoyed the program and would continue to implement it in the future. Through the follow-up interviews and/or questionnaires, many teachers revealed that they were still implementing the program after the study had concluded. Some teachers suggested that by purposefully planning the program into their weekly schedule would help them remember and make time to implement the program in the future.

Implications

Children and adolescents in the United States are not getting enough daily PA (Troiano et al., 2008). Schools are an ideal place to promote PA because a majority of American youths attend schools (National Association for Sport and Physical Education, 2008; Wechsler et al., 2004). However, because of the "No Child Left Behind Act" that was enacted in 2002 (House of Representatives, 2002), many schools had decreased physical education and recess time to focus on academic achievements and annual standardized testing. Continued emphasis on standardized testing makes it challenging to implement PA interventions that do not directly support academic instruction (Bartholomew & Jowers, 2011). Hence, movement integration programs, such as TAKE 10!® that integrates PA with curriculum provides a means through which students can learn academics while doing physical activities. Movement integration programs have also been shown to improve students' academic performance (Bartholomew & Jowers, 2011; Donnelly & Lambourne, 2011; Kibbe et al., 2011).

Considering the benefits of the TAKE 10!® program, it is worthwhile to train elementary teachers to implement movement-integrated lessons in their classrooms. The TAKE 10!® program consists of grade-specific lessons (i.e. language arts, math, science,

social studies, and health) that teachers can easily implement in their daily classroom curriculum. Currently, the TAKE 10!® program is specifically designed for elementary schools. Perhaps, in the future, movement integration programs can be extended to include lessons suitable for secondary school levels. Teachers in this study also indicated that though they find the TAKE 10!® program beneficial, emphasis on standardized testing and hence, lack of time became a pertinent barrier to implementing the program. The teachers suggested that if the TAKE 10!® program is planned into their daily schedule, it would be easier for them to implement the program. A change in school policies at a district-level or state-level to include movement integration programs in teachers' classroom schedule may also help to promote these programs in schools. Additionally, with support and direction from higher level policies (Langille & Rodgers, 2010), there may be more accountability among teachers to implement the program. In conclusion, results from this dissertation research supports the promotion of the TAKE 10!® program as an effective strategy to increase children's' PA levels and on-task behavior in schools.

APPENDIX A

EXAMPLE OF A TAKE 10!® PROGRAM

2: Math/Number Sense

TAKE 10!™

Invisible Jump Rope

How to play:

- The objective of this TAKE 10!® activity is to recall basic counting, addition and subtraction facts while jumping.
- Each student pretends to have an invisible jump rope and begins to jump.
- Class continues until 10 minutes of physical activity have been completed.

Beginner:

- Teacher calls out numbers from 1-10 starting with one.
- Everyone jumps as they count up to that number.
- Start at 20 and count backwards as students do the invisible jump rope backwards.

Intermediate:

- Incorporate different jumping rope styles such as crossing arms or alternating one-footed vs. two footed jumping.
- Warm up with class as indicated in beginner's section above, counting up to 20.
- Start at 20 and count backwards as students do the invisible jump rope backwards.
- Counting by 2's: Recite the cheer and then start counting!
- Counting by 5's: Count by 5's up to 100!
- Counting by 3's: Count up to 36 or count by 4's up to 48!

Advanced:

- You do the math: The leader calls out different math problems while everyone is jumping rope at a steady pace. Use addition, subtraction and multiplication problems to make it more difficult. Once someone says the correct answer, everyone jumps that number of jumps while counting all together. During this time, have the children jump at a more vigorous rate.

How Health Smart Are You?

1. What is the name of the tube that brings air into your lungs?
2. What is the name of the muscle near your stomach area that goes up and down as you breathe?
3. What gas in the air does the body use? It begins with the letter "O."

Answers:
1. The windpipe (also called the trachea)
2. Diaphragm
3. Oxygen

Invisible Jump Rope

Warm-ups:

1 - 1
2 - 1,2
3 - 1,2,3
4 - 1,2,3,4
5 - 1,2,3,4,5
6 - 1,2,3,4,5,6
7 - 1,2,3,4,5,6,7
8 - 1,2,3,4,5,6,7,8
9 - 1,2,3,4,5,6,7,8,9
10 - 1,2,3,4,5,6,7,8,9,10

Counting backwards:

- Starting at 20
- Starting at 50

Counting by 2's:

Two, four, six, eight,
staying healthy's really great!
While you jump count by two
up to 20 then you're through!
Ready, go!

Counting by 5's:

Count by 5's to 100.

Counting by 10's:

Count by 10's to 100.

You do the math:

5+5=10
5+6=11
5+7=12
5+8=13
5+9=14
5+10=15
5+11=16
5+12=17

6+6=12
6+7=13
6+8=14
6+9=15
6+10=16
6+11=17
6+12=18

7+7=14
7+8=15
7+9=16
7+10=17
7+11=18
7+12=19

8+8=16
8+9=17
8+10=18
8+11=19
8+12=20

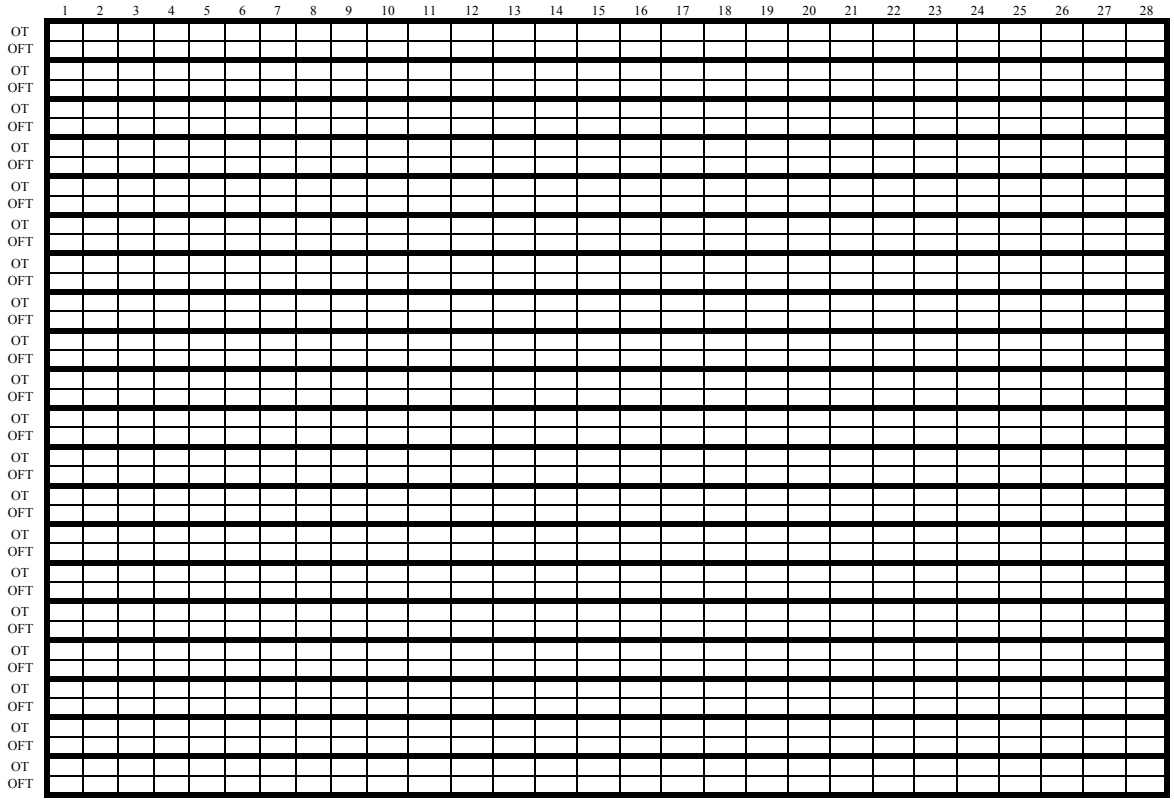
Switch and do Subtraction

APPENDIX B

ON-TASK BEHAVIOR MEASURES

On-Task Behavior Observation

Recorder _____(Pri / Sec) Teacher _____
School _____ Grade _____ Date _____
Time Started _____ Time finished _____ Baseline/Intervention Pre-/Post-activity



OT	On-Task. Any behavior in which a student is attentive to the teacher or actively engaged in the appropriate task, as assigned by the teacher
OFT	Off-Task. (E.g. – gazing off, placing his head on the desk, reading or writing inappropriate or unassigned material, talking to or looking at other students when not part of a given assignment, and leaving the desk without receiving permission from the teacher or teacher's aid)

On-Task Behavior Observation Summary

Recorder _____(Pri / Sec) Teacher _____
School _____ Grade _____ Date _____
Time Started _____ Time finished _____ Baseline/Intervention Pre-/Post-activity

Category	Code	Number of category intervals	Total Number of intervals for observation period	Percentage of occurrence
On-Task	OT			
Off-Task	OFT			
Subtotal				
Grand Total				

Observation Notes

- 1 primary observer and 1 secondary observer
- 30-minute observation before and 30-minute observation after in-class activity
- The numbers on the top of the table represent student number
- Observers will decide the sequence of observation before starting at the same time
- Each observer will observe individual student for 5 s before moving on to another student, until all students in the class are observed
- The researchers will repeat this sequence for the entire observation period set at 30 minutes
- Each observer listened to an MP3 file via headphones that signaled every fifth second. At the signal, the observer notes the appropriate behavior code and begins observing the next student.
- Students are observed in the same order during both observations for the given day
- With 360 observations per 30-minute period, each student will be observed approximately 14 times for a class of 25 students

APPENDIX C

INTERVIEW PROTOCOL

Attitudes/Beliefs/Willingness/Competency

Thank you for your participation in the Take 10 project. You have been implementing Take 10 activities in your classroom for the past 8 weeks. What is your first impression of Take 10?

Probe

How do you feel when you are asked to do the Take 10 project at the beginning?
How do you feel now?
How confident were you in implementing Take 10 at the beginning?
How do you feel now?
Did you feel successful at implementing Take 10?
Did you experience any changes personally in the process of implementing Take 10?
Would you see yourself implementing Take 10 or other classroom activities in the future?
Would you recommend such in-class activities to your colleagues?

Experiences

How did implementing Take 10 go during these 8 weeks?

Probe

Before you were introduced to Take 10, have you heard of or use any types of physical activities in the past?
Did you find the Take 10 book useful?
Did you make up your own activities?
Did you try out new Take 10 activities each time?
Did you share resources/experiences with the other teachers?
How many times a day did you implement the activities?
Were you able to implement it for 10 minutes?

Barriers/Benefits

How easy was it to implement Take 10?

Probe

What difficulties did you encounter in implementing Take 10?
What benefits do you see from implementing Take 10?
Are activities integrated with curriculum such as Take 10 or movement activities useful?
Describe the students' level of effort during Take 10.
Did the students seem like they enjoy Take 10?
Describe the students' classroom behavior right after Take 10.
Did you see any changes in the students' physical activity levels?

Closing questions:

How many years have you been teaching in elementary school?
Do you think physical education and recesses are an important part of the school?
Do you think classroom teachers play a major role in physical activity programs and help children adopt physical activity habits?
Is it important for classroom teachers to be physically active and fit?
Are you physically active? How many times a week?
Is there anything you want to share with me that is important for this study?

Interview Protocol (Follow-up)

Did you implement the Take 10 activities this semester?
Probe
Why/why not?
If you did, how many times a day/week did you implement them?
Were you able to implement them for 10 minutes? If not, how long did you implement them?
Did you modify the Take 10 activities?
Describe the children's behavior after the activities.
Did the children request to continue to do the Take 10 activities?

APPENDIX D

QUESTIONAIRE

1. How frequently did you implement Take 10?

Day	Please circle one			Comments
Monday	1	2	3	
Tuesday	1	2	3	
Wednesday	1	2	3	
Thursday	1	2	3	
Friday	1	2	3	

2. How easy is it to implement Take 10?

Difficult				Easy
1	2	3	4	5

3. What were students' physical intensity levels while participating in Take 10?

Not Intense				Intense
1	2	3	4	5

4. Did the students enjoy Take 10?

Not enjoyable				Very enjoyable
1	2	3	4	5

5. Please provide any further comments on Take 10.

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