

SCHLOSSER, THERESA B., Ed.D. Teaching Strategies and their Impact on Physical Activity Intensity in Elementary School Physical Education. (2018) Directed by Dr. Pam Brown. 54 pp.

The project's purpose was to determine the class time students spent at moderate to vigorous physical activity (MVPA) levels during 3rd, 4th, and 5th grade physical education class, the extent to which teachers are implementing effective teaching strategies, and the relationship of those strategies to MVPA levels. Specific teaching strategies including task design, task presentation, classroom management, and instructional response, shown to promote MVPA and learning among elementary school children were assessed using the Assessing Quality Teaching Rubric (AQTR). Six teachers volunteered to participate in the study and have their students wear Polar Active activity monitors during a regularly scheduled physical education class. Overall, levels of MVPA were greater than the recommended 50% of physical education class, reaching an average of 54.3%. However, no significant differences in MVPA minutes as a function of gender or grade level were found. Results indicated a positive association between overall AQTR scores and MVPA minutes, $R^2 = .233$, $F(1,15) = 4.566$, $p = 0.049$. Classroom management had a significant association and was the strongest predictor of MVPA minutes during class, $R^2 = .364$, $F(1, 15) = 17.63$, $p < .010$.

TEACHING STRATEGIES AND THEIR IMPACT ON PHYSICAL ACTIVITY
INTENSITY IN ELEMENTARY SCHOOL PHYSICAL EDUCATION

by

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A Dissertation Submitted to
the Faculty of The Graduate School at
The University of North Carolina at Greensboro
in Partial Fulfillment
of the Requirements for the Degree
Doctor of Education

Greensboro
2018

Approved by

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APPROVAL PAGE

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CHAPTER I

PROJECT OVERVIEW

Children can establish healthy physical activity habits early in life. Effective physical education instruction delivered during elementary school years provides appropriate practice opportunities to learn and motivates young children to be physically active. Participating in moderate to vigorous physical activity (MVPA) intensity each day can combat childhood obesity by increasing energy expenditure (Kahan & McKenzie, 2015). Quality teaching practices in elementary physical education is a necessity in the fight against childhood obesity through the promotion of physical activity behaviors for a lifetime (Ennis, 2011; Rink, 2013). Students are not achieving the health-enhancing levels of physical activity intensity necessary for weight maintenance. Specifically, research suggests that students should spend at least 50% of class time at MVPA intensity levels. However, according to the most recent research, most students fall well short of the expectation, only reaching an average of 34% of class time in MVPA (Fairclough & Stratton, 2006; Kahan & McKenzie, 2015; McKenzie & Lounsbery, 2009).

To address this gap, a critical need exists to understand the relationship between specific teacher behaviors and MVPA measured objectively (Chen, Mason, Staniszewski, Upton, Valley, 2011). Failure to address the advancement

of knowledge that promotes strategies to prevent childhood obesity, a public health crisis further marginalizes the role physical education can play in improving the health of our children. Alternatively, the benefits of physical education are driven by the known health benefits of participation in MVPA that include reducing the risk of heart disease, diabetes, weight management, and stress management (Carter & Micheli, 2012; Cook-Cottone, Casey, Feeley, & Baran, 2009; Williams, Hayman, Daniels, Robinson, Steinberger, Paridon & Bazzarre, 2002).

Purpose and Aims

The goal is to promote specific teaching strategies that result in students reaching health enhancing activity intensity levels during class. Moderate to vigorous intensity levels increase energy expenditure and provide adequate opportunity for skill practice that transfers into an active adult life. The purpose of the project was to investigate the use of four teaching strategies as they relate to MVPA minutes during physical education class. My aims are:

Aim #1: *To determine the amount of class time students are reaching at least 50% of class time at MVPA levels during physical education class of 3rd, 4th, and 5th grade students. Based on the research, I expect MVPA minutes to be less than the recommended duration.*

Aim #2: **A: To determine extent to which teachers are implementing effective teaching strategies including task design, task presentation, classroom management, and instructional response; and B: to determine**

the relationship of these teaching strategies to MVPA levels of 3rd, 4th, and 5th grade students. *My working hypothesis is the use of all four teaching strategies is related to average MVPA minutes during physical education class.*

Background

Quality teaching practices in elementary school physical education are necessary in the fight against childhood obesity through the promotion of physical activity for a lifetime (McKenzie & Lounsbery, 2013; Rink & Hall, 2008). Currently, more than 50% of children today do not participate in the recommended amount of sixty minutes of daily physical activity with some rates reaching as high as 69% (Erwin, Stellino, Beets, Beighle, & Johnson, 2013) to achieve the health benefits that include combatting obesity (Center for Disease Control, 2015a; Fairclough & Stratton, 2006). The prevalence of childhood obesity has tripled over the last twenty years (Cook-Cottone et al., 2009; Ogden, Carroll, Kit, Flegal, 2014; Story, Kaphingst & French, 2006). However, recently rates for elementary school children have remained stable at 17.7%. Rates of obesity are higher for older children (20.5%) and for specific ethnic groups including non-Hispanic blacks (20.2%) and Hispanics (22.4%) (CDC, 2015a). The CDC (2015a) defines childhood obesity as a child's body mass index measuring 95th percentile or higher for age and gender. Obesity can affect children of all races, gender, social status, or ethnic diversity, and increase the risk of becoming an obese adult (Cook-Cottone et al., 2009). Excess weight in childhood mimics similar cardiovascular risk factors in adults, negatively affecting

both cholesterol levels and blood pressure, and may result in onset of type II diabetes (Cook-Cottone et al., 2009; Williams et al., 2002). Additional comorbid conditions for children are seen in various health consequences that include poor sleep patterns and poor academic achievement (Cook-Cottone et al., 2009; Story et al., 2006). Psychological issues may arise due to lack of regular activity that include depression and anxiety, along with behavior problems (Story et al., 2006).

Lack of physical activity is a major risk factor for preventable diseases (Rink & Hall, 2008) and is considered a public health issue (McKenzie & Lounsbery, 2009). As sedentary behaviors increase in children, there is a positive correlation with an increased risk of being overweight or obese (Erwin et al, 2013; Fairclough & Stratton, 2006). Participation in 60 minutes of moderate to vigorous activity intensity include a plethora of health benefits by reducing the risk of heart disease and diabetes (Carter & Micheli, 2012; CDC, 2015b; McKenzie & Lounsbery, 2009). Regular exercise can improve weight management, stress management, and self-esteem (Carter & Micheli, 2012; Chen, Mason, Zalmout, Hammond-Benett, & Hypnar, 2014) while positively promoting increased bone density (Carter & Micheli, 2012).

The school setting can provide optimal opportunities for physical activity interventions as children spend much of their day at school. Interventions designed to increase activity through physical education class, recess, classroom breaks, before school, and after school programming can result in increased

activity levels in children (Chen, et al., 2014; Erwin, et al., 2013; Fairclough & Stratton, 2006). Physical education has an obligation to enhance these benefits by promoting physical activity opportunities that increase activity intensity through effective teaching strategies (Fairclough & Stratton, 2006; Story et al., 2006). The committee on Physical Activity and Physical Education in the School Environment along with the National Association for Sport and Physical Education recommend 150 minutes of physical education each week for students (Committee, 2013; Story et al., 2006). However, this frequency is reported in less than 8% of elementary schools (McKenzie & Lounsbery, 2009). Moreover, at least half of the class time should be spent at moderate to vigorous activity levels (Erwin et al., 2013; Fairclough & Stratton, 2006). Reaching appropriate levels of MVPA during elementary school physical education is simply a by-product of effective teaching and promotes student learning (Ward, 2014), even though students are short of the recommendation by more than 15% (Fairclough & Stratton, 2006). Since many students do not receive adequate amounts of physical education each week, developing and implementing effective lessons is necessary to ensure students are active during class.

To develop active lessons, Chen, Mason, Staniszewski, Upton, and Valley (2011b) have described four distinct dimensions that promote effective teaching and the strategies necessary to accomplish the *what*, *how*, and *why* of teaching in physical education. The dimensions included task design, task presentation, class management, and instructional response (Chen et al., 2011b). A deeper

understanding of the association between these strategies and increased physical activity levels during elementary school physical education class is needed.

Methods

Participants

Six elementary physical education teachers from the same district in the southeastern United States volunteered to participate in the study. Five teachers chose one 3rd, 4th, and 5th grade class and one teacher chose one 4th and 5th grade intact classes to utilize for the study; a total of 17 of their own classes.

Setting

This rural county had one full-time physical education teacher at each elementary school and had scheduled physical education for approximately 40 minutes within a 168-day school calendar. Two school scheduled physical education class twice a week, while two schools had physical education one to two times a week based on a rotating schedule, and the remaining two schools scheduled physical education once a week. Five schools operated on a traditional schedule, while one school operated on a year-round schedule. Three of the participating schools received Title I funding. The six schools' combined demographic data averaged 54.83% Caucasian, 38.33% African American, and less than 7% Hispanic or other (RCS, 2017).

Procedures

Approval to conduct research from the Institutional Review Board and school officials was obtained. Six volunteer elementary physical education teachers signed an adult consent form. Participating teachers completed an online survey to gather demographic data. Additional questions gathered contextual information about the strategies teachers employed to develop and implement effective physical education lessons. A Likert question identified the value teachers placed on moderate to vigorous physical activity intensity as a student learning outcome during physical education class.

Teachers provided students with parent information forms that described the study procedures and presented parents with the opportunity to opt out of the study. Each teacher was provided 30 Polar Active wrist-worn accelerometers for approximately three weeks during the implementation of the study. The first two weeks provided the opportunity for students to become accustomed to wearing the wrist-worn device, reduced the novelty of the product, and reduced the risk of experimental error. During the third week of implementation, the physical education lessons were videotaped for evaluation using the AQTR (Chen et al., 2011b) during a regularly scheduled class while students simultaneously wore the activity monitors.

The researcher sent teachers a de-identified Microsoft Excel spreadsheet to input accurate height and weight data and age of participating students. On the spreadsheet, each student was assigned a study code for the physical

education teacher to match the monitor ID to the participating student's study code. The researcher uploaded the spreadsheet data to the online platform for the participating classes prior to the videotaped lesson. Uploaded data included study codes for student name, student identification number, age, gender, grade, height, and weight.

Measures

Assessing Quality Teaching

The Assessing Quality Teaching Rubric (AQTR) was originally developed to educate and evaluate pre-service physical education teachers (Chen, Hendricks & Archibald, 2011a). The performance indicators of the AQTR aligned with the expectations for quality teaching as set by the National Association for Sport and Physical Education (NASPE) and quality physical education programming as described by the North Carolina Department of Public Instruction (Committee, 2013). The rubric identified 17 components that comprise the four teaching dimensions: task design, task presentation, classroom management, and instructional response. Each component utilized a 3-point rating scale, with three representing high-quality instructional practices.

The researcher and coder completed at least 10 hours of training utilizing the evaluation tool. Protocol for coding the videotaped observations allowed for the researcher and coder to pause the videotaped lesson after each dimension to record the numeric score. This process continued for the remaining three dimensions (Chen et al., 2011a). Utilizing a direct observation analysis provided

the opportunity to identify the content presented as it aligned with the lesson plans provided by the teachers. Additional contextual variables presented during the video were noted on the rubric. The interobserver agreement (IOA) between the researcher and coder was calculated by the number of agreements divided by the total number of ratings to generate a reliability score of 92.39% for this study. This evaluation tool has demonstrated reliability and validity in the field with pre-service teachers (Chen et al., 2011a) and in-service teachers (Chen et al., 2011b).

Physical Activity Intensity

Student's physical activity intensity and duration were measured using wrist worn Polar Active accelerometers. The Polar Active wrist-worn accelerometers were chosen due to the availability of the product in the county. Activity intensity was translated into metabolic equivalents of a task (MET) based on the frequency, intensity, and regularity of wrist movements, along with participants' height (Polar, 2016). The researcher was responsible for transferring the data from the activity monitors to the Polar GoFit platform after each videotaped class. The data were downloaded into a Microsoft Excel spreadsheet that contains the dates the monitor was in use, student name, age, height, weight, and total number of minutes in MVPA intensity. A column for gender and grade level was added to the student report for data transfer to SPSS software. The activity monitors were then assigned to the next school and new student data were uploaded to the online platform using a de-identified spreadsheet.

Data Analysis

Data analysis utilized SPSS software for Windows (version 24). A descriptive analysis described and compared data gathered during this case study. Teachers received a score for each of the 17 teaching components. The 17 scores were tallied for each dimension (task design, task presentation, classroom management and instructional response) that resulted in an overall quality teaching score for each video. Two-way ANOVA was used to compare minutes of MVPA as a function of gender (male and female) and of grade (third, fourth, and fifth). A linear regression was used to assess the degree of linear association between each component and the total score AQTR with MVPA percentage and MVPA minutes.

Results

To answer Aim #1: ***To determine the amount of class time students are reaching at least 50% of class time at MVPA levels during physical education class of 3rd, 4th, and 5th grade students.*** Overall, students in these six schools spent an average of 54.3% of class time at appropriate MVPA levels. When compared to previous studies, with no specific intervention, this average was greater than the reported 34% (Fairclough and Stratton, 2006). The current research data regarding differences between grade levels and gender is inconsistent. However, in this study, the two-way ANOVA found no significant differences in MVPA levels as a factor of gender $F(1, 371) = 1.984, p=.16$, or

grade level $F(2, 371) = 1.578, p = .208$ or an interaction between grade level and gender $F(2, 371) = .513, p = .599$.

In table 1., although there were no significant differences between females and males MVPA levels, a pattern emerged in the data. In general, females reached lower levels of MVPA than their male counterparts and most observable during fifth grade, even though females still reached acceptable levels of MVPA.

Table 1

MVPA by Grade Level and Gender

Grade	Male Frequency	Female Frequency	Male MVPA Minutes (SD)	Female MVPA Minutes (SD)
3 rd	47	56	22.19 (6.55)	21.82 (7.36)
4 th	65	83	21.80 (6.39)	21.08 (7.99)
5 th	60	66	24.13 (8.24)	21.94 (7.49)
Total	172	205		

To answer Aim #2: ***To determine extent to which teachers are implementing effective teaching strategies through task design, task presentation, classroom management and instructional response as it relates to MVPA levels of 3rd, 4th and 5th grade students.*** A linear regression analysis revealed a significant association between the total AQTR scores and increased MVPA minutes in students $R^2 = 0.233 F(1,15) = 4.566, p = .049$. In addition, teachers were consistent in their use of teaching strategies across grade levels, see Table 2. A regression analysis was conducted for each

teaching strategy and the association with MVPA. The linear regression determined only classroom management to have a significant association with MVPA minutes during class $F(1, 15) = 17.63, p < .01$; classroom management also explained a significant proportion of variance in MVPA minutes, $R^2 = .364, p < .01$, see Table 3.

Table 2

Teacher Use of Strategies in Percent for All Grade Levels.

Teacher	TD	TP	CM	IR	Total
1	66.67(0.00)	72.22(0.76)	63.89(1.04)	73.33(1.00)	69.61(2.00)
2	77.78(0.00)	90.0(1.32)	70.83(1.32)	93.33 (0.00)	84.64(0.86)
3	99.02(0.87)	98.89(0.29)	100.0(0.00)	97.78 (0.58)	99.02(0.87)
4	74.07(0.58)	77.78(1.15)	97.22(0.58)	52.22(1.61)	74.18(1.04)
5	85.19(0.58)	95.56(1.15)	97.22(0.58)	88.89(1.53)	92.65(2.65)
6	100.0(0.00)	93.33(1.41)	95.83(0.71)	96.67(0.71)	96.08(1.41)

TD=Task Design, TP= Task Presentation, CM=Classroom Management, IR= Instructional Response, (*SD*).

Table 3

Linear Regression of AQTR Components and MVPA

AQTR Components	<i>df</i>	MS	F	<i>p</i>
Task Design	1	60.371	4.056	.062
Task Presentation	1	41.174	2.547	.131
Classroom Management	1	153.245	17.627	.001
Instructional Response	1	1.814	.097	.760

MVPA in minutes

Conclusion

Current research has indicated that students are not reaching health enhancing levels of physical activity in or out of school (Fairclough & Stratton, 2006). During school hours, physical education may only be scheduled once a week with an average class time of approximately 40 minutes. Therefore, students are not engaging in adequate amounts of physical education and not clearly active enough in the time available (McKenzie & Lounsbery, 2009). Health enhancing benefits of daily moderate to vigorous activity include the risk reduction of heart disease and diabetes (Carter & Micheli, 2012) along with maintaining a healthy weight (Kahan, & McKenzie, 2015). To cultivate these healthy activity behaviors early in life, elementary physical education teachers are positioned to impact these positive behaviors through effective teaching

practices that result in appropriate and adequate practice opportunities during class (Chen et al, 2014; Fairclough & Stratton, 2006; Story et al., 2006).

These rates remain high; therefore, this project was highly significant because it demonstrated the ability for teachers to employ effective teaching strategies that promoted acceptable levels of physical activity intensity and duration in the classroom. A student's physical activity intensity was increased through the effective use of task design, task presentation, classroom management, and instructional response. The dissemination of this new knowledge must be coupled with skills and strategies to be implemented in the classroom effectively. The data positively affirmed quality physical education programming as an effective intervention by addressing the current energy imbalance in children that has resulted in the obesity epidemic. Clearly, the use of these specific teaching strategies to promote an efficient learning environment can result in an increase in energy expenditure to enhance health benefits for elementary students.

These findings provided insight into the challenging, yet manageable, task of reaching 50% of class time at MVPA levels during physical education class. Moreover, the information can guide the next steps to address the gap between intensity levels by providing specific teaching strategies to enact behavior change. The implementation of these specific teaching strategies that promote MVPA during physical education can be a powerful tool in reducing childhood obesity. The positive impact of this project can be the far-reaching. It has the

potential to provide physical education teachers with the skills and strategies to deliver effective content which is conducive to activity intensity and directly impacts the health of our students today and into the future.

CHAPTER II

DISSEMINATION

The dissemination format is a research article to be submitted to the Journal of Teaching in Physical Education. The journal attracts a specific audience that is made up of physical education curriculum professionals in the field at all levels, including pre-service teachers, administrators and in-service teachers. These professionals may be interested in the associations presented in this article based on the study data. The data and results align with the JTPE's mission to evaluate teaching methods.

Introduction

Physical educators have an obligation to promote the health benefits of reaching moderate to vigorous physical activity (MVPA) levels among their students. Effective teaching strategies promoted physical activity opportunities that increase student's activity intensity (Story, Kaphingst, & French, 2006). Greater use of effective teaching strategies, as measured by overall Assessing Quality Teaching Rubric (AQTR) scores, had a significant association with the average physical activity minutes of elementary students during the school day (Chen et al., 2014). More specifically, quality lesson planning has been shown to promote higher levels of activity for both boys and girls (Chen et al., 2014). The increased time teachers spend in task presentation was negatively associated

with the time students spent devoted to practice during class (Derri, Emmanouilidou, Vassiliadou, Tzetzis, & Kioumourtzoglou, 2008). The organizational decisions teachers make during class directly impacted the activity and learning opportunities of students (Rasmussen, Scrabis-Fletcher, Silverman, 2014). However, a clearer understanding of how each of these teaching strategies can result in increased physical activity levels in elementary school children is warranted.

Public health officials encouraged schools to implement interventions, such as quality physical education, to address rising childhood obesity rates and create an environment conducive to physical activity (McKenzie & Lounsbery, 2009). The prevalence of childhood obesity has tripled over the last twenty years (Ogden, Carroll, Kit, & Flegal, 2014). Today, almost 32% of elementary school children are classified as overweight or obese (Ogden et al., 2014). To combat obesity, students must engage in daily MVPA, a portion of which should occur within physical education class. However, on average third, fourth, and fifth grade students spend only 35.6% of physical education class time in MVPA (Levin, McKenzie, Hussey, Kelder, & Lytle, 2001; Nettlefold, McKay, Warburton, McGuire, Bredin, & Naylor, 2011) which falls well short of the 50% recommendation. Although research has identified specific teacher behaviors that pose a strong correlation to student learning, defining the extent of the relationship that is directly correlated with physical activity intensity levels has not been done using objective measures of MVPA. To identify these specific

teaching strategies, research has shifted from indirect teaching methods to more observable, direct teaching methods, such as task design, lesson delivery, activity time, classroom management, and feedback (Chen, Hendricks & Archibald, 2011; Rink, 2013). To determine the effectiveness of a teaching strategy, direct observation has been shown to be most effective when examining the student's interaction with the teacher and the learning material (Rink, 2013). Moreover, the evaluation tool should address the specific teaching practices based on the course content and context (Chen et al., 2011).

Systematic observation analysis in physical education has proven advantageous due to the observable and measurable student engagement during class (Metzler, 1986). This observation method is continually utilized to improve student learning, along with outcomes of teacher effectiveness through the rich contextual data collected (McKenzie, 2010). Chen and colleagues (2011) developed the Assessing Quality Teaching Rubrics (AQTR) to evaluate the relationships between teacher, student, and the content. In addition to evaluating teacher behaviors using AQTR, objectively measuring MVPA using accelerometry to ensure student's work is aligned with state and national standards at 50% of class time, provides a clearer picture of the learning and activity occurring in the classroom.

This research proposed to answer two questions: Are students reaching 50% of class time at MVPA intensity levels during physical education classes of 3rd, 4th and 5th grade students and to what extent are teachers implementing

effective teaching strategies through task design, task presentation, classroom management, and instructional response as they relate to MVPA levels of 3rd, 4th, and 5th grade students?

Methods

Participants

A sample of six elementary physical education teachers (4 male, 2 female) from the same district in the southeastern United States volunteered to participate in the case study. All six (100%) teachers were certified in K-12 physical education, two (33.33%) teachers held master's degrees, and one (16.67%) of these teachers was also national board certified. Four (66.67%) teachers have 11 years or more of experience, and five (83.33%) of the teachers have been in the same position for six or more years. One (16.67%) teacher had fewer than five years of experience. These teachers chose 17 classes made up of their own 3rd, 4th, and 5th grade students to utilize for the study. Of the 409 students eligible to participate, on the day of the study, 23 students were absent, six students were on a field trip, two students chose not to participate, and one lost the accelerometer which resulted in 377 participating students with data. Female students comprised 54.4% ($n=205$) and males 45.6% ($n=172$), see Table 4. Students in third grade made up 27.3% ($n=103$), fourth grade 39.3% ($n=148$), and fifth grade 33.4% ($n=126$) of the participating students, see Table 5.

Table 4

MVPA by Gender

Gender	Frequency	Percent	MVPA Minutes	MVPA Percent	SD
Male	172	45.6	22.71	55.8	7.06
Female	205	54.4	21.63	53.2	7.73
Total	377	100		54.3*	

*Average

Table 5

MVPA by Grade Level

Grade	Frequency	Percent	MVPA Minutes	MVPA Percent	SD
3 rd	103	27.3	22.03	54.2	6.96
4 th	148	39.3	21.44	52.7	7.18
5 th	126	33.4	23.04	56.6	7.84

Setting

This rural county had one full-time physical education teacher at each elementary school. The six schools' combined demographic data averaged 54.83% Caucasian, 38.33% African American, and less than 7% Hispanic or other (RCS, 2017). Physical education was scheduled for approximately forty minutes per week within a 168-day school calendar. Physical education class was scheduled twice a week in two schools, while two schools had physical

education one to two times a week based on a rotating schedule, and the remaining two schools scheduled physical education once a week. Five schools operated on a traditional schedule, while one school operated on a year-round schedule. Three of the participating schools received Title I funding.

Procedures

Participating teachers completed an online survey to gather demographic data and contextual information about the strategies teachers use to develop effective physical education lessons. Demographic data included number of years teaching in the field and additional qualifications obtained. Each question was designed to identify how teachers implemented each of the four teaching strategies in their classroom. One question addressed the value teachers placed on students reaching adequate MVPA during class as a Likert scale. Pertaining to task design, survey questions asked teachers how much time was provided in the school's schedule to design physical education lessons and how much time was spent planning these lessons. Additional questions identified the specific strategies teachers employed to teach their lesson, manage students and equipment, and to enhance student learning through feedback.

Detailed protocols were provided to the teachers on how to implement the Polar Active activity monitors during class, scheduling observation dates, and operating the video camera. The protocol for operating the video camera aligns with the expectations established by the National Board for Professional Teaching Standards, a national nonprofit organization, designed to promote

effective teaching behaviors (NBPTS, 2018). Teachers were responsible for videotaping the class and were instructed to place the camera in the corner of the room to ensure the video captured the students and teachers at all times. Providing teachers with videotaping protocols, ensured the teacher and students were heard on the video as well as seen throughout the video. The secure digital video could hold up to two hours of high definition video. The recording began before students entered the room and stopped as students left the classroom.

Each teacher received 30 Polar Active wrist-worn accelerometers for approximately three weeks during the implementation of the study. The wrist-worn monitors were registered on the Polar GoFit online platform by researcher with an identification (ID) letter and number. The researcher sent teachers a deidentified Excel spreadsheet to input accurate height and weight data and age of participating students. The physical education teacher matched the monitor ID to the participating student study code. Height and weight data were gathered at the beginning of the school year as part of the county's participation in state regulated fitness testing. The deidentified spreadsheet was uploaded for participating classes to the online platform prior to videotaping. The data uploaded included study codes for student name, student identification number, age, gender, grade, height, and weight.

Participating teachers had the accelerometers for approximately three weeks. The first two weeks provided the opportunity for students to become accustomed to wearing the wrist-worn device to reduce the novelty of the

product, and to reduce the risk of experimental error. Teachers were responsible for implementing the use of the Polar Active accelerometers with fidelity. Once videotaping was completed as scheduled, the researcher transferred the accelerometer data using the Polar GoFit platform and properly stored the video on a secure digital card for later evaluation. Once data was downloaded, new student data was uploaded for the next teacher. The physical education lessons were videotaped during a regularly scheduled class for evaluation using the AQTR (Chen, Mason, Staniszewski, Upton, Valley, 2011b).

Data Collection

Assessing Quality Teaching

The Assessing Quality Teaching Rubric (AQTR) was originally developed to educate and evaluate pre-service physical education teachers (Chen, Hendricks & Archibald, 2011a). The AQTR performance indicators are aligned with the expectations for quality teaching as set by the National Association for Sport and Physical Education (NASPE) and quality physical education programming described by the North Carolina Department of Public Instruction (Committee, 2013). The rubric identified 17 components that comprised the four teaching dimensions: 1) task design, 2) task presentation, 3) classroom management, and 4) instructional response. Each component utilized a 3-point rating scale, with three represented high-quality instructional practices.

The researcher and coder completed at least 10 hours of training on utilizing the evaluation tool. Protocol for coding the videotaped observations

allowed for the researcher and coder to pause the videotaped lesson after each dimension to record the numeric score. This process continued for the remaining three dimensions. In addition, the coders provided open-ended comments for each dimension (Chen et al., 2011a). This provided the opportunity to identify the content presented and any additional contextual variables presented during the video. Furthermore, the coders reviewed any portion of the lesson when needed. This was necessary if the teacher or student was not clearly audible during the initial review of the recording, especially for task presentation and instructional response. Although each teacher utilized some type of voice amplification device, there were times the students and/or the teacher was not clearly heard during the playback. The video and audio captured the teacher and the students during the duration of the class. Hands-on experience using the AQTR in live settings and again during evaluation of videotape provided both intrarater and interrater reliability scores. The interobserver agreement (IOA) was calculated by the number of agreements divided by the total number of ratings to calculate a reliability score. For this study, the IOA generated a reliability score of 92.39%. This evaluation tool has demonstrated reliability and validity in the field with pre-service teachers (Chen et al., 2011a) and in-service teachers (Chen et al., 2011b).

Physical Activity Intensity

Physical activity intensity and duration was measured using wrist-worn Polar Active accelerometers for 3rd, 4th, and 5th grade students. The Polar Active

accelerometers were chosen due to the availability of the product in the county. The wrist-worn accelerometers provided students with instant feedback that included the number of the activity minutes and intensity level as demonstrated by the animated figures on the watch face (Polar, 2016a; Schaefer, Van Loan, & German, 2014). The activity monitor was directed to be worn on the non-dominant arm of the student. Activity intensity was translated into metabolic equivalents of a task (MET) based on the frequency, intensity, and regularity of wrist movements, along with participants' height in inches (Polar, 2016b). The accelerometer had been validated for measuring activity intensity in children (Virtanen, Kidwell, Kinnunen, & Finn, 2011). The raw data was downloaded into a Microsoft Excel spreadsheet from Polar GoFit platform after each videotaped class. The data contained the dates the monitor was in use, student code, age, height, weight, and total number of minutes in MVPA intensity. A column for gender and grade level were added to the student report for data transfer to the data analysis software.

Data Analysis

Data analysis used SPSS software for Windows (version 24). A descriptive analysis described and compared data gathered during this case study. Teachers received a score for each of the 17 teaching components. The scores were tallied for each dimension that totaled an overall quality teaching score based on the video evaluation using the AQTR (Chen et al., 2014). This information was compared to the percentage of class time students spent in

MVPA to identify themes between strategies used to promote activity levels and objective MVPA minutes. A two-way ANOVA was used to analyze the mean differences between minutes of MVPA as a function of gender (male and female) and of grade level (third, fourth, and fifth). Additionally, any significant interaction between variables determined effects of the dependent variable (MVPA) on the levels of the independent variables (gender or grade level). An ANOVA compared mean differences between overall AQTR scores by teacher and by grade level. A linear regression analysis determined the associations between MVPA scores and overall AQTR score as well as the subcomponents: task design, task presentation, classroom management, and instructional response.

Results

For task design, survey results indicated that five (83.33%) teachers spent one to two hours a week planning lessons, while one (16.67%) teacher spent two to four hours planning for physical education lessons. This time was closely aligned with the planning time allotted in the school's master schedule. All (100%) teachers identified using the Sports, Play and Active Recreation for Kids (SPARK) curriculum as one resource in designing lessons. For task presentation, all (100%) teachers utilized a variety of resources including teacher or student demonstration and video demonstration. To organize students, music was the most utilized start and stop signal (83.33%), followed using a whistle (50%) and verbal call and response (33.33%). Five teachers (83.33%) indicated that the equipment for the lesson was out and ready prior to the students entering the

classroom. All (100%) teachers agreed they implemented specific feedback and questioning to enhance student learning as part of instructional response.

The survey results found that five (83.33%) of the teachers deemed reaching adequate levels of MVPA as very important, and one (16.67%) teacher identified reaching MVPA as extremely essential. The objective measure of MVPA found that on average, students in these six schools spent 54.3% of class time at appropriate MVPA levels. When compared to previous studies with no specific intervention, this average is greater than the reported 34%. The current research data regarding MVPA differences during physical education class between grade levels and gender is inconsistent. However, in this study, the two-way ANOVA found no significant differences between MVPA levels as a factor of gender $F(1, 371) = 1.984, p=.16$, grade $F(2, 371) = 1.578, p=.208$ nor an interaction between grade and gender $F(2, 371) = .513, p=.599$. Figure 1 represents the data collected in this study and for every grade level boys accumulated higher levels of MVPA than females. This is consistent with current research that boys are generally more active than females (Jin, & Yun, 2013; Trost, Pate, Sallis, Freedson, Taylor, Dowda, & Sirard, 2001) and an increase in MVPA from 3rd to 5th grade (Levin et al, 2001).

A linear regression analysis revealed a significant association, using aggregated data due to nesting of students, between the use of effective teaching strategies and increased MVPA minutes in students $R^2 = 0.233 F(1,15) = 4.566, p=0.049$ as seen in Figure 2. An ANOVA determined there were no

significant differences between the overall AQTR score and grade level $F(2, 13) = 0.017, p=.983$ by teacher. This indicates teachers were consistent in their use of teaching strategies across grade levels, see Figure 3. A regression analysis was conducted for each teaching strategy to determine an association with MVPA. The linear regression determined only classroom management to have a significant association with MVPA minutes during class $F(1, 15) = 17.63, p < .01$; classroom management also explained a significant proportion of variance in MVPA minutes, $R^2 = .364, p < .01$, see Table 6.

Figure 1. Estimated Marginal Means of MVPA by Gender and Grade Level

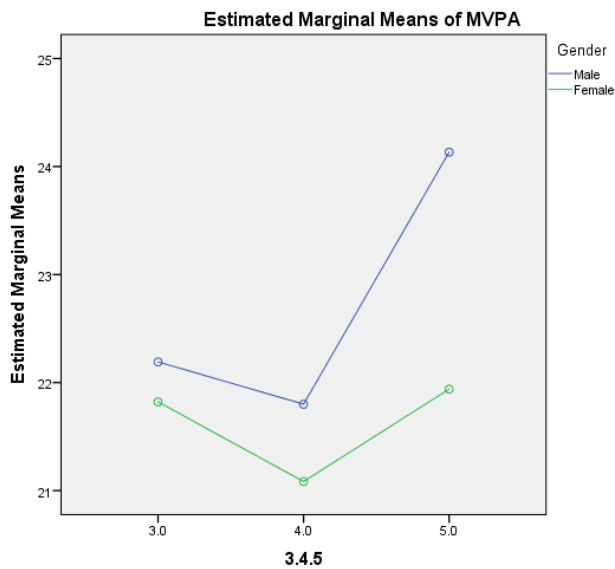


Table 6

Linear Regression of AQTR Components and MVPA

AQTR Components	df	MS	F	p
Task Design	1	60.371	4.056	.062
Task Presentation	1	41.174	2.547	.131
Classroom Management	1	153.245	17.627	.001
Instructional Response	1	1.814	.097	.760

MVPA in minutes

Figure 2. Linear Association Between MVPA Minutes and Overall AQTR Score

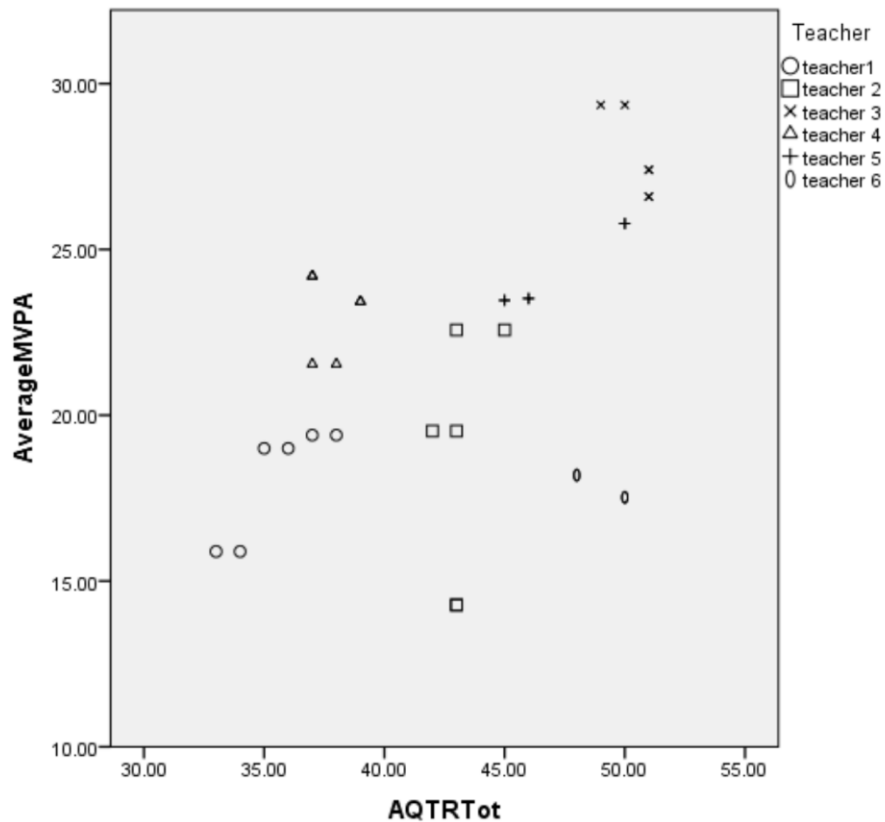
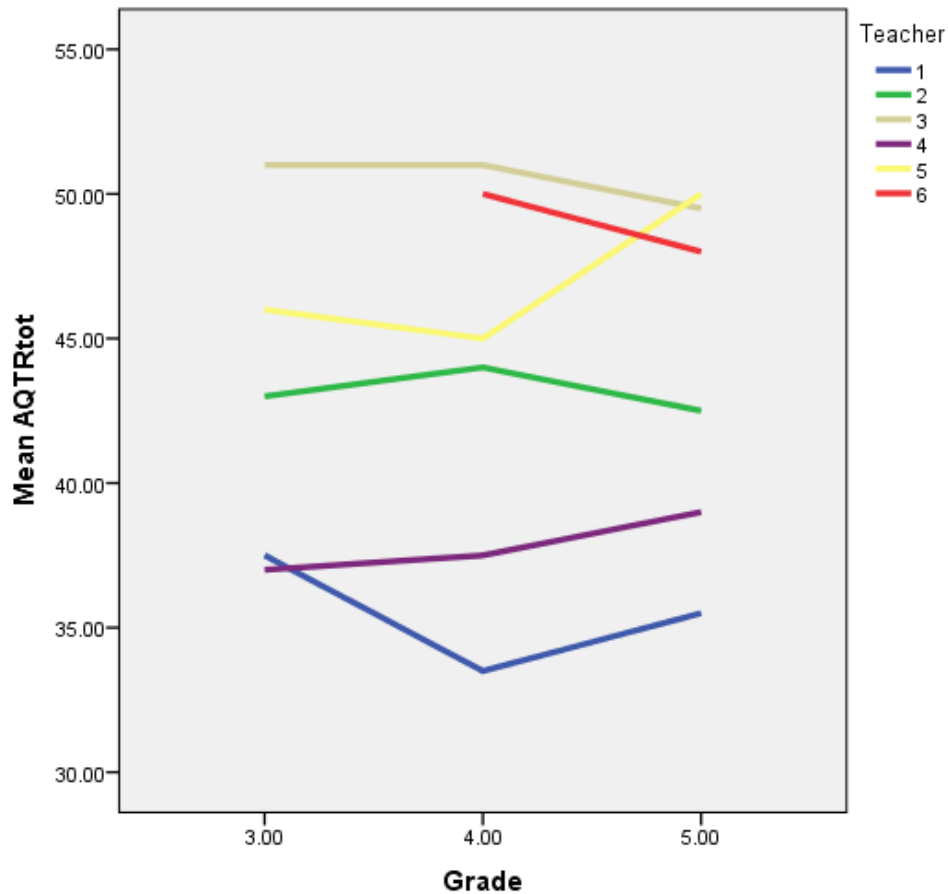


Figure 3. Individual Teacher AQTR Scores Across Grade Levels.



Discussion

Individual teachers were consistent in their overall AQTR scores between the two coders and across grade levels, see Figure 3. Although the significant findings indicated there were differences between each teacher's AQTR score this was not true for grade level difference within teachers. There existed a strong relationship between teacher and overall AQTR score and the variability of the score was explained by the individual teacher. Grade level was not a meaningful in predictor of MVPA levels in students.

Teachers scored an average of 85.35% in their overall AQTR scores. This can be equated to a score of 2.55 out of 3 describing the effective use of all 17 strategies. Teachers were most effective in implementing task presentation at 88.04%, followed by classroom management at 86.77%, task design at 83%, and instructional response at 82.94%. When identifying themes between teachers who consistently reached over 50% of class time at MVPA levels, the effective use of two strategies were most often identified: task design and classroom management. More specifically within task design, many lessons were age appropriate, challenging, and designed for maximum participation.

Higher scores on the AQTR were lessons that implemented multiple tasks throughout the lesson which provided each student with the opportunity to be physically active, see Figure 3, teachers 3, 5 and 6. This is opposite to the single activity lesson where students had to wait their turn or were eliminated from the activity, see Figure 3, teachers 1 and 2. The difference was the incorporation of progressive tasks throughout the tasks or between tasks. Teachers who demonstrated task progression had MVPA levels that were above the 50% criteria. Teachers with lower overall scores in task presentation also resulted in lower averages of MVPA during class. Similar to the findings of Fröberg, Raustorp, Pagels, Larsson, & Boldemann, (2016), classroom management was found to significantly impact reaching adequate levels of MVPA during class. In Figure 2, Teacher 2 spent more time distributing equipment than in other classes which reduced MVPA time. Teacher 1 had more down time between activities

that resulted in lower AQTR scores and lower MVPA minutes. Although Teacher 6 had lower MVPA minutes, the beginning of class students participated in a warm up that incorporated sit ups and pushups, not accumulating MVPA minutes, also a limitation of the product. There was little observable association between instructional response scores and MVPA.

The AQTR is an effective tool in evaluating teacher behaviors and could be utilized for self-evaluation. Utilizing systematic observation tools for one's own self-evaluation has proven to be a valuable guide to promote reflective practices and professional growth (Hemphill, Templin, & Wright, 2015). Although this data is not necessarily inferable, the procedures could easily be replicated to determine the level of engagement of students with the content during physical education class. Using the AQTR to guide planning, presentation, classroom management, and feedback could result in more effective lessons and highly engaged students that are motivated by the content and the teacher.

Conclusion

It is plausible for students to engage in adequate levels of MVPA during physical education class, even without a specific intervention. The process-product paradigm is too simplistic to define the relationship between teacher behavior and student learning (Rink, 2013). The effective implementation of all the teaching strategies aligns with the ecological paradigm and results in students reaching adequate levels of MVPA. The implementation of more effective teaching strategies better addresses the complexity of the relationship

between the teacher, student, and the content (Ward, 2014). Based on these evaluations, teacher behavior does impact the student's achievement of MVPA. The lack of significant differences between males and females and MVPA minutes indicates that physical education provides equal opportunity for students to be active using these strategies.

The goal of reaching MVPA during class has far reaching benefits by increasing energy expenditure and impacting childhood obesity (Kahan & McKenzie, 2015). Moreover, when the task was presented with progressive activities, students demonstrated autonomy to engage in the task at their own pace and increased the potential for students to experience success, leading to skill competency (Erwin et al., 2013). Motivation was often another variable in reaching MVPA during physical education class. Erwin and colleagues (2013) found that elementary students were intrinsically motivated to be physically active. The activity monitor complemented this motivation by providing students with instant feedback about their current activity levels. Incorporating this technology was relatable for students to assist in making connections between the content their own learning outcomes. Upon the completion of the study, students were requesting the use the of the accelerometers, indicating a positive reaction to the product for motivation and learning.

There is the preconception that if the lesson activity is focused on MVPA, then learning is negatively impacted (Ennis, 2011). These observations demonstrated clearly that lessons can be designed to promote student learning

while concurrently helping students to reach adequate levels of MVPA, even with varying content such as tagging and fleeing, dance, fitness, cooperative learning, throwing and catching. Physical education is much more than just physical activity (Dyson, 2014). Quality physical education programming has the potential to promote lifelong activity behaviors (McKenzie & Lounsbery, 2008). Providing a quality instructional program that results in high levels of physical activity during physical education is a challenge (Rink, 2014; Verstraete et al., 2007), but is plausible.

Limitations

Although the Polar Active accelerometer is often utilized during physical education class to measure levels of activity intensity, it does not detect MVPA of select movements such as sit-ups or push-ups, often incorporated during physical education class. The study utilized intact classes which resulted in convenience sampling. Multi-level modeling may be a more appropriate statistical analysis to determine the impact of each teaching component on MVPA.

CHAPTER III

ACTION PLAN

To disseminate the information learned from the study, a multifaceted approach is warranted. At the start of the school year, an effective professional development opportunity (PD) will be developed for the elementary physical education teachers of the county that participated in the study. Next, the results will be submitted for potential publication in a journal that reaches future and practicing physical educators, along with administrators and collegiate professionals in the field. Finally, a proposal for presenting the information has been submitted to the state level conference for physical educators.

This action plan for professional impact will present the aggregated data collected from this research project to the elementary physical education teachers. The PD will be created *with* the teacher and not just *for* the teacher to enhance student learning outcomes and activity intensity (Bechtel, & O'Sullivan, 2006). Effective strategies for PD begin with the teacher in mind. Teachers will guide their own development throughout the school year by identifying their needs and understanding their own values. This can be completed through utilizing systematic observation tools for one's own self-evaluation. This process has proven to be a valuable guide to promote reflective practices and professional growth (Hemphill, Templin, & Wright, 2015). Teachers will be asked

to bring three lessons utilized during the previous school year for grades three through five and any related resources that provided guidance on the development of the lessons.

The session will be designed to impart the necessary conceptual knowledge, provide the rationale for collecting the data in the county and demonstrate the impact on teachers, students, and the school's environment. A presentation of the data will demonstrate how much physical activity is occurring during class and the diversity throughout the county with respect to the use of various teaching strategies. Then, the presentation will continue with how each strategy can impact reaching adequate MVPA in the classroom. Next, teachers will be provided the skills to implement change using their curricular choice, in preparation, delivery, management, and assessment of physical education lessons. The AQTR will be presented to the teachers followed by an explanation and example of each strategy. Teachers will use the AQTR to evaluate their current lessons based on the rubric. This information will guide the PD to include opportunities to apply this knowledge by improving current lessons and developing physical education lessons designed to promote learning, and to encourage MVPA intensive movements. Finally, teachers will be presented with the opportunity to self-evaluate their performance for reflection and revise lessons throughout the school year in small professional learning communities.

Through effective teaching strategies, physical education can play a role in promoting physical activity for a lifetime (Dyson, 2014; Fairclough & Stratton,

2006). Effective teaching is generally defined by the student learning outcomes, often focused on motor skill competency (Rink, 2013). Teaching is a science, and knowledge production and reproduction are due to intentional curricular implementation, even though the learning outcomes may be different than what was intended (Tinning, 2008). The complexity of teaching requires knowledge transfer as an essential task. To do so, a teacher must understand how to assess student learning and how to structure tasks to make connections between the student and the content. Teachers in physical education have great flexibility in delivering the curriculum (Rink, 2013). Essentially, lesson choices are driven by the values and beliefs of the teacher. Although the lesson content should align with state objectives and meet the needs of the students, variations in content delivery were evident during these teacher observations.

Designing lesson activities that increase physical activity intensity and promote student learning requires thoughtful interactions between teacher, student, and the content (Tinning, 2008). To accomplish the course objectives in the limited amount of time elementary students have physical education, lessons should be content focused to include skill and fitness components while managing time and students (Ennis, 2011). Analyzing the relationship between pedagogical strategies and MVPA may influence teachers when designing lessons and choosing effective curricula to implement in class. Chen, Mason, Staniszewski, Upton & Valley (2011) describe four distinct dimensions that promote effective teaching and the strategies to accomplish the what, how, and

why of teaching in physical education. The dimensions include task design, task presentation, class management, and instructional response (Chen et al., 2011). These strategies have been found to have a significant correlation with physical activity levels in elementary school children (Chen et al., 2014). Each strategy will be addressed during the professional development, as they are interconnected and designed to produce effective lessons with maximum participation and learning.

Task Design

Designing a successful lesson is the first step in increasing activity intensity and enhancing student learning (Chen et al., 2011). *Task design* is focused on the development of the lesson plan (Chen et al., 2011) to meet the needs of the students based on skill level and ability due to regular formative assessments (Rink & Hall, 2008). Therefore, the activity should be developmentally appropriate (Chen et al., 2011) according to the national grade level outcomes (SHAPE America, 2013). Teachers indicated they spend at least one to two hours a week planning for lessons in physical education. This time can be spent designing lesson tasks to progress from one task to the next allowing for multiple skill levels. Teachers will evaluate their own lessons to ensure that the lesson plan begins by connecting students to the content through a moderate to vigorous physical activity, thus engaging students in the learning process (Fairclough & Stratton, 2006). This task is followed by a routine of calisthenics, stretches, or another dynamic warm-up. In addition, the lesson

should include necessary scaffolding, differentiating (Fairclough & Stratton, 2006), and maximum opportunities to practice. Teachers will evaluate their lessons to ensure tasks progress within each task and between the tasks. Based on the data, teachers who designed lessons with progressive tasks resulted in higher levels of MVPA during physical education class. The rationale behind incorporating progressive tasks will be to engage students consistently in the task and to challenge students to improve skills at their own pace.

An open discussion will follow to identify various strategies to increase participation during activities that use long relay lines, activities that eliminate students, or when limited equipment is available. Then, teachers will engage in two common activities that I will break down into three or four progressive tasks. Providing students with succinct instructions increases activity and reduces time teachers spend in task presentation.

Task Presentation

An effective *task presentation* has clarity so that the students can be observed performing the appropriate task (Rink, 2013). Teachers should effectively present the information for students to perform the task successfully while assessing the need for enrichment and intervention. Examples include providing guidance to extend tasks for students who have mastered progression and refine tasks for students struggling to reach skill success (Rink, 2008). To transfer learning, pedagogical content knowledge (Dyson, 2014) is necessary to make the task meaningful and applicable to students by calling on prior

knowledge and experiences. The task must provide cues verbally, through demonstrations, and visual task cards to present effectively (Chen et al., 2011), and minimize direct instruction (Fairclough & Stratton, 2006) resulting in student success (Rink, 2013). This can be accomplished by scaffolding the task into levels or rounds. Breaking down the single task into multiple tasks reduced the number of lesson cues for each activity, reduced the time needed for direct instruction, while encouraging student motivation to remain active during the task. Lessons that presented students with multiple tasks throughout the class yielded higher levels of MVPA than lessons with only one task per lesson.

Class Management

Effective *class management* reduces student's time being off task and increases activity time which results in additional opportunities to practice that enhance student learning (Chen et al., 2011; Rink, 2013). Class management begins with establishing a supportive environment and clear behavioral expectations. Establishing a routine as students enter the class, distribute equipment, transitions between activities, and exiting class can positively impact student behavior (Rink & Hall, 2008). Failure to reach adequate MVPA was often due to transitions, equipment distribution, and grouping students. To enhance practice opportunities, the student to equipment ratio should be low and lessons can incorporate station activities which reduce the time students spend waiting in line (Rink & Hall, 2008). When designing progressive lessons, equipment distribution and collection should be a purposeful component of the lesson.

Meaning, when designing the task progressions, also design the lesson so that the equipment can easily transition from one task to the next. When grouping students, lessons that incorporated active transitions to group students efficiently resulted in higher levels of MVPA, versus a teacher directed grouping strategy.

Teachers will engage in a lesson that demonstrates classroom management strategies by designing activities that easily transition in the next. Classroom management made up for the most variance in reaching MVPA during the study. Therefore, the lesson presented to the teachers will demonstrate strategies to gain attention, collect and return equipment, group students and transition to the next activity.

Instructional Response

The fourth dimension is *instructional response* (Chen et al., 2011) and is effective when the feedback provided to students during the activity is accurate and can be used to modify and improve behaviors (Rink, 2013). Active monitoring of activities is critical to encourage student engagement in the learning activities. Through direct observation, effective teachers monitor student successes and challenges to modify the lesson to further meet the needs of the students. Effective questioning takes place to “guide students to think deeply and broadly” (Chen et al., 2011, p. 27). Although the impact of instructional feedback is inconsistent on MVPA during class, research indicates that providing feedback to students can improve performance and motivate students to be active. Moreover, regular assessments of student skill achievement are necessary to

provide differentiation during the lesson for students to experience success.

Finally, regular monitoring allows teachers to pause the task to debrief students regarding re-emphasizing the task or providing variations for the task as well as equipment options to further promote student skill success and motivation.

Understanding these effective teaching practices is necessary to promote quality physical education programming and contribute to the professional practice. Teachers will experience these skills through lesson examples provided by the professional development session leaders. Practical application of these strategies will occur when teachers evaluate their own lessons and revise to reflect the incorporation of these strategies using the AQTR as a guide. Then, teachers will have the opportunity to review these lessons with their peers through professional learning community meetings. Three professional learning communities will be developed in the fall with elementary physical education teachers. These small learning groups will meet three times during the year for half day planning sessions. These sessions will review and revise lesson plans to align with the AQTR and ensure student learning and activity. Working in collaborative learning communities provide support for program implementation and continued follow-up (Armour & Yelling, 2004). A follow-up opportunity will be provided for teachers to observe others in the county implementing these strategies effectively. Observing peers in the field also encourages self-reflection and professional growth (Hemphill, Templin, & Wright, 2015).

Providing teachers with the support and resources to effectively plan and implement physical education lessons result in student learning and higher levels of MVPA. Creating a school environment that promotes physical activity can have a direct impact on childhood obesity. Energy expenditure during the school day can be increased through effective physical education and activity opportunities such as recess, before and after school programs, and brain breaks. A school environment that values physical activity can positively impact student's health today and into the future.

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APPENDIX A

ASSESSING QUALITY TEACHING

(I) Task Design

A. Developmentally Appropriate and Challenging Tasks

3. Learning tasks are developmentally appropriate and challenging for students' skill levels.
2. Learning tasks are somewhat developmentally appropriate and challenging for students' skill levels.
1. Learning tasks are not developmentally appropriate or challenging for students' skill levels.

B. Maximally Engaging Tasks

3. The learning tasks provide students with active and maximum participation.
2. Some of the learning tasks provide students with active and maximum participation.
1. None of learning tasks provide students with active and maximum participation.

C. Progressive Tasks

3. Learning tasks build on the previous tasks in a clear progression.
2. Learning tasks build on the previous tasks in a somewhat clear progression.
1. Learning tasks do not build on the previous tasks in a clear progression.

(II) Instructions

A. Clarity of Task Presentation

3. The teacher presents the tasks in a clear, concise, and accurate manner.
2. To some degree, the teacher presents the learning tasks in a clear, concise, and accurate manner.
1. The teacher presents the learning tasks in an unclear, wordy, and/or inaccurate manner.

B. Linking to Prior Knowledge (Cognitive Engagement)

3. The teacher effectively links the task presentation to game situations by using examples/metaphors, asking questions, presenting scenarios, and/or using visual aids to help students understand the rationales for learning/using a skill/tactics.

2. To some degree, the teacher links the task presentation to game situations by using examples/metaphors, asking questions, presenting scenarios, and/or using visual aids to help understand the rationales for learning/using a skill/ tactics.

1. The teacher does not link the task presentation to game situations by using examples/metaphors, asking questions, presenting scenarios, and/or using visual aids to help understand the rationales for learning/using a skill/tactics.

C. Demonstration

3. The teacher effectively demonstrates the correct form of the skill, tactical concepts, and/or organizational formats throughout the teaching segment. (using themselves or student volunteers)

2. To some degree, the teacher demonstrates the correct form of the skill, tactical concepts, and/or organizational formats throughout some of the teaching segment (using themselves or student volunteers)

1. The teacher did not demonstrate the correct form of the skill, tactical concepts, and/or organizational formats throughout the teaching segment.

D. Learning Cues

3. The teacher effectively presents the learning cues in a simple, accurate, and relevant manner throughout the teaching segment.

2. To some degree, the teacher presents the learning cues in a simple, accurate, and relevant manner throughout some of the teaching segment.

1. The teacher presents the learning cues in a complicated, inaccurate, and irrelevant manner throughout the teaching segment.

E. Checking for understanding

3. The teacher effectively facilitates students' understanding of the task by either asking questions or re-emphasizing critical elements before students practice the learning task.

2. To some degree, the teacher facilitates students' understanding of the task by either asking questions or re-emphasizing critical elements before students practice the learning task.

1. The teacher does not ask questions to facilitate students' understanding nor re-emphasizes critical elements to facilitate students' understanding of the task either before or after the learning task.

(III) Management

A. Gaining/Keeping attention

3. The teacher effectively uses teaching strategies/routines to have students listen attentively to his/her instructions throughout most of the teaching segment (e.g., use of stop signal, ways to hold equipment).

2. To some degree, the teacher effectively uses teaching strategies/routines to have students listen attentively to his/her instructions throughout some of the teaching segment.

1. The teacher does not use teaching strategies/routines to have students listen attentively to his/her instructions throughout the teaching segment.

B. Equipment collection/returning

3. The teacher uses efficient ways for students to collect and return equipment throughout most of the teaching segment.

2. To some degree, the teacher uses efficient ways for students to collect and return equipment throughout some of the teaching segment.

1. The teacher does not use efficient ways for students to collect and return equipment throughout the teaching segment.

C. Grouping students

3. The teacher efficiently forms students into pairs, groups, and/or teams throughout the teaching segment.

2. To some degree, the teacher efficiently forms students into pairs, groups, and/or teams throughout some of the teaching segment.

1. The teacher inefficiently forms students into pairs, groups, and/or teams throughout most of the lesson throughout the teaching segment.

D. Transitions

3. The teacher provides clear and complete directions for students to efficiently transit from one learning task to the next throughout the teaching segment.

2. To some degree, the teacher provides clear and complete directions for students to efficiently transit from one learning task to the next throughout some of the teaching segment.

1. The teacher provides unclear and incomplete directions for students to transit from one learning task to the next throughout the teaching segment.

(IV) Responses

A. Monitoring the class

3. The teacher uses effective strategies to keep the entire class in his/her view and stop any off-task behaviors immediately throughout the teaching segment.

2. To some degree, the teacher uses effective strategies to keep the entire class in his/her view and stop any off-task behaviors immediately throughout some of the teaching segment.

1. The teacher does not keep the entire class in his/her view and stop any off-task behaviors immediately throughout the teaching segment.

B. Adjusting/Re-emphasizing the task

3. The teacher stops the entire class to re-state the critical elements of the task whenever he/she finds a majority of students are not able to perform the task successfully and/or the task could be run more efficiently, or to make it more or less challenging.

2. The teacher re-states and emphasizes the critical elements of the task to a few students whenever he/she finds a majority of students are not able to perform the task successfully and/or the task could be run more efficiently, or to make it more or less challenging.

1. The teacher does not stop the entire class to re-state the critical elements of the task whenever he/she finds a majority of students are not able to perform the task successfully and/or the task could be run more efficiently, or to make it more or less challenging.

C. Positive/General Feedback

3. The teacher provides students with sufficient positive/general feedback throughout the teaching segment.

2. The teacher provides students with insufficient positive/general feedback throughout the teaching segment.

1. The teacher does not provide students with positive/general feedback at all throughout the teaching segment.

D. Specific Performance Feedback

3. The teacher provides students with sufficient specific performance feedback based on students' movement response throughout the teaching segment.

2. The teacher provides students with insufficient specific performance feedback based on students' movement response throughout the teaching segment.

1. The teacher does not provide students with specific performance feedback based on students' movement response throughout the teaching segment.

E. Reflections

3. The teacher adequately engages students in reflecting on what they have done and/or how to successfully perform the task throughout the teaching segment.

2. The teacher inadequately engages students in reflecting on what they have done and/or how to successfully perform the task throughout the teaching segment.

1. The teacher does not engage students reflecting on what they have done and/ or how to successfully perform the task throughout the teaching segment.

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APPENDIX B

THE AQTR ASSESSMENT

The AQTR Assessment Sheet																			
Lesson:											Date:								
Task Design				Task Presentation						Management				Responses					
#	Type	Appropriateness	Maximum Participation	Progression	Clarity and accuracy	Linking prior knowledge	Demonstration	Learning Cues	Check for understanding	Gaining Attention	Equipment distribution	Grouping Students	Transition	Monitoring class	Adjusting/re-emphasizing the task	Reflective Questions	General Feedback	Specific Feedback	Open Comments
1																			
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			