Fall 12-2022

Social Emotional Competency Change During the Pandemic: Impacts of a Virtual Physical Activity Program

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SOCIAL EMOTIONAL COMPETENCY CHANGE DURING THE PANDEMIC: IMPACTS OF A VIRTUAL PHYSICAL ACTIVITY PROGRAM

by

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B.S. May 2008, Old Dominion University

A Thesis Proposal Submitted to the Faculty of
Old Dominion University in Partial Fulfillment of the
Requirements for the Degree of

MASTER OF SCIENCE IN EDUCATION

PHYSICAL EDUCATION

OLD DOMINION UNIVERSITY
December 2022

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ABSTRACT

SOCIAL EMOTIONAL COMPETENCY CHANGE DURING THE PANDEMIC: IMPACTS OF A VIRTUAL PHYSICAL ACTIVITY PROGRAM

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There is currently limited research on virtual physical activity (PA) programs and their relationship on social emotional competency (SEC). Therefore, the purpose of this study was to examine the effect of a virtual after-school PA program has on SEC among elementary school students. The participants of this study are 122 elementary school students (Mean Age=11.69) enrolled in grades 2-6 from six elementary schools. Children registered and participated in the virtual after-school PA program *Move 60!*, that was offered four times per week during the pandemic (Fall 2021 from October to December). SEC was measured using the Washoe County School District (WCSD) Social and Emotional Competency Assessments-Short Form (SECAs) at the beginning and end of the *Move 60!* program. Data analysis included descriptive analysis of demographic variables and SEC. A dependent sample t test was used to examine changes in SEC from pre to post Move60! and Cohen's *d* was computed as the effect size. Independent sample *t* test was used to determine changes (Δ) between boys and girls. Additionally, a chi-squared test was conducted to examine the potential association between student sex and whether the composite scores were improved (i.e., $\Delta > 0$). No differences between girls and boys were found based on premeasures of SEC. Student's SEC significantly improved from pre to post measure. The average SEC improvement did not differ between boys and girls, although girls did report greater gains. A statistically significant association between sex and SEC improvement

was found, with about 60% of girls improving SEC compared to about 40% of boys. These findings suggest that a virtual after-school PA program may enhance the SEC of elementary children. Further, girls seemed to have experienced even a greater benefit than boys by participating in such a program.

ACKNOWLEDGEMENTS

I want to thank my committee members for their patience and guidance in this journey. It was a great challenge because of the pandemic and institutional barriers, and I would not have been able to complete it without your help. I am particularly grateful for *Move 60!* program directors and their district allowing us to use the de-identified data. Dr. Haegele, thank you for always challenging me and teaching me to ask "why". Dr. Zhu, I want to especially thank you for everything. You have always been there to help and guide me in my graduate studies and research.

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CHAPTER I: INTRODUCTION

A well-rounded education can teach children skills they need to become successful and healthy. Opportunities for children to develop these skills can be provided by social and emotional learning (SEL). SEL is defined as the "process by which young people acquire and apply the knowledge, skills, and attitudes to develop healthy identities, manage emotions and achieve personal and collective goals, feel and show empathy for others, establish and maintain supportive relationships, and make responsible and caring decisions" (CASEL, 2022). These skills comprise what is known as social and emotional competency (SEC). Specifically, self-awareness, self-management, social awareness, relationship skills, and responsible decision making are the five inter-related areas of SEC (Payton et al., 2008). A school can implement SEL-related activities in the classroom, before or after school, or as a separate program for indicated students. For SEL to be effective it should develop SEC, provide experiences to practice social and emotional skills, involve the school community, and foster relationships with stakeholders (Greenberg et al., 2003). Current research indicates that SEL programs have positive and lasting effects for many different youth populations (Durlak et al., 2011; Payton et al., 2008).

In two large reviews examining the impact of SEL programs, researchers found that students in general classroom programs, after school programs, and indicated programs improved social emotional skills, attitudes, prosocial behavior, and academic performance while decreasing problem behaviors compared to students in control groups (Payton et al., 2008; Durlak et al., 2011). In a separate study about after-school programs designed to develop personal and social skills, youth from elementary and middle school had significant increases in self-perceptions and positive social behavior, while decreasing problem behaviors when

compared to children not in the program (Durlak et al., 2010). SEL can have lasting effects years after exposure, with children having more community involvement, social emotional skills, well-being, and less mental health problems compared to others that did not receive SEL (Hawkins et al., 2008; Taylor et al., 2017).

The impact that physical activity (PA) has on areas like SEC and SEL has been reported as well. For example, older children and adolescents that are physically active report greater levels of physical, social, and mental functioning compared to less active peers (Gu et al., 2016; Gopinath et al., 2012). In addition, there is evidence that PA has been effective in lowering depression (Fox, 1999; Brown et al., 2013) and anxiety (Zhu et al., 2019), and improving self-esteem (Ekeland et al., 2005). Further, a young person's friends and relationships with their peers has been found to be positively associated with their PA levels (Strauss et al., 2001; Ianotti, et al., 2009).

Research about how PA programs can affect SEC have largely taken place at elementary schools with interventions before or after school. For example, a study by Goh et al. (2022) found that a before school PA program improved children's SEC by 7-10% compared to a control group. Further, kindergarten-8th grade students that participated in a before school PA program reported an improvement in social emotional wellness compared to students not in the program (Whooten et al., 2018). Additionally, in a similar study using an after-school PA program, Caldwell et al. (2022) found a slight improvement in peer relationships for children that participated. However, there was not significant improvement in the other areas measured: cognitive function, peer and family relationships, physical activity, life satisfaction, sleep, positive affect, and global health (Caldwell et al., 2022). Lastly, an after-school PA program, based on Hellison's Teaching Personal and Social Responsibility Model (2003), did not improve

children's SEC based on reporting from before and after the program (Olive et al., 2020). As such, there remains many questions to explore about the impact of PA programs on the SEC of children.

Regular PA is associated with abundant physical health benefits for children and adolescents such as improved bone health, weight status, cardiorespiratory and muscular fitness, and cardiometabolic health (U.S. Department of Health and Human Services, 2018). An individual's health is a multifaceted concept that consists of physical, mental, and social well-being (World Health Organization, 1948). Previous studies have investigated how PA relates to health-related quality of life, attitudes, emotional distress, and social health, but relatively few studies have sought to examine how it relates to SEC. In addition, PA programs have been primarily in-person and taken place before, during, or after school hours. In the context of the COVID-19 pandemic, many schools moved to a virtual environment and have continued to offer virtual options for learning. There is currently limited research based on virtual PA programs provided to students at home. Therefore, the purpose of this study is to examine the effect of a virtual after-school PA program on SEC among elementary school students.

Research Questions

This study focused on the following two research questions:

1. How does a virtual after-school PA program effect the SEC of 2nd -6th grade children?
2. How does SEC vary by gender for students participating in a virtual after-school PA program?

Definition of Terms

Afterschool PA Program: An opportunity, after school hours, for students to participate in physical activity. The program can be offered in person or virtually.

Move 60! Program: A one hour after-school PA program offered to elementary aged children virtually on Zoom. Physical activities included guided exercises such as jogging, jump roping, yoga and other activities that can be done by the students, without additional equipment.

Social and Emotional Competency: SEC is defined by student's self-reported proficiencies in the CASEL 5: self-awareness, self-management, social awareness, relationship skills, and responsible decision making (Payton et al., 2008).

Social Emotional Learning: SEL is "the process through which children and adults develop the skills, attitudes, and values necessary to acquire social and emotional competence" (Elias et al., 1997, p. 2).

Limitations

There are several limitations that should be noted for this study. First, using self-report to measure SEC may be a limitation. Even though the social emotional competency measure has been validated, the participants may not be able to respond accurately. For example, social desirability could play a role where children may over report their actual perception. Also, the virtual after-school PA program is only one hour of the day which may be challenging to control for other circumstances that contribute to self-reported SEC. Further, research findings will only be generalizable to schools with similar student populations. Lastly, we did not have knowledge of SEL programs that might be implemented in schools. Concurrent SEL programs implemented at the children's elementary schools may play a role in the improvement of SEC.

Delimitations

There are delimitations present for this study. Data collection only involved program participants in 2nd-6th grade with convenient sampling. The SECAs are appropriate measures for

this age group. Also, all participants that participated in the virtual after-school PA program completed the SECAs before and after the virtual after-school PA program.

Significance of the Study

The findings of this study could help alert stakeholders of the effects that a virtual after-school PA program has on children's SEC. If a positive connection between PA and SEC is found it could potentially lead to more instructional resources devoted to both areas. This would ultimately lead to more opportunities for children to become successful and healthy individuals. Additionally, many children and adolescents in the U.S. do not participate in the recommended daily 60 minutes of moderate-to-vigorous PA (U.S. Department of Health and Human Services, 2018), which means that children are not reaping the associated SEC benefits associated with PA. More readily available afterschool PA program could help fulfill the recommended daily PA time.

CHAPTER II: REVIEW OF LITERATURE

The purpose of this chapter is to review literature on social emotional learning (SEL) and social emotional competency (SEC) and how they are related to physical activity (PA). Additionally, areas with similarities to SEC such as health related quality of life, attitudes, emotional distress, and positive social behaviors were reviewed. The following questions shaped my literature search. What are SEL and SEC? How do children develop SEC? How does SEC affect children's behaviors? How is SEC measured in children? How does children's PA relate to SEC? Are there gender differences for SEC? Elementary school children are the target group the review, however, studies that involve adolescents and adults are included.

History of SEL, Competencies, and Effects of SEL

In 1987, stakeholders in New Haven, CT, public schools created a task force to survey and respond to the high-risk behaviors of children in the community. These behaviors included substance abuse, drug use, teen pregnancy, truancy, and dropping out of school that were contributing to negative outcomes for children. As members of the task force, Weissburg and colleagues (1997) constructed a curriculum designed for students (K-12) to develop social skills. Previously, there had been minimal success with programs designed to address specific risk behaviors like substance abuse or teen pregnancy (Weissburg et al., 1997). The task force's goal was for children to develop social competence, which would play a role in students avoiding high-risk behaviors and providing them with skills to stay healthy and successful in school. The results of the curriculum were positive, with children in inner city and suburban schools improving many social and emotional skills: problem solving, coping with anxiety, conflict resolution, and impulse control (Caplan et al.,1992). Building on the success of the social skills curriculum in New Haven, a group of professionals met in 1994 and created the Collaborative for

Academic, Social, and Emotional Learning (CASEL) and Social Emotional Learning (SEL) (CASEL, 2021).

SEL is "the process through which children and adults develop the skills, attitudes, and values necessary to acquire social and emotional competence" (Elias et al., 1997, p. 2). CASEL highlights five inter-related social and emotional competencies for children to develop from SEL: self-awareness, self-management, social awareness, relationship skills, and responsible decision making (Payton et al., 2008). SEL can be used as a framework for curriculum or an intervention in a school setting. Schools can offer SEL programs in the classroom, before or after school, or they can be assigned to small groups of individuals that need help (Payton et al., 2008). Current research seems to indicate that SEL programs have positive and lasting effects for children (Durlak et al., 2011; Hawkins et al., 2008; Taylor et al., 2017).

For SEL programs to be effective, schools should focus on developing SEC, provide experiences to practice SEC, involve the school community, and foster relationships with stakeholders (Greenberg et al., 2003). The results of SEL programs have been meaningful for elementary and secondary students in different school settings: urban, suburban, rural (Payton et al., 2008, Durlak et al., 2011). Most SEL interventions take place in elementary school (Payton et al., 2008, Durlak et al., 2011) because of their impact being greater for younger children compared to older children (Durlak & Wells, 1997, Taylor et al., 2017).

Payton et al. (2008) examined 317 studies from three different reviews about general SEL programs, after school SEL programs, and indicated programs. An indicated program "focused on children who show signs of social, emotional, or behavioral problems, but had not been diagnosed with a mental disorder or need for special education" (Payton et al., 2008, pg.5).

The study measured the effect that SEL had on student outcomes such as social-emotional skills, positive attitudes, prosocial behaviors, conduct problems, emotional distress, and academic performance. They reported that students in all settings improved SE skills, attitudes, prosocial behavior, and academic performance while decreasing conduct problems and emotional distress (Payton et al., 2008). Also, the researchers noted that school personnel were as impactful as the researchers in delivering the SEL interventions and had a greater effect in academic achievement. In addition, a review by Durlak et al. (2011) found that children in the SEL interventions had significant changes in SE skills (ES= 0.57), attitudes (ES= 0.23), prosocial behavior (ES= 0.24), conduct problems (ES= 0.22), emotional distress (ES=0.24), and academic performance (ES= 0.27) compared to controls. In both reviews, a SEL program intervention was included in the study if focused on developing one or more SE skills, targeted school aged children, included a control group, and reported an effect size or data to calculate an effect size (Payton et al., 2008; Durlak et al., 2011). Further, in Durlak et al. (2011) study of 213 SEL interventions, the average number of sessions per intervention was 40.8. Additionally, after school programs have been successful in developing personal and social skills among youth. In a meta-analysis of 68 studies, youth from elementary, middle, and high school that participated in after school programs had significant improvement in self perceptions (ES= 0.37), school bonding (ES= 0.25), positive social behavior (ES= 0.29), and problem behaviors (ES= 0.30) when compared to controls (Durlak et al., 2010).

SEL, positive youth development (PYD), and prevention programs have similarities because they all help develop competency in areas of social and emotional health. In a review of 177 prevention programs designed to foster mental health and prevent problem behavior, Durlak and Wells (1997) found that children improved internalizing and externalizing behaviors and

cognitive processes post intervention compared to controls. Further, in a study investigating the effects of PYD programs among children, Catalano and colleagues (2014) found similar results with "significant improvements in interpersonal skills, quality of peer and adult's relationships, self-control, problem solving, cognitive competencies, self-efficacy, commitment to schooling, and academic achievement" (pg. 434). It is important to note that most successful PYD programs were active for nine months or more, with high amounts of fidelity (Catalano et al., 2014).

Children can benefit from SEL years after exposure (Hawkins et al., 2008; Taylor et al., 2017). Hawkins et al. (2008) found that adults that went through a social and emotional skill program in elementary school were more involved in their community and less likely to suffer mental health problems compared to adults that did not participate in the program. In addition, a large-scale meta-analysis examining follow up effects of SEL interventions found that children that received SEL had greater social and emotional skills (ES= 0.23), attitudes (ES=0.13), and positive social behavior (ES= 0.13) compared to controls 1-3 years post intervention (Taylor et al., 2017).

Measurement of Social and Emotional Competency

It is recommended that researchers use observation and performance-based assessments for SEC among children (Campbell et al., 2016). However, most of the research about SEC in children uses reporting methods that can be completed by parents, teachers, and children. When selecting a SEC measure, it is important to find one that is age appropriate with strong validity and reliability. This can be challenging because there are many social and emotional measures for children, but few provide sufficient reliability and validity and parent, teacher, and student reporting methods (Humphrey et al., 2011). Also, selecting a measure that includes both social

and emotional skills can be difficult because many are unidimensional. Several options measure both social and emotional competency: the Bar-On Emotional Quotient Inventory: Youth Version (Bar On & Parker, 2000), the Prosocial Tendencies Measure- Revised (Carlo-Hausmann et al., 2003), the Social Skills Improvement System (Gresham & Elliot, 2008), the Devereux Student Strengths Assessment-Mini (Shapiro et al., 2017), the Social-Emotional and Character Development Scale (Ji et. al, 2013), the Social Emotional Learning Scale (Coryn et al., 2009), the Patient Reported Outcomes Measurement Information System (Ravens-Sieberer et al., 2014), and the Emotion Regulation Checklist (Shields & Cicchetti, 1997). Also, subscales from the National Institutes of Health Patient-Reported Outcomes Measures Information System parent proxy questionnaire were used to measure cognitive, social, and emotional health in a study (Forrest et al., 2018). Also, the Social Skills Improvement System (SSIS) measure can be used with children ages 3-18 and has options for parent, teacher, and student reporting. The SSIS can be completed in a short amount of time and has strong reliability and validity (Halle & Darling-Churchill, 2016; Humphrey et. al, 2011). Lasty, the Washoe County School District (WCSD) partnered with CASEL and the University of Illinois at Chicago to develop free open-source Social and Emotional Competency Assessments (SECAs). The SECAs have been validated and tested among school-aged children in previous studies within large public-school contexts (Crowder et al., 2019; Davidson et al., 2018). In this study, WCSD measure was used because of (a) its open-access nature, and (b) validation had been conducted among school-aged children (Crowder et al., 2019; Davidson et al., 2018)

Physical Activity and SEC

There is limited research investigating the use of PA programs and how they impact children's SEC. Specifically, there are few studies measuring CASEL's five social emotional

competencies: self-awareness, self-management, social-awareness, relationship skills, and responsible decision. A study by Goh et al. (2022) examined how a before school PA program would affect SEC among students in 4th and 6th grade. There was a 7-10% improvement of reported SEC among program participants, with no improvement reported by the control group (Goh et al., 2022). The program met three days a week for three weeks. In a much larger study that included 707 children in kindergarten-8th grade in Massachusetts, researchers found that a before school PA activity program improved participants' social and emotional wellness compared to controls that did not sign up and participate (Whooten et al., 2018). The before school PA programs met 2-3 times per week and lasted anywhere from 3-12 weeks. Social and emotional wellness was defined by scores on scales measuring peer relationships, positive affect, life satisfaction, vitality/energy, and student engagement. Specifically, Whooten et al. (2018) found that students that participated in before school program improved student engagement (0.79-unit difference, 95% CI= -0.01,1.60), student affect (1.41-unit difference, 95% CI=0.16,2.65) and vitality/energy score (0.60-unit difference, 95% CI=0.11, 1.08) when compared to children in the control group. Further, in both studies (Goh et al., 2022, Whooten et al., 2018) the PA intervention did not specifically teach SEL or address SEC during the before-school sessions.

In a similar study, parents of elementary-aged children that participated in an after-school PA program completed a questionnaire rating their children's cognitive function, peer and family relationships, life satisfaction, physical activity, sleep, positive affect, and global health. They rated their children before and after the three-month program. Although an increase in peer relationship scores was seen, there was no significant improvement in any of the areas measured (Caldwell et al., 2022). A different study investigated an after-school PA program based on the

physical education instructional model of Teaching Personal and Social Responsibility (Hellison, 2003). The participants (n=29) ,7-12 years of age, did not improve SEC based on scores before and after the intervention (Olive et al., 2020). Olive et al. (2020) used the Social Emotional Learning Scale (SELS) and the Social-Emotional Character Development Scale (SELS).

PA and HRQOL

A study by Gu and colleagues (2016) found that self-reported and pedometer-based PA were both significant predictors of physical and mental functioning. Additionally, they found a significant association between fitness and physical and mental functioning (Gu et al., 2016). Further, in a longitudinal study of 2353 children (median age: 12.7 years) Gopinath et al. (2012) found that those reporting high levels of PA also had significantly higher physical and social functioning compared to others that participated in lower amounts of PA. Lastly, youth that reported greater amounts of screen time reported significantly lower physical, psychosocial, emotional, and school functioning compared to youth who reported low amounts of screen time (Gopinath et al., 2012).

Researchers primarily used recall questionnaires and objective instruments to measure PA as related to student SEL. The following subjective recall questionnaires were commonly used to measure PA: the Physical Activity Questionnaire for Older Children (PAQ-C: Kowalski et al., 1997), the Physical Activity Questionnaire for Adolescents (PAQ-A: Kowalski et al., 1997), the Children's Physical Activity Questionnaire (Saunders et al., 1997), and the International Physical Activity Questionnaire (Craig et al., 2003). Commonly used direct measures of PA included pedometers and accelerometers.

PA and Attitudes, Emotional Distress

Numerous studies have examined if PA can be used to improve attitudes and emotional distress in children. PA programs have been effective in lowering depression (Fox, 1999; Brown et al., 2013) and anxiety levels (Zhu et al., 2019) in youth. Further, PA programs can improve self-esteem (Ekeland et al., 2005, Bonhauser et al., 2005), self-worth, and social emotional functioning among obese/overweight children and at- risk youth (Goldfield et al., 2007).

In addition to PA interventions, the relationship between PA, attitudes, and emotional distress in children has been widely studied. Adolescents that are physically active experience lower depression levels, anxiety (Sabiston et al., 2013; Zhu et al., 2019), feelings of sadness, and decreased risk of suicide (Brosnahan et al., 2004) in comparison with less active peers. In addition to its connection with emotional distress, PA may also be linked to self-esteem. In a large study involving over 6,000 Icelandic adolescents, researchers discovered a significant position association between self-reported PA and self-esteem ($r = .22$; Kristjánsson et al., 2010). However, not all studies have found positive associations between PA and emotional distress. In a study involving Chinese adolescents, participants with high amounts of PA were more likely to binge alcohol, think about suicide, and suffer from mental health problems (Tao et al., 2007).

PA and Social Health

Social influence and support can play a role in a young person's PA level. Strauss et al. (2001) found that highly active children, ages 10-16, also reported having greater social influences on their PA. The source of social support may play a role in children's PA levels. A study that examined social supports and PA levels of 372 children and adolescents (Mean Age=12.05) reported that support from friends, compared to parents and siblings, played the biggest role in PA participation (Duncan et al., 2005). In a separate but larger study, Ianotti et al. (2009) reported a positive association between PA and both family relationships and peer

relationships. In a similar finding to Duncan et al. (2005) the researchers also found that peer relationships had stronger connections with PA than family relationships. It is important to note the Ianotti et al. (2009) study included 204,534 students (11-15) from 41 countries in North America and Europe. In addition to relationships, effective communication such as encouragement and positive comments are also connected to PA among adolescents (Merdonça & Junior, 2015).

In summary, PA may help lower anxiety, depression, and stress levels. Youth that make PA a part of their lives may possess greater levels of self-esteem, self-worth, and life satisfaction. Positive social supports such as friends, parents, and siblings have shown to help contribute to a physically active lifestyle.

Sex Differences

SEC, HRQOL, Emotional Distress and Attitudes, Social Health

There were no gender differences reported in studies measuring SEC (Goh et al., 2022; Olive et al., 2020). These findings included analyses of pre and post measurement data. In the HRQOL studies reviewed, gender differences were not reported (Gu et al., 2016; Gopinath et al., 2012). In the literature examining emotional distress and attitudes, one observational study involving 1,870 (14-18) adolescents, Brosnohan et al. (2004) found that females reported feelings of sad or hopeless, considered suicide, planned suicide, and attempted suicide more than males. Lastly, an investigation of sources and types of social support on youth PA highlighted that encouragement was an area associated with PA of 14–16-year-old females (Duncan et al., 2005). This was not an area found statistically significant for males.

PA

There were several studies that reported males being more physically active than females (Mendonca & Junior, 2015; Duncan et al., 2005; Tao et al., 2007; Brosnahan et al., 2004; Sabiston et al., 2013; Strauss et al., 2001). Further, most literature reviewed in this chapter was among the adolescent population where this difference exists. In the Strauss et al. (2001) study it should be noted that PA among 10–13-year-old males and females was similar, and only differences appeared after age 13. Additionally, most of the literature used self-report methods to measure PA which may lead to participants under or over reporting PA levels.

Summary

SEL was created with the intention of providing youth the social and emotional tools to make connections with people and make healthy decisions. The goal of SEL is to provide learning experiences for children to develop social and emotional competency. This type of learning has reaped many benefits for children by developing SE skills, attitudes, prosocial behaviors, conduct problems, emotional distress, and academic performance (Payton et al., 2008). These skills can have lasting effects years after instruction (Hawkins et al., 2008; Taylor et al., 2017).

PA is associated with better physical, mental, and social functioning (Gu et al., 2016, Gopinath et al., 2016) self-esteem (Kristjánsson et al., 2010), and lower depression and anxiety (Sabiston et al., 2013; Zhu et al., 2019). PA has been used as an intervention for youth to improve depression (Fox, 1999; Brown et al., 2013), anxiety (Zhu et al., 2019), and self-esteem (Ekeland et al., 2005). Further, a young person's friends and relationships with their peers has been found to be positively associated with their PA levels (Strauss et al., 2001; Ianotti et al., 2009).

Although a vast amount of research has been generated about social and emotional health and PA, there is relatively little research that explores the relationship between participation in PA program and the social emotional competencies: self-awareness, self-management, social-awareness, relationship skills, and responsible decision making. Additionally, the studies that have explored SEC have used before or after school in person PA programs. There remain many unanswered questions about the effectiveness that a virtual PA program has on SEC.

CHAPTER III: METHODOLOGY

Research Design and Context

This study used an observational design through pre-post measures of existing data from the elementary students who participated in the online after-school physical activity program, *Move 60!*. The program aimed to increase students' participation in physical activity and sports outside of the school hours. The program offered one hour sessions Mondays to Thursdays during after-school hours on Zoom during the pandemic (fall 2021 from October to December), and the activities included guided exercises such as jogging, jump roping, yoga and other activities that can be done by the students, without additional equipment. The program was directed by certified physical educators who were trained for *Move 60!*. The program was offered to all elementary school students from grade 2 to 6 in a school district in a Northwestern state, free of charge. The district's student population demographics included 13.1% Asian, 7.6% Black, 22% Hispanic/Latino of any race, 0.5% Native American, 0.9% Native Hawaiian/other Pacific Islander, 11% two or more races, and 44% White. The students and parents chose to register for the program voluntarily or withdraw from it at any time after the registration.

Participants

The participants were 122 elementary school students from six elementary schools. The students were enrolled in the grade 2 to 6, and their mean age was 11.69 ±1.66 years old. About half (50.6%) of the participants were girls, and 49.4% were boys. The students included 11.4% Asian, 7.6% Black, 20.7%, Hispanic/Latino of any race, 48.1% White, and 12.2% Multiracial/Native American and others at the schools. All participants voluntarily registered for the program and participated in the study, with their parental/guardian consent. Based on the

attendance record on Zoom that was kept by the instructors, these students (n =122) attended at least 80% of the sessions to be included in this study. Given that this study used the teacher collected and de-identified data, the school district and the researchers' college human subject review committee approved this study.

Variables and Measures

The measures of this study included the participant demographic variables and social and emotional competency.

Demographic variables. The demographic variables included the elementary school student age, race and ethnicity, sex, and grade level. These variables were collected directly through an online system that imported the student information directly with the approval of the school district. As such, the participants did not have to self-report them. It should be noted that the researchers only had access to the de-identified data such that the student and school names were not revealed to the researchers.

Social and Emotional Competency. We used the Washoe County School District (WCSD) Social and Emotional Competency Assessments – Short Form (SECAs), a free, open-source instrument that measures the self-reported social and emotional competencies of students. The SECAs have been validated and tested among school-aged children in previous studies within large public-school contexts (Crowder et al., 2019; Davidson et al., 2018). The short form of the SECAs was completed by the students at the beginning (pre) and end (post) of the *Move 60!*. The WCSD Short Form contained 17 items that measured students' self-awareness ([4 items]self-concept, emotional knowledge), social awareness (3 items), self-management ([6 items]emotional regulation, goal management, schoolwork), relationship skills (2 items), and responsible decision-making (2 items). Each item begins with a short statement asking students

to rate how easy or difficult for them. For example, an item on emotion knowledge read "Knowing the emotions I feel", and another on self-management reads "Doing my schoolwork even when I do not feel like it." Each item has four response options: 1 = "Very Difficult," 2 = "Difficult," 3 = "Easy," 4 = "Very Easy." The total composite score from all 17 items were used to reflect the global social and emotional competence (Crowder et al., 2019), with higher scores representing greater social emotional competency. In this study, the 17-item WCSD Short Form showed good internal consistency, with a Cronbach $\alpha = 0.88$ based on the collected dataset.

Data Analysis

Three types of data analyses were conducted to meet the purposes of the study. First, descriptive analysis on demographic variables and social emotional competency was conducted. A frequency analysis was conducted to show the percentage of students whose social emotional competency has improved. Then, to examine to what extent the student social emotional competency has changed from pre to post measures of the online physical activity program, a dependent sample t test was conducted, and Cohen's d was computed as the effect size. Finally, to examine whether there were differences in student social emotional competency in the pretest and changes (Δ) between boys and girls, independent sample t tests were conducted. Additionally, a chi-squared test was conducted to examine the potential association between student sex and whether the composite scores were improved (i.e., $\Delta > 0$). These analyses were conducted using SPSS (version 27; IBM, Armonk, NY), and statistical significance tests were done with $\alpha = .05$.

CHAPTER IV: MANUSCRIPT

Social Emotional Competency Change During the Pandemic: Impacts of a Virtual Physical Activity Program

Abstract

There is currently limited research on virtual physical activity (PA) programs and their relationship on social emotional competency (SEC). Therefore, the purpose of this study was to examine the effect of a virtual after-school PA program has on SEC among elementary school students. The participants of this study are 122 elementary school students (Mean Age=11.69) enrolled in grades 2-6 from six elementary schools. Children registered and participated in the virtual after-school PA program *Move 60!*, that was offered four times per week during the pandemic (Fall 2021 from October to December). SEC was measured using the Washoe County School District (WCSD) Social and Emotional Competency Assessments-Short Form (SECAs) at the beginning and end of the *Move 60!* program. Data analysis included descriptive analysis of demographic variables and SEC. A dependent sample t test was used to examine changes in SEC from pre to post *Move 60!* and Cohen's *d* was computed as the effect size. Independent sample t test were used to determine changes (Δ) between boys and girls. Additionally, a chi-squared test was conducted to examine the potential association between student sex and whether the composite scores were improved (i.e., $\Delta > 0$). No differences between girls and boys were found based on premeasures of SEC at the beginning of *Move 60!*. Student's SEC significantly improved from pre to post measure. The average SEC improvement did not differ between boys and girls, although girls did report greater gains. A statistically significant association between sex and SEC improvement was found, with about 60% of girls improving SEC compared to about 40% of boys. These findings suggest that a virtual after-school PA program may enhance the SEC of elementary children. Further, girls may experience a greater benefit than boys by participating in such a program.

SOCIAL EMOTIONAL COMPETENCY CHANGE DURING THE PANDEMIC: IMPACTS OF A VIRTUAL PHYSICAL ACTIVITY PROGRAM

A well-rounded education can teach children skills they need to become successful and healthy. Opportunities for children to develop these skills can be provided by social and emotional learning (SEL). SEL is defined as the "process by which young people acquire and apply the knowledge, skills, and attitudes to develop healthy identities, manage emotions and achieve personal and collective goals, feel and show empathy for others, establish and maintain supportive relationships, and make responsible and caring decisions" (CASEL, 2022). These skills comprise what is known as social and emotional competency (SEC). Specifically, self-awareness, self-management, social awareness, relationship skills, and responsible decision making are the five inter-related areas of SEC (Payton et al., 2008). A school can implement SEL-related activities in the classroom, before or after school, or as a separate program for indicated students. For SEL to be effective it should develop SEC, provide experiences to practice social and emotional skills, involve the school community, and foster relationships with stakeholders (Greenberg et al., 2003). Current research indicates that SEL programs have positive and lasting effects for many different youth populations (Durlak et al., 2011; Payton et al., 2008).

In two large reviews examining the impact of SEL programs, researchers found that students in general classroom programs, after school programs, and indicated programs improved social emotional skills, attitudes, prosocial behavior, and academic performance while decreasing problem behaviors compared to students in control groups (Payton et al., 2008; Durlak et al., 2011). In a separate study about after-school programs designed to develop personal and social skills, youth from elementary and middle school had significant increases in

self-perceptions and positive social behavior, while decreasing problem behaviors when compared to children not in the program (Durlak et al., 2010). SEL can have lasting effects years after exposure, with children having more community involvement, social emotional skills, well-being, and less mental health problems compared to others that did not receive SEL (Hawkins et al., 2008; Taylor et al., 2017).

The impact that physical activity (PA) has on areas like SEC and SEL has been reported as well. For example, older children and adolescents that are physically active report greater levels of physical, social, and mental functioning compared to less active peers (Gu et al., 2016; Gopinath et al., 2012). In addition, there is evidence that PA has been effective in lowering depression (Fox, 1999; Brown et al., 2013) and anxiety (Zhu et al., 2019), and improving self-esteem (Ekeland et al., 2005). Further, a young person's friends and relationships with their peers has been found to be positively associated with their PA levels (Strauss et al., 2001; Ianotti, et al., 2009).

Research about how PA programs can affect SEC have largely taken place at elementary schools with interventions before or after school. For example, a study by Goh et al. (2022) found that a before school PA program improved children's SEC by 7-10% compared to a control group. Further, kindergarten-8th grade students that participated in a before school PA program reported an improvement in social-emotional wellness compared to students not in the program (Whooten et al., 2018). Additionally, in a similar study using an after-school PA program, Caldwell et al. (2022) found a slight improvement in peer relationships for children that participated. However, there was not significant improvement in the other areas measured: cognitive function, peer and family relationships, physical activity, life satisfaction, sleep, positive affect, and global health (Caldwell et al., 2022). Lastly, an after-school PA program,

based on Hellison's Teaching Personal and Social Responsibility Model (2003), did not improve children's SEC based on reporting from before and after the program (Olive et al., 2020). As such, there remains many questions to explore about the impact of PA programs on the SEC of children.

Regular PA is associated with abundant physical health benefits for children and adolescents such as improved bone health, weight status, cardiorespiratory and muscular fitness, and cardiometabolic health (U.S. Department of Health and Human Services, 2018). An individual's health is a multifaceted concept that consists of physical, mental, and social well-being (World Health Organization, 1948). Previous studies have investigated how PA relates to health-related quality of life, attitudes, emotional distress, and social health, but relatively few studies have sought to examine how it relates to SEC. In addition, PA programs have been primarily in-person and taken place before, during, or after school hours. In the context of the COVID-19 pandemic, many schools moved to a virtual environment and have continued to offer virtual options for learning. There is currently limited research based on virtual PA programs provided to students at home. Therefore, the purpose of this study is to examine the effect of a virtual after-school PA program has on SEC among elementary school students.

Methods

Research Design and Context

This study used an observational design through pre-post measures of existing data from the elementary students who participated in the online after-school physical activity program, *Move 60!*. The program aimed to increase students' participation in physical activity and sports outside of the school hours. The program offered one hour sessions Mondays to Thursdays during after-school hours on Zoom during the pandemic (fall 2021 from October to December),

and the activities included guided exercises such as jogging, jump roping, yoga and other activities that can be done by the students, without additional equipment. The program was directed by certified physical educators who were trained for *Move 60!*. The program was offered to all elementary school students from grade 2 to 6 in a school district in a Northwestern state, free of charge. The district's student population demographics included 13.1% Asian, 7.6% Black, 22% Hispanic/Latino of any race, 0.5% Native American, 0.9% Native Hawaiian/other Pacific Islander, 11% two or more races, and 44% White. The students and parents chose to register for the program voluntarily or withdraw from it at any time after the registration.

Participants

The participants were 122 elementary school students from six elementary schools. The students were enrolled in the grade 2 to 6, and their mean age was 11.69 ±1.66 years old. About half (50.6%) of the participants were girls, and 49.4% were boys. The students included 11.4% Asian, 7.6% Black, 20.7% Hispanic/Latino of any race, 48.1% White, and 12.2% Multiracial/Native American and others at the schools. All participants voluntarily registered for the program and participated in the study, with their parental/guardian consent. Based on the attendance record on Zoom that was kept by the instructors, these students (n =122) attended at least 80% of the sessions to be included in this study. Given that this study used the teacher collected and de-identified data, the school district and the researchers' college human subject review committee approved this study.

Variables and Measures

The measures of this study included the participant demographic variables and social and emotional competency.

Demographic variables. The demographic variables included the elementary school student age, race and ethnicity, sex, and grade level. These variables were collected directly through an online system that imported the student information directly with the approval of the school district. As such, the participants did not have to self-report them. It should be noted that the researchers only had access to the de-identified data such that the student and school names were not revealed to the researchers.

Social and Emotional Competency. We used the Washoe County School District (WCSD) Social and Emotional Competency Assessments – Short Form (SECAs), a free, open-source instrument that measures the self-reported social and emotional competencies of students. The SECAs have been validated and tested among school-aged children in previous studies within large public-school contexts (Crowder et al., 2019; Davidson et al., 2018). The short form of the SECAs was completed by the students at the beginning (pre) and end (post) of the *Move 60!*. The WCSD Short Form contained 17 items that measured students' self-awareness ([4 items]self-concept, emotional knowledge), social awareness (3 items), self-management ([6 items]emotional regulation, goal management, schoolwork), relationship skills (2 items), and responsible decision-making (2 items). Each item begins with a short statement asking students to rate how easy or difficult for them. For example, an item on emotion knowledge read "Knowing the emotions I feel", and another on self-management reads "Doing my schoolwork even when I do not feel like it." Each item has four response options: 1 = "Very Difficult," 2 = "Difficult," 3 = "Easy," 4 = "Very Easy." The total composite score from all 17 items were used to reflect the global social and emotional competence (Crowder et al., 2019), with higher scores representing greater social emotional competency. In this study, the 17-item WCSD Short Form showed good internal consistency, with a Cronbach $\alpha = 0.88$ based on the collected dataset.

Data Analysis

Three types of data analyses were conducted to meet the purposes of the study. First, descriptive analysis on demographic variables and social emotional competency was conducted. A frequency analysis was conducted to show the percentage of students whose social emotional competency has improved. Then, to examine to what extent the student social emotional competency has changed from pre to post measures of the online physical activity program, a dependent sample t test was conducted, and Cohen's *d* was computed as the effect size. Finally, to examine whether there were differences in student social emotional competency in the pretest and changes (Δ) between boys and girls, independent sample t tests were conducted. Additionally, a chi-squared test was conducted to examine the potential association between student sex and whether the composite scores were improved (i.e., $\Delta > 0$). These analyses were conducted using SPSS (version 27; IBM, Armonk, NY), and statistical significance tests were done with $\alpha = .05$.

Results

When examining the student social emotional competency in the premeasure, we did not find a statistically significant difference between boys and girls, $t = -.76$, $df = 120$, $p = .45$. Overall, student social emotional competency was significantly improved from the pre to post measure, as indicated by the total composite score changes. As shown in Figure 1 and Table 1, the student composite scores for social emotional competency increased from pre = 33.09 ± 7.92 to post = 34.56 ± 8.32, on average improving about $\Delta = 1.47 \pm .57$ from pre to post *Move 60!* program, $t = 2.57$, $df = 121$, $p = .01$. The effect size Cohen $d = .23$, showed a small positive effect size.

--- Insert Figure 1 and Table 1 about here ---

The average improvement on social emotional competency composite did not differ significantly between boys and girls, while girls ($\Delta = 2.34$) did have higher though not statistically significant improvement than boys ($\Delta = .73$), $t = 1.41$, $df = 120$, $p = .17$. When examining the association between student sex and whether their social emotional competency composite scores were improved (i.e., $\Delta > 0$), we found a statistically significant association between sex and whether there was an improvement in the composite score, $\chi^2 = 3.94$, $df = 1$, $p < 0.05$. As seen in Figure 2, there were about 60% of girls whose social emotional competency scores were improved, while there were about 40% of boys who had such improvement.

--- Insert Figure 2 about here ---

In summary, there was no significant difference in the premeasure of student social emotional competency composite score. On average, students did have a significant improvement in the social emotional competency score from pre to post the *Move 60!* program. There was a statistically significant association between student sex and whether they had improvement in their social emotional competency scores. The average improvement was slightly higher for girls compared to boys, though not statistically significantly.

Discussion

The purpose of this study was to examine the impacts that *Move 60!* had on SEC among elementary school students. Students that participated in *Move 60!* improved SEC from pre to post, showing a small effect size (Cohen *d*= .23). This result aligned with previous research investigating the effects of PA programs on elementary aged children. Prior studies found improvements in SEC and social-emotional wellness among children that participated in before school PA programs (Goh et al., 2022; Whooten et al., 2018). Another similarity to previous research is that *Move 60!* does not specifically teach SEL but is used as a PA opportunity. The

differences in the PA programs should be noted. *Move 60!* was offered as an online program for children four times per week and the physical activities were mostly self-sufficient with limited use of equipment. Previous research investigated in-person programs that met two to three times per week with a focus on exercise and playing sports/games (Goh et al., 2022; Whooten et al., 2018). Considering the effect size ($\eta_p{}^2$= .136) of similar study by Goh et al. (2022), there is limited evidence to suggest that offering different types of physical activities to children may help improve SEC.

Additionally, most of the existing literature examining how PA programs affect SEC have not addressed differences among girls and boys (Caldwell et al., 2022; Olive et al., 2020; Whooten et al., 2018). The study by Goh et al. (2022) reported no statistically significant effect between girls and boys. A key addition this study brings is how SEC changed between girls and boys. While there were no significant differences in average SEC composite scoring between girls and boys before the start of *Move 60!* (Girls= 32.50, Boys=33.59, p=.45), after the online program, there were differences in average improvement. Although it was not significantly different, girls improved almost two points more than boys. Additionally, there was a significant association between sex and improvement in the composite score, with about 60% of girls improving compared to about 40% of boys. This finding of uneven SEL improvement is unique and could potentially result from the nature of the activities offered in the online program. As described earlier, the activities offered through the online program were mainly self-sufficient ones such as jogging, jumping ropes, and yoga. These activities may appeal more to girls than boys, as boys tend to participate in more team sports and active play (Peral-Suárez et al., 2020). As such, this could be a probable source for the higher portion of SEL improvement in girls than in boys.

The study adds to the limited research on PA programs and their impact on SEC and introduces differences between girls and boys. There are several limitations that should be noted for this study. First, we used children's self-report to measure SEC. Even though the SECAs have been validated, the participants may not be able to respond to them accurately. Further, SEL is growing in popularity among schools nationally, and has increased from 2018-2021 (Schwartz et al., 2022). If children in this study received SEL instruction, that may have led to greater increases in SEC. Another limitation was that the sample size was relatively small and program attendance was not directly monitored by the researchers but only by the teachers implementing the program through Zoom. A direct monitoring of the program implementation may have led to more meaningful results and interpretation regarding a dose-response relationship between *Move 60!* participation and SEC.

The results of this study support that a virtual after-school PA program may improve SEC among 2nd-6th grade students. Further, girls may experience greater improvement in SEC by participating in a PA program. Another important finding is the effectiveness of a virtual PA program. This would help schools and students create programs and participate in PA without the challenges that in-person programs present. For example, securing facilities and staffing would not be as difficult because teachers or trainers could run the PA program from their own space at home or in a classroom. It is apparent that youth today are struggling with health problems. Childhood obesity remains high (Ogden et al., 2015) and the American Academy of Pediatrics declared a National Emergency in Child and Adolescent Mental Health (American Academy of Pediatrics, 2021). Youth do not meet daily aerobic PA guidelines and only 29% of children receive daily physical education (Center for Disease Control and Prevention, 2014). The physical, social, and emotional benefits that PA programs have for children are well

established (Goh et al., 2022; Whooten et al., 2018; Gu et al., 2016; Brown et al., 2012; Bonhauser et al., 2005; Ekeland et al., 2005). Lastly, the opportunity for children to be physically active at home, with their peers and teacher online, may provide similar benefits.

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Table 1. Student Social Emotional Competency Composite Score

Measure	Mean	SD	Δ	*d*	*t*	*p*
Pre for boys	33.59	8.37				
Pre for girls	32.50	7.40	1.09	.14	-.76	.45
Pre for all students	33.09	7.92				
Post for all students	34.56	8.32	1.47	.23	2.57	.01
Post-Pre (Δ) for boys	.73	.69				
Post-Pre (Δ) for girls	2.34	.92	1.61	-.25	1.41	.16

Note: SD = Standard deviation.

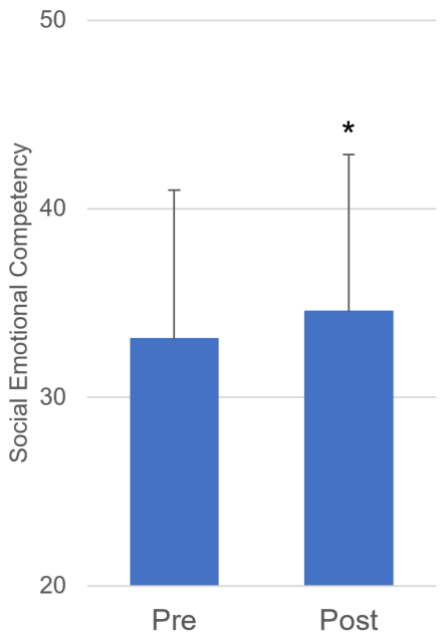

Figure 1. Student social emotional competency measures pre- and post *Move 60!*

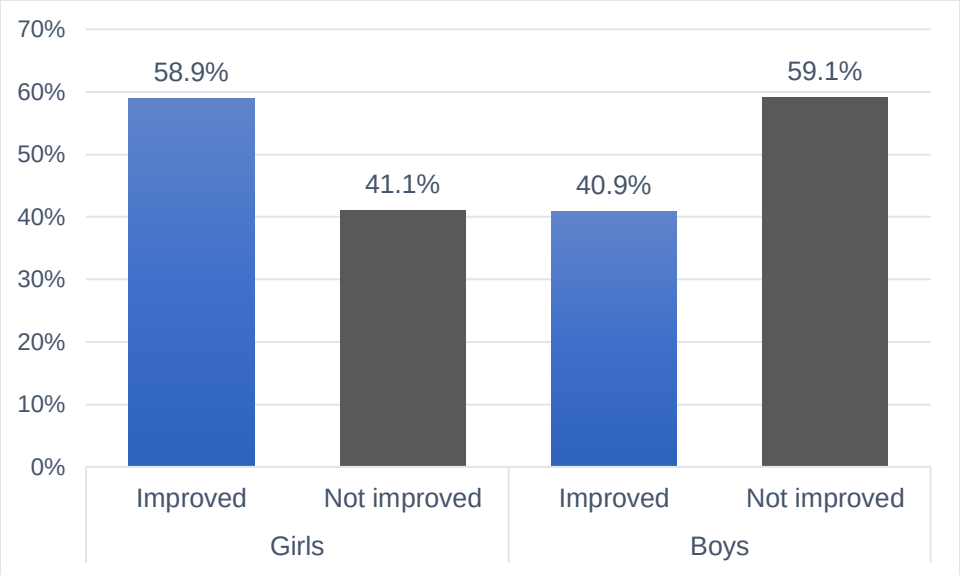

Figure 2. Percent of students whose social emotional competency composite score improved, $\chi^2 = 3.94$, $df = 1$, $p < 0.05$.

CHAPTER V: GENERAL DISCUSSION

The purpose of this study was to examine the impacts that *Move 60!* had on SEC among elementary school students. Students that participated in *Move 60!* improved SEC from pre to post, showing a small effect size (Cohen *d*= .23). This result aligned with previous research investigating the effects of PA programs on elementary aged children. Prior studies found improvements in SEC and social-emotional wellness among children that participated in before school PA programs (Goh et al., 2022; Whooten et al., 2018). Another similarity to previous research is that *Move 60!* does not specifically teach SEL but is used as a PA opportunity. The differences in the PA programs should be noted. *Move 60!* was offered as an online program for children four times per week and the physical activities were mostly self-sufficient with limited use of equipment. Previous research investigated in-person programs that met two to three times per week with a focus on exercise and playing sports/games (Goh et al., 2022; Whooten et al., 2018). Considering the effect size ($\eta_p 2$= .136) of similar study by Goh et al. (2022), there is limited evidence to suggest that offering different types of physical activities to children may help improve SEC.

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association between sex and improvement in the composite score, with about 60% of girls improving compared to about 40% of boys. This finding of uneven SEL improvement is unique and could potentially result from the nature of the activities offered in the online program. As described earlier, the activities offered through the online program were mainly self-sufficient ones such as jogging, jumping ropes, and yoga. These activities may appeal more to girls than boys, as boys tend to participate in more team sports and active play (Peral-Suárez et al., 2020). As such, this could be a probable source for the higher portion of SEL improvement in girls than in boys.

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CV

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Education

Master of Science in Education Old Dominion University, Norfolk, VA **Dec 2022 (pending)**
- Major: Physical Education
- Concentration: Curriculum and Instruction

Bachelor of Science Old Dominion University, Norfolk, VA **May 2008**
- Major: Physical Education
- Minor: Health Education

Teaching Experience and Certifications

- King's Fork High School **2022-present**
  - Health and Physical Education 9 Teacher
  - Advanced Physical Education Teacher
- Kilby Shores Elementary School, Suffolk, VA, Teacher **2015-2022**
  - HPE
- Hungary Creek Middle School, Glen Allen, VA, Teacher **2014-2015**
  - HPE
- Berkeley Middle School, Williamsburg, VA, Teacher **2009-2014**
  - HPE
- Certifications
  - National Fishing in the Schools Program: Cast a Fly, Catch a Student Curriculum
  - National Fishing in the Schools Program: Cast a Lure, Catch a Student Curriculum
  - National Archery in the Schools Program
  - First Aid/CPR/AED Instructor
  - First Aid/CPE/AED Adult and Child

Leadership Experience

- Suffolk Public Schools
  - Elementary HPE Member of the School Health Advisory Board
  - High School HPE Member of the School Health Advisory Board
- Kilby Shores Elementary School
  - PBIS Tier 2 Behavior Support Team Leader
  - School Leadership Team
  - Wellness Champion
- Berkeley Middle School
  - HPE Department Chair
  - Athletic Director
- Virginia Association for Health, Physical Education, Recreation, and Dance (VAHPERD)
  - Vice President of the Recreation Division (current)
  - Advocacy Committee Member (current)
  - Outdoor Education Department Chair (past)

Coaching and Related Experience

- Lakeland High School, Suffolk, VA, Coach **2016-2017**
  - Varsity and Junior Varsity Soccer
- Richmond Kickers, Richmond, VA, Coach **2014-2015**
  - U-9 Soccer coach

- Virginia Fishing Adventures, Richmond, VA, Camp Counselor **2013-2015**
    - 6–8-year-olds, 9–14-year old's Camp Counselor
- Jamestown High School, Williamsburg, VA, Coach
    - Boys JV Soccer Head Coach, Boys Varsity Soccer Assistant Coach **2010/2012**

Membership in Professional Associations

- Society of Health and Physical Educators (SHAPE) America
- Virginia Association for Health, Physical Education, Recreation, and Dance (VAHPERD)

Professional Presentations and Publications

- Kulp, A.J., & Zhu, X. (2022). Before school exercise effects on fitness and academic performance in schoolchildren: a retrospective case-controlled study. *Journal of Teaching in Physical Education, 41*(4), 738-743. https://doi.org/10.1123/jtpe.2021-0058
- Kulp, A.J. (2022). *The trek to improve children's health: Designing and implementing a school-wide physical activity program*. VAHPERD Conference.
- Kulp, A.J. (2021). *Putting the Es into elementary health*. VAHPERD Conference.
- Kulp, A.J. (2020). *The PE marketplace: Fresh ideas to teach nutrition and energy balance while moving.* VAHPERD Conference.
- Kulp, A.J., & Zhu, X. (2019). *Effects of before school exercise on fitness and academic performance.* SHAPE America Conference.
- Kulp, A.J. (2019). *The fishing tackle box: Fishing activities to improve health.* VAHPERD Conference.

Honors and Awards

- Suffolk Public Schools Superintendent Star Award Nominee 2018
- Suffolk Public Schools Superintendent Star Award Nominee 2016
- Kilby Shores Elementary School Teacher of the Year 2016-2017
- Berkeley Middle School Teacher of the Year Nominee 2014
- Varsity Soccer: Old Dominion University 2004-2007
    - Old Dominion University Athletic Department Sportsmanship Award 2007
    - NCAA National Leadership Conference Nominee
    - Elected captain by teammates and coaches' senior year