

8-20-2024

## Teacher Implementation Profiles: A Response to Top-Down Mandate of Movement Integration

Zack Beddoes  
*Brigham Young University*

Jeanne Barcelona  
*Wayne State University, jeanne.barcelona@wayne.edu*

Darla Castelli  
*Northeastern University*

Follow this and additional works at: <https://scholarworks.boisestate.edu/ijpah>



Part of the [Elementary Education Commons](#), [Exercise Science Commons](#), [Health and Physical Education Commons](#), [Public Health Commons](#), [Sports Studies Commons](#), and the [Teacher Education and Professional Development Commons](#)

---

### Recommended Citation

Beddoes, Zack; Barcelona, Jeanne; and Castelli, Darla (2024) "Teacher Implementation Profiles: A Response to Top-Down Mandate of Movement Integration," *International Journal of Physical Activity and Health*: Vol. 3: Iss. 2, Article 7.

DOI: <https://doi.org/10.18122/ijpah.3.2.7.boisestate>

Available at: <https://scholarworks.boisestate.edu/ijpah/vol3/iss2/7>

---

## Teacher Implementation Profiles: A Response to Top-Down Mandate of Movement Integration

### Abstract

This study examined teacher implementation practices to meet a state mandate requiring 135 minutes of student physical activity (PA) weekly. Teachers were required to implement a video-based movement integration (MI) program. Using an embedded mixed-methods design, provider characteristics of 42 teachers and the organizational capacity of six schools were developed from interviews, surveys, observations, and artifacts. Data analysis revealed three teacher profiles (a) *Dynamic Experientialists*, (b) *Coachable Constructivists*, and (c) *Cautious Behaviorists*, and three school profiles (a) *Whole Child Approach*, (b) *Grade Level Champions*, and (c) *Back to Basics*. Findings suggest that school, teacher, and student factors affect MI implementation.

# Teacher Implementation Profiles: A Response to Top-Down Mandate of Movement Integration

**Zack Beddoes**  
Brigham Young University

**Jeanne Barcelona**  
Wayne State University

**Darla Castelli**  
Northeastern University

This study examined teacher implementation practices to meet a state mandate requiring 135 minutes of student physical activity (PA) weekly. Teachers were required to implement a video-based movement integration (MI) program. Using an embedded mixed-methods design, provider characteristics of 42 teachers and the organizational capacity of six schools were developed from interviews, surveys, observations, and artifacts. Data analysis revealed three teacher profiles: (a) *Dynamic Experientialists*, (b) *Coachable Constructivists*, and (c) *Cautious Behaviorists*. There were also three school profiles: (a) *Whole Child Approach*, (b) *Grade Level Champions*, and (c) *Back to Basics*. Findings suggest that school, teacher, and student factors affect MI implementation.

**Keywords:** classroom physical activity; class climate

## Introduction

Over the last several decades, educational priorities at the policy level have shifted from science, technology, engineering, and math (STEM) to holistic approaches that acknowledge the need to support physical, mental, and cognitive development in children. Prompted by progressive collaborations between education and health sectors, this swing was influenced by evidence across multiple domains highlighting the importance of a mind and body connection. In a longitudinal cohort of Canadian 5<sup>th</sup> grade students, a latent profile analysis concluded that early life physical activity (PA) shapes physical literacy and health trajectories (Brown et al., 2020). Students in the schools offering the fewest PA opportunities had the lowest PA participation, enjoyment, motor competence, and confidence. This finding confirms that schools are an ideal place to address concerns surrounding physical inactivity by providing students with opportunities to accumulate at least half of the recommended daily 60 minutes of moderate to vigorous PA ([MVPA]; Piercy et al., 2018).

Movement integration (MI) involves infusing PA into regular classroom activities and has generally been positively perceived by teachers;

however, they face several challenges related to time, resources, and connectedness with the daily routine (Webster et al., 2015, 2017, 2020). Globally, teachers who encounter increased academic pressures, such as standardized testing, are significantly less likely to implement the program as intended or even attempt to offer MI (Lomsdal et al., 2022a, 2022b). Increased academic pressure and implementation of novel MI require new teacher competencies.

In the United States, the education system has accepted the potential benefits of providing youth with ample opportunities to engage in PA across the school day. However, classroom teachers have yet to unilaterally embrace the implementation of MI. Teachers have reported being overwhelmed by perceived barriers of time, space, and a lack of training (Goh et al., 2013, 2017a). Research has also indicated that teachers' self-efficacy toward classroom PA significantly influences their level of implementation (Sum et al., 2018). Teachers have likewise noted beliefs that classroom PA may diminish their ability to manage student behavior (Schmidt et al., 2017), lead to burnout (Gillet et al., 2022), and potentially reduce classroom climate (Webster et al., 2017, 2020). Ironically, implementing MI can improve student behaviors in the classroom and increase time on task related to academic learning time (Bartholomew et al., 2018; Carlson et al., 2013; Watson et al., 2017). Furthermore, when PA is effectively implemented, negative class climate perceptions are related to friction (lack of cohesion) and screen time, not MI or PA (Efsthathiou et al., 2016). While classroom PA may be endorsed systemically, the

---

Beddoes is with Brigham Young University, Provo, UT, USA. Barcelona is with Wayne State University, Detroit, MI, USA. Castelli is with Northeastern University, Boston, MA, USA. Barcelona ([jeanne.barcelona@wayne.edu](mailto:jeanne.barcelona@wayne.edu)) is corresponding author.

implementation and sustained use rely heavily on school and teacher practices.

## Conceptual Frameworks

Evidence suggests that physical inactivity, obesity, and type II diabetes may be inversely related to academic success (Janssen & LeBlanc, 2010). Comprehensive health approaches in schools are recommended because, when implemented as intended, they can simultaneously address both health and educational outcomes. As such, this study was grounded in the Whole School, Whole Community, Whole Child Model (WSCC), an adaptation of the Social Ecological Framework.

The WSCC Model considers the dynamic interplay of interpersonal, community, and organizational factors as they relate to student level factors (Bronfenbrenner, 1994; Lewallen et al., 2015) and those connected with implementation (Durlak & DuPre, 2008). Additionally, it provides a roadmap that educators may use to adopt a holistic approach to the development of the child, prioritizing mental, social, and physiological health components. While the model comprehensively defines multiple dimensions of health that should be addressed when cultivating a health-based school environment, it explicitly names PA during the school day as one of the ten essential components of a holistic environment. This is important, especially because there is evidence that classroom-based MI increases daily PA (Daly-Smith et al., 2020).

In addition to the WSCC model, this study was also informed by educational learning theories. Specifically, the experiential learning theory posits that individuals learn best through hands-on experiences and reflection that provide opportunities to gain knowledge through direct engagement with activities (Kolb et al., 2014). The concept of constructivism suggests that learners build their understanding through exploration and interaction and that learning is an ongoing process that is often challenged and refined as new knowledge is gained (Bada & Olusegun, 2015; Hein, 1991). Finally, behavioral learning theory takes the prospective that learning is a passive process driven by the teacher who provides reinforcement and practice and uses rewards and consequences to shape and modify behavior (Huit & Hummel, 2006). Taken collectively, there are broad and diverse educational philosophies that frame how teachers may approach their classroom based instructional approaches.

## Teachers and Physical Activity in the Classroom

A review of 2929 publications investigating the cognitive benefits of classroom-based MI concluded that PA and active learning increased daily PA and student time on academic tasks (Daly-Smith et al., 2018). Integrating bodily

movement into the classroom can no longer be relegated to early childhood education. There are too many programs to name, but the *Active and Healthy Kids Program* (Schmidt et al., 2022) and *Active Classrooms* (Martin & Murtagh, 2015) are both focused on integrating PA and have been well received by students and teachers alike and cost-effectively increased student PA and academic performance by creating a positive class climate and increasing student time on task.

Class climate and student participation are known facilitators of offering PA in the classroom (Efsthathiou et al., 2016; McMullen et al., 2014). Class climate represents the nature of interpersonal relationships among children and between the teacher and the students (Fraser & Fisher, 1982; Loukas et al., 2006). When teachers perceive the inclusion of classroom PA to negatively impact class climate (i.e., increased management issues, inability to maintain control, disconnect between PA and academic tasks; McMullen et al., 2014), they are less likely to implement PA in the classrooms.

Though there is growing evidence that classroom PA integration may increase on-task behavior and daily PA accumulation for students (Daly-Smith et al., 2018; Goh et al., 2017b; Martin & Murtagh, 2015), little is known about how teachers implement MI and integrate the PA opportunities into daily routines (Russ et al., 2017). To help fill this knowledge gap, Webster and colleagues (2015) recommend that researchers use narrative inquiry to examine how classroom teachers integrate PA. The limited empirical data and measurable outcomes of PA in a classroom make defining specific, evidence-based recommendations challenging. Moreover, it needs to be clarified how teachers implement PA programming designated to meet the state-mandated specified number of minutes of PA as top-down legislation. This study aimed to examine the implementation practices of elementary school teachers to meet a state mandate requiring 135 minutes of student PA across the entire school day each week by implementing the GoNoodle™ video-based MI program. Further, using an embedded mixed method design, this study sought to identify factors contributing to MI implementation through narrative, deductively derived profiles. Embedded mixed methods designs are an implementation science approach employed to determine the acceptability of novel interventions (Teddlie & Tashakkori, 2003). Quantitative data (e.g., accelerometry data, school report cards, and surveys) are used to corroborate the findings in the qualitative methodology of interviews to increase the overall validity. The following research questions were explored in this study:

1. To what extent does teacher-selected MI type and intensity align with student engagement in physical activity?
2. What teacher and classroom characteristics contribute to teacher MI implementation, classroom

climate, and student PA patterns in elementary schools?

3. What school level characteristics may contribute to the implementation of MI?

## Methodology

This study was performed in elementary classrooms and not physical education. The mixed-method study collected school, teacher, and student-level data to develop teacher and school profiles representing the variations in MI implementation. As mandated by the school districts, study procedures were only executed once the Institutional Review Board, school district administrators, teachers, and parents granted written, active consent. All students participated in the MI, but only 42% of parents/students consented/assented to research participation. All study-related activities were collected before the school closures due to the COVID-19 pandemic.

All teachers housed at the participating school sites were provided professional development focused on the benefits and strategies for implementing classroom PA. Through an interactive tutorial, teachers were trained to integrate GoNoodle™, a virtual PA resource. At the end of the professional development, teachers were recruited to participate in the research. Consenting teachers agreed to track their weekly usage of GoNoodle™, complete surveys, participate in interviews, and allow a series of classroom observations and student data collection.

## Participants

Purposeful sampling (Patton, 2002) was used to recruit teacher and student participants from six schools across two school districts in an urban, minority-majority region of the United States. Both school districts required teachers to use GoNoodle™ as the primary means for meeting the 135 minutes of weekly PA state mandate for K-6 students. District A served 81,000 students, female (48%), Hispanic (56%), Caucasian (28%), African American (7%), and other (9%). District B served 48,500 students, female (48%), Hispanic (30%), Caucasian (40%), Asian (16%), more than two races (5%), and other (9%). Three schools from each school district agreed to participate, resulting in 42 teachers and 420 students. Teaching experience ranged from 1-28 years ( $M = 9.06$ ;  $SD = 6.79$ ).

## Data Sources and Data Collection

Five data sources were used to create teacher and school profiles: accelerometers, one survey, teaching artifacts for

reporting the fidelity of the classroom PA sessions, teacher interviews, and the school report card.

### *Accelerometers*

Because meeting the weekly PA mandate was the stated goal, all students wore Actigraph GXT3 accelerometers on their right hip on the observation days. Each class was observed a minimum and up to between 5-7 times over the school year. The accelerometers were initialized to collect epochs every 5-seconds for the activity time to objectively measure the class aggregated intensity and duration of PA participation. Students who did not grant permission for research participation wore uninitialized accelerometers that did not store data to protect the identity of those students not assenting to be in the study. A continuous measure of movement was secured.

### *My Class Inventory (MCI)*

Knowing that class climate could influence the rate of PA participation, the My Class Inventory (MCI) (Loukas et al., 2006) was utilized in this study. The MCI is a four-subscale, 20-item assessment of class climate. In this research study, the class climate was operationally defined as the interpersonal relationships between teacher-student and student-student in a classroom setting. Because the tool is age-appropriate for PreK through adulthood, it captured teacher and child perceptions of class climate. The subscales on the inventory included questions focused on cohesion (e.g., “All students in this class get along”), friction (e.g., “Students in this class always fight”), competition (e.g., “Students in this class race to see who can finish first), and overall satisfaction (e.g., “This class is fun”). The estimates of scale reliability were acceptable, with a range of 0.73 to 0.88 across the subscales, and 5-point Likert foils, representing adequate internal consistency (Fraser & Fisher, 1982). A sum score was calculated for each participant for use in the analysis.

### *Observations*

The research team performed systematic and informal observations to understand teacher instructional practices before, during, and after PA sessions (on data collection days) and non-data collection days. More than 80 formal observations were performed, recorded as field notes, and interpreted through weekly research team debriefing, thoughtful commentary, and ongoing evaluation coding (Patton, 2002; Sekayi & Strong, 2017). Artifacts were gathered at each observation, including the fidelity of treatment teacher reports, classroom prompts, any posted PA guidelines or rules, and teacher plans. Artifacts, including fidelity logs, were coded, categorically organized, and integrated into themes and other observational data

sources. Direct observation criteria included modes of GoNoodle™ PA videos used, frequency of MI, teacher engagement in the activity and classroom management practices.

### ***Teacher Formal and Informal Interviews***

Using a semi-structured interview protocol, the teachers were interviewed during the fall of the first year of data collection. Questions focused on how, when, and why MI was integrated into the classroom lessons and the observed benefits or limitations of MI integration; and the facilitators/inhibitors of integration. The teachers were asked about the factors affecting the implementation process. Seven participants declined to be interviewed or could not commit to a scheduled interview time. Interviews lasted approximately 60 minutes. Interviews were audio-recorded, transcribed verbatim, and returned to the teachers for member checking when they could revise their comments. Follow-up informal teacher interviews were conducted during formal observations, and fidelity visits, asking questions like, “How did you think the MI went today? Is there anything that you might do differently?”

### ***School Report Card***

Publicly available school report cards issued by the Texas Education Agency were used as the primary measure of school enrollment; student demographics and academic performance by grade level; financial information; teacher and leadership demographics, credentials, and attendance; and performance index reflecting the overall accountability rating (e.g., Met Standard, Improvement Required, Not Rated). These data were used for the school profiles.

### **Data Analysis**

Data analysis was ongoing by examining weekly teacher reports of implementation and usage of GoNoodle™. Survey data were reduced to sum scores for each participant. Missing data and outliers were addressed using machine learning techniques. Normality was confirmed by acceptable skewness, kurtosis, and boxplot displays. Using the Actilife software, accelerometer data were wear-time validated and used as continuous variables and as cutpoints to determine PA intensity and duration (Evenson et al., 2008). Paired sample *t*-tests (beginning of school year/end of school year for the teacher group and the student group) and analysis of variance (ANOVA) were used to compare teacher and student survey and PA data by class, grade level, and school.

To build teacher and school profiles, the research team utilized grounded theory and deductive analysis to explore the patterns of each variable by student, teacher, and school (Corbin & Strauss, 2015). Interviews and artifacts were open coded to identify critical points and axial coded as a constant

comparative method of exploring interrelationships among quantitative and qualitative data points and organizing them into representative profiles (Sekayi & Strong, 2017). Research team debriefing sessions and peer audits were used to confirm the consistency of a teacher being placed into a profile which sometimes resulted in the recategorization of the teacher. Trustworthiness was confirmed through multiple data sources from teachers and students and enhanced through member checks by returning interview transcriptions for review (Merriam & Grenier, 2019). Further, data were inherently triangulated through the utilization of a rigorous mixed-method approach capturing multiple data points across student, teacher and school levels.

## **Results**

Descriptive statistics were used to answer research question 1 investigating the role of MI session type and intensity as well as student engagement by type and intensity. Teachers’ weekly usage reports identified that the number of MI sessions provided ranged from zero to 15 times per week, with 36% of the teachers offering predominantly high-intensity GoNoodle™ videos that included dancing, jogging, and jumping activities and 18% using yoga-based videos for MI. ANOVA calculations revealed that accelerometry data differed significantly by teacher,  $F(1, 375) = 298.53, p < .0001$ . Not accounting for PA beyond that provided by GoNoodle™ in the classroom, 57% of the teachers provided an average of more than 135 minutes per week, thus meeting the state mandate.

When high-intensity videos were viewed, the students had significantly higher MVPA (42% of the MI time was moderate to vigorous intensity) than low-intensity videos (7% of the MI time was moderate to very vigorous intensity). The accumulative result of adding PA minutes from physical education and recess is unknown and beyond the scope of this study.

Descriptive statistics were also used to investigate perceptions of class climate (MCI) at the student and teacher level. Paired sample *t*-tests confirmed no significant difference between the teacher (beginning of the year and end of the year) and child (beginning of the year to end of the year) perceptions of the classroom climate. Further the correlations between teacher and child climate scores were significant ( $r = 0.31, p < 0.01$ ) but weak, suggesting congruence between how the teachers and children perceived the classroom climate. ANOVA revealed no grade-level differences among climate scales when controlling for sample size in each grade, thus confirming that teachers and students similarly perceived class climate.

## Teacher Profiles

All classroom level variables were used to collectively address research question 2, including student MI engagement, classroom climate, teacher interviews and observations were synthesized to establish commonalities and differences across teacher MI implementation. Three teacher profiles emerged *Dynamic Experientialists* ( $n = 9$ ), *Coachable Constructivists* ( $n = 28$ ), and *Cautious Behaviorists* ( $n = 3$ ) (Table 1), embodying the distinct implementation strategies. Notably, the cluster of school, teacher, and student factors distinguished the profiles through student physical activity, class climate, perceived benefits of MI, classroom norms, and MI-specific pedagogy were teacher factors affecting the implementation of MI.

### *Dynamic Experientialists*

Experiential learning focuses on student engagement and actively involves students in their learning process (Kolb, 2014). Energetic and frequent MI experiences characterized the *Dynamic Experientialists* who provided children with daily opportunities to engage in various MI, including high-intensity (e.g., dancing, jogging, hopping) and low-intensity activities (e.g., yoga, stretching, mindfulness). Teachers ( $M = 77.70$ ,  $SD = 9.51$ ) and students ( $M = 77.81$ ,  $SD = 10.76$ ) under this profile also exhibited positive and congruent perceptions of class climate. Further, *Dynamic Experientialists* had students with significantly more time engaged in MVPA than students in the other two profiles,  $F(2, 375) = 20.52$ ,  $p < .0001$ .

Field notes, observations, and artifacts (fidelity reports) suggested that *Dynamic Experientialists* implemented MI based on their appreciation for the benefits of movement, their ongoing assessment of the classroom, and their sense of what their students need at any given moment. A third-grade teacher with 13 years of experience explained,

It's [MI] one of those things we are always thinking and talking about like, 'why are we doing it?' I have a lot of conversations where I verbalize the why, like, 'hey, I noticed that we've gotten wiggly so let's do a yoga pose and really focus so we can move on from there.' Sometimes I say, 'hey we need to get up and energize, and then I'll have one of the kids pick a video like dancing or jumping' (Teacher 2, School 1).

Notably, several *Dynamic Experientialists* explained their commitment to differentiating their pedagogical approaches to accommodate varied learning styles. As succinctly stated, "we know kids learn differently. They need to use their bodies, and I learned before about crossing the midline and how important it is" (Teacher 3, School 3). Another teacher also spoke about their pedagogical approach related to learning styles,

One of the things I really try to do is reach all learners with all learning styles and we know that kinetic and aesthetic is a huge one for kids so I think in addition to taking class time to energize or calm down or whatever, we are expected to incorporate a lot of movement [sic] in our classroom, like ok, we're working on a math problem at our desk, now we're gonna come to the carpet and your gonna touch five tables on the way, high five your partner, do 10 jumping jacks then sit down, so there's a lot of that and it's constant. I mean if I think of specific MI with GoNoodle™, it's maybe 4 or 5 a day, but if I think about how we use movement throughout the day, it happens all the time (Teacher 1, School 2).

Observations revealed that *Dynamic Experientialists* exhibited a well-communicated and effective management style that provided consistent routine and structure. Teachers in this profile tracked student progress in multiple learning domains, provided ongoing feedback, and held their students to high expectations. Observations also suggested that *Dynamic Experientialists* purposefully arranged their classroom environment, ensuring adequate spacing to accommodate MI. *Dynamic Experientialists* were comfortable and willing to be active participants in classroom MI activities. One teacher suggested that MI benefits them personally, "One thing for me is like, I've noticed, I need the movement, I love getting up" (Teacher 1, School 4).

While *Dynamic Experientialists* sometimes participated with their students, they also empowered them to select and lead classroom PA breaks across the day. Student modeling was commonly observed in the classrooms of *Dynamic Experientialists*. One teacher also noted a unique strategy, "Well, and I do it (MI) with the kids, and I purposefully make mistakes and will be like WHOOH! We are practicing this one tomorrow because I can't keep up with all the moves. It helps them (students) participate" (Teacher 2, School 2). In sum, *Dynamic Experientialists* sought to build a classroom environment to support student success by nurturing their physiological, mental, and cognitive needs.

### *Coachable Constructivists*

Constructivists are lifelong learners who continually build and refine their lived truth to ensure that it always reflects the new information they gain. In the current study, teachers classified as *Coachable Constructivists* represented the highest proportion of teachers ( $n = 28$ ). They shared stories reflective of their learning journeys and willingness to try new pedagogical strategies, especially those related to integrating MI. Teachers in this profile utilized MI videos multiple times per week and sometimes daily, yet the involvement of these teachers in PA was inconsistent and not as strategically planned as the *Dynamic Experientialists*.

A heavier emphasis was also placed on low-intensity MI activities (e.g., artifacts, teacher fidelity reports, accelerometer data). Surveys suggested that the teachers in this profile ( $M = 74.13$ ,  $SD = 8.17$ ) and their students ( $M = 67.94$ ;  $SD = 14.59$ ) perceived a moderately positive class climate significantly lower than the children in *Dynamic Experientialist's* classrooms.

Even though these teachers demonstrated active classrooms, in the interviews, most admitted initial apprehension with the idea of children “exercising” in class. One first-grade teacher in her third year expressed her initial reluctance to implement MI, stating,

“When I first saw [the MI videos], [...] I didn't use it because I was too scared. I thought, ‘this is going to make my class even crazier [loud voice inflection]! I do not need this! They are already crazy enough!’ But I started using it, and then I just realized it just had the opposite effect. It just made them calmer, more focused, and ready to take on the next learning task” (Teacher 3, School 3).

As this quote suggests, despite the initial apprehension that MI would make the classroom more chaotic, teachers were learning through their experiences that the MI videos may enhance the learning environment.

Another aspect of the *Coachable Constructivists'* journey was the inconsistent implementation of MI, as indicated by artifacts and teacher fidelity reports, and the emphasis on low-intensity MI activities confirmed by the accelerometry data. One teacher explained,

I started by using the calming ones [MI videos]. I've been trying to do them before we read or write because it calms them down and makes them think... I have been trying to [use the MI videos to] celebrate when there is something that is really great that happened or that they've [students] done really well and they really like that” (Teacher 12, School 1).

This teacher and other interviewees suggest that gradually over time, and through their experiences with MI, the *Coachable Constructivists* are learning and trying out different types of MI to establish a practical, responsive approach to the needs of students. Another *Coachable Constructivists* commented on their learning journey about implementation, stating,

It depends on my kids and what they need,... in the morning, they usually need something that's get up and moving. In the afternoons, at least so far, what I've noticed we need something that's a little more calming. So, what I am learning is it all depends on the time of day and what I see they are needing at the time (Teacher 2, School 3).

Collectively, teacher interviews and artifacts revealed that *Coachable Constructivists* were willing to engage in a reflective journey to learn how to effectively implement classroom PA in a way that was responsive to their students'

needs. The teacher statements represented a general pattern for implementing PA in the classroom among many ( $n = 28$ ) teachers in this study. *Coachable Constructivists* preferred to engage children in yoga, stretching, mindfulness, and other calming activities (artifacts; teacher fidelity reports). These teachers occasionally utilized the higher intensity videos; however, interview data confirmed a general apprehension for introducing any activity that would cause the children to “not come back” to engage in academic tasks. When higher intensity activities were utilized, they were typically immediately preceding recess, at the end of the school day, or sporadically in the morning when teachers felt students were tired. Notably, three teachers specifically stated that the end of the school day was the ideal time to use the higher intensity videos so that after the activity was over, the teacher could “send [students] home happy” rather than calm the children back down.

Observations revealed that while *Coachable Constructivists* offered MI, they were not assertive in managing student behaviors. Though students appeared to be *busy, happy, and good* (Placek, 1983, p. 49), they were often grouped near the projector screen, where children bumped into one another while participating and were left to take the initiative regarding the degree to which they would engage. For example, one student complained during an observation because they could not see. The teacher replied, “If you cannot see, you just need to move up front” (Teacher 4, School 5).

These results collectively suggest that *Coachable Constructivists* were knowledgeable and receptive to MI but had not yet identified pedagogical and managerial strategies to maximize their approach. MI was not part of their daily routine and was sometimes left up to a grade-level champion to integrate. This is an important finding because this profile contained the largest proportion of teachers.

### ***Cautious Behaviorists***

The behaviorist perspective suggests that students will be reactive to learning opportunities presented to them instead of taking an active role in their learning process. Teachers that take a behaviorist approach offer instruction and learning opportunities that are more teacher-directed and minimally student-centered. In the current study, teachers who took this more traditional approach did not implement MI with fidelity, as evidenced by teacher reports and site visits. According to the survey data, teachers ( $M = 53.10$ ;  $SD = 5.06$ ) and children ( $M = 61.43$ ;  $SD = 17.22$ ) perceived a low-class climate, with teachers reporting a less positive class climate than children in their classes. Though not significant  $F(1, 28) = 20.17$ ,  $p = 0.059$ , this may be attributable to the low sample size for *Cautious Behaviorists* ( $n = 3$ ).

When *Cautious Behaviorists* attempted to implement MI, they favored stretching, yoga, or meditation videos



over higher intensity activities like jogging in place, as reported on the fidelity sheet and confirmed by accelerometry data. Interviews provided further context suggesting that *Cautious Behaviorists'* MI implementation was centered on management and using MI to “fill time” rather than identifying movement as an essential aspect of the learning environment. One teacher explained, “I kind of use it [MI] as a reward sometimes or ... we have an extra minute, so let’s get some jitters out or whatever (Teacher 1, School 6). Another teacher shared a similar sentiment explaining, “You want them [students] to be excited about reading or writing, so I just tell them [students] if you work hard, then you get to play hard and if you continue to do a good job with your lessons then maybe eventually I can increase the number of those [MI] breaks [I let the students pick the video]” (Teacher 3, School 5).

Teacher interviews also indicated that *Cautious Behaviorists* felt more comfortable offering low-intensity

PA breaks because of apprehensions about classroom management. “I was kind of nervous to try to use it...like what is this thing? Are kids going to be able to settle down after it? Is it going to ramp them up so much that they are not able to continue their day” (Teacher 14, School 2). One teacher further noted they were apprehensive about using higher intensity MI videos for fear that they would “lose control” of students. They stated,

“Sometimes you can’t do the highest paced, like the highest impact stuff. It’s great cuz they’re like squatting, and you know doing all the like, the music is like fast, but they have a hard time coming back down from the high and being able to focus. So, I’ve searched and found more of the like, reflection, talking about what your body is doing, and that gets them moving and stop thinking about school and then they are able to come back down from that . . . even though they like the dancing ones, I struggle with calming them down...” (Teacher 2, School 6).

**Table 1** Teacher Profiles, Data Sources, and Implementation Factors

Profile Name (n = 33) 7 declined	# MI opportunities	Type of PA video	MVPA % time	Student Class Climate (M ± SD)	Teachers Class Climate (M ± SD)	Teacher Planning, Pedagogy, & Implementation Factors	Researcher Observations
<b>Dynamic Experientialists</b> (n = 7); 1 declined	1+ /day	Dancing, jogging, jumping, stretching, mindfulness	36%	77.81 ± 10.76	77.7 ± 9.5	Variety of PA types dependent on student learning needs. MI as pedagogical strategy. Routines that integrate MI.	Adequate spacing; planned; teacher participated; students modeled; tracked progress; high expectations; integrated into daily routine.
<b>Coachable Constructivists</b> (n = 23); 5 declined	3-5 /week	Stretching, calming, mindfulness, dancing	20%	67.94 ± 14.59	74.1 ± 8.17	Planned integration for morning calming & afternoon energy boost.	Most student participated; no teacher participation; poor spacing; sometimes student-led
<b>Cautious Behaviorists</b> (n = 3); 1 declined	0-1 /week	Low intensity when teacher selected; high intensity when student choice	27%	61.43 ± 17.22	53.1 ± 5.0	End of the week reward only	Low organization; free play expectation; reward structure – reinforcing behaviors during the week
<b>Data Sources</b>	<b>Teacher Weekly EMA</b>	<b>Teacher Weekly EMA</b>	<b>Actigraph GXT3 (waist)</b>	<b>MCI Survey</b>	<b>MCI Survey</b>	<b>Teacher Interview</b>	<b>Observations &amp; Informal Interviews</b>

**Note:** EMA = Ecological Momentary Assessments; MVPA = Moderate to Vigorous Physical Activity; M = Mean; SD = Standard Deviation; MCI = Teachers’ My Class Inventory

Observations revealed that *Cautious Behaviorists* struggled to organize and arrange students when implementing MI effectively. For example, in two classrooms, students were placed in a large group right in

front of the projector screen and bumped into one another while participating. In another classroom, students stayed at their desks with no direction or modeling from their teacher on how to engage in the MI activity. *Cautious*

*Behaviorists* relied on their peers to champion MI. When the teacher was asked how to describe how they implemented MI, they replied, “I just tell my kids to stand up and play along with the video...Um, that’s about it” (Teacher 1, School 5). Space was perceived as a barrier too challenging to plan for or overcome.

## School Profiles

This study included six different schools, to purposefully consider how accessibility may be linked to school report card data, school demographics, and student performance, as suggested in the third research question. This approach allowed the researchers to consider more than just analytic socio-economic factors (e.g., resources, expenditures per student).

Three school profiles emerged from these data (a) *Whole Child Approach*, (b) *Grade Level Champions*, and (c) *Back to Basics*, suggesting that school context may affect implementation (Table 2). The findings are reported as deduced narrative profiles because teachers and students are nested within schools. Although all teachers at all schools were expected to implement MI to meet the state mandate for weekly PA minutes, 43% of the teachers did not consistently meet this goal. Student engagement, climate, organizational norms, grade level,

administrator leadership, and shared vision were school factors affecting the implementation of MI.

There were differences in teacher and student class climate perceptions by school, with *Whole Child Approach* schools having the most positive reported climate and *Back to Basics* having the lowest perceived positivity by teachers and students alike (see Table 2). The number of MI opportunities per week and total minutes had a similar trajectory as climate. Surprisingly, however, PA intensity did not follow this pattern. Although *Whole Child Approach* schools did have the highest MVPA, the second highest was among the *Back to Basics* schools. This finding may be attributed to the prevalence of student choice as part of the rewards system and the limited number of participants at these schools.

According to the school report cards, all schools included in this study met the state-level performance standards; however, two schools were purposefully included in this study because these schools previously had a *Needs Improvement* rating on the school report card. Collectively, the data sources suggested that grade-level leaders and active administrators with a shared vision helped facilitate implementation; in comparison, an overcrowded curriculum and competing priorities (e.g., focus on Improvement Required and standardized testing) inhibited MI implementation.

**Table 2** School Profiles, Data Sources, and Implementation Factors

School Characteristics			Teachers					Students	
ID (Size) District	Performance Index (Distinctions) Free Lunch %	School Profile	N	MCI	Student PA mins/wk	Interviews	Teacher Profiles	N	MCI
1 (362) District -B	Met Standard (1) Free lunch – 68%	Grade Level Champions	13	79.25 ±6.50	Mins by grade level	Team planning & integration	All	104	75.88 ±13.85
2 (803) District -B	Met Standard (4) Free lunch – 21%	Whole Child Approach	10	77.70 ± 4.13	> 135 mins	Whole of School Approach	Coachable Constructivists & Dynamic Experientialists	110	74.75 ± 11.70
3 (507) District -A	Met Standard (0) Free lunch – 75%	Grade Level Champions	4	74.29 ±7.96	Mins by class	Supportive administration	Coachable Constructivists & Dynamic Experientialists	38	75.32 ± 9.54
4 (401) District - A	Met Standard (3) Free lunch – 31%	Whole Child Approach	3	76.00 ±5.24	> 135 mins	Whole of School Approach	Dynamic Experientialists	28	77.25 ±11.14
5 (635) District - B	Met Standard (1 – closing gap) <sup>a</sup> Free lunch – 46%	Back to Basics	4	66.75 ±13.51	< 135 mins	Testing pressure	Coachable Constructivists & Cautious Behaviorists	28	71.04 ±13.33

6 (442) District - A	Met Standard (1 – closing gap) <sup>a</sup> Free lunch – 31%	Back to Basics	8	62.17 ±7.31	< 135 mins	Testing pressure	Coachable Constructivists & Cautious Behaviorists	11 2	67.87 ±16. 05
----------------------------	--	-------------------	---	----------------	---------------	------------------	---	---------	---------------------

**Note:** Mins = minutes; wk = week; MCI = My Class Inventory (which was completed by the teachers and the students);

<sup>a</sup> Closing gap denotes that the school had a rating of Improvement Required in the previous academic year and has now Met Stand

## Discussion

This study was unique because of its focus on school, teacher, and student factors affecting the implementation of an MI program intended to meet a state mandate. Previous research has not included all of these levels, has been limited to facilitators and inhibitors of implementation, and has not included objective measurement of PA duration and intensity. All teachers reported that the GoNoodle™ package of developmentally appropriate videos was easy to use, thereby overcoming barriers related to access and limited resources mentioned in previous research and advancing our understanding of MI implementation (Michael et al., 2019; Webster et al., 2020).

Three school and three teacher profiles of MI implementation emerged as derived deductively from multiple quantitative and qualitative data sources. A student with a *Dynamic Experientialist* teacher attending a *Whole Child Approach* school appears to be more likely to reap MI benefits (e.g., greater time on task, teachers implementing MI based on student needs). These students experience patterns of MI integrated into the school curriculum and part of the daily class routines. They also tend to experience positive behavioral and academic expectations and a generally positive class climate.

Teachers who effectively implemented MI approached this challenge like all others. Similar to other studies (Stylianou et al., 2016), these teachers demonstrated common strategies for managing and directing PA congruent with how they managed other activities. For *Dynamic Experientialists*, MI was considered an important element of the daily experience. *Dynamic Experientialists* demonstrate that MI implementation is plausible while attending to academic, climate, and health concerns across the school day.

*Coachable Constructivists* are learning and growing with their students but are not there yet. Contextual school factors (e.g., teacher or administrator leadership) and teacher characteristics (e.g., strength-based management of student behaviors) must be considered when implementing new MI opportunities or curricula. To varying degrees, and consistent with previous research (McMullen et al., 2014), participants admitted initial (and in a few cases continuing)

reluctances to incorporate classroom activities where children were running, jumping, or otherwise “chaotic” for fear of both management issues as well as a delayed return to academic content. These findings suggest that the initial hesitancy to fully embrace the implementation of MI as part of the daily learning experiences may be modifiable, as nine teachers in this study did so.

## Factors Affecting the Implementation of MI

Although causal and associate relationships of critical factors were not examined because of a lack of statistical power, seemingly interactive factors produced full and partial MI implementation. Student physical activity participation, class climate, perceived benefits of MI, classroom norms, and MI-specific pedagogy were factors affecting teacher implementation. On the school level, student engagement, climate, organizational norms, grade level, teacher/administrator leadership, and shared vision were school factors affecting the implementation of MI.

### *Class Climate*

Elementary school students and their teachers are together for most of a six-hour day.

The influence of classroom climate in this study has relevance to implementing the WSCC model because the model emphasizes the social and emotional climate in schools and classrooms (Durlak et al., 2011). These findings suggest that children in the classrooms with *Dynamic Experientialists* had more favorable perceptions of class climate than in classrooms led by teachers in the other classifications. Despite these positive connections, because this study was quasi-experimental, it is impossible to determine the positive climate's causation.

Since the 1960s, researchers have examined the association between perceptions of class climate and learning outcomes (Walberg & Anderson, 1968). Learning outcomes are positively correlated with perceptions of class cohesiveness and overall satisfaction and negatively associated with perceptions of friction (Haertel et al., 1981). It is worth noting that teachers in this study that utilized classroom PA multiple times per day (*Dynamic Experientialists*) and actively participated with children in the activities also had high climate scores (teacher and

child). In contrast, children and educators in more sedentary classrooms reported lower perceptions of climate. Though further research is needed, these findings raise the possibility that when children are provided frequent opportunities to be physically active intermittently throughout the school day, they may be more likely to expend energy positively rather than engage in behaviors that produce friction and competition. Conversely, a positive classroom climate may increase MI opportunities. Because a positive classroom climate has been linked to enhanced learning outcomes (Durlak et al., 2011), more research is needed to understand better the impact of regular classroom PA engagement on overall perceptions of class climate.

### ***MI Implementation for Student and Teacher Health***

Teacher burnout is real and was sometimes eluded to in our observations. “I’m glad you are here to observe, it gives me time to get my papers graded.” This teacher expressed not having enough time to complete the required tasks related to an overcrowded curriculum. However, some of the *Coachable Constructivists* discovered that when they also participated in the MI, they felt more ready to lead and might have even been open to having students do a peer review over teacher-graded assignments only. With the findings related to the discovery of unique pedagogical strategies for MI integration, new research questions emerge, such as: Do MI implementation pedagogical strategies enhance student learning? If so, is deeper student learning related to experiential learning, PA intensity, time on task, or purposeful teacher preparation and long-term planning?

### ***Pedagogy of MI Implementation***

Undoubtedly, the most illuminating discovery from this research was the deep integration of MI by the *Dynamic Experientialists*. As the teachers shared, they are continually and purposeful in identifying when and how the students should move throughout the day – when to increase/decrease movement intensity and how to move during transitions (e.g., touching the east and north walls of the classroom before you line up to go to lunch; using GoNoodle™ to transition from one subject to another). *Coachable Constructivists* talked about having an epiphany when they discovered that their intuition about student needs was reality and that they had responded by meaningfully implementing an MI-specific pedagogical strategy like building in Instant Activity at the start of the school day, an idea that was introduced in 1998 as an appropriate practice to begin physical education lessons (Rauschenbach & Vanoer, 1998). The feasibility of deep integration of MI across the curriculum was supported in this study. Likely, this will require modifications in teacher education and ongoing professional development.

## **Teacher Education and Professional Development**

The professional development preparing the teachers for this study did not include strategies to manage student movement as a behavior. It is possible that some teachers lacked the self-efficacy necessary to be comfortable using the higher-intensity videos. The lack of teacher training is consistent with other research examining MI implementation (Russ et al., 2017; Webster et al., 2017, 2020). Since professional development relative to MI implementation are primarily a single session, teacher education should move toward ongoing MI learning opportunities where purposeful and consistent implementation can be experienced (Russ et al., 2017). Some scholars have suggested teacher education and professional development delivered as a bottom-up approach or expert down the hall, where teachers train one another and new teachers share in the learning experience (Howie et al., 2014). Specifically, teachers with more experience integrating PA into the classroom could mentor the less-experienced teachers (Donnelly et al., 2017). In the present study, several teachers justified this approach as they acknowledged the influence of grade-level team leaders who facilitated establishing climate and expectations of student behavior during MI, so there was consistency for all students and teachers at that grade level. Authentic school internships with *Dynamic Experientialists* are advantageous in preparing new teachers.

## **Study Limitations**

The limitations of this study include the selection of schools with a relatively high implementation of MI with participating student PA participation above 135 minutes per week. This exploration was centered primarily on the investigation of video MI, and thus by emphasis, teachers who may utilize other forms of classroom MI may have been reluctant to participate. Most often, teachers who agreed to participate were willing to implement MI programs and were enthusiastic about sharing their experiences. Possibly because these resources are a current emphasis across the two districts, primarily those actively engaging their students in frequent PA breaks were comfortable participating.

## **Conclusions**

The WSCC proposes that schools place a shared emphasis on academic and health outcomes. Since PA has health benefits, all school faculty are responsible for advocating for children’s health. MI is a feasible way to increase children’s daily PA, and videos have provided teachers with resources for implementation. Future research could examine the MI-

specific pedagogies, teacher education utilizing MI-specific pedagogies, and how such strategies impact student learning across the curriculum. Discovering the appropriate teacher education and professional development mechanisms might also assist teachers with training for improving teacher attitudes or disrupting deficit thinking while challenging the practices of traditional sedentary classrooms. In addition, an understudied area of research in this context involves examining students' voices to understand those conditions and activities which foster perceptions of positive climate, enjoyment, and enhanced PA engagement within a classroom setting.

## Acknowledgments

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

## References

- Bada, S. O., & Olusegun, S. (2015). Constructivism learning theory: A paradigm for teaching and learning. *Journal of Research & Method in Education*, 5(6), 66-70.
- Bartholomew, J. B., Golaszewski, N. M., Jowers, E., Korinek, E., Roberts, G., Fall, A., & Vaughn, S. (2018). Active learning improves on-task behaviors in 4th grade children. *Preventive Medicine*, 111, 49–54. <https://doi.org/10.1016/j.ypmed.2018.02.023>
- Bronfenbrenner, U. (1994). Ecological models of human development. Dalam International Encyclopedia of Education. 3 (2). *Oxford: Elsevier. Reprinted in: Gauvain, M & Cole, M (Eds). Reading on the Development of Children (Ed 2), Hal, 37, 43.*
- Brown, D. M., Dudley, D. A., & Cairney, J. (2020). Physical literacy profiles are associated with differences in children's physical activity participation: A latent profile analysis approach. *Journal of Science and Medicine in Sport*, 23(11), 1062–1067.
- Carlson, J. A., Sallis, J. F., Norman, G. J., McKenzie, T. L., Kerr, J., Arredondo, E. M., Madanat, H., Mignano, A. M., Cain, K. L., Elder, J. P., & Saelens, B. E. (2013). Elementary school practices and children's objectively measured physical activity during school. *Preventive Medicine*, 57(5), 591–595. <https://doi.org/10.1016/j.ypmed.2013.08.003>
- Corbin, J., & Strauss, A. (2015). *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory* (4th ed.). Newbury Park: Sage.
- Daly-Smith, A. J., Zwolinsky, S., McKenna, J., Tomporowski, P. D., Defeyter, M. A., & Manley, A. (2018). Systematic review of acute physically active learning and classroom movement breaks on children's physical activity, cognition, academic performance and classroom behaviour: Understanding critical design features. *BMJ Open Sport & Exercise Medicine*, 4(1), e000341–e000341. <https://doi.org/10.1136/bmjsem-2018-000341>
- Donnelly, J. E., Hillman, C. H., Greene, J. L., Hansen, D. M., Gibson, C. A., Sullivan, D. K., Poggio, J., Mayo, M. S., Lambourne, K., Szabo-Reed, A. N., Herrmann, S. D., Honas, J. J., Scudder, M. R., Betts, J. L., Henley, K., Hunt, S. L., & Washburn, R. A. (2017). Physical activity and academic achievement across the curriculum: Results from a 3-year cluster-randomized trial. *Preventive Medicine*, 99, 140–145. <https://doi.org/10.1016/j.ypmed.2017.02.006>
- Durlak, J. A., & DuPre, E. P. (2008). Implementation matters: A review of research on the influence of implementation on program outcomes and the factors affecting implementation. *American Journal of Community Psychology*, 41(3), 327–350.
- Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child Development*, 82(1), 405–432.
- Efstathiou, N. T., Risvas, G. S., Theodoraki, E.-M. M., Galanaki, E. P., & Zampelas, A. D. (2016). Health education: Effects on classroom climate and physical activity. *Health Education Journal*, 75(7), 799–810. <https://doi.org/10.1177/0017896916628576>
- Evenson, K. R., Catellier, D. J., Gill, K., Ondrak, K. S., & McMurray, R. G. (2008). Calibration of two objective measures of physical activity for children. *Journal of Sports Sciences*, 26(14), 1557–1565.
- Gillet, N., Morin, A. J., Sandrin, É., & Fernet, C. (2022). Predictors and outcomes of teachers' burnout trajectories over a seven-year period. *Teaching and Teacher Education*, 117, 103781.
- Goh, T. L., Hannon, J. C., Newton, M., Webster, C., Podlog, L., & Pillow, W. (2013). "I'll squeeze it in": Transforming preservice classroom teachers' perceptions toward movement integration in schools. *Action in Teacher Education*, 35(4), 286–300.
- Goh, T. L., Hannon, J. C., Webster, C. A., & Podlog, L. (2017a). Classroom teachers' experiences implementing a movement integration program:

- Barriers, facilitators, and continuance. *Teaching and Teacher Education*, 66, 88–95.
- Goh, T. L., Hannon, J. C., Webster, C. A., & Podlog, L. (2017b). Classroom teachers' experiences implementing a movement integration program: Barriers, facilitators, and continuance. *Teaching and Teacher Education*, 66, 88–95.
- Haertel, G. D., Walberg, H. J., & Haertel, E. H. (1981). Socio-psychological environments and learning: A quantitative synthesis. *British Educational Research Journal*, 7(1), 27–36.
- Hein, G. E. (1991). Constructivist learning theory. *Institute for Inquiry*. Available at: <http://www.exploratorium.edu/ifi/resources/constructivistlearning.html>.
- Howie, E., Beets, M., Newman-Norlund, R., Schatz, J., Straker, L., & Pate, R. (2014). Minutes count: Determining the dose response of classroom exercise breaks on acute educational outcomes in primary school students. *Journal of Science and Medicine in Sport*, 18, e122.
- Howie, E. K., Newman-Norlund, R. D., & Pate, R. R. (2014). Smiles count but minutes matter: Responses to classroom exercise breaks. *American Journal of Health Behavior*, 38(5), 681–689.
- Huitt, W., & Hummel, J. (2006). An overview of the behavioral perspective. *Educational Psychology Interactive*, 206.
- Janssen, I., & LeBlanc, A. G. (2010). Systematic review of the health benefits of physical activity and fitness in school-aged children and youth. *International Journal of Behavioral Nutrition and Physical Activity*, 7(1), 40.
- Kolb, D. A. (2014). *Experiential learning: Experience as the source of learning and development*. FT press.
- Kolb, D. A., Boyatzis, R. E., & Mainemelis, C. (2014). Experiential learning theory: Previous research and new directions. In *Perspectives on thinking, learning, and cognitive styles* (pp. 227–247). Routledge.
- Lewallen, T. C., Hunt, H., Potts-Datema, W., Zaza, S., & Giles, W. (2015). The whole school, whole community, whole child model: A new approach for improving educational attainment and healthy development for students. *Journal of School Health*, 85(11), 729–
- Lomsdal, S. A., Lyngstad, I. K., & Lagestad, P. A. (2022a). Teachers' perceptions of barriers related to implementation of daily physical activity in secondary school: Academic pressure and the need for new competence. *Teaching and Teacher Education*, 115, 103749.
- Lomsdal, S. A., Lyngstad, I., & Lagestad, P. A. (2022b). Norwegian Secondary School Lomsdal, S. A., Lyngstad, I. K., & Lagestad, P. A. (2022, May). Norwegian Secondary School Teachers' Reflections on Models for Physical Activity During Schooltime: A Longitudinal Intervention Study. In *Frontiers in Education* (Vol. 7, p. 839709). Frontiers Media SA.
- Martin, R., & Murtagh, E. M. (2015). An intervention to improve the physical activity levels of children: Design and rationale of the 'Active Classrooms' cluster randomised controlled trial. *Contemporary Clinical Trials*, 41, 180–191. <https://doi.org/10.1016/j.cct.2015.01.019>
- McMullen, J., Kulinna, P., & Cothran, D. (2014). Physical activity opportunities during the school day: Classroom teachers' perceptions of using activity breaks in the classroom. *Journal of Teaching in Physical Education*, 33(4), 511–527.
- Merriam, S. B., & Grenier, R. S. (2019). *Qualitative research in practice: Examples for discussion and analysis*. John Wiley & Sons.
- Michael, R. D., Webster, C. A., Egan, C. A., Nilges, L., Brian, A., Johnson, R., & Carson, R. L. (2019). Facilitators and barriers to movement integration in elementary classrooms: A systematic review. *Research Quarterly for Exercise and Sport*, 90(2), 151–162.
- Patton, M. Q. (2002). *Qualitative Research & Evaluation Methods*. Sage.
- Piercy K. L., Troiano, R. P., Ballard R. M. et al. (2018). The physical activity guidelines for Americans. *Jama*, 320(19).
- Placek, J. (1983). Conceptions of success in teaching: Busy, happy and good. *Teaching in Physical Education*, 14, 46–56.
- Rauschenbach, J., & Vanoer, S. (1998). Instant activities: Active learning tasks that start a lesson out right. *Journal of Physical Education, Recreation & Dance*, 69(2), 7–8.
- Russ, L. B., Webster, C. A., Beets, M. W., Egan, C., Weaver, R. G., Harvey, R., & Phillips, D. S. (2017). Development of the system for observing student movement in academic routines and transitions (SOSMART). *Health Education & Behavior*, 44(2), 304–315.
- Schmidt, M., Egger, F., Benzing, V., Jäger, K., Conzelmann, A., Roebbers, C. M., & Pesce, C. (2017). Disentangling the relationship between children's motor ability, executive function and academic achievement. *PloS One*, 12(8), e0182845–e0182845. <https://doi.org/10.1371/journal.pone.0182845>
- Schmidt, S. K., Bratland-Sanda, S., & Bongaardt, R. (2022). Young adolescents' lived experience with teacher-led classroom-based physical activity: A

- phenomenological study. *Teaching and Teacher Education*, 116. <https://doi.org/10.1016/j.tate.2022.103777>
- Sekayi, D., & Strong, A. C. (2017). *The Crooked Pathway to Analytic Induction: A Case Study of Making Mid-Course Corrections in the Data Analysis Process*. SAGE Publications Ltd. <https://doi.org/10.4135/9781473958296>
- Stylianou, M., Kulinna, P. H., & Naiman, T. (2016). ‘... because there’s nobody who can just sit that long’ Teacher perceptions of classroom-based physical activity and related management issues. *European Physical Education Review*, 22(3), 390–408.
- Sum, K. W. R., Wallhead, T., Ha, S. C. A., & Sit, H. P. C. (2018). Effects of physical education continuing professional development on teachers’ physical literacy and self-efficacy and students’ learning outcomes. *International Journal of Educational Research*, 88, 1–8. <https://doi.org/10.1016/j.ijer.2018.01.001>
- Teddlie C., Tashakkori A. (2003). *Handbook of mixed methods in social behavioral research*. SAGE.
- Walberg, H. J., & Anderson, G. J. (1968). Classroom climate and individual learning. *Journal of Educational Psychology*, 59(6p1), 414.
- Watson, A., Timperio, A., Brown, H., Best, K., & Hesketh, K. D. (2017). Effect of classroom-based physical activity interventions on academic and physical activity outcomes: A systematic review and meta-analysis. *The International Journal of Behavioral Nutrition and Physical Activity*, 14(1), 114–114. <https://doi.org/10.1186/s12966-017-0569-9>
- Webster, C. A., Russ, L., Vazou, S., Goh, T. L., & Erwin, H. (2015). Integrating movement in academic classrooms: Understanding, applying and advancing the knowledge base. *Obesity Reviews*, 16(8), 691–701.
- Webster, C. A., Starrett, A., Rehling, J., Chen, B., Beets, M. W., & Weaver, R. G. (2020). Understanding Elementary Classroom Teachers’ Use of Movement Integration Resources. *Frontiers in Education*, 5, 56.
- Webster, C. A., Zarrett, N., Cook, B. S., Egan, C., Nesbitt, D., & Weaver, R. G. (2017). Movement integration in elementary classrooms: Teacher perceptions and implications for program planning. *Evaluation and Program Planning*, 61, 134–143.