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# Teacher Classifications of Implementing Classroom Movement Integration in Elementary Schools

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## Abstract

We explore the multifaceted role of elementary school teachers in implementing classroom-based Movement Integration (MI) to promote physical activity among children. While many factors and barriers can influence the successful execution of MI activities, understanding the nature and use of MI video resources remains unexplored. Therefore, we focus on exploring elementary school teachers' MI practices and their engagement with MI in order to identify teachers' different typologies. The research involved a mixed-methods design, predominantly qualitative, with teachers from a specific demographic. We identified three distinct teacher typologies: High-Engagement Providers (HEPs), Strategic Providers (SPs), and Reluctant Providers (RPs). The HEPs were highly engaged, incorporating multiple MI activities daily and effectively managing student behavior and motivation. Conversely, SPs acknowledged classroom management issues but attributed successful MI implementation to students' self-control and effective routines. However, RPs expressed reservations due to management challenges and potential distractions from academic tasks. Regardless of typology, all teachers accentuated the need for professional development opportunities to improve MI practices. We recommend providing training and support to enhance teacher self-efficacy in implementing MI and addressing challenges. Even though limitations exist regarding participant demographics, our study offers an initial in-depth exploration of teachers' MI implementation and may pioneer future studies.

**Keywords:**

Whole-of-school approach, teacher education, pedagogical practices, health promotion, technology

## Introduction

Regular physical activity (PA) is universally recognized for school-aged youth's healthy growth and development (García-Hermoso et al., 2017; World Health Organization, 2020). PA provides many health benefits for children, including enhanced physical fitness (incorporating cardiorespiratory and muscular fitness) and cardiometabolic health (manifested through regulated blood pressure, glucose levels, and insulin resistance; Tambalis & Sidossis, 2019; Warburton et al., 2006). Furthermore, PA serves as a protective shield against the onset of unhealthy body

weight (Janssen & LeBlanc, 2010; Schmidt et al., 2016; Trudeau & Shephard, 2008; Watson et al., 2017). Notably, fostering PA habits in children can yield substantial long-term benefits because early childhood is crucial for instilling enduring healthy practices (Eime et al., 2013). Even though PA offers an abundance of health benefits, alarmingly, many elementary-aged children in the United States cannot meet the national recommendation for the amount of PA. A study conducted by the National Physical Activity Plan Alliance (NPAPA, 2018) found that slightly more than 40% (42.5%) of children can attain a minimum of 60 minutes of primarily moderate-to-vigorous (MV) PA daily. Exploring strategies for improving PA involvement and integrating it within the classroom becomes crucial. Though much of the research explicitly mentions the United States, the issue of children's PA and thus the findings of this study have implications and relevance for all children and thus all countries around the globe.

Schools, widely present in society, critically promote children's growth and holistic development by facilitating PA. These establishments are hubs, offering access to many children and creating a supportive infrastructure for implementing programs that enhance health. Further, these institutions can profoundly influence the broader community by diffusing such programs (Carson et al., 2014; Institute of Medicine [IOM], 2013). Therefore, schools are crucial intervention sites to increase children's engagement in PA (IOM, 2013). Moreover, schools are cost-effective and can serve as ideal platforms for devising and implementing initiatives to address public health issues (McKenzie & Lounsbery, 2013).

Physical education lessons often are primary mediums for conducting PA in schools, with high-quality programs instilling enduring habits that positively impact long-term student health (McLennan & Thompson, 2015). The neglect of physical education in schools in many countries worldwide and perceived shortcomings in allocating curriculum time for physical activity (Hardman, 2008) is a cause for concern. For example, in the United States, only 15% of elementary schools mandate or recommend physical education three times a week throughout the academic year, and more than a third (35.2%) lack policies for regular recess (NPAPA, 2018). Additionally, research indicates that children spend most of their waking hours (80-93%) engaging in sedentary behavior (Turner et al., 2014), highlighting the insufficiency of current practices. This condition suggests the need for comprehensive initiatives to improve existing programs and explore opportunities for PA beyond traditional settings (e.g., Martin & Murtagh, 2017; McMullen et al., 2019).

The Comprehensive School Physical Activity Program (CSPAP), developed by the Centers for Disease Control and Prevention (CDC), is a holistic national framework that embodies a whole-of-school approach for school-based PA. CSPAP aims to advance multicomponent strategies for PA promotion within and beyond school environments (CDC, 2019). This program comprises five interconnected dimensions: 1) physical education, 2) in-school PA, 3) before and after-school PA, 4) staff engagement, and 5) family and community collaboration. CSPAP also intends to support youth in achieving the nationally recommended 60 minutes of daily MVPA by providing abundant opportunities for PA throughout the school day (CDC, 2019).

Movement Integration (MI) provides a complementary approach to integrating PA and bolsters the CSPAP framework regardless of intensity in daily classroom activities (Webster et al., 2015; Moon & Webster, 2019). This approach occurs within general education classroom settings at the elementary level and employs various academic subjects to integrate PA. The MI can manifest itself in teacher-led PA breaks between lessons, incorporating physically active learning experiences into curricular content, and incorporating movement into routine transitions (Moon & Webster, 2019). By strategically incorporating PA in these ways, MI reinforces the support system for student PA within the classroom, further solidifying the CSPAP model's comprehensive nature. Incorporating PA breaks throughout the school day and integrating them within the classroom can improve PA involvement. These breaks can be short, lasting five to ten minutes, where students engage in active games or exercises. Research has indicated that these brief bursts of PA can improve children's attention, concentration, and academic performance (Erwin et al., 2012; Foran et al., 2017; McClelland et al., 2015). Moreover, teachers can integrate movement into their lessons by using kinesthetic learning techniques. This approach involves incorporating physical movements into the learning process, such as enacting a story or using gestures to represent concepts. By combining PA with academic content, students are more likely to be actively engaged and better able to retain information (Norris et al., 2020).

Extensive research in recent decades has examined the efficacy of MI programs in promoting youth's daily MVPA. Previous studies have shown that MI has a positive impact on PA, as measured through step counts (Martin & Murtagh, 2017; Mahar et al., 2006). A comprehensive systematic review of 85 studies revealed that MI enables students to accumulate an average of 19 minutes of MVPA (Bassett et al., 2013). Moreover, compelling evidence affirms that even an average opportunity for MI daily can substantially curtail sedentary behavior and increase students' daily PA (Norris et al., 2020; Watson et al., 2017). In addition to promoting PA, MI has also been associated with improvements in academic performance (Donnelly

& Lambourne, 2011; Fedewa et al., 2015), including enhanced reading comprehension (Uhrich & Swalm, 2007) and mathematical achievement (Fredericks et al., 2006). While many studies on MI explore teacher-led strategies to promote children's PA, recent research has accentuated the benefits of incorporating PA facilitative equipment such as stand-biased desks or stability balls. Benden et al. (2014) and Swartz et al. (2019) have demonstrated that these interventions can positively impact student PA levels similarly. Fedewa et al. (2015) found that facilitative equipment can also have cognitive benefits. Additionally, research by Burgoyne and Ketcham (2015) suggests that PA facilitative equipment can improve classroom behavior. Overall, the literature provides compelling evidence for the effectiveness of MI in promoting daily MVPA and highlights the potential advantages of incorporating MI into classroom-based interventions. However, more precise information about these studies' specific benefits and opportunities would enhance the research in this area. For instance, the research could examine how MI increased youth participation in physical activities, promoted better health outcomes, or fostered lifelong habits of regular PA.

The role of classroom teachers in implementing MI is pivotal (Moon & Webster, 2019). Many studies identify multifaceted determinants shaping teachers' adoption of MI activities. These factors encompass various elements, including the recognition and value that teachers place on PA for their students (Allison et al., 2016), the empowering impact of administrative support (Calvert et al., 2019), and the enthusiastic readiness to integrate PA into the regular classroom schedule (Dinkel et al., 2017). Furthermore, the teachers' dedication to enhancing their knowledge and skills in implementing MI highlights their commitment to utilizing MI effectively (Benes et al., 2016). However, perceived impediments can hinder MI implementation. These obstacles can include time scarcity (Allison et al., 2016; Dinkel et al., 2017; McMullen et al., 2016; Perera et al., 2015), classroom management apprehensions (McMullen et al., 2014), constricted curriculum space (Masse et al., 2013), and decreased PA prioritization (Brown & Elliot, 2015; Cothran et al., 2010; Quarmby et al., 2019). The availability, or lack thereof, to resources for MI further exacerbates this challenge (Kennedy et al., 2019). Consequently, equipping teachers with specific resources to overcome these perceived obstacles could be a powerful strategy for enhancing the utilization of PA opportunities.

Given the substantial advantages of MI and the potential obstacles teachers may face in implementing it, critically evaluating the extent of MI utilization in classrooms is imperative. However, despite its importance, only limited research has been conducted to thoroughly understand the usage of MI video resources and its impact. A groundbreaking study, albeit with certain limitations, has provided valuable insights into teacher-led MI implementations of MI and their impact on PA intensity. By objectively evaluating teachers' MI practices and engagement, a study by Russ et al. (2015) has remarkably advanced the field of MI and CSPAP research, which has predominantly depended on self-reported data from teachers until now.

Providing comprehensive descriptions of the methods employed by classroom teachers to implement MI can offer valuable insights to teacher educators, enabling them to promote PA in school settings. By aligning resources with teachers' specific interests and needs, teacher educators can bolster their support for pre-and in-service teachers who adopt MI in their classroom routines. Moreover, researchers can provide customized MI training tailored to the distinct contexts of teachers and schools. This training ensures educators can access readily available resources tailored to their needs and circumstances. Therefore, the objective of our study encompasses three main aspects: (a) to explore teachers' perceptions (perceived barriers, benefits, and beliefs-importance) of classroom MI opportunities, (b) to investigate the actual implementation practices of MI in classrooms, encompassing classroom management, instructional techniques, and frequency of implementation, and (c) to identify different teacher typologies based on their MI practices and perceptions of using MI video resources.

**Method**

A mixed-methods research design (Fetters et al., 2013) focusing on qualitative methods was used to explore teachers' practices for implementing MI in classroom settings. A mixed methods design is particularly beneficial when investigating complex phenomena, processes, and systems (Fetters et al., 2013). Specifically, qualitative inquiry is inherently subjective because the researcher acts as the primary instrument for data analysis and interpretation (Creswell & Poth, 2017; Patton, 2015). As a physical educator and a generalist (i.e., a teacher who teaches every subject) elementary school teacher, the researcher had training and experience in managing active students in PA settings. These experiences may create a bias regarding what the teacher believes to be best practices for providing classroom MI activities to students, which may influence how these data were interpreted. Thus, the quantitative portion of the design was used to support the main qualitative methodology (Fetters et al., 2013). The participants in this study were graduates from different teacher education programs, and they had experiences different from the researcher in instructing and managing students. This method can allow for the understanding of how teachers approach the process of integrating MI into the classroom settings.

### Participants and Settings

Purposeful sampling (Patton, 2015) was used to recruit teacher and student participants from two schools in a rural area of the southeastern United States. Slightly less than half of the students were female (46%). Races included in this district were African American (42%), Hispanic (18%), Caucasian (27%), Asian (8%), and other (5%). Approximately 93% of the students in this study were enrolled in the free or reduced-cost lunch program, indicating a high level of socioeconomic need. This study included twelve elementary school teachers who volunteered to take part, the majority of whom were female and identified as Caucasian. Teaching experience ranged from 2-29 years ($M$ = 11.83; $SD$ = 8.87).

**Table 1**

*Participants*

| Teacher name* | Grade | Sex | Age | Teaching experiences years | Highest Education Level | Number of Students in Class |
|---|---|---|---|---|---|---|
| Andrews | 1 | F | 28 | 2 | M | 20-22 |
| Branden | 1 | F | 54 | 29 | M | 18-20 |
| Collins | 2 | F | 24 | 2 | B | 22-25 |
| Davis | 3 | F | 38 | 10 | M | 20-22 |
| Evans | 1 | F | 31 | 7 | B | 20-25 |
| Franklin | 1 | F | 26 | 2 | B | 20-24 |
| Gilbert | 3 | M | 40 | 14 | M | 17-20 |
| Hooper | 2 | F | 47 | 20 | M | 18-22 |
| Irving | 2 | F | 30 | 5 | B | 18-22 |
| Jones | 1 | F | 45 | 25 | M | 20-22 |
| Kelly | 1 | F | 35 | 11 | B | 20-25 |
| Lawson | 2 | M | 46 | 15 | B | 20-23 |

Note: *Teacher's unique identification for coding, **Highest Education Level, Bachelors, Masters

### Instrumentations

*Interviews.* In the qualitative portion of the study, data were collected through formal and informal semi-structured face-to-face interviews (Patton, 2015) in order to maintain consistency throughout the interviews, to enhance the integrity of the data, and to provide the possibility for follow-up questions. The teacher interviews, lasting 28-41 minutes, were focused on gaining understanding of the teachers' perceptions about MI as a teaching strategy and of general implementation of classroom MI activities (i.e., the teachers' perceptions of the MI videos used during the sessions, the teachers' strategic approaches when implementing MI activities, the barriers and/or challenges of using MI video resources, the teachers' professional or pre-professional training experiences related to classroom MI). The data from teacher interviews guided information on the nature of implementation of MI in each classroom, on the occurrences of MI activities in each classroom, and on the opportunities that teachers provided for students to be physically active. All interviews were audio-recorded and transcribed verbatim (Creswell & Poth, 2017; Patton, 2015).

*Physical Activity*. In the quantitative portion of the study, the frequency and intensity of PA was measured using wrist-worn ActiGraph GT3X + (Actigraph, Ft. Walton, FL) accelerometers. Accelerometers are widely accepted as the gold standard for measuring youth and adult free-living PA (Kelly et al., 2016; Troiano et al., 2014); they have been demonstrated as valid and reliable in a diverse range of populations and are used in the National Health and Nutritional Examination Survey study (Troiano et al., 2014). These devices mainly measure steps taken, distance traveled, calories burned, active minutes, hourly activity, and stationary time (Troiano et al., 2014). The minutes-per-classroom MI session and total school day of MVPA was used as the secondary outcome variable.

*Supplementary Materials.* Participant observations, field notes, and teacher fidelity-reports were used as supplementary evidence to interview and accelerometer data. Participant observations were conducted before, during, and after the MI activities on data collection days as well as on non-data collection days. The teacher fidelity reports included a record of the kinds of MI video activities that were implemented and the frequency with which these videos were used beyond the days of formal observations. The supplementary materials were coded by the researcher, categorically organized, and deductively integrated into teacher typologies in conjunction with the other primary data sources.

### Data Collection

The study protocol was approved by the Institutional Review Board (IRB) of the author's university (Pro000097020). Prior to data collection, all teachers who participated in the study provided written informed consent. Participation in the study was voluntary, and those invited to participate had the right to refuse with no negative consequences. Prior to the start of the study, the researcher provided each participating classroom teacher with a two-hour information session for leading the classroom MI activities (i.e., instruction on the use of MI resources, classroom management, PA promotion strategy, the characteristics of the PA videos). Throughout the study, bi-weekly follow-up emails were sent to the teachers containing additional online resources (e.g., EduMotion, PowerUp Fitness), classroom management tips (Kounin, 1970), and reminders about MI sessions. Participating teachers were interviewed during the first month of the school year, and the initial classroom observations were scheduled after the teacher interviews.

After the teachers' assent was obtained and before the first formal classroom MI session, the researcher familiarized the participating teachers with the accelerometers. The participating teachers wore the accelerometers on observation days. At the beginning of each day where data was collected, the accelerometers were reset. During the MI activity in the participating classroom, the researcher entered the room as quietly and unobtrusively as possible and placed accelerometers on the teachers present that day. Each accelerometer was individually numbered and the teachers who received each number were documented. The observer also recorded the time the last accelerometer was placed on a teacher's non-dominant wrist. The same process for distributing accelerometers to teachers was repeated for the remaining participating classrooms. Once the accelerometers were distributed, the researcher began observation of the classrooms. In the classroom, the researcher sat to the side and completed a fidelity sheet that recorded the name of the video, the type of PA (e.g., fitness exercise, dance, yoga) and the start and stop times of PA. In addition, the teacher's instructional or managerial practices were recorded. Simultaneously, contextual observations of students' behavior were recorded by continually scanning the classroom. The total length of MI participation during each classroom MI session ranged from four to seven minutes, depending on the number of videos played consecutively. The number of MI sessions ranged from zero to ten in a week. Over the span of a school year, 45 observations were carried out and documented in detailed field notes. These observations were analyzed through a rigorous process of weekly researcher debriefings, thoughtful commentary, and ongoing evaluative coding to ensure their accuracy and validity, in line with Patton's (2015) recommendations.

**Data Analysis**

This study addressed a more robust and nuanced analysis of the research question by utilizing a mixed-methods approach. By incorporating both qualitative and quantitative data, as suggested by Creswell and Poth (2017), we provided a comprehensive understanding of the phenomenon under investigation. The researchers meticulously followed four rigorous procedures to establish the teacher typologies using all data sources. This approach further enhanced the reliability and validity of the findings.

The first step included analyzing and interpreting accelerometer data using the ActiLife 5.5 software and Matthew's (2005) cut points (Sedentary < 251 counts per minute [CPM], Light 251-760 CPM, Moderate 761-5724 CPM, Vigorous > 5724 CPM). This step examined the wear time and proportion of time spent in light, moderate, and vigorous PA (Trost et al., 2011). Descriptive statistics such as means and standard deviations were generated for the sample to determine MVPA. Specifically, the average percentage of time spent in MVPA (MVPA counts per minute/Total break counts per minute × 100) was used to measure the teacher's PA during the MI activities.

Secondly, all transcripts and interview notes were compiled into a Microsoft Word file to maintain consistency in the analytical work, as suggested by Patton (2015). As recommended by Clarke and Braun (2014), the thematic analysis approach was employed to code and analyze the qualitative data obtained from the participant interviews. Subsequently, a systematic interpretation was conducted, categorizing data into different types and themes. As a result of this analysis, three initial teacher typologies emerged.

Thirdly, constructing teacher MI implementation typologies reflected an iterative and meticulous process. This approach involved identifying and refining patterns, accommodating deviations from emerging trends, and integrating quantitative and qualitative results. The research approach encompassed an in-depth comparative analysis, where data obtained from one method were cross-examined with supplementary sources containing corresponding information (Lincoln & Guba, 1985). This process involved determining the frequency and intensity of PA and contrasting teacher fidelity reports with teacher interviews and participant observations. The researcher debriefed MI sessions, and external peers reviewed data and checked to ensure the consistency of categorizing teachers into specific types. In some cases, this review process resulted in the recategorization of the teachers (Prasad, 2005).

Finally, the researcher employed various strategies to enhance the credibility (and validity of the research findings and data triangulations by using multiple data sources, as posed by Creswell & Poth (2017) and Patton (2015). Member checks were implemented to heighten the trustworthiness and accuracy of the data. This step involved providing participants with their interview transcripts for review and potential clarification, thus ensuring that their recorded responses accurately mirrored their viewpoints and aligned with the guidelines outlined by Prasad (2005).

**Results**

*Teacher typologies of MI implementation*

Multiple data sources including teacher individual interviews, accelerometry, teacher reports, and observations were used for categorizing teacher typologies based on their perceptions and practices of classroom MI. Table 2 shows the summary of the results.

**Table 2**

*Teacher typologies of MI implementation*

| Data Source | PA (Mean/SD) | Teacher Reports | | Observation & Field note |
|---|---|---|---|---|
| Typologies | PA Intensity (PA time in MVPA, %) | PA Frequency (Days/Week) | PA Activities (Type and Intensity) | Teacher Participation & Student Engagement in PA |
| High-Engagement Providers | 46.53 (40.95) | Multiple times daily (five days per week) | Various video types (dancing, jumping, dodging) | Frequent teacher participation and high student engagement |
| Strategic Providers | 20.17 (12.11) | Once daily (three to four days per week) | Stretching with periodic higher intensity and dance (middle to low intensity) | Low teacher engagement and moderate-to-high student engagement |
| Reluctant Providers | 17.35 (10.86) | Once daily (none or one day per week) | Did not offer MI opportunities or reported only using meditation videos | Low teacher engagement and low-to-moderate student engagement |

Note: MI = Movement Integration; PA = Physical Activity

*High-Engagement Providers (HEPs).*

HEPs ($n$ = 4) were characterized by the types of MI activities and the frequency of PA that they implemented. They delivered MI opportunities daily, including high intensity PA activities (e.g., dancing, jogging-in-place, and hopping). Participant observations and supplementary materials (teacher reports) showed that HEPs gave classroom MI opportunities for students multiple (1-3) times throughout the day. Many of these activities caused students to sweat and get drinks, and most students appeared to be engaged (greater than 85% per the observational notes). When students participated in MI activities, HEPs also had a high level of MVPA intensity (as indicated by the accelerometer data). Although these teachers successfully implemented active classrooms, they later admitted that they initially had apprehension about whether their students would benefit from "exercising or being physically active" in class. Ms. Andrews, a first-grade teacher in her second year who regularly utilizes MI activities in the classroom, expressed her initial reluctance to use the video resources when offering MI opportunities:

> *When I first saw the MI video resources, I didn't use them because I was too concerned. I thought, this is going to make my students even crazier... But when I started using it, I just realized that it had the opposite effect... The MI opportunities just helped the students calm down, be more focused, and get ready for the next learning activity.*

According to the teacher interviews and reports, despite some initial hesitancy, HEPs routinely implemented MI activities. In addition, participant observations revealed that the teachers were skilled managers and used effective proactive management strategies (e.g., established and used classroom rules and routines, used proximity control, and used pre-corrective statements) for successful MI that aligned with their classroom management for other class activities. Moreover, as evidenced in the following report from Ms. Branden:

> *I believe that effectively managing students is essential for delivering relevant MI opportunities. At first, it was difficult to manage the students, small space, limited time, active students... It was hard, but I think I was gradually learning good management skills such as using cues, making routines, keeping space clear... In the end, I was able to find a positive aspect where students were more focused during class and reduced off-task behavior.*

Another common feature of HEPs was their strong belief that students "need" more PA during the school day. During a participant observation, some students were happily and vigorously dancing in the back of the classroom. In an informal interview, Ms. Collins said, "Oh yes, they want to do this all the time. I know these children need to move actively, and so I am trying to let them do it as long as they are under control." Additionally, Ms. Davis, a second-grade teacher, designated a specific time period each day for providing students the opportunity to participate in MI activities. She felt the students in her class did not receive adequate daily PA time throughout the school day. She said during her interview:

> *Although maybe it is not a good option for me, I believe they need to get exercise every morning. We do not even start our work until 8:10 am, and because I want my students to wake up mentally and physically and get ready for the day, I will put on the MI videos and do it right along with them. It is like our class routine. We are calling it 'time for waking up our brain.'*

Similarly, Ms. Andrews shared, "I would say the biggest thing is engagement in their academic tasks, because the students can't just sit there and disengage if their

main goal is to actively move around in the classroom and to engage with friends and with the content." These comments are representative of this typology insofar as these teachers frequently indicated their belief in the necessity of activity engagement in classroom tasks.

*Strategic Providers (SPs).*

The majority of teachers ($n$ = 6) are categorized as SPs. The teachers in this group preferred to provide light-to-moderate PA (e.g., fitness exercise, stretching, yoga) over MVPA. When students participated in MI activities, SPs displayed a comparatively low level of MVPA intensity (as indicated by the accelerometer data). In addition, the teacher fidelity reports demonstrate there was inconsistent delivery as well as low frequency of MI. Even though they used video resources multiple times per week, sometimes daily, the implementation of MI was limited based on the classroom contexts. In other words, compared with HEPs, SPs did not establish MI as a daily routine in their classes nor did they employ effective management strategies. According to the individual interviews, this group of teachers tended to openly oppose the higher intensity PA video materials, and they were not committed to using those MI videos regularly.

Ms. Evans, a first-grade teacher in her seventh year who recently began including MI activities in her classroom, broadly supports the idea of classroom MI, but often avoids using the more active videos in her lessons. She stated, "I have learned that sometimes you can't do the fast-paced stuff. So, I have searched and found more of the reflective activities, and that gets them moving and stops them from thinking about school, and then they are able to come back down from that." This statement describes a general pattern for implementing MI into the classroom among many of the teachers in this type; SPs preferred to engage students in yoga, stretching, and other calming activities (from observations and teacher reports). These teachers did use higher-intensity PA videos on occasion; however, teacher interview data confirmed a general apprehension for showing any MI activity that would cause the students to "not come back" to engage in academic tasks.

Furthermore, SPs strategically showed and applied MI activities in appropriate contexts. When high-intensity MI activities were provided, it was typically immediately preceding recess time, at the end of the school day, or during the morning if students were especially tired. At least three teachers stated that toward the end of day was the best time to administer the higher intensity MI videos so that the teacher could "send the children home happy" (Ms. Franklin's interview).

During the observations, it was noted that SPs rarely (i.e., an average of two to three times per month) participated with their students, but when they did participate, they sometimes would become distracted by another task. These teachers also had difficulty finding effective management practices. As students participated in the MI activities, these teachers focused on preparing for the next learning task instead of the MI activities. In one instance when the researcher arrived for observations of classroom MI, second-grade teacher Mr. Gilbert said, "I'm glad you are here to observe; it gives me extra time to get my papers graded." SPs integrated the MI videos strategically to calm students, to get extra time to work, and to let the students experience joyful and meaningful MI activities just before going home.

Even though SPs' students seemed to be busy, happy, and engaged in good activities (Placek, 1983: 49), the teachers were not implementing appropriate management of classroom MI. For example, students were often grouped closely near the projector screen where they often bumped into one another without any intervention by the teacher (from Ms. Irving's observation note). Additionally, students were left to take initiative for the degree to which they would engage. When one student complained because he could not see a screen, Ms. Hooper replied, "If you cannot see, you just need to move up front."

The SPs also indicated that they do not regularly include MI activities due to a lack of time and training. Expressing the former concern, Mr. Jones stated, "I just would love to see them move more, but I don't have a lot of time." During her interview, Ms. Evans suggested that their lack of training precluded useful implementation of MI activities: "I don't understand how it [MI] would make my class better or what I could do to make it productive." However, a few weeks later, after the participant observation (during an informal conversation), Ms. Evans expressed, "I am very excited to learn more about how to add [MI activities] into my classroom and help my students engage with them." SPs stated a desire to learn more about not just how to increase the quantity of MI, but also how to properly incorporate MI into their classroom.

*Reluctant Providers (RPs).*

RPs ($n$ = 2) were characterized as rarely providing (i.e., an average of one time per week) students with any form of MI in the classroom setting. Different data sources (teacher interviews, fidelity reports, and observations) showed that constant resistance and challenges categorized the teachers in this typology. It seemed that the teachers had difficulty getting the students to follow the instructions of the MI video resources. During scheduled observations and informal site visits, the researcher did not observe a RP teacher interacting with the students while the MI

videos were playing unless a student engaged in off-task behaviors and needed redirection.

RPs also did not use proximity control and/or give effective instructional prompts for managing their students. As reported on the fidelity sheet, RPs tended to prefer stretching, yoga, or meditation activities with limited opportunities. In addition, as discovered in the interview data and observations, RPs seemed to express the similar fear of losing control as the SPs. RPs, on the other hand, tended to attribute their lack of classroom MI implementation to the nature of the resources and lack of opportunity or time. When asked why RPs do not implement classroom MI activities, Ms. Kelly, a first-grade teacher in her eleventh year, stated, "with the mix of kids that I get, I just found that the video resources were inappropriate for the classroom environment." During an observation, she sent students to the front of the classroom one student at a time, and the students gathered together just a few feet away from the screen. The wait time led to students pushing one another. The teacher expressed to the researcher, "We don't do MI in this class, because we have some kids who act a little crazy." The teacher exhibited frustration and seemed unable to use any classroom management strategies to help the students focus on the activity.

Mr. Jones was a second-grade teacher in his fifth year of teaching. He was reluctant to practice MI activities in the classroom because the notion of going "back to academic tasks" left students feeling less enthusiastic about academic work. In the interview, he explained:

> *What I find to be a struggle is the negativity that comes with [the realization that] 'now, we are done' [with PA when the MI video ends]. I hate this situation because … it takes away from the essential purpose of the activity, which is getting [the students] up and moving, because [while they are participating in the PA] they are already thinking 'Oh, we are not going to get to do this all day,' so [the PA results in] a negative [overall disposition for the students]. The next task has a negative cloud over it.*

He later mentioned during an informal conversation:

> *We are trying to encourage reading and writing… and you want students to be excited about these tasks. Then all of a sudden I have to be the cheerleader for writing because the video contents are more fun and interesting.*

Mr. Jones offered a unique perspective. He is categorized as an RP, not because he was concerned about managerial issues like the other teacher in this category, but instead because he resisted providing MI activities as it competed with students' enthusiasm for learning other academic subjects. Aligning with previous studies, this research demonstrates that the teachers who find PA to be a low priority tend to not place importance on MI activities (Brown & Elliot, 2015).

## Discussion

School environments are strategic venue for fostering PA among children (IOM, 2013). The CSPAP framework proposes a holistic approach to PA by promoting engagement before, during, and after the school day (CDC, 2019). According to Owen et al.'s (2016) meta-analysis of 38 studies, positive correlations existed between PA and students' academic achievements, school engagement, and favorable cognitive and emotional outcomes, including self-regulated learning. Even though research endorses MI within schools, a limited understanding of how teachers use video resources to implement MI in classrooms is present. Thus, we aimed to elucidate the nature and form of MI implementation. Utilizing a mixed-methods approach, we identified distinct typologies of teachers based on their implementation of video-based MI in the classroom. These typologies included HEPs, SPs, and RPs and were devised inductively by analyzing qualitative and quantitative data.

Teachers identified as HEPs organized several daily MI activities. These teachers effectively balanced behavioral expectations and academic goals while actively encouraging students to participate in MVPA opportunities during each session. Notably, students guided by HEPs exhibited higher engagement in PA intensity than their SP and RP classrooms counterparts. This finding aligns with prior empirical research accentuating the impact of different PA types on fulfilling students' daily PA needs (Watson et al., 2017). Moreover, this result reinforces the imperative to maximize student participation during typically brief classroom PA sessions (Calvert et al., 2019). Because these classroom PA sessions are inherently brief (Daly-Smith et al., 2018), teachers play a critical role in enhancing student PA engagement within these limited time frames.

This study reveals considerable variation in implementing MI video resources among teachers, all exposed to identical training. This diversity highlights the complex interplay of personal convictions regarding MI practices, classroom management strategies, and specific classroom contexts, which shape a teacher's pedagogical approach. For example, RPs resisted incorporating PA into their classrooms. This resistance primarily stemmed from concerns about managing student behavior post-activity and potential academic disruptions. Contrarily, SPs expected students to self-regulate their behaviors and did not attribute the limited opportunities for MI to student characteristics. Teachers categorized as RPs expressed an overall unwillingness to incorporate PA into the classroom either entirely or partially because they recognized that managing and/or calming the students following the activity might pose challenges and potentially divert their focus from academic tasks.

While teachers in all typologies voiced apprehensions about effective classroom management, SPs maintained that students can self-regulate. They recognized the importance of establishing clear routines and guidelines and holding students accountable, deeming it time-efficient. Existing literature corroborates that hurdle in classroom management, including chaotic behavior (e.g., rowdiness during MI) (McMullen et al., 2014), off-task student behavior (Burke et al., 2011), and transitions from PA back to academic tasks (Goh et al., 2017). Inconsistencies in management (e.g., clarity of instructions and routine reinforcement; Sylianou et al., 2016) can impede the implementation of MI. Intriguingly, Goh et al. (2016) reported that students who displayed the most disruptive behavior exhibited the most remarkable improvement in on-task behavior after engaging in intense PA. This finding has initiated debate and has required further investigation. In the context of our study, conceivably, students who experienced the least participation in MVPA might have exhibited the highest level of on-task behavior. This notion can influence future research in classroom behavior management and the implementation of MI.

Additional findings suggest that HEPs maintain active management with students throughout MI sessions. They perceive these segments not as "downtime" but as pivotal windows for student growth. The HEPs demonstrate the ability to address academic and health considerations throughout the school day, highlighting the potential benefits of employing strategic classroom management techniques. This finding aligns with the work of Routen et al.'s (2018) on the CLASS PAL (Physically Active Learning) Program, where similar strategic tactics were employed to manage and guide PA activities. This correlation implies that the methodologies utilized in PA activities can parallel teachers' management approaches for other classroom duties, thereby fostering a framework for smoothly integrating such activities into the daily school routine. However, despite the promising findings, acknowledging the concerns expressed by many teachers is crucial. Several studies confirm that teachers frequently complain about incorporating high-energy activities such as hopping or jumping. These concerns predominantly stem from fears of losing control of the classroom and possible delays in reverting to academic tasks (McMullen et al., 2014; Routen et al., 2018; Webster et al., 2015).

Our research findings posit that this initial reluctance to implement regular classroom MI fully can be reduced to some extent. Ten teachers from the HEP and SP groups overcame this reluctance by learning and implementing effective management strategies. These findings align with those of Moon et al. (2022), highlighting a significant positive correlation between MI and teachers' management practices. These practices included effective instructional, proactive, and reactive management strategies. The present study accentuates the importance of teacher management approaches in successfully implementing classroom MI activities. Future research could further investigate the effectiveness of different management approaches and techniques in fostering student engagement and compliance. In future studies, researchers could examine the impact of proactive and reactive management strategies on student behavior during MI activities and academic performance. Moreover, future research could explore the role of classroom climate and teacher-student relationships in facilitating MI implementation and fostering positive student outcomes. These studies can identify effective practices for managing and directing PA activities in the classroom, promoting the efficient and sustainable implementation of MI programs. Additionally, more research is needed to determine strategies for integrating MI into regular classroom routines.

Based on the results of our study, participating teachers suggest that schools have a vital role in addressing PA in youth development. Most participating teachers agreed that affording students with MI opportunities is essential. However, applying higher-intensity PA videos was frequently relegated to a select group of teachers (i.e., HEPs). Prior research (e.g., Perera et al., 2015; Routen et al., 2018; Stylianou et al., 2016) has also addressed this issue. A possible explanation for a few teachers' limited adoption of high-intensity PA videos daily is linked to an apparent deficiency of training in managing high-energy students during and after MI sessions. One could interpret this as a reflection of lower teacher self-efficacy, deterring the successful usage of high-intensity PA video resources (Michael et al., 2019). Empirical research indicates that a lack of pedagogical training substantially impedes the implementation of MI in the classroom (Van den Berg et al., 2018). While integrating PA into teaching resonates with many classroom teachers (Dinkel et al., 2017), an increasing body of research accentuates the merit of providing teachers with adequate learning opportunities and preparation for implementing MI (Tompkins et al., 2019).

Russ et al. (2015) emphasized that most professional development opportunities regarding MI implementation are often intermittent experiences rather than consistent, supportive efforts (McMullen et al., 2016). Brown and Elliot (2015) also proposed that teacher training programs adopt an inductive (or bottom-up) approach aligning with teachers' routines. Hence, teachers can support each other, and more experienced educators can mentor those who are less experienced in integrating PA into classroom routines (Skage & Dyrstad, 2019; Turner et al., 2019). Moreover, Stylianou et al. (2016) emphasized the

importance of regular follow-ups, accountability, and administrative support in helping teachers enhance students' levels of PA in schools. Therefore, the quality of teacher training programs becomes a crucial factor in supporting educators in adopting MI practices. The field of MI training for teachers lacks extensive research, leaving critical questions regarding the quality and effectiveness of such training unanswered. Future research should identify and comprehend the most effective training methods or strategies, assisting them in developing the necessary skills to implement the MI program in their classrooms successfully.

In summary, the teachers in our study acknowledged the potential benefits of implementing MI in classroom settings. However, they also recognized various challenges that can impact MI implementation. The findings reveal that incorporating MI in the classroom is a viable approach to enhance students' daily PA, and the video resources provided valuable tools for implementation. However, the teachers noted the importance of school support in effectively and strategically utilizing MI. They also recognized that adopting MI would require changes in their instructional and management practices.

Our study has several limitations that should be acknowledged. Firstly, the sample comprised solely elementary school teachers instructing students in grades one through three. This limitation may have influenced the developmental characteristics of the students' and teachers' experiences with integrating MI into the classroom. Additionally, purposeful sampling, as outlined by Patton (2015), was employed to recruit teachers currently teaching in the field. While purposeful sampling can be valuable for specific target groups, it may limit the generalizability of the findings to a broader population of teachers. In our study, many participating teachers were directly known by the researcher and/or institution, limiting the generalization of the results compared to random sampling. Additionally, the participants in our study were drawn from a limited number of school districts. Consequently, the generalizability of the findings may be limited to teachers within those specific states and content areas represented. Another important limitation is the lack of gender balance in our study, with ten female teachers and only two male teachers participating. This gender imbalance could have influenced the results of the study. Additionally, this research only focused on implementing video-based MI activities. Teachers who utilize other types of classroom MI such as teacher-directed without technology resources, may have been reluctant to participate in our study. Despite these limitations, our research is an essential initial step in providing an in-depth analysis of teachers' implementation of MI and its impact on students' PA levels.

## Implications

Drawing from the key findings of our research, we propose seven practical strategies for effectively integrating MI within educational settings. These strategies are articulated within the PREPACE guidelines, which represent the foundational elements for setting the pace of MI: (a) Professional development; (b) Resources center; (c) Enhanced training; (d) Peer mentorship; (e) Assessment; (f) Collaboration; and (g) Educator feedback.

a. Professional development: Focusing on classroom management during physical activities, the effective use of MI resources, and transition strategies from physical to academic tasks is vital in professional development sessions.

b. Resources center: Schools must create accessible MI teacher resources. This access can be through online repositories or physical centers stocked with videos, lesson plans, and activity guides suitable for various age groups.

c. Enhanced training: Enhancing teacher training to bolster their confidence and skill set in MI implementation is vital. The dynamic nature of education necessitates continuous refinements to MI training modules.

d. Peer mentorship: Beyond formal training, the value of cultivating a peer mentorship culture is evident. Seasoned educators—well-versed in MI—can guide newer colleagues, fostering an exchange of methodologies, best practices, and challenges.

e. Assessment: Regular evaluations of MI activities are indispensable. Such assessments bring to light both strengths and potential areas for refinement.

f. Collaboration: Given the varied MI implementation experiences across different classrooms and schools, this collaboration assumes paramount importance. Engaging educators, administrators, and policymakers in frequent dialogues can lead to mutual understanding and joint strategy-making. Moreover, it is crucial for the overarching education ecosystem, from education boards to curriculum designers, to embed MI activities as core components of daily lesson plans, making them an integral part of a student's academic experience.

g. Educator feedback: Actively collecting feedback from educators and students can fine-tune prevailing MI practices and provide insights into our dynamic educational environment's evolving needs and challenges.

## Conclusion

This study highlights the central role of schools in promoting PA for children by emphasizing the

imperative role of educators in implementing MI, given their direct interaction with students. The findings suggest that teachers recognize the potential benefits of MI in classroom environments. However, they also reported various obstacles, such as time constraints, classroom management concerns, and limited curricular space, which may hinder MI's successful implementation. Thus, ensuring easy access to MI resources can facilitate their utilization, accentuating the importance of equipping teachers with the necessary tools. Furthermore, our study emphasizes the importance of conducting further research to assess the effectiveness of various management strategies and explore methods for consistently integrating MI into classroom settings.

Our study highlights a pressing need for systemic reform in pre-and in-service teacher education, which should influence research and practice on several fronts. The curriculum should incorporate pedagogical strategies promoting MI to empower educators. This approach will enable teachers to provide meaningful classroom MI opportunities, increasing students' daily PA participation. Our study accentuates the strategic role of stakeholders, including administrators and educators, in fostering a robust learning environment where PA and movement are integral components. Their responsibility encompasses initiating endeavors that offer necessary training and support, yielding a more physically active and healthy learning atmosphere. By doing so, educators can leverage the numerous benefits of MI, transforming classrooms into spaces that encourage movement and cultivate healthy habits. Achieving this transformation necessitates a collective effort, underscoring the importance of collaboration among educators, administrators, and policymakers to overcome barriers and effectuate meaningful change. In conclusion, investing in fostering teachers' self-efficacy in implementing MI can improve children's health, well-being, and academic success.

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