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Assessment of Pedagogical Contributions toward Enhancing Physical Activity within the Secondary School Physical Education Curricula in Southwestern China

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Abstract: Students enrolled in secondary schools often fail to engage in moderate to vigorous levels of physical activity (MVLPA) due to inadequacies in their physical education programs. Physical education teachers (PETs) foster student involvement in MVLPA. Consequently, it becomes imperative to identify and scrutinize factors pertaining to PETs that could influence students' MVLPA within secondary school settings, an area that has been relatively overlooked in China. To address this gap, the present study delved into MVLPA among secondary school students in southwest China with the following objectives: (i) to assess students' MVLPA alongside PET characteristics and teaching behaviors during physical education classes; (ii) to explore discrepancies in PET behaviors and characteristics; and (iii) to establish connections between students' MVLPA and PET behaviors and characteristics during physical education sessions. A questionnaire survey was administered to 54 full-time PETs across nine secondary schools in Chengdu, China, aimed at gathering data on their personal and professional attributes. Additionally, a system for observing fitness instruction time was employed to document PET instructional traits, while accelerometers were utilized to track students' MVLPA. The study objectives were investigated using multiple statistical analyses. The findings indicate that PETs do not meet the recommended 50% MVLPA time allocation during physical education sessions. Noteworthy patterns emerged, revealing that PETs with 1–5 years of teaching experience allocated less time to student observation and more time to classroom management compared to their counterparts with 6–10 years and over 10 years of teaching experience. Moreover, MVLPA time invested in lessons led by male PETs (B = −3.221) was significantly higher than time spent in lessons led by female PETs, which was attributed to PET gender. Furthermore, students under the tutelage of PETs with 6–10 years of teaching experience (B = 3.101) and those with over 10 years of experience (B = 2.989) exhibited significantly higher MVLPAs than under those with 1–5 years of teaching experience. Additionally, PET attitudes such as observation (B = 1.621) and promoting (B = 1.317) behaviors during physical education sessions were positively correlated with students' MVLPA. A regression analysis revealed that PET characteristics and behaviors explained 21.3% of students' MVLPA variance. This study offers insights into PETs' pivotal role in promoting physical activity. It underscores the ramifications for students' MVLPA in the Chinese educational context.

Keywords: moderate to vigorous levels of physical activity; teaching methods; teacher behavior; teacher experience; schools in China; physical activity intensity; sustainable education

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1. Introduction

The importance of physical activity (PA) stands as a cornerstone in an era where technology often overshadows physical engagement [1–4]. Regular exercise, totaling at least 60 min, is fundamental for maintaining healthy lifestyles [5], offering benefits ranging from enhancing cardio-vascular health to fostering mental well-being [6]. The

difference between varying exercise levels is vital to tailoring fitness programs that align with everyone's goals and capabilities [7]. However, all PA is not created equal, and it is essential for individuals to understand the differences between moderate and vigorous levels of physical activity (MVLPA). Exercises ranging from brisk walking to high-intensity interval training are classified as "moderate" or "vigorous" PA based on their intensity [8]. The right intensity for each level of activity can contribute to achieving fitness goals [9]. Research has explored MVLPA nuances around the world [10,11]. To establish sustainable and effective fitness regimens, the scientific community has examined several advantages and risks [12]. In order to lead a healthier and more active lifestyle, it is imperative to understand these distinctions [13]. This is regardless of whether one is just beginning their fitness journey or fine-tuning an existing workout regimen in the pursuit of education [14].

The influence of educators extends well beyond the confines of the classroom [15,16]. Teachers are not only responsible for imparting knowledge but also shaping their students' behavior, attitudes, and habits [17]. Within the realm of physical education (PE), physical education teachers (PETs) guide students toward healthier and more active lifestyles [18]. Although PETs influence PA students' behaviors, their impact extends beyond their own instructional methods [19]. It also encompasses their own attitudes, beliefs, and practices [20]. Teacher-related factors and students' levels of PA are significant yet frequently overlooked aspects of PE. Investigators can explore this aspect to better understand teachers' profound impact on students' PA participation. Investigating this facet can deepen our understanding of the profound influence teachers wield over students' PA participation, offering insights into the quality of PE students receive at school [21,22]. This, in turn, holds implications for their long-term health and well-being, shedding light on how PETs can serve as catalysts for positive change in their students' lives. Exploring the relationship between teaching styles, teacher enthusiasm, and the promotion of MVLPA can equip PETs with tools to encourage lifelong PA engagement among students [23–25].

China has a vivid PE context that reflects the nation's multifaceted identity, characterized by its history, cultural diversity, and escalating modernization [26]. PE occupies a prominent and enduring position within this intricate tapestry of tradition and progress [16,27], embodying both ancient wisdom and contemporary aspirations in Chinese society [28]. It fosters physical fitness, national pride, and cultural identity. PE in China is deeply embedded in its historical significance [29]. Traditional Chinese medicine, martial arts, and Tai Chi have highlighted the importance of overall health and the interconnection between mind and body for millennia [27]. Throughout history, these ancient traditions have shaped PE, and they continue today. The Chinese national curriculum promoting PE from 2011 places tremendous emphasis on PE, beginning with primary school and ending with secondary education [10]. This comprehensive curriculum encompasses traditional martial arts and dance alongside modern team sports and gymnastics. This reflects China's dedication to fostering physical fitness, teamwork, and discipline among its citizens. China's athletic prowess, evident in sports such as gymnastics, diving, and table tennis, underscores its commitment to excellence in PA. This commitment is demonstrated by significant investments in athlete development that yield remarkable results on the global stage [30].

The Chinese government also promotes physical fitness and sports participation among its citizens through ambitious initiatives [28,31]. National programs such as "The National Fitness Program" and "Sports for All" demonstrate that the government is committed to ensuring that sports and PAs are accessible to all members of society [29]. China still faces challenges in PE, despite its impressive achievements and initiatives. There are many factors affecting PA availability, including the increases in sedentary urban lifestyles, academic pressures, and unequal access to sport facilities across geographies. The world witnesses the combination of ancient traditions and modern aspirations in this multifaceted context, creating an evolving and unique PE landscape in China. Studies concerning this aspect can provide a deeper understanding of PE diversity in China. This covers everything from its historical roots to its current challenges and accomplishments. By studying the

impact of PE on the nation's well-being, health, and cultural and social identity, individuals can gain a deeper understanding of its multifaceted influence [32–34].

This research initiative is intended to fill critical knowledge gaps. It explores the context of PE in secondary schools (SSs) in southwest China. The study seeks to provide insights into effective strategies for promoting PA in this specific regional context. It does this by assessing teacher practices, understanding teacher attitudes, and evaluating student engagement. This research ultimately seeks to offer practical recommendations for improving PE programs in southwest China and contributing to students' overall well-being. PE research in China focuses on the eastern and northern regions [9,10,13]. Therefore, a substantial research gap exists in understanding PA promotion dynamics in SSs in southwest China. Studies on students' PA levels and health outcomes are frequently conducted, emphasizing teachers' importance as key influencers in this process [35–37]. This study is focused on teachers and explores their teaching methods, beliefs, and practices related to PA promotion. Cultures and socioeconomic conditions vary widely throughout China's vast terrain. Identifying region-specific factors that may influence PE delivery and effectiveness in southwest China requires investigating PET roles. Our study aims to identify and examine factors related to PETs that may impact students' MVLPA in SSs. This study had three objectives: (i) the determination of students' MVLPA and PET characteristics, as well as teaching behaviors during PE; (ii) the investigation of variations in PET behavior and characteristics; and (iii) the establishment of links between students' MVLPA and PET attributes during PE.

2. Methods

2.1. Participants

The research procedures received approval from the relevant university ethics committee and school authorities. For this study, we selected nine public SSs as representative samples, covering nine districts within Chengdu city, located at coordinates 30°34′22.134″ N and 104°4′0.4836″ E, in southwest China. The teacher sample in these nine SSs comprised 54 full-time PETs, consisting of 35 females and 19 males based on a naturally available distribution (Figure 1). Their average age (mean ± standard deviation) was 39.19 ± 9.32 years, and their accumulated teaching experience was 11.52 ± 8.99 years. It is expected that the student population involved in this study mirrors those attending SSs in Chengdu. The city exhibits very low levels of mobility, which contributed to this situation [16,27]. Each of these schools had three intact classes for each of the seven to nine grade levels. The average enrollment in these schools was 1054 ± 378 students. We randomly selected three or four classes from each grade, depending on the student population size at each school. The parents or guardians of 3378 (92.78%) of the 3641 students across 126 classes approved participation in this MVLPA study.

2.2. Physical Education Setting

In line with standard practice in Chinese schools, the participating SSs adhered to fundamental requirements. They were instructed to offer three PE classes per week for grades seven to nine. These PE sessions were conducted coeducationally within the SSs. Each session was allotted a duration of 45 min. There were between 20 and 40 students in each class. Various sport-specific indoor locations, such as gymnasiums, and outdoor areas, such as basketball courts and school fields, were used to conduct the lessons. A PE class generally consisted of three segments: (a) an initiation and preparatory exercise, supervised by the PE specialist (lasting 5 min); (b) the teaching of sports and motor skills, including trainer demonstrations and explanations, along with student skill practice (about 30 min); and (c) concluding remarks and students cooling down (lasting 10 min).

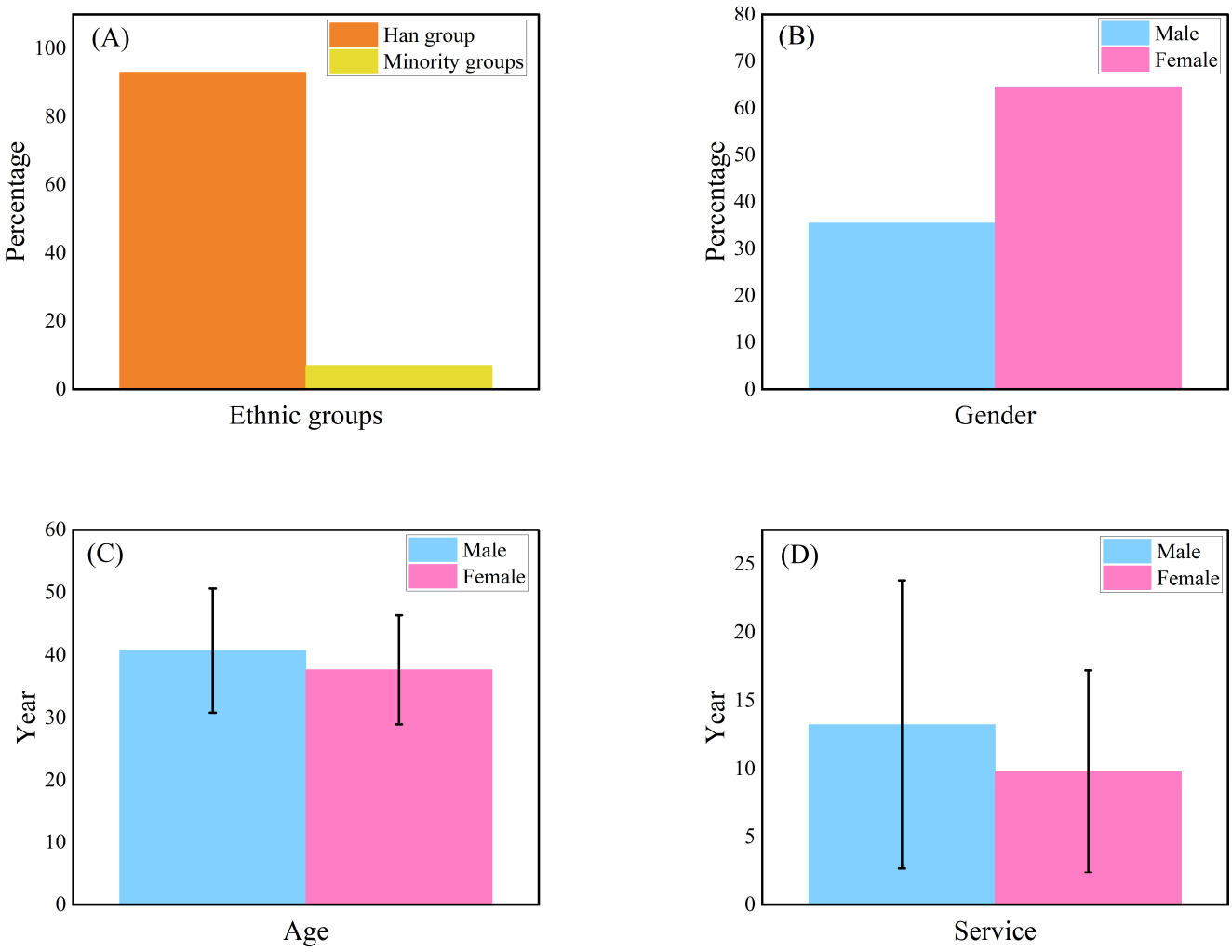

Figure 1. The sociodemographic attributes of teachers (**A**–**D**). The vertical bars along the y-axis represent the measures of the standard deviation.

2.3. Variables and Metrics

Under the category "teacher characteristics", two factors were considered: the experience and gender of the teacher. Three levels of teaching experience were categorized in this study: 1 to 5 years, 6 to 10 years, and more than 10 years. This categorization aimed to capture the idea that teachers may undergo the most significant changes in their teaching approaches during the initial stages of their careers. Wolters and Daugherty [38] proposed similar approaches. These variables were assessed through self-identified responses provided in a demographic information survey.

Six different instructional actions were identified in "teacher's instructional behavior" (Figure 2):

1. Promoting Fitness: This involves encouraging and motivating students to participate in fitness activities as well as enhancing their engagement in these activities.
2. Demonstrating Fitness: This includes physically demonstrating or modeling various fitness exercises and activities to engage students.
3. Instructing: This encompasses traditional teaching methods such as lecturing, describing, and providing feedback on PE content, excluding fitness engagement.
4. Managing: This refers to activities related to organizing students or the classroom environment that are not directly connected to the subject matter but are essential for smooth class functioning.

5. Observing: This involves monitoring the class, groups, or individual students without engaging in verbal communication.
6. Other Tasks: This pertains to instances where teachers are involved in activities unrelated to their teaching responsibilities.

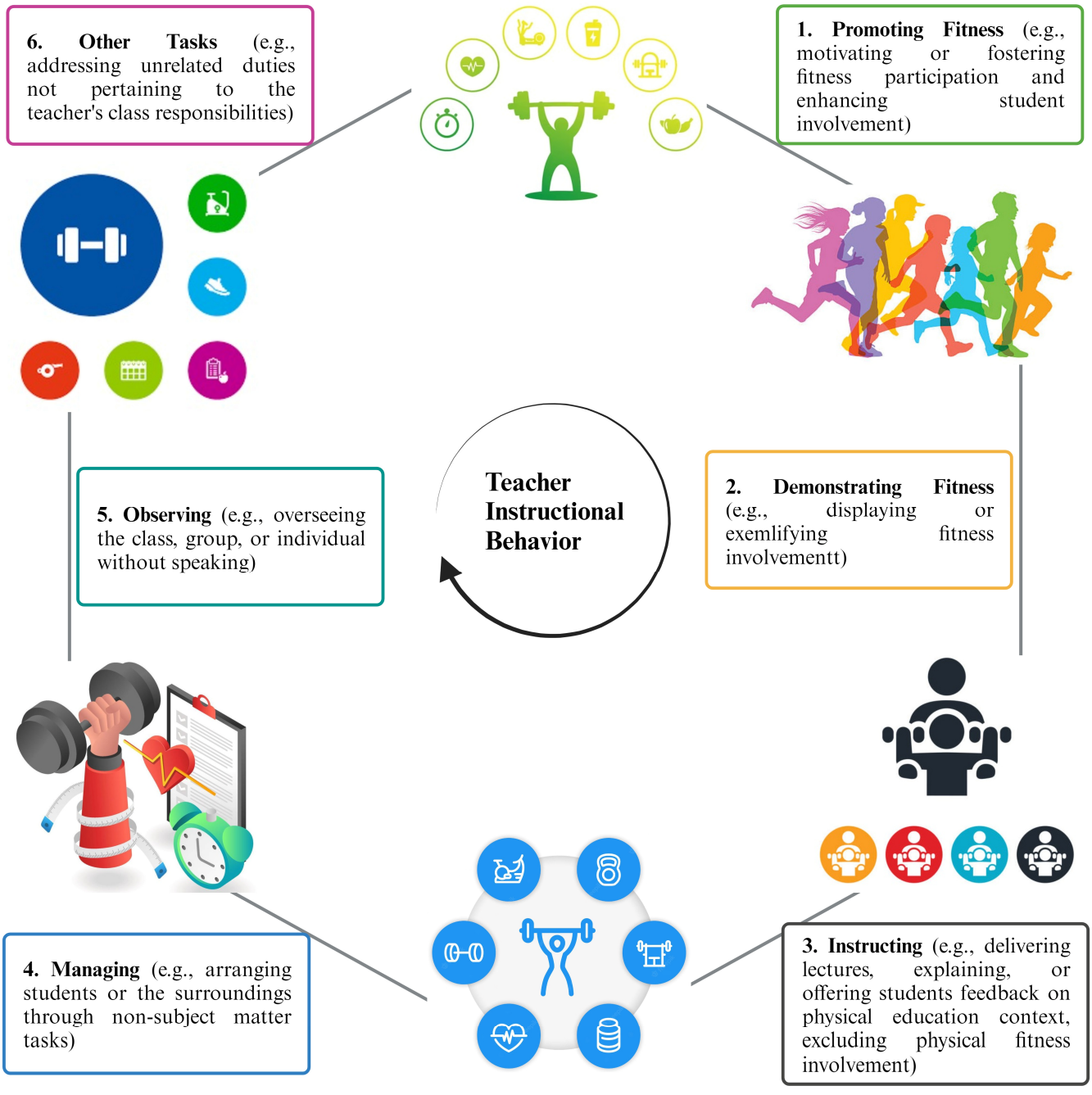

Figure 2. Teacher instructional behavior: six steps adopted in this study.

These data were collected utilizing the System for Observing Fitness Instruction Time (SOFIT), an observation system that records the precise duration of each of these identified behaviors. SOFIT was developed and utilized for this purpose [10].

Within the classroom context of "MVLPA of students", MVLPA is defined as PA performed with a minimum or maximum intensity of ≥2800 repetitions per minute [39]. To accurately quantify PA quantities, Actigraph wGT3X-BT accelerometers were used to collect the data with a recording interval set to 1 s [40]. Children and adolescents have

been assessed with these accelerometers in previous research, and their accuracy has been confirmed [10]. We extracted the original accelerometer data files and processed them using ActiLife software version 6.11.5 in accordance with Actigraph's guidelines for data collection. The MVLPA duration during classroom lessons was calculated by converting data meeting the predetermined criteria into minutes. Based on the average MVLPA time spent by all students during class, we calculated the percentage of time spent in MVLPA during class.

2.4. Data Collection

From early September 2022 to late January 2023, data were collected throughout the autumn semester. Nine SSs were observed over two 12-week cycles in order to ensure that every class was observed once during each cycle. This approach was adopted to accommodate variations in both seasons and curricula. In cases where classes were canceled due to unfavorable weather conditions or other school events such as sport meetings or midterm exams, the subsequent scheduled lesson was chosen for observation. During the semester, 252 intact lessons (126 classes observed twice) were scheduled for observation. Despite this, two lessons were observed only once due to school-wide virus outbreaks that resulted in the cancellation of the second lesson. The final data set consisted of 250 PE classes. Based on these, the details of lessons on athletics, ball games, fitness activities, games, gymnastics, and individual activities are presented in Figure 3. It was communicated to PETs in advance that their PA classes would be observed for a certain period of time. They were unaware of which lessons would be discussed until the first day of class. Teachers were specifically instructed not to modify the instructional strategies or content of their classes.

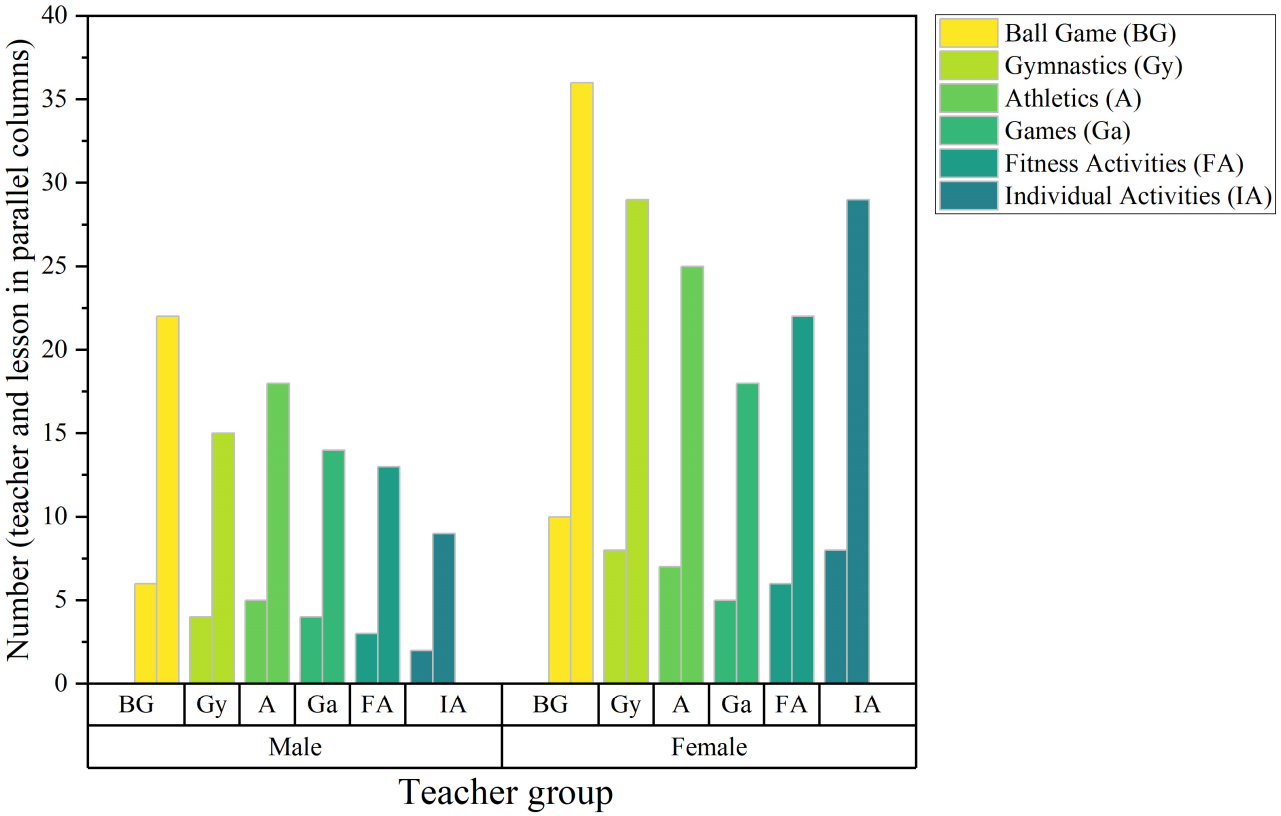

Figure 3. Group column plot for male and female teachers that participated in this study.

The authors are well-trained PETs who serve as faculty specializing in sport pedagogy. Students' MVLPAs and SOFITs were evaluated simultaneously using accelerometers in PE classes in order to assess teaching behavior. The collection of data began at the beginning

of each class and was completed at the end of each class. All students were provided with accelerometers prior to PE class. Strategically positioned, a Sony HDR-XR500 video camera captured the classroom setting. Students wore elastic belts with accelerometers on their right hipbones. Researchers ensured proper accelerometer placement during PE and retrieved the devices afterward. Valid accelerometer usage was defined as 100% of the PE class duration. Post class, data were promptly transferred to a computer for analysis, converting raw counts to MVLPA intervals and calculating MVLPA time.

The research assistants quantified the duration of each observed teaching behavior by recording it at 20 s intervals. Every interval was divided into two parts: the first ten seconds were devoted to observing teaching behavior, followed by the second ten seconds spent recording what was found. Generally, 12% of all lessons assessed were tested for interobserver reliability, following other researchers' methodology [10]. These lessons were compiled independently by both authors and research assistants during the reliability check. In the literature, 85% or more interobserver agreement is considered acceptable for teaching behavior [10]. To assess the proportion of class time devoted to each teaching behavior, the count of observation intervals per behavior was divided by the total observation intervals in the session. Subsequently, this quotient was multiplied by 100 to obtain the percentage. Additionally, research assistants collected demographic data on PETs post class, including their teaching experience, gender, and age.

2.5. Data Analysis

This study primarily relied on a correlational research methodology. Using descriptive statistics, the first research objective was addressed by describing the characteristics of the teachers, their teaching behaviors, and the MVLPA of the students. In pursuit of the second aim, the study employed multivariate analyses of variance (MANOVAs) to explore variances in teaching approaches contingent upon teacher attributes. For those instances where noteworthy differences were identified, the significances of the MANOVAs were assessed through one-way analyses of variance (ANOVAs) and subsequent least significant difference (LSD) tests. The measures of effect size for multivariate effects employed partial eta-squared (η^2) and categorized as small, medium, or large with values of 0.01, 0.06, and 0.14, respectively, in accordance with Cohen's 1988 guidelines. As part of the third research objective, we performed a hierarchical regression analysis in three steps. This was to investigate the associations between teacher characteristics, teaching behavior, and students' MVLPAs. Class size was controlled in Model 1, since previous studies have shown that class size affects students' MVLPA during PE lessons [41]. In addition, the impact of teacher characteristics on students' MVLPA was examined in Model 2, while in Model 3, the analysis considered teaching behavior, with male teachers and teachers possessing 1–5 years' experience serving as the reference categories for teacher characteristics. Data analyses and graphical representations were realized using IBM SPSS Statistics for Windows, Version 28.

3. Results

3.1. The Characteristics of the Sample, the Moderate to Vigorous Levels of Physical Activity (MVLPA) of Students, and Teaching Behavior

The observation encompassed 250 PE lessons across nine SSs. Among them, 159 (63.6%) were taught by female teachers, and 91 (36.4%) were taught by male teachers (Figure 3). The average experiences of the female and male teachers were 9.79 ± 7.43 years and 13.24 ± 10.56 years, respectively (Figure 1). There were around 33.71% PETs with 1–5 years of experience, 22.69% PETs with 6–10 years, and 40.6% PETs with more than 10 years of experience (n = 54). The results are presented in Figure 4 for PE lesson time devoted to MVLPA and teaching behaviors in different categories. Students spent an average of 16.25 ± 3.20 min engaging in MVLPA throughout SS PE classes, which represented 45.02 ± 8.15% of the total class time. As for teaching behavior, teachers spent 40.90 ± 13.50% of the lesson time instructing, while 32.56 ± 14.10% was spent managing,

18.03 ± 13.01% was spent observing, 12.96 ± 9.94% was spent demonstrating, 4.75 ± 5.05% was spent promoting, and 0.78 ± 2.48% was spent performing other tasks.

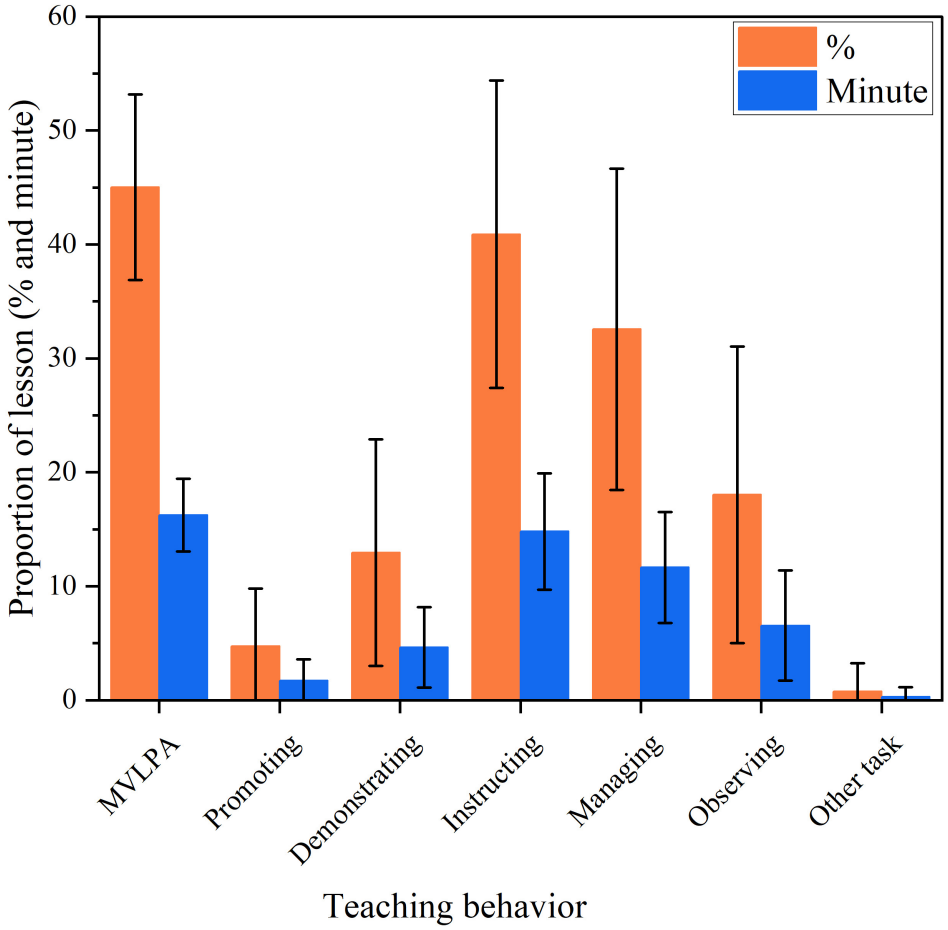

Figure 4. Bar graph of students' moderate and vigorous levels of physical activity (MVLPA) and teaching behavior. The vertical bars along the y-axis represent the measure of standard deviation.

3.2. Variations in Teaching Behavior as Influenced by Teacher Characteristics

Based on gender and the experience levels of the teachers, Figure 5 compares the proportions of teaching behaviors. As a result of MANOVA analyses ($\eta^2 = 0.033$, $p = 0.314$, $F(2, 252) = 1.385$), the proportional distribution of all types of teaching behavior was not significantly different between female and male teachers. Despite this, the MANOVA results ($\eta^2 = 0.091$, $p = 0.005$, $F(2, 252) = 3.472$) indicate that there were significant differences between teaching experiences. An analysis of the outcome of the follow-up ANOVA revealed that the significant differences in teaching experiences could be attributed specifically to differences in observing ($\eta^2 = 0.047$, $p = 0.009$, $F(2, 252) = 4.359$) and managing ($\eta^2 = 0.048$, $p = 0.005$, $F(2, 252) = 4.798$) behaviors. In contrast to PETs with 6–10 years and >10 years of experience, post-hoc LSD examinations demonstrated that PETs with 1–5 years of experience allocated more time to classroom management and less time to student observation and other responsibilities.

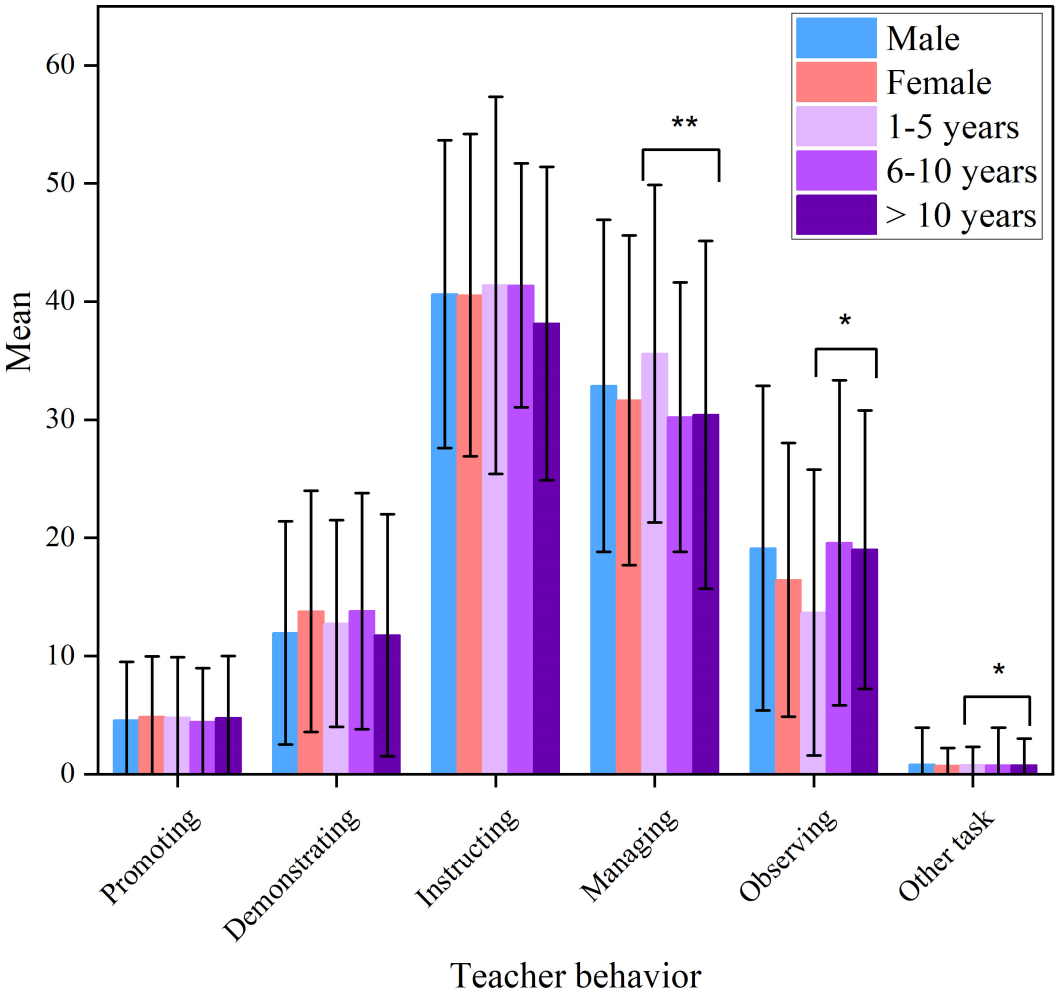

Figure 5. Bar chart depicting teaching behaviors across teachers' gender and experience in secondary schools in southwest China. The vertical bars along the y-axis represent the measure of standard deviation. The differences between different experiences are shown at $p < 0.01$ (**) or $p < 0.05$ (*) based on the least significant difference test.

3.3. Teacher Traits and Actions Impact Students' MVLPA

Detailed information concerning the relationship between the characteristics of teachers, their teaching behavior, and their students' MVLPA is highlighted in Table 1. As part of Model 1, we examined the relationship between controlling factors, such as class size, and the duration of the MVLPA for students. Students' MVLPA during PE classes was not significantly influenced by class size (B = 0.039), as it accounted for only −0.2% of the variance ($p = 0.589$, F (1, 251) = 0.292), indicating that class size has no significant influence on student performance. We found that Model 2 accounted for 5.1% of the variance in students' MVLPA when we introduced the teacher factors of gender and experience ($p = 0.003$, F (4, 227) = 4.573). The standardized beta coefficients indicated an inverse relationship between teacher gender (B = −3.221) and students' MVLPA, whereas a teaching experience of 6–10 years (B = 3.101) and >10 years (B = 2.989) exhibited positive associations with MVLPA. The incorporation of teaching behavior into Model 3 led to a substantial 21.3% enhancement in the capacity to explain the variance in students' MVLPA ($p = 0.000$, F (11, 082) = 5.461). It was found that teacher gender (B = −2.717) remained negatively associated with MVLPA. Moreover, teaching experience within the range of 6–10 years (B = 3.426) and over 10 years (B = 3.364), along with teaching behaviors such as observation (B = 1.621) and the encouragement of physical fitness (B = 1.317), exhibited favorable effects on students' MVLPA.

Table 1. Hierarchical regression analysis provides predictions of moderate and vigorous levels of physical activity.

	Model 1			Model 2			Model 3		
	B	**SE**	***β***	***B***	**SE**	***β***	***B***	**SE**	***β***
Class size	0.039	0.081	0.041	0.038	0.080	0.041	−0.079	0.081	−0.069
Teacher gender—female				−3.221	1.129	−0.225 **	2.717	0.982	−0.192 **
Teaching experience—6–10 years				3.101	1.352	0.179 *	3.426	1.213	0.215 **
Teaching experience—>10 years				2.989	1.201	0.188 *	3.364	1.217	0.220 **
Promoting							1.317	0.492	0.161 *
Demonstrating							−0.981	0.617	0.141
Instructing							−1.552	1.391	−0.089
Managing							−1.021	1.516	−0.059
Observing							1.621	0.592	0.213 *
Other tasks							0.392	0.971	0.031
R^2	0.001						0.325		
R^2_{adj}		−0.002					0.213		

** significant (at $p < 0.01$); * significant (at $p < 0.05$).

4. Discussion

Our study, conducted in Chengdu, China, revealed that 45.2% of PE lessons were devoted to MVLPA (Figure 4). It falls short of the recommended 50% threshold. This outcome, while not unexpected, aligns with previous findings indicating that students often fall below MVLPA recommendations [11,21,23–25,42,43]. A literature review examined 13 studies on students' MVLPAs in elementary school PE classes [44]. In their study, they found that students spent 44.8% of their PE class time engaged in MVLPA. This recommendation was not met in 9 of their 13 studies. During our study, each PE class lasted 45 min. PE lessons in the United States last 36–45 min [21,42], and in Japan, it is 45 min [23]. Students struggle to spend 50% of their class time on MVLPA in such a short lesson. To improve student MVLPA levels, PE classes may need to be increased. However, despite the similar levels of MVLPA reported in other studies, intervention strategies are necessary to enhance MVLPA in PE classes. This is regardless of the MVLPA levels of the students in our study. Students can benefit from this improvement by increasing their PA each day. This is especially important when considering the intense academic competition faced by Chinese children and their limited access to PA outside of PE classes [45].

In terms of PET behaviors during lessons, instruction (40.9%) and classroom management (32.56%) take up most of the time (Figure 4). As previously documented [41,46], these findings are in line with prior research. This also indicates that a substantial portion of class time is dedicated to instruction and management. The term "instruction" refers to activities such as lectures, explanations, or feedback provided to students regarding PE content. Considering that PE instruction in SSs in China focuses on physical skills, it is not surprising that the greatest percentage of class time was dedicated to teacher instruction. PETs in China impart motor skills to their students [10]. Furthermore, PETs spend considerable time managing the class. SS students have characteristics consistent with those found in other schools [18]. They may provide guidance on self-regulation and behavior management. Additionally, Chinese teachers emphasize discipline and have more stringent classroom behavior expectations [47]. Chinese PE classes mandate students to maintain order by refraining from engaging in conversations and adhering to structured routines throughout the class period. This requires PETs to dedicate substantial time to classroom management to ensure effective task completion.

Student engagement in MVLPA is positively correlated with the frequency of PETs' encouragement of physical fitness, such as through praise, prompts, or reinforcement. Similar results have been reported in other studies [41,46], suggesting that students gain confidence and enthusiasm for PE classes when they receive praise and encouragement from their teachers. Consequently, students are motivated to perform tasks more efficiently

and thoroughly, leading to substantial energy expenditure [48]. While praise is a powerful teaching tool, it should be noted that relying solely on praise is ineffective. Students should be encouraged to participate actively in the learning process, and praise statements must also be student-centered. In using this approach, students will be more disciplined in the classroom, and disruptive behavior will be reduced [49–51]. In this study, it was also found that students' engagement in MVLPA was associated with their ability to monitor teaching behavior in the classroom. Previous studies have not reported any significant association between observation and students' MVLPA [41,46], unlike this study. PETs provide students with opportunities to engage in PA when they observe and supervise them in PE classes [52–54]. Students are more likely to engage in their tasks and practice their skills when PETs observe and assist them. In order to achieve this, PA must be maintained.

The study analyzed two variables based on teacher gender and PETs' experience levels (Figure 5). PETs with teaching experience ranging from 1 to 5 years allocated a significant portion of their time to classroom management. In addition, they reduced their observation time. This contrasted with individuals with 6–10 years' experience or >10 years' experience. There is evidence that PETs with teaching experience are more efficient when managing PE classes, enabling them to devote more time to observation [10]. Our study supports this perspective. In this context, observation extends beyond monitoring classes. PETs engage in the interpretation of student learning and offer feedback grounded in performance assessment. In addition to this, it involves offering students guidance based on their performance and helping them find alternative solutions when obstacles are encountered [55]. Observation is an active process in which students learn largely independently with their teachers' support and guidance. By spending more time observing, PETs adopt a facilitative approach rather than a directive approach. Our study may indicate that more experienced educators use student-centered approaches more frequently. According to the regression analysis results, PETs who have been teaching for 6–10 years and those who have been teaching for >10 years have positive correlations with students' engagement in MVLPA. Teachers with more experience spend more time observing students, potentially increasing their task time and involvement in MVLPA.

While our study found no significant gender differences between male and female PETs. In the regression analysis (Table 1), however, male PETs were significantly more likely to involve their students in MVLPA during PE classes. This was compared to female PETs. This finding diverges from those of previous studies [41,56], which have found no significant differences in students' MVLPAs during lessons led by male or female PETs and have even reported that female-led classes spent more time on MVLPA [43]. Our study did not reveal any differences in teaching behavior between genders. It appears that students under male PET's guidance spend more time engaged in MVLPA. This is due to differences in the role models and context of the lessons. Traditionally, Chinese culture has emphasized male dominance and women's dependence on men, which is influenced by Confucian philosophy [13]. Confucian principles emphasize activeness, bravery, and assertiveness in males. Females are generally gentle, quiet, and nurturing [57]. Students may be motivated to be more physically active during lessons when exposed to a male PET as a role model [19]. MVLPA may also be affected by differences in the context and content of lessons taught by male and female PETs. Students who participate in ball games and fitness activities are inherently more likely to be involved in MVLPA, according to our study's findings. Female PETs, on the other hand, typically devote more time to gymnastics. This may result in a reduction in the amount of time students have to complete MVLPA. While MVLPA time may vary, female PETs contribute substantially to PE learning. Female PETs are generally more nurturing and caring in social settings. Moreover, communicating effectively with students and providing essential support may be their greatest strengths [50,51,58–60].

Constraints and Prospects for Further Investigation

This study has certain limitations that need to be acknowledged. First, the conclusions are derived from an examination of 252 lessons taken from nine SSs in Chengdu, China. It is therefore possible that the results are not indicative of schools or regions of other types. Second, this study found that only a small proportion (21.3%) of the variance in the participation rate in MVLPA during SS PE classes is related to teacher-related factors. Teacher-related factors may not explain MVLPA. This phenomenon should be studied in more detail in the future. This should include demographic, biological, and physical factors associated with the school's physical environment, as well as psychological factors. Thirdly, it must be recognized that these data are retrospective in nature. The results indicate that teacher-related factors do not causally impact students' MVLPA during PE classes. Therefore, no causal relationship exists. In future research endeavors, intervention studies will be necessary to establish causal relationships.

5. Conclusions and Practical Implications

The present study contributes to the existing literature by examining the correlation between variables associated with PETs and students' engagement in MVLPA within PE classes, specifically within the context of Chinese culture. These findings indicate that SS students in China fall short of the established standard of dedicating 50% of class time to MVLPA. Notably, students instructed by male PETs and those with teaching experience of 6–10 years and >10 years participated significantly more in MVLPA compared to students instructed by female PETs and those with teaching experience of 1–5 years. Additionally, PETs who focused their efforts on closely observing their students and promoting physical fitness during PE sessions were positively associated with increased MVLPA among students.

Given that the MVLPA of SS students in this study did not meet the benchmark, PETs in southwest China need to implement strategies to enhance their students' MVLPA during PE. Particularly, attention should be paid to female PETs with 1–5 years' experience. PE interventions should aim to boost students' MVLPA during PE through instructional approaches that prioritize fitness promotion and vigilant student conduct supervision. Furthermore, PETs promote fitness only 4.75% of the time. Promoting behavior in PE can increase MVLPA time for students. Praising students in PE classes can be planned and implemented using effective praise statements. Students' MVLPA was positively correlated with observation as another teaching behavior. Teachers spend 18.03% of their class time observing, which is less than the managing or instructing of classes. Observation techniques in PE teaching should be incorporated into teachers' practices. Nonetheless, it is wise to exercise caution when exclusively relying on this approach, as MVLPA represents a wide range of educational objectives within the realm of PE. Achieving a well-rounded PE curriculum entails promoting MVLPA and also emphasizing diverse teaching behaviors to address multiple facets of student development. Teachers can employ strategies like maintaining constant mobility within the activity area and staying vigilant to all classroom occurrences. Observation effectiveness will be enhanced as a result. In addition, incorporating more students, improving lesson planning, preventing behavior problems, removing queues, optimizing space, and integrating small-sided games are some other teaching strategies. Collectively, these strategies increase MVLPA time for PE students.

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