

Teacher-student relationship and class flow in physical education class: The mediating effect of emotion regulation

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Abstract

Positive teacher–student relationships are associated with several student outcomes, including reduced problematic behavior; increased academic motivation, achievement, and emotion regulation; and classroom immersion. We examined the mediating role of emotion regulation in the association between teacher–student relationships and class flow in physical education, which had received scant research attention. Participants comprised a convenience sample of 374 students from four middle schools (50.3% girls and 49.7% boys). They completed existing reliable and valid scales measuring perceived teacher–student relationships, emotion regulation, and class flow. Data were analyzed using Pearson’s product-moment correlations. We also tested the goodness-of-fit of the model and used bootstrapping to verify the effects of emotion regulation as the mediating variable. Results revealed significant correlations between all subfactors of the teacher–student relationship, emotion regulation, and class flow scales. The devised model satisfied the goodness-of-fit criteria ($\chi^2 = 56.408$, $df = 17$, $CFI = .978$, $TLI = .965$, $RMSEA = .073$, $SRMR = .0328$). The direct effects of teacher–student relationship on emotion regulation, teacher–student relationship on class flow, and emotion regulation on class flow were all significant. Emotion regulation played a partial mediating role in the association between teacher–student relationship and class flow. In physical education, teachers’ relationships with students are key to classroom management, and teachers must build and develop emotional rapport with students to promote students’ focus and immersion and enhance class flow.

Keywords: *Physical education, Teacher-student relationship, Class Flow, Emotion regulation*

1. INTRODUCTION

The valuable relationships between teachers and students serve as a cornerstone of successful class management. In a good lesson, teachers and students value their interpersonal relationship, and a good teacher is one who understands and respects students. A teacher-student relationship has to be established first, in order to achieve meaningful PE education. This will reduce the amount of time taken for inducing discipline, while increasing the amount of time used for learning.

The teacher–student relationship refers to the level of connection between the two, which represents a human psychological need. Teachers and students desire mutual trust, respect, and support from each other. In class, teachers and students influence each other as they continue to develop relationships.

According to self-determination theory, individual well-being is enhanced when the three psychological needs of autonomy, competence, and relatedness are satisfied. Among the three needs that constitute self-determination, relatedness refers to intimacy in that students have meaningful relationships with teachers and peers [1]. Further, student-perceived satisfaction with relatedness has direct or positive effects on class flow [2]. In addition, positive teacher-student relationships are a basis for overcoming challenges in task performance and achieving educational goals [3]; they are closely related to variables associated with active class participation and academic achievement among students.

The teacher–student relationship also has a significant relationship with students’ emotion regulation. The emotional relationship between teachers and students affects the learning environment and students’

personality development [4]. Further, a positive emotional teacher–student relationship can reduce the misbehavior problems (e.g., bullying, puberty concerns) that students and fosters achievement of educational goals [5]. Like relatedness, emotion regulation has been reported to directly and indirectly affect class flow. When a teacher creates an emotional bond with a student and empathizes with the student’s situation, the student is more immersed in class flow, and the relationship promotes the student’s adaptability [6]. In particular, emotion regulation contributes to enhance the levels of flow in learning situations through variables (e.g., academic attitudes, motivation, self-regulation, etc.) which are known to be positively related to class flow [7]. Therefore, student-perceived relatedness and emotion regulation enable students to immerse themselves in classes in learning situations, thereby exerting their learning ability.

Despite the fact that the importance of teachers’ roles and relatedness in physical education classes have recently emerged [5], there have been few studies comprehensively examining the relationship between teacher-student relatedness, emotion regulation, and class flow in physical education class. In particular, studies on class flow have focused mainly on individuals’ internal factors [7], [8]. Studies are thus needed to find the meaning of class flow in a relational context.

Positive emotional experiences and active participation in physical education classes among students occur as a result of effective communication between teachers and students, and mutual and social interactions between teachers and students [9]. Teaching behaviors that support relationships are socio-environmental factors that can directly satisfy students’ relationship needs [1], [10]. When an amicable teacher-student relationship in a physical education class is formed, where teachers and students communicate, interact with each other, and develop a bond of empathy, students experience positive emotions [11], thereby improving their emotion regulation, skills, and task performance. An approach by which teachers understand, empathize, and respect students in physical education classes is an important antecedent for predicting learning behaviors such as learning motivation, flow, and performance in students [1].

The teacher–student relationship can help facilitate learning. However, if students do not meet their social and psychological needs in a learning process, they lose their interest in learning, cannot immerse themselves in learning, and tend to face difficulties in learning. Therefore, the teacher–student relationship is considered to be very important as well as having close relationships in a teaching context. In physical education, where various emotions are experienced through physical activities, it is important to investigate how the teacher–student relationship affects class flow and what role emotion regulation plays, as this will ultimately affect class quality. Our main purpose was thus to verify the mediating role of emotion regulation in the association between teacher–student relationships and class flow in physical education.

The research hypotheses to achieve this aim are as follows. First, the teacher–student relationship in the physical education class will affect emotion regulation. Second, the teacher–student relationship in the physical education class will affect class flow. Third, emotion regulation in the physical education class will play a mediating role in the relationship between teacher and student relationships and class flow.

2. Background

2.1. Teacher-Student Relationship

The teacher–student relationship is a component of relationships, one of the basic psychological needs of human beings [1], specifically referring to the degree of teacher–student relationship. Relationship refers to the desire to receive trust, attention, respect, care, and support from others within a social context. In the process of satisfying these desires, individuals develop learning progression and feel psychologically stable.

Students can feel scared or anxious in the presence of indifferent teachers and in controlling teaching environments, and therefore may not be able to form a harmonious relationship with teachers in these cases. Although forming a teacher–student relationship is important, at times physical education (PE) teachers dominate and control students through hierarchical structures and strict rules when instructing them [12]. Given the nature of the subject, PE classes are mostly held in school fields or auditoriums, and the contents of the tasks or the range of activities may be extremely limited for teachers for safety and efficiency purposes. Teachers who instruct many students have a tendency to prioritize rules given by the teacher over a student’s autonomy and the teacher–student relationship. This may reduce the primary goal of PE classes to maintaining order and controlling students, leading to a negative perception and attitude toward these classes.

A supportive teaching method used by teachers, as one of the key social factors based on understanding, empathy, respect, and care from students’ point of view, can satisfy students’ relationship needs [13]. This plays an important role in promoting learning motivation, developing positive emotions, and regulating emotions [1]. As students cannot satisfy their personal psychological needs (e.g., relationship, autonomy) in a class, they may also form a hostile teacher–student relationship and engage in activities that disturb the class or commit acts of misconduct. Some teachers experience hardships due to a weak emotional bond and lack of communication with students, caused by a learning environment where the decisions regarding how the lessons proceed are teacher-driven. Positive teacher–student relationships are the basis for students to overcome their challenges and achieve educational goals [3]. In addition, when their relationship needs are satisfied, the boredom of participation and efforts regarding learning is alleviated, and emotional stability is achieved [4].

Recent studies regarding teacher–student relationships include research on emotional support, teachers’ relationship support, teachers’ interpersonal relationships, and teaching behaviors and methods [12] that support relationships. Social environment and teaching behaviors that support relatedness in school settings should be treated importantly [13]. It is vital for students to engage in activities they want and to showcase their skills efficiently in physical education classes. However, students’ skill improvement and class flow can be enhanced when teachers and students communicate effectively, interact with each other, and create a bond of empathy [14].

2.2. Emotion Regulation

People experience various emotions in their lives. When people feel that emotions have a negative impact on themselves, they start to think about how they can regulate them in a positive way. Recent studies in social psychology have focused on emotion regulation, and the results of related studies have described the unconscious and conscious process of what emotions an individual had, and how he or she expressed them [15]. In addition, active research efforts are being made to highlight emotional aspects in teaching and learning situations. There have been studies highlighting several important virtues in teaching and learning, such as caring, passion, thoughtfulness, hope, and emotional intelligence. In physical education classes, students do not experience the same emotions as teachers do in a social environment (class). For example, some students may be angry because they were unable to complete a learning assignment, while others may feel sad because of this. The situations in which students feel emotions also vary from student to student. Some students may be surprised by a teacher’s question, and others may also feel joy and satisfaction as they succeed in a task that they have failed in or a task that took several hours to complete.

Emotion regulation refers to the ability to effectively control one’s own or others’ emotional experiences and affects the formation of relationships and interactions with others [16]. Teachers and students sometimes fail to control their emotions in a class situation when there are emotional responses and exchanges [17]. Consequently, they may experience negative emotions such as anxiety, shame, and

depression—damaging the relationships they have formed.

Concerning the positive emotions of teachers, it was found that teachers who took good care of students had a variety of influences on students. In particular, high school students reported that they thought it important to meet teachers who would take good care of them [18]. Middle school students who felt that teachers took good care of them were reported to be more motivated, less likely to engage in misconduct, more cooperative and supportive, and more likely to comply with classroom rules and norms [19]. In addition, when students felt that they received emotional and academic support from their teacher, their self-regulation and learning strategies improved [20]. The emotional development of students may be promoted or hindered depending on the learning environment [12]. It is thought that a learning environment where it is easy for students to express their emotions can positively develop their emotion regulation, and that teaching methods in which teachers understand, empathize, and respect their students can play an important role in regulating students' emotions.

When teacher–student relationships are positive, students smoothly control their emotions [21], and support from teachers has a positive effect on academic progress and social growth. Emotion regulation is positively related to various variables (e.g., motivation, academic achievement, class attitude, self-regulation, etc.), and it is associated with increased concentration and classroom immersion [7].

2.3. Class Flow

Class flow is the optimal psychological state—when students are immersed and focused on what is happening in the classroom. Earlier studies on flow were mainly related to sports and artistic activities [22], but recent studies on flow have been extensively conducted in sociology, psychology, and education areas which are involved in investigating human behaviors [23]. Students' flow can increase their class participation, provide a sense of achievement, and improve self-esteem, thereby maximizing their learning effects. Studies on class flow mainly focus on internal factors which come from within individual students. However, even if flow is a subjective psychological state, it is difficult to explain flow in a personal context that excludes others, and it is thus necessary to find the meaning of class flow in a relational context. Linger [24] described that intimacy in teacher-student communications affected students' class flow. Since intimacy is one of the sub-factors of the teacher–student relationship scale, it can be inferred that teacher–student relationships may be correlated with class flow.

When examining prior studies concerning class flow, positive teacher–student relationships as perceived by students had a positive effect on students' immersion and goal orientation [24]. Student engagement affects intrinsic motivation and leads students to fully devote themselves to learning activities by inducing interest in and amusement toward given assignments [6]. When teachers approach students in a friendly manner with genuine interest, allowing students to experience psychological stability, students' academic motivation and concentration levels increase. When teachers construct lesson plans based on students' desires and interests, the level of academic engagement in students can be improved [7], [25]. There is also a positive correlation between emotion regulation and class and students' concentration and immersion in class situations cannot exclude the effects of emotion regulation. Teachers should strive to create a learning environment so that students can immerse themselves in classes, to stimulate students' intellectual curiosity so that their motivation for learning and class participation can be enhanced, and to use appropriate cognitive strategies so that various aspects of educational experiences can be reflected.

Looking at the major factors for class flow as found in studies, the internal psychological characteristics of individual students included need for achievement, self-efficacy, and self-determined motivation [8]. Meanwhile, the major factors affecting students' learning motivation, learning flow, and academic achievement in a relational context included students' beliefs in their teachers and teacher–student relationship as found in previous studies [4], [23], [26]. In addition, teaching behavior that supports

autonomy has been found to affect class flow. In terms of learning motivation, class effects can be expected when students voluntarily participate in class, and it can be seen that building teacher–student relationships has an important effect on promoting class participation.

3. Methods

3.1. Participants

The participants in this study were 374 students aged 14–16 years from four public middle schools located in Jeonbuk, South Korea. There were 186 male students (49.7%) and 188 female students (50.3%).

3.2. Measures

To test the reliability of the measurement tools, internal consistency was estimated using Cronbach's α using the IBM SPSS 23.0 program. To test the validity of each measurement tool, a confirmatory factor analysis was performed using IBM Amos 23.0.

First, to measure the teacher–student relationship, scales developed by [27-28] were revised and used. The teacher–student relationship scale consists of questionnaire items on understanding and empathy (5 items: “PE teachers think from our perspective.”), intimacy (5 items: “PE teachers treat us kindly.”), and trust (3 items: “PE teachers respect individuals.”). This scale uses a 5-point Likert scale (1 = not at all, 5 = very so), and higher scores indicate better teacher–student relationships. The subscales are reliable: Cronbach's α s = .922 (empathy), .885 (intimacy), and .949 (trust). A confirmatory factor analysis assessing the validity of the scale ($\chi^2 = 238.994$, $df = 74$, $p < .001$, CFI = .963, NFI = .948, TLI = .955, RMSEA = .077, SRMR = .0451) showed that its goodness-of-fit was acceptable.

Second, for the assessment of emotion regulation, a scale developed by [16] was modified and used. The emotion regulation scale consists of questionnaire items on one's own emotion regulation (6 items: “I try to feel positive emotions during PE class.”) and the emotion regulation of others (4 items: “I act carefully when my friend seems unhappy.”). This scale uses a 5-point Likert scale (1 = not at all, 5 = very so), and higher scores indicate better emotion regulation. The subscales are reliable: Cronbach's α s = .892 (one's own emotion regulation) and .873 (others' emotion regulation). A confirmatory factor analysis assessing the validity of the scale ($\chi^2 = 110.329$, $df = 34$, $p < .001$, CFI = .966, NFI = .952, TLI = .956, RMSEA = .078, SRMR = .0360) showed that its goodness-of-fit was acceptable.

Third, for the assessment of class flow, a scale developed by [29-30] was modified and used. The class flow scale consists of questionnaire items on autotelic experience (6 items: “I enjoy PE classes.”), class content (5 items: “I know exactly what I am learning.”), and sense of challenge and control (4 items: “I have a desire to try different activities in a class.”). This scale uses a 5-point Likert scale (1 = not at all, 5 = very so), and higher scores represent better class flow. The subscales are reliable: Cronbach's α s = .905 (autotelic experience), .868 (class content), and .773 (sense of challenge and control). A confirmatory factor analysis assessing the validity of the scale ($\chi^2 = 274.073$, $df = 87$, $p < .001$, CFI = .945, NFI = .922, TLI = .934, RMSEA = .076, SRMR = .0351) showed that its goodness-of-fit was acceptable.

3.3. Procedure

We collected data using a self-reporting questionnaire survey method, using measurement tools that met reliability and validity tests in previous research, and were judged as appropriate for the purpose of this study. The researcher and research assistants visited the participating schools to explain the purpose of this study to the participants. The questionnaires consisted of items regarding the general characteristics of the participants (e.g., school year, gender, etc.), teacher–student relationship, emotion regulation, and class flow. Those students who agreed to voluntarily participate were fully informed of the purpose and methods

to be utilized. Incomplete responses were excluded from the data collected.

Based on this data, we investigated the indirect effects of teacher–student relationships on class flow through emotional control. Since the participants were minors, we obtained approvals from teachers in charge, principals at the concerned schools, and their parents. In addition, students and parents were informed that the personal data collected for statistical purposes would not be used for any purpose, other than statistical.

3.4. Data Analyses

In order to analyze the relationship between teacher and student relationships, emotion regulation, and class flow in the physical education class, a reliability analysis was performed, and the correlation between the variables (Pearson's product-moment correlation coefficient) was tested using the IBM SPSS 23.0 program. Confirmed factor analysis and path analysis were performed using AMOS 18.0. The mean, standard deviation, skewness, and kurtosis of the collected data were checked to satisfy an assumption that the population would be normally distributed. The goodness-of-fit of the model was tested based on CFI (.90 or more), TLI (.90 or more), RMSEA (.08 or less), and SRMR (.08 or less), and χ^2/df [22]. The effects of mediating variables were tested using [31] approach, and the significance test was performed using bootstrapping. In addition, 5,000 bootstrap samples generated from the raw data were used for parameter estimation, and the confidence interval was set at 95%.

4. Results

4.1. Descriptive Analyses

To test whether a normal distribution of a structural equation model was fulfilled (skewness <2, kurtosis <4), descriptive statistics (mean, standard deviation, skewness, and kurtosis) were analyzed for each sub-factor. The mean of each sub-factor was distributed from 3.60 to 4.10, and the standard deviation varied from .70 to .83. Upon checking skewness (absolute value of .20–.78) and kurtosis (absolute value of .11–.80), the conditions for a normal distribution were satisfied.

Table I. Mean, standardized deviation

	Variables	Mean	Standard Deviation	Skewness	Kurtosis
Teacher-student relationship	Understanding and empathy	4.01	.83	-.78	.20
	Intimacy	4.10	.71	-.59	.12
	Trust	3.93	.79	-.27	-.80
Emotion regulation	One's own emotion regulation	3.60	.79	-.20	.16
	Others' emotion regulation	3.93	.74	-.35	-.11
Class flow	Autotelic experience	3.86	.82	-.46	-.30
	Class content	3.92	.70	-.34	-.30
	Sense of challenge and control	3.71	.71	-.21	-.48

4.2. Correlations Between Variables

Table 2 shows the correlation between teacher–student relationship perceived by students, emotion regulation, and class flow. All sub-factors of teacher–student relationship, class flow, and emotion regulation showed significant positive correlation ($p < .01$). The teacher–student relationship perceived by

the student was found to have a positive relationship between class flow and emotion regulation. In addition, the R value was found to be less than .90, indicating that the possibility of multicollinearity between the measurement variables was low.

Table II. Correlation between variables

Variable	1.	2.	3.	4.	5.	6.	7.	8.
1. Understanding and empathy	1							
2. Intimacy	.673**	1						
3. Trust	.500**	.570**	1					
4. One's own emotion regulation	.524**	.594**	.500**	1				
5. Others' emotion regulation	.492**	.600**	.506**	.683**	1			
6. Autotelic experience	.511**	.579**	.487**	.650**	.571**	1		
7. Class content	.480**	.582**	.536**	.526**	.549**	.638**	1	
8. Sense of challenge and control	.350**	.385**	.361**	.393**	.357**	.574**	.549**	1

** $p < .01$.

4.3. Goodness-Of-Fit

Table 3 shows the results of analyzing the goodness-of-fit of the proposed model. To test the model's goodness-of-fit, the criteria proposed by Hair et al. [31] were used. The research model satisfied the goodness-of-fit criteria ($Q = 2.965$ ($\chi^2 = 50.408$, $df = 17$, $p < .001$), $CFI = .978$, $TLI = .965$, $RMSEA = .073$, $SRMR = .0328$), and it was proved that the proposed model can be established as a theoretical model.

Table III. Result of the goodness-of-fit test and causal relationship test

	Path		Est.	SE	C.R(t)	Effects		
						Total effect	Direct	Indirect
Emotion regulation	←	Teacher-student relationship	.800	.063	12.777***	.800	.800	
Class flow	←	Teacher-student relationship	.426	.125	3.411***	.905	.426	.479***
Class flow	←	Emotion regulation	.599	.134	4.485***	.599	.599	

$\chi^2 = 50.408$, $df = 17$, $CFI = .978$, $TLI = .965$, $RMSEA = .073$, $SRMR = .0328$

*** $p < .001$, Est. = estimate, SE = standard error.

Based on the above, the results of causal relationship verification of the study model are shown in Table 3. According to Table 3, the direct effect of teacher–student relationship and emotion regulation was .800 ($SE=.063$, $CR=12.777$), showing significance, and the direct effect of teacher–student relationship and class flow was also significant at .426 ($SE = .125$, $CR = 3.411$), and the direct effect of emotion regulation and class flow was significant at .599 ($SE = .134$, $CR = 4.485$).

The goodness-of-fit index for the research model satisfied the standard values and every path coefficient was statistically significant ($p < .001$), thus satisfying the prerequisites to test mediating effects. To test the

mediating effects of emotion regulation on the association between the teacher–student relationship and academic engagement, the bootstrapping (5,000 times) method proposed by Hoyle and Smith [32] was used.

The indirect effect of teacher–student relationship and class flow (.479, $p < .001$) was found to be significant. Emotion regulation played a partial mediating role in the association between teacher–student relationship and class flow (Figure 1).

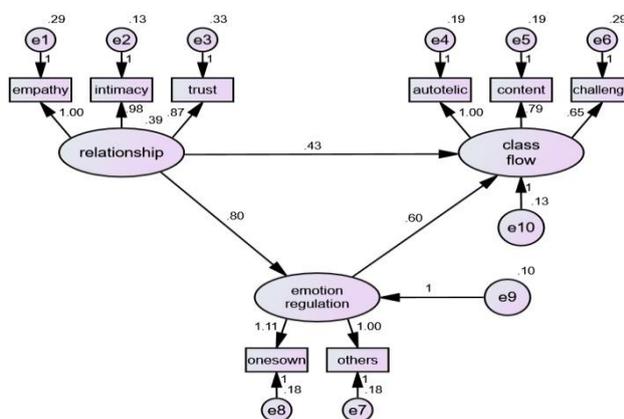


Fig. 1. Result of a structural equation model analysis

5. Discussion

We examined the effect of emotion regulation on the relationship between teacher–student relationship and class flow in physical education. In the case of PE classes, students’ perception of teacher–student relationships had a statistically significant effect on emotion regulation and academic engagement, and emotion regulation had a partial mediating effect on the association between teacher–student relationship and academic engagement.

In physical education, the teacher–student relationship was directly correlated with emotion regulation. This result supports previous findings [7], [33]—students who have formed a relationship of trust with teachers can effectively control their emotions when faced with conflicts or stressful situations. Students who have a close relationship with their teacher are less likely to develop psychological maladjustment symptoms such as anxiety, depression, or problem behaviors [34-35]. In addition, students who display emotion regulation have excellent social adaptability [36]. Perceived social support from teachers is related to students’ psychological stability and emotion control. Positive teacher–student interactions are also associated with positive student–peer interactions [37]. Teachers and students are interdependent in the teaching and learning processes, and emotions such as trust, anticipation, academic motivation, and self-worth are communicated through teachers’ relatedness support toward students [38]. In a class, teachers’ relatedness support provides psychological stability for students, affecting their academic motivation, attitude, and academic achievement [39]. Thus, teachers’ relatedness support plays a role in creating a safe learning environment that promotes growth in students. Formation of teacher–student relationships inevitably requires emotional understanding. Learning environments that cause continuous and excessive stress in students not only reduce their academic ability and higher-order thinking capabilities, but also disturb their emotional well-being, causing disciplinary issues [40]. Therefore, constructing an emotionally safe school environment is very important for students to be able to adapt well to school. To ensure the emotional stability of learners, teachers should create an emotional bond with them and improve their own competence in handling the emotional needs of students.

In physical education, the teacher–student relationship also had a direct positive relationship with class flow. Positive teacher–student relationships are likely to have positive effects throughout the class [9]. Intimacy with teachers felt by students, and the level of trust obtained from teachers lead students to concentrate on learning and actively participate in class, thereby successfully achieving instructional objectives [41-42]. This finding supports prior studies that showed that the level of trust students gain from teachers affects students' perceived class flow, active class participation, and academic achievement [21]. According to Self-determination Theory [1], the formation of effective relationships with peers, teachers, and parents is meaningful to students. Students who have formed positive relationships with teachers display more effort, patience, and immersion in class [41]. Positive teacher–student relationships also contribute to students' participation and continuity in class activities and class flow [42], as well as students' engagement and internal learning motivation [4]. For class engagement of students, important factors include not only teaching ability but also teacher–student intimacy, trust, understanding and empathy, positive feedback, etc. To increase student engagement in class activities, teachers must develop intimacy with students and establish instructional strategies considering each pupil, thereby making efforts to build teacher–student relationships [43]. Students develop when lessons are provided in such an environment that goes beyond the simple education of skills and knowledge and teachers provide education that students can appreciate.

In the relationship between teacher–student relationship and class flow, emotion regulation was found to play a partial mediating role. If the teacher and students have more intimate relationships, students are better engaged in class and regulate their emotions more smoothly. Further, effortless emotion regulation helps them to be better engaged in class. These findings partially support the results of a study reporting that better emotion regulation was associated with better flow in learning situations [21], [24]. As students feel that they are receiving sufficient social support from teachers that are meaningful to them, they show more adaptive emotion regulation than maladaptive. In class, emotion regulation is important in that it promotes students' psychological stability and learning ability [33]. When students are able to use emotion regulation strategies well in class, they can maintain emotional stability and improve their interpersonal competence. Students who regulate their emotions well also excel in academic engagement [44]. The positive emotional experience of students in class broadens the range and scope of attention, allowing them to be better focused and immersed in the class. Providing positive feedback from teachers can help control student behavior and improve the level of emotion regulation [45]. In contrast, if a teacher gives a student negative feedback, it can cause negative emotions such as helplessness and anxiety [15], which hinders students' focus and immersion. However, when teachers give positive feedback to students, students can develop emotion regulation skills and it enhances class flow.

Based on the above, the results of this study are significant for the following reasons: First, teacher-student interactions during students' flow in learning activities during physical education class were not significantly discussed. This study found that teacher–student relationships were an important variable for effective class operation and learning effects. For promoting class flow, it is important to design interesting class activities and student-centered classes, and to promote learning motivation, but variables for teacher–student relationships should also be fully considered.

Second, we found the importance of emotion regulation in teacher–student relationships and class flow. In physical education, students perform physical activities, experience various emotions, and share emotional empathy with teachers. Generally, in PE classes, teachers spend a lot of time running and organizing the class, providing information, observing, and supervising; little time is spent on interactive behavior [46]. Even if PE teachers implement a carefully selected lesson plan, negative teacher–student relationships, indifference, and level of interest toward the subject determine the quality and quantity of learning [47]. A strong factor that determines students' attitude and engagement toward the lesson is the teacher himself/herself; how the teacher constructs and manages lessons and how they interact with students

results in differences in students' emotion regulation, academic attitude, and academic engagement. When a physical education teacher disciplines a student owing to safety requirements or instructional goals, the student will experience negative emotions. Students' negative emotional experiences can disrupt class flow and damage teacher–student relationships.

To allow students to experience positive emotions and engage in classes, teachers should form a social environment where they can emotionally understand students and support their relationships. Such an environment allows students to break away from behaving in a perfect, standardized order and is built upon the teacher understanding the students and forming healthy relationships with them. In physical education, teachers need to understand students' emotional regulation and express emotional empathy to promote class flow.

6. Conclusion

In the association between teacher–student relationship and academic engagement, students' emotion regulation had a partial mediating effect on both factors. Forming a strong teacher–student bond is important since students can achieve the best outcome by controlling their emotions well and effectively engaging in the learning environment when they perceive their relationship with teachers positively.

Students' emotional experience in classes is important. Teaching cannot be achieved solely through teaching techniques; it also needs communication and sympathy toward students. If teachers cannot make students trust them, no lessons will appeal to the students. Accordingly, teaching must start from building positive relationships. If teachers do not relate to students, they cannot have their students fully engage in learning. To help students control their emotions and engage in PE classes, teachers must understand and sympathize with students and form a friendly relationship. Students' positive emotional experience and trusting relationship are the outcome of the teacher's building a consistent and tolerant relationship, especially for middle school students (aged 14–16) who are going through serious emotional and physical changes. To best benefit these students, teachers should construct an environment where students can stably participate in classes. In addition, students' emotion regulation ability and academic engagement can be improved when teachers form emotional bonds with students to spontaneously communicate with each other, and when teachers form learning environments where students who need help can readily approach and communicate with the teacher. Further, to enhance students' positive emotional experience and personal well-being, teachers should form a close, trusted relationship with students by displaying a reliable and understanding leadership.

Based on the results of this study, suggestions for future research are as follows. This study investigated the mediating effects of positive aspects of emotion regulation on teacher–student relationship and class flow, but it does not provide indications to identify how the negative aspects of emotion regulation might affect teacher–student relationships and class flow. Further studies that consider both the positive and negative aspects of emotion regulation should be conducted. Moreover, although the role of teachers as a social factor in promoting students' motivation is significant, relationships between students or peers also have an important influence. Therefore, if multiple studies regarding relationships between peers and teacher–student relationships affecting students' socialization processes were conducted, the quality of class learning may be further improved.

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