

The Mediating Effect of Positive Psychological Capital in the Relationship Between Physical Education Teachers' Instructional Styles and Class Flow

Ji Heum Park¹, Ho hyun Song^{2*}

¹ Lecturer, Department of Physical Education, Korea National University of Education, Republic of Korea, the128@knue.ac.kr

² Lecturer, Department of Physical Education, Korea National University of Education, Republic of Korea, hohyunss@jbbedu.kr

* Corresponding author: Ho hyun Song

Abstract: Physical education classes offer students the opportunity to develop a healthy lifestyle through physical activity. For students to actively participate in class, they must not simply follow the teacher's instructions passively but engage with a clear sense of purpose and focus on the task. This study aimed to analyze the mediating effect of Positive psychological capital in the relationship between physical education (PE) teachers' instructional styles and students' class flow. To achieve the purpose of this study, in May 2025, 416 questionnaires were collected from middle school students enrolled in S city, South Korea. The collected data were analyzed using descriptive statistics, confirmatory factor analysis (CFA), path analysis based on structural equation modeling (SEM), and bootstrapping to verify the mediating effect. The results of the study are as follows. First, PE teachers' instructional styles had a positive effect on students' Positive psychological capital. Second, Positive psychological capital had a positive impact on class flow. Third, the instructional styles of PE teachers had a positive effect on class flow. Fourth, Positive psychological capital was found to mediate the relationship between instructional styles and class flow. These findings suggest that physical education classes contribute not only to students' physical development but also to their psychological growth. Therefore, PE teachers should consider instructional approaches that stimulate students' positive psychological states. By implementing teaching strategies that enhance students' Positive psychological capital, it is possible to create a more immersive and engaging PE class environment.

Keywords: Instructional Styles of Physical Education Teachers, Positive Psychological Capital, Class Flow, Structural Equation Modeling

1. Introduction

Physical education classes offer students opportunities to develop a healthy lifestyle through physical activity. For physical education classes to be meaningful, students' voluntary and active participation is essential. For students to actively engage in class, they must not merely participate passively by following the teacher's instructions, but rather focus on the task with a clear sense of purpose.

Class flow refers to a state in which students become fully immersed in learning activities and experience optimal enjoyment [1]. Student participation is crucial for educational achievement and academic outcomes [2], and flow is positively associated with academic success [3]. Students' behavioral and cognitive engagement has been reported to exert significant direct and indirect effects on achievement [4]. Numerous previous studies have

suggested that class flow is a key factor in determining academic achievement. Therefore, exploring methods to enhance class flow is highly important.

Unlike theory-oriented subjects, physical education is delivered through physical activity. Physical education classes provide not only knowledge transmission but also a learning environment characterized by bodily movement and social interaction. As such, the instructional styles of physical education teachers may differ from those in other subjects. Instructional styles refer to various leadership approaches through which teachers influence students' learning achievement and satisfaction [5]. Specifically, training and instruction represent a task-oriented style, democratic behavior reflects a participatory decision-making process, autocratic behavior indicates unilateral control by the teacher, and social support emphasizes emotional bonding [6].

According to previous research, teacher feedback and interaction in physical education classes strengthen students' behavioral and emotional engagement, while a mastery-oriented classroom climate positively contributes to class flow [7]. Stringfellow reported that teacher support in physical education classes has a significant influence on students' class flow, particularly in terms of behavioral and emotional participation [8]. Similarly, Li and Xue found that a supportive learning environment provided by teachers is a critical factor in enhancing flow [8]. Based on these findings, it can be expected that physical education teachers' instructional styles positively influence students' psychology and class flow.

Students' psychological factors are key determinants of educational success, as they are closely linked to class participation [9]. In this regard, recent educational research has paid increasing attention to Positive psychological capital. Positive psychological capital refers to an individual's positive psychological developmental state [31]. It has been identified as a predictor of students' autonomous motivation, academic engagement, and academic achievement [10]. According to King et al., higher levels of Positive psychological capital strengthen students' energy, commitment, and absorption in class, leading to greater academic engagement [11]. Camacho-Morles et al. also demonstrated that achievement-related emotions are closely connected to academic performance, with enjoyment of learning having a particularly positive effect on outcomes [12]. Positive psychological capital has been actively studied across various academic fields, including management, psychology, and sports science, and has been reported to produce positive outcomes in a wide range of contexts such as organizational performance, athletes' competitive performance, and university students' academic achievement. These findings suggest that Positive psychological capital can also serve as a key mediating variable in the field of physical education.

Thus, Positive psychological capital can be considered an important variable in determining educational achievement. Importantly, Positive psychological capital is not viewed as a fixed trait. Still, rather as a state, and it can be developed depending on the school environment, teacher support, and classroom climate [31,37]. For example, Jung and Song reported that the perceptions of taekwondo athletes regarding their coaches' emotional leadership significantly influenced their Positive psychological capital and perceived performance, with emotional leadership exerting an indirect effect on perceived performance through Positive psychological capital [13]. Kang also found that social support perceived by adolescent athletes had a significant impact on both Positive psychological capital and grit [14].

However, existing studies have often focused on specific age groups or particular sports, and there is a lack of research that examines the relationship between Positive psychological

capital and class flow in the general context of middle school physical education classes. Therefore, this study seeks to fill this gap, and its significance can be considered particularly substantial. Taken together, previous findings suggest that students' Positive psychological capital can be improved through the instructional styles of physical education teachers, and that Positive psychological capital in turn positively influences class flow.

Unlike prior studies, this research sets physical education teachers' instructional styles as the independent variable, Positive psychological capital as the mediating variable, and class flow as the dependent variable. Through this study, we aim to explore strategies for promoting students' voluntary participation in physical education classes and for achieving more effective instruction. By focusing on teachers' instructional styles and presenting strategies to enhance class flow through Positive psychological capital, this study is expected to provide a theoretical foundation for improving physical education classes and enhancing the professionalism of physical education teachers. The research model and hypotheses of this study are presented in [Figure 1].

Hypothesis 1. Physical education teachers' instructional styles will have a positive effect on Positive psychological capital.

Hypothesis 2. Positive psychological capital will have a positive effect on class flow.

Hypothesis 3. Physical education teachers' instructional styles will have a positive effect on class flow.

Hypothesis 4. Positive psychological capital will mediate the relationship between instructional styles and class flow.

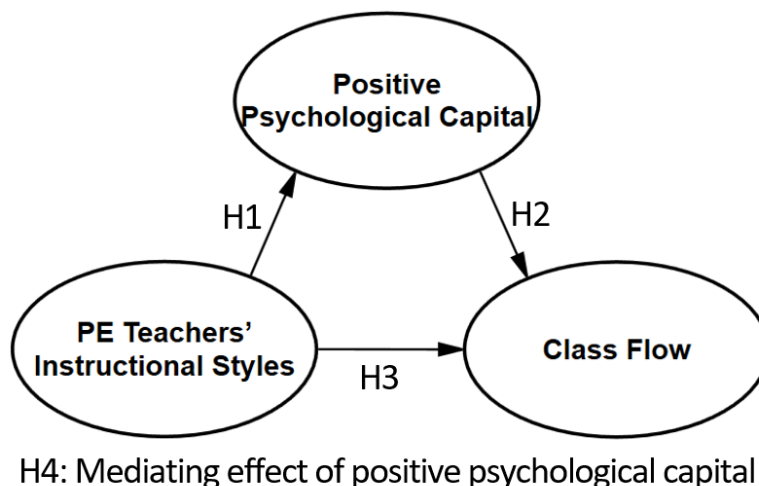


Figure 1. Research model

2. Methods

2.1. Participants

To achieve the purpose of this study, a survey was conducted in May 2025 with 450 middle school students enrolled in S city, South Korea. In South Korea, the period of elementary and middle school constitutes compulsory education, during which students are provided with equal educational content through the national curriculum. S city, where the sampling was conducted, is a newly developed city with central government agencies concentrated there, and the physical educational environment within the city is relatively homogeneous. Based on this educational context, the sampling method used in this study was convenience sampling, as the characteristics of the population were considered relatively homogeneous. Among the 430 questionnaires collected, 14 with insincere responses were excluded, and a total of 416 questionnaires were used for the analysis. The general characteristics of the participants are presented in [Table 1].

Table 1. General characteristics of the study participants

Characteristic	Categories	Frequency(n)	Percentage(%)
Sex	Male	203	48.8
	Female	213	51.2
	Total	416	100
Grade	7th	153	36.8
	8th	153	36.8
	9th	110	26.4
	Total	416	100

2.2. Descriptive Statistics of Variables

The questionnaires used in this study were adapted and revised from instruments that had been previously validated for reliability and validity in prior research, ensuring that they aligned with the purpose of this study. To examine the demographic characteristics of the participants, two items were included: gender and grade level.

The questionnaire on physical education teachers' instructional styles was based on the leadership scale for sports developed by Chelladurai and Saleh [6], and revised from the Korean version adapted by Park, Shin, and Lee [5][15]. The sub-factors of instructional styles consisted of four dimensions: democratic instructional style, positive reinforcement style, directive teaching style, and social supportive style. The instrument comprised 20 items in total, with 5 items for democratic instructional style, 5 items for positive reinforcement style, 5 items for directive teaching style, and 5 items for social supportive style.

Positive psychological capital was measured using the scale developed by Luthans et al. [31], revised from the Korean version of the Positive Psychological Capital Questionnaire [16]. Its sub-factors included self-efficacy, optimism, and resilience. The instrument contained 13 items in total, with 5 items for self-efficacy, 5 items for optimism, and 3 items for resilience.

Class flow was assessed using the physical education class flow scale developed by Kim [17], which was adapted from Csikszentmihalyi's flow construct [32]. The sub-factors included self-determined experience, engagement with class content, and congruence between class behavior and awareness. The instrument consisted of 17 items in total, with 6 items for self-determined experience, 6 items for engagement with class content, and 5 items for congruence between class behavior and awareness.

All questionnaires were measured using a 5-point Likert scale, ranging from 1 ("strongly disagree") to 5 ("strongly agree").

The means of the variables ranged from 3.277 to 3.947, and the standard deviations ranged from 0.723 to 0.971. Skewness values ranged from -0.862 to 0.074, and kurtosis values ranged from -0.444 to 1.110, confirming that the assumption of normal distribution was met. The detailed descriptive statistics are presented in [Table 2].

Table 2. Descriptive statistics by factor

Variables	Factor	Average	Standard Deviation	Skewness	Kurtosis
PE teachers' instructional styles	Democratic instructional style	3.569	0.936	-0.383	0.058
	Positive reinforcement style	3.947	0.823	-0.862	1.110
	Directive teaching style	3.664	0.847	-0.285	0.013
	Social supportive style	3.892	0.805	-0.642	0.622
Positive psychological capital	Self-efficacy	3.530	0.880	0.045	-0.390
	Optimism	3.561	0.817	0.025	-0.159
	Resilience	3.530	0.942	-0.125	-0.444
Class flow	Self-determined experience	3.740	0.971	-0.498	-0.414
	Engagement with class content	3.768	0.726	-0.018	-0.225
	Congruence between class behavior and awareness	3.277	0.959	0.074	-0.389

2.3. Confirmatory Factor Analysis

In this study, the content validity of the measurement instruments was verified in advance by one professor specializing in sport pedagogy and two Ph.D. researchers. A confirmatory factor analysis (CFA) was conducted using the maximum likelihood estimation method, and Cronbach's α coefficients were employed to examine the internal consistency reliability of the items.

The analysis of the validity and reliability of the measurement tools yielded the following fit indices: $\chi^2 = 111.532$, GFI = 0.950, RMR = 0.029, RMSEA = 0.077, IFI = 0.974, TLI = 0.964, and CFI = 0.974. The Cronbach's α coefficients ranged from 0.858 to 0.960, indicating that reliability was established. The values of average variance extracted (AVE) ranged from 0.747 to 0.781, which were interpreted as being at a desirable level. The detailed results of the confirmatory factor analysis are presented in [Table 3].

Table 3. Results of confirmatory factor analysis

Variables	Factor	Estimate	β	Standard Error	Critical Ratio	Cronbach's α	AVE
PE teachers' instructional styles	Democratic instructional style	1.035	0.779	0.053	19.621***	0.947	0.781
	Positive reinforcement style	1.012	0.866	0.043	23.579***	0.921	
	Directive teaching style	1.068	0.888	0.043	24.643***	0.871	
	Social supportive style	1.000	0.875	-	-	0.901	
Positive psychological capital	Self-efficacy	1.000	0.918	-	-	0.941	0.747
	Optimism	0.839	0.830	0.038	22.116***	0.884	
	Resilience	0.878	0.753	0.047	18.861***	0.858	
Class flow	Self-determined experience	1.000	0.842	-	-	0.960	0.759
	Engagement with class content	0.747	0.844	0.036	20.714***	0.886	
	Congruence between class behavior and awareness	0.997	0.850	0.048	20.930***	0.881	
Goodness-of-fit index	$\chi^2=111.532$, df=32, GFI=0.950, RMR=0.029, RMSEA=0.077, IFI=0.974, TLI=0.964, CFI=0.974						

***p<0.001

2.4. Data Analysis

In this study, responses judged to be insincere were excluded from the dataset before analysis, as they were considered to have low reliability. Data analysis was conducted using SPSS 29.0 and AMOS 29.0, with the level of statistical significance set at 5%. The specific procedures were as follows.

First, descriptive statistics were performed to examine the general characteristics of the data and to verify normality. For the assessment of normality, skewness and kurtosis values were calculated. If skewness values were within ± 3 and kurtosis values were within ± 8 , the data were considered to satisfy the assumption of normality [33][34].

Second, confirmatory factor analysis (CFA) was conducted using the maximum likelihood estimation method, and Cronbach's α coefficients were calculated to evaluate the internal consistency and validity of the measurement instruments. For model fit, a normed χ^2 value below 3 was regarded as strict, and a value below 5 as acceptable [33][34]. A GFI of 0.9 or higher indicated a good fit, an RMR of 0.05 or lower indicated a good fit, an RMSEA of 0.1 or lower was considered acceptable, and IFI, TLI, and CFI values of 0.9 or higher were regarded as satisfactory [33][34]. A Cronbach's α coefficient of 0.6 or higher was considered to indicate acceptable internal consistency. An average variance extracted (AVE) value above 0.5 was interpreted as desirable.

Third, correlation analysis was performed to test for multicollinearity among the variables.

Fourth, path analysis based on structural equation modeling (SEM) was conducted to analyze the relationships among physical education teachers' instructional styles, Positive psychological capital, and class flow.

Fifth, bootstrapping was performed to test the mediating effect. Bootstrapping was conducted 2,000 times, and the level of statistical significance was set at $p < 0.05$.

3. Results

3.1. Correlation Analysis

To test for multicollinearity among the sub-factors of physical education teachers' instructional styles (democratic behavior, positive reward, training and instruction, social support), Positive psychological capital (self-efficacy, optimism, resilience), and class flow (autotelic experience, absorption in class content, unity of action and awareness), a correlation analysis was conducted. The detailed results are presented in [Table 4].

The analysis revealed that all sub-factors were positively and significantly correlated with one another. The highest correlation was observed between positive reward and social support (0.779), while the lowest correlation was found between democratic behavior and resilience (0.315). Furthermore, as all correlation coefficients were below 0.8, it was determined that there was no issue of multicollinearity.

Table 4. Results of correlation analysis

	1	2	3	4	5	6	7	8	9	10
1	1									
2	0.657**	1								
3	0.712**	0.763**	1							
4	0.659**	0.779**	0.774**	1						
5	0.372**	0.351**	0.386**	0.364**	1					
6	0.334**	0.339**	0.379**	0.340**	0.761**	1				
7	0.315**	0.373**	0.386**	0.403**	0.680**	0.651**	1			
8	0.521**	0.531**	0.511**	0.521**	0.618**	0.523**	0.493**	1		
9	0.519**	0.528**	0.529**	0.522**	0.664**	0.602**	0.532**	0.694**	1	
10	0.442**	0.375**	0.453**	0.409**	0.689**	0.578**	0.564**	0.747**	0.703**	1

1. Democratic instructional style, 2. Positive reinforcement style, 3. Directive teaching style, 4. Social supportive style, 5. Self-efficacy, 6. Optimism, 7. Resilience, 8. Self-determined experience, 9. Engagement with class content, 10. Congruence between class behavior and awareness

** $p < 0.01$

3.2. Verification of Model Fit

The goodness of fit of the research model was verified using a variety of fit indices. Fit indices are critical criteria in structural equation modeling, as they indicate the extent to which the proposed model adequately explains the observed data. The detailed indices are presented in [Table 5]. In the results of this study, the Normed χ^2 value was 3.485, which falls slightly short of the strict criterion of less than 3 but meets the more lenient criterion of less than 5, and therefore can be interpreted as acceptable. The GFI value was 0.950, which is considered good when greater than 0.90, and the RMR value was 0.029, which is well below the 0.05 threshold, indicating a highly satisfactory result. The RMSEA value was 0.077, which is acceptable when below 0.10. In addition, the IFI (0.974), TLI (0.964), and CFI (0.974) values all exceeded 0.90, demonstrating that the overall fit of the model was sufficiently established.

Table 5. Model fit indices of the research model

	Normed χ^2	GFI	RMR	RMSEA	IFI	TLI	CFI
Goodness-of-fit index	3.485 ($\chi^2=111.532$, $df=32$)	0.950	0.029	0.077	0.974	0.964	0.974
Criteria of model fit	< 5	≥ 0.9	≤ 0.05	≤ 0.1	≥ 0.9	≥ 0.9	≥ 0.9

3.3. Verification of Causal Relationships in the Research Model

The causal relationships among physical education teachers' instructional styles, Positive psychological capital, and class flow were tested using the research model, and the results are presented in [Table 6].

First, in the relationship between instructional styles and Positive psychological capital, the standardized coefficient (β) was 0.489, and the critical ratio (C.R.) was 9.668, indicating statistical significance ($p < 0.001$).

Second, in the relationship between Positive psychological capital and class flow, the standardized coefficient (β) was 0.670 and the critical ratio (C.R.) was 14.502, which are relatively high values ($p < 0.001$). This suggests that Positive psychological capital is a crucial factor in students' classroom engagement.

Third, in the relationship between instructional styles and class flow, the standardized coefficient (β) was 0.340 and the C.R. was 8.346, showing statistical significance ($p < 0.001$). This demonstrates that instructional styles have a direct positive effect on students' level of flow.

Fourth, the indirect effect of instructional styles on class flow through Positive psychological capital was statistically significant, with an unstandardized estimate of 0.380 and a standardized coefficient (β) of 0.328 ($p < 0.01$). The results are presented in [Table 7]. Since instructional styles also had a direct effect on class flow, it can be concluded that Positive psychological capital partially mediates the relationship between instructional styles and class flow.

Table 6. Estimates of direct paths

Path		Estimate	β	Standard Error	Critical Ratio	Hypothesis
H1	PE teachers' instructional styles→ Positive psychological capital	0.560	0.489	0.058	9.668***	Supported
H2	Positive psychological capital→ Class flow	0.678	0.670	0.047	14.502***	Supported
H3	PE teachers' instructional styles→ Class flow	0.395	0.340	0.047	8.346***	Supported

***p<0.001

Table 7. Estimates of indirect paths

Indirect Path		Estimate	Standard Error	95%confidence interval		Hypothesis
				Lower	Upper	
H4	PE teachers' instructional styles→ Positive psychological capital→ Class flow	0.380	0.056	0.279	0.500	Supported

**p<0.01

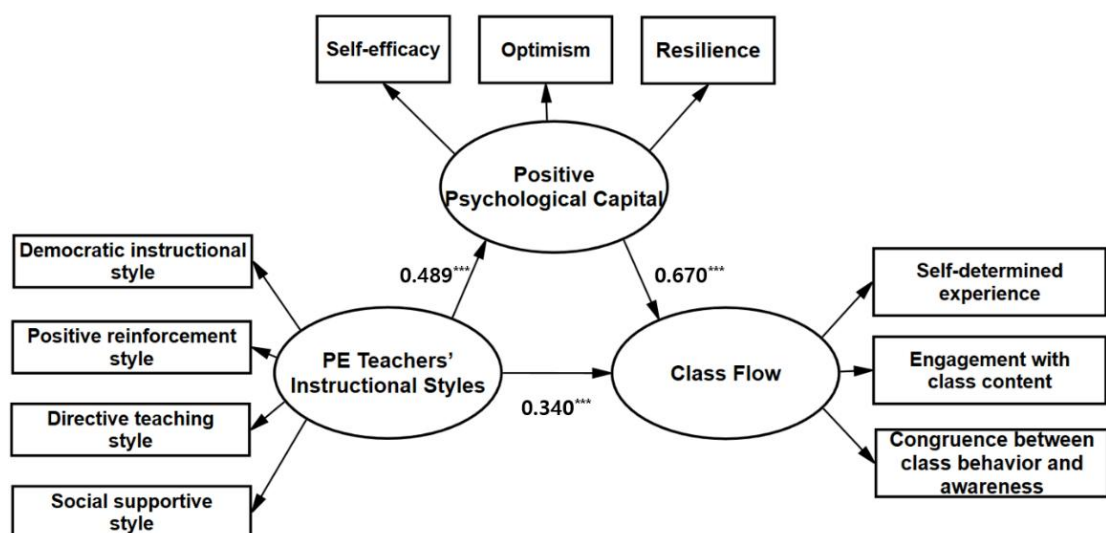


Figure 2. Standardized estimates of the research model(***p < 0.001)

4. Discussion

This study analyzed the effects of physical education teachers' instructional styles on students' class flow and the mediating role of Positive psychological capital using structural equation modeling. The results confirmed that all hypothesized paths were statistically significant. The specific discussions based on these findings are as follows.

First, the instructional styles of physical education teachers were found to have a positive effect on middle school students' positive psychological capital. In line with this, the study by Kim et al. demonstrated that teachers' communication skills significantly influenced students' Positive psychological capital, with empathy, cooperation, and supportive behaviors being particularly effective in enhancing students' self-efficacy, hope, and resilience [18]. Oh's research further suggested that task-oriented class design could strengthen students' Positive psychological capital [19]. Similarly, Cardenal et al. reported that teacher-student relationships vary depending on teachers' instructional styles [20].

When synthesizing the results of this study with those of previous research, it becomes evident that physical education teachers' instructional styles have a positive influence on enhancing students' positive psychological states. In particular, given that Positive psychological capital contributes to students' holistic development in the long term, the findings of this study carry significant meaning. However, these results do not suggest that a single instructional style is universally effective in fostering students' Positive psychological capital. Therefore, caution is required when applying these findings in educational practice. Physical education teachers should recognize that even when employing the same instructional style, students may perceive it differently depending on their individual characteristics and backgrounds. Accordingly, teachers need to identify such diversity and flexibly select instructional approaches suited to students' needs. This implies that, rather than adhering to a single style, teachers should employ a variety of instructional styles to ensure that teaching remains student-centered.

Second, Positive psychological capital was found to affect students' class flow positively. Prior research has reported that students' Positive psychological capital directly influences class flow [21][22]. King and Caleon suggested that Positive psychological capital is a psychological variable that explains behavioral, emotional, and cognitive engagement simultaneously [23]. Likewise, Datu and Valdez, in their study of Filipino high school students, found that Positive psychological capital predicted both academic engagement and emotional well-being [24].

These results suggest that students' positive psychological capital is not merely a psychological factor, but also serves as a resource that enables them to concentrate and actively participate in class. In particular, the sub-factor of self-efficacy can encourage students to take on challenging tasks, and it becomes further reinforced when they gain successful experiences. Moreover, optimism enhances the likelihood that students will perceive failures not as sources of stress but as opportunities to try again with a positive mindset. Even when faced with discouraging experiences, students with high resilience are more likely to turn such experiences into opportunities for growth and to persist in accomplishing tasks with perseverance. Therefore, Positive psychological capital is not only an important factor in promoting class flow but also has the potential to serve as a key factor that contributes to long-term academic persistence and the development of constructive habits.

Third, instructional styles of physical education teachers had a positive effect on students' class flow. According to previous studies, Bryan and Solmon argued that teachers' autonomy support and provision of competence promote student participation in activities [25]. Coterón

et al. reported that students' perceptions of teachers' motivational or controlling instructional styles most accurately predicted behavioral engagement [26]. This finding aligns with the present study, as it also considered students' perceptions of teachers' instructional styles. González-Peño et al. found that providing structure during activity and relatedness support positively predicted students' engagement [27]. Interestingly, they also found that cold teaching was a positive predictor of engagement [27], which is consistent with the finding of this study that the training and instruction style positively affected class flow.

These results suggest that teachers should guide students from different perspectives, depending on the type of task. For example, in tasks requiring creative strategies and movement composition, teachers should maintain structure while avoiding unnecessary control to maximize students' motivation and flow [28]. Conversely, in dance or physical activities that emphasize uniform aesthetic expression or involve a higher risk of injury, consistent control and directive instruction may be more appropriate than autonomy support. Physical education teachers should therefore design classes in detail and with precision to enhance class flow and ensure effective instruction.

Fourth, Positive psychological capital was found to have a mediating effect in the relationship between instructional styles of physical education teachers and class flow among middle school students. In relation to this, Huang et al. reported in a study of Chinese middle and high school students that teachers' instructional styles directly influenced sport learning flow, with resilience serving as a mediating factor, which partially aligns with the findings of this study [29][36]. Carmona-Halty et al. found that positive emotional experiences of high school students led to engagement through Positive psychological capital and ultimately contributed to improved performance [30]. Similarly, Coterón et al. reported that in physical education classes, teachers with a highly structured but low-controlling style maximized engagement, and resilience indirectly facilitated flow through its mediating effect [28].

These findings suggest that teachers' instructional styles are not limited to methods of managing and delivering physical education classes, but can also positively influence students' emotions, with Positive psychological capital leading to greater class flow. Therefore, when considering instructional approaches for successful classes, physical education teachers need to adopt strategies that stimulate students' positive psychological states. If appropriate guidance is provided that enhances students' positive psychological states, it is possible to operate classes at a higher level of engagement. Moreover, physical education should be recognized not only as a means of promoting physical growth but also as an opportunity to foster Positive psychological capital, and teachers should approach their classes with a strong sense of responsibility.

Positive psychological capital should not be regarded merely as a mediating variable explaining the relationship between instructional styles and class flow, but rather as a core factor that can predict students' long-term developmental trajectories. In other words, Positive psychological capital can be understood as a comprehensive construct that not only enhances students' immediate engagement in class but also contributes to their long-term academic persistence, willingness to take on challenges, and overall life satisfaction. This perspective is consistent with the broader educational aim goal of physical education, which emphasizes holistic development. Accordingly, physical education teachers should be attentive to students' psychological states and provide instructional support that fosters a positive mindset.

Based on the preceding discussion, the implications and significance of this study can be summarized as follows. First, unlike previous research, this study has of academic

significance in that it empirically verified the positive effects of Positive psychological capital, which can directly influence students' everyday lives. Positive psychological capital should not be understood as merely a temporary academic attitude or learning behavior, but rather as a core psychological resource that can positively affect broader aspects of life, including long-term academic persistence, resilience in the face of challenges, and emotional well-being [35].

Second, physical education is not limited to simple physical activity but is a subject that simultaneously pursues cognitive, emotional, and social development through physical activity. In this respect, it can be considered one of the most suitable subjects for cultivating Positive psychological capital. The findings of this study demonstrate that physical education classes play a crucial role not only in strengthening students' positive psychological states but also in promoting holistic growth.

Third, physical education teachers should actively consider strategies that can enhance students' Positive psychological capital—such as self-efficacy, optimism, and resilience—when designing and conducting classes. For example, providing step-by-step achievement experiences can reinforce self-efficacy; encouraging students to view failures as growth opportunities can strengthen resilience; and creating a classroom atmosphere that promotes positive thinking can foster optimism. Such approaches can increase students' class flow in the short term and, in the long term, contribute to sustained learning engagement and the development of healthy lifestyle habits.

Fourth, this study also provides implications for educational practice. Teacher training programs should incorporate the concept of Positive psychological capital to strengthen teachers' capacity to foster students' psychological growth. At the school level, diverse educational programs and physical activities that enhance Positive psychological capital should be actively introduced.

Therefore, when students' psychological factors are recognized not as secondary variables but as central components of education, the overall quality of physical education classes can be further improved. Ultimately, by strengthening students' positive psychological capital, it is expected that their level of class flow will naturally increase, leading to more effective achievement of instructional goals and, furthermore, exerting positive ripple effects on students' overall lives.

5. Conclusion

The purpose of this study was to analyze the mediating effect of Positive psychological capital in the relationship between physical education teachers' instructional styles and students' class flow. The findings were as follows. First, instructional styles had a positive effect on Positive psychological capital. Second, Positive psychological capital positively influenced class flow. Third, instructional styles had a positive effect on class flow. Fourth, Positive psychological capital was found to mediate the relationship between instructional styles and class flow. These results suggest that physical education classes contribute not only to students' physical development but also to their psychological growth. Accordingly, physical education teachers should consider instructional approaches that stimulate students' positive psychological states. By implementing teaching strategies that enhance Positive psychological capital, it is possible to create a class environment that fosters higher levels of class flow.

Finally, several suggestions for future research are proposed. First, this study was conducted with middle school students from a newly developed city where the educational infrastructure is relatively well-established. Therefore, future studies should expand the sample to include students of different ages, educational environments, personal characteristics, and family backgrounds to generalize the findings. Second, this study collected quantitative data on students' perceptions of physical education teachers' instructional styles through questionnaires. Subsequent research could incorporate qualitative methods, such as interviews with teachers and classroom observations, to further analyze the relationship between instructional styles and class flow. Third, while this study focused on Positive psychological capital as a mediating variable, future studies should explore other psychological factors that may serve as mediators in the relationship between instructional styles and class flow. Factors such as teacher–student trust, class satisfaction, and motivation are closely related to class flow. They may provide further insights into how instructional styles contribute to student engagement in physical education classes.

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