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## **The Multifaceted Learning Climate: Exploring the interplay of teacher effectiveness, peer dynamics, and environmental factors in Physical Education engagement**

**El clima de aprendizaje multifacético: Explorando la interacción entre la eficacia docente, la dinámica de pares y los factores ambientales en el compromiso con la Educación Física**

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## Abstract

This study explored the multifaceted learning climate in higher education Physical Education (PE) by examining the interplay of teacher effectiveness, peer dynamics, and environmental factors on student engagement. Employing a mixed-methods design with 1,955 university students, the research integrated quantitative survey data with qualitative insights. Multiple linear regression analysis revealed that the three domains collectively accounted for 77% ( $R^2 = .77$ ) of the variance in student motivation and engagement. Peer dynamics emerged as the strongest predictor ( $\beta = .42$ ), followed by safety in the learning environment ( $\beta = .32$ ) and teacher effectiveness ( $\beta = .27$ ). Qualitative findings corroborated these results, highlighting that while students perceived teaching as highly effective, their engagement was more significantly influenced by the quality of peer interactions and the physical learning environment. Key deterrents included overcrowded facilities, excessive heat, and social exclusion, whereas motivators included supportive peer relationships, varied activities, and encouraging instructors. The findings underscore that fostering a safe, socially supportive, and well-resourced environment is as critical as effective teaching for enhancing student engagement in PE. This study provides evidence-based recommendations for educators and administrators to cultivate a holistic and motivating PE learning climate.

**Keywords:** physical education, student engagement, learning climate, teacher effectiveness, peer dynamics

## Resumen

Este estudio exploró el clima de aprendizaje multifacético en la Educación Física (EF) de nivel superior al examinar la interacción entre la eficacia docente, la dinámica de pares y los factores ambientales sobre el compromiso estudiantil. Mediante un diseño de métodos mixtos con 1.955 estudiantes universitarios, la investigación integró datos cuantitativos de encuestas con perspectivas cualitativas. El análisis de regresión lineal múltiple reveló que los tres dominios explicaron colectivamente el 77% ( $R^2 = 0,77$ ) de la varianza en la motivación y el compromiso de los estudiantes. La dinámica de pares surgió como el predictor más fuerte ( $\beta = 0,42$ ), seguida por la seguridad en el entorno de aprendizaje ( $\beta = 0,32$ ) y la eficacia docente ( $\beta = 0,27$ ). Los hallazgos cualitativos corroboraron estos resultados, destacando que, si bien los estudiantes percibían la enseñanza como altamente eficaz, su compromiso estaba influenciado de manera más significativa por la calidad de las interacciones entre compañeros y el entorno físico de aprendizaje. Los principales obstáculos incluyeron instalaciones abarrotadas, calor excesivo y exclusión social, mientras que los motivadores incluyeron relaciones de apoyo entre compañeros, actividades variadas e instructores alentadores. Los hallazgos subrayan que fomentar un entorno seguro, socialmente solidario y con buenos recursos es tan fundamental como una enseñanza eficaz para mejorar el compromiso de los estudiantes en la EF. Este estudio ofrece recomendaciones basadas en evidencia para que educadores y administradores cultiven un clima de aprendizaje de EF holístico y motivador.

**Palabras clave:** educación física, compromiso estudiantil, clima de aprendizaje, eficacia docente, dinámica de pares.



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## Introduction

Physical Education (PE) has a transformative role to play in the overall development of the learners, developing not just physical fitness but also fostering social interaction, emotional well-being, and mental discipline. In higher education, success of PE programs is now measured more and more in terms of student engagement a multidimensional construct encompassing behavioral involvement, emotional investment, and cognitive participation. PE participation is different from the rest of academic subjects in that it involves the direct interaction with peers, physical settings, and instructional formats, all of which have to be synchronized to facilitate effective participation (Standage, Duda, & Ntoumanis, 2003). Therefore, the instructional environment in PE, influenced by the interaction among teacher competence, peer relationships, and environmental settings, becomes the key to student motivation and achievement. One of the most powerful players in the PE learning environment is the teacher's role. The best PE teachers accomplish more than teaching they create inclusive environments, promote autonomy, and develop relationships that foster motivation (Gamlem & Smith, 2013). Time and again, research indicates that if students see their teachers as supportive, nonjudgmental, and competent, they show greater levels of engagement and achievement. This perspective is shared by Lobo et al. (2024), who established that students of higher education become more academically involved in PE when they are motivated by teacher-led curiosity and guided by organized, but flexible instruction. They highlighted the fact that internal qualities such as grit and external factors such as instructional climate, play a significant role in influencing the level of engagement.

Peer relationships are also another important aspect of the learning environment within PE. The very social context of PE activities ensures that the quality of interactions between peers has the potential to facilitate or discourage participation. When students feel supported and approved of by their peers, they are more likely to participate actively and confidently (Casey & Jones, 2021). On the contrary, negative peer behavior like exclusion, non-cooperation, or mocking can decrease self-efficacy and discourage students to fully engage. Panganiban et al. (2025) emphasized how positive school and peer climate support academic resilience among PE teacher education students,



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reiterating the imperative for schools to develop a setting whereby relational safety and peer support are emphasized. The physical setting, such as the nature and condition of facilities, equipment, and space planning, also plays a noteworthy role in engaging in PE. In contrast to classrooms, PE environments call for proper spatial arrangements and environmental settings to support safe and efficient teaching. Physical comfort for participants like sufficient ventilation, shade, and room can influence their participation willingness and satisfaction with PE classes (Zhao et al., 2021). Inadequate facilities or congested rooms may discourage students and reduce the value of physical education as a school subject.

There are more recent studies that demand a more integrated perspective of how these aspects teacher practices, peer culture, and environment adequacy collectively create the PE experience. For instance, Quibrál, Garganera, and Mangali (2024) examined how PE teachers exhibited resilience and adaptability in varied learning settings, calling for responsive instructional design taking into account student needs and situation constraints. This is in line with larger pedagogical schemes that promote student-centered strategies based on mutual respect, inclusiveness, and flexibility. Furthermore, recent educational psychology scholarship emphasizes that student engagement is most long-term when both autonomy and interpersonal belonging are facilitated in school environments (Vansteenkiste, Ryan, & Soenens, 2020).

In light of this context, the current research explores the multifaceted learning environment of higher education PE, with a specific focus on how teacher effectiveness, peer relationships, and environmental conditions predict and affect student engagement. Drawing upon both quantitative and qualitative data, this study aims to present an in-depth understanding of the factors facilitating or hindering engagement in PE environments. Through statistical modeling and student perspectives, the research also seeks to reveal actionable suggestions for educators and administrators who want to improve the quality and effectiveness of PE programs. In the process, it joins a developing body of evidence-based research committed to turning PE into an active, engaging, and intellectually demanding element of the college experience.



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## Statement of the Problem

1. How do students' perceptions of teacher effectiveness, including instructional practices and interpersonal interactions, impact the overall learning climate and their engagement in Physical Education?
2. To what extent do students' perceptions of teacher effectiveness, peer interactions, and environmental conditions statistically predict their engagement levels in physical education settings?
3. To what extent do teacher effectiveness, peer interactions, and environmental adequacy influence the learning climate and student engagement in physical education classes?
4. What are the primary factors that motivate or deter student engagement and active participation in Physical Education activities?
5. What specific recommendations do students have for improving the learning climate in Physical Education, and how do these recommendations relate to the identified key factors?

## Research Methodology

A mixed-method design is employed to explore the multifaceted physical education (PE) learning environment. This approach combines qualitative and quantitative data collection through standardized questionnaires, surveys, and open-ended questions, allowing for a comprehensive analysis of student perceptions on teacher effectiveness, peer relationships, environmental influences, and motivation. The quantitative data will undergo statistical analysis using methods such as correlation and regression, highlighting broader patterns, while qualitative data will be thematically analyzed to derive contextual insights into student experiences (Brannen, 2017; Morse, 2016; Hesse-Biber, 2010).

For participant selection, purposive criterion sampling is applied, focusing on students enrolled in PE classes at Rizal Technological University during the 2024-2025 academic year. This is supplemented by convenience sampling to manage logistical challenges, resulting in a substantial pool of 1955 respondents (Palinkas et al., 2020;



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Robinson, 2022). Data collection occurs simultaneously, with surveys administered in a controlled environment to maintain ethical standards and ensure anonymity (Creswell & Guetterman, 2019; Leech & Onwuegbuzie, 2023).

Data analysis involves several statistical techniques. Descriptive statistics, including means and standard deviations, assess teacher effectiveness (RQ1), while Pearson correlation examines relationships between variables (RQ2). Multiple linear regression evaluates the predictive power of teacher effectiveness and peer dynamics (RQ3). Thematic analysis is applied to qualitative responses to identify themes related to environmental and social factors (RQ4 & RQ5). This multi-method approach ensures that the study delivers a comprehensive and nuanced understanding of the factors influencing the PE learning environment, balancing statistical trends with the lived experiences of participants (Pallant, 2020; Yu & Hutson, 2022; Dufera et al., 2023; Braun & Clarke, 2022; Krippendorff, 2018).

## Results

1. How do students' perceptions of teacher effectiveness, including instructional practices and interpersonal interactions, impact the overall learning climate and their engagement in Physical Education?



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**Table 1.**

*Descriptive Statistics of the Multifaceted Learning Climate (Teacher and Peer Factors) in Physical Education*

| Dimensions                                    | Mean        | SD          | Interpretation        |
|-----------------------------------------------|-------------|-------------|-----------------------|
| <b>Teacher Effectiveness (Overall)</b>        | <b>4.47</b> | <b>0.67</b> | <b>Strongly Agree</b> |
| Teacher Effectiveness                         | 4.48        | 0.78        | Strongly Agree        |
| Instructional Practices                       | 4.46        | 0.68        | Strongly Agree        |
| Interpersonal Interactions                    | 4.47        | 0.74        | Strongly Agree        |
| <b>Peer Dynamics and Learning Environment</b> | <b>4.20</b> | <b>0.73</b> | <b>Agree</b>          |
| Social Interactions                           | 4.30        | 0.80        | Strongly Agree        |
| Social Support                                | 3.96        | 0.76        | Agree                 |
| Safety in the Learning Environment            | 4.28        | 0.75        | Strongly Agree        |
| <b>Environmental Factors</b>                  | <b>4.07</b> | <b>0.78</b> | <b>Agree</b>          |
| Resources                                     | 4.00        | 0.86        | Agree                 |
| Facilities                                    | 4.10        | 0.80        | Agree                 |
| Conditions                                    | 4.12        | 0.82        | Agree                 |

**Legend:** 1.00–1.80 = Strongly Disagree, 1.81–2.60 = Disagree, 2.61–3.40 = Neutral, 3.41–4.20 = Agree, 4.21–5.00 = Strongly Agree

The empirical findings present a highly positive student evaluation of the physical education (PE) environment, establishing teacher effectiveness ( $M = 4.47$ ) as the primary anchor of the overall learning climate. When analyzed through Self-Determination Theory, the exceptionally high appraisal of instructional practices ( $M = 4.46$ ) and interpersonal interactions ( $M = 4.47$ ) indicates that the instructor functions as the essential mechanism for satisfying students' basic psychological needs. Clear, high-quality instruction directly addresses the need for competence, providing a structured, predictable learning pathway where students can attempt new motor tasks without the fear of public failure (Haerens et al., 2013; Centeio, 2024). Concurrently, supportive interpersonal dynamics fulfill the need for relatedness. When an instructor pairs pedagogical clarity with genuine relational warmth, they successfully foster a mastery-oriented climate that drives autonomous engagement, reduces self-conscious ego-defensiveness, and shifts

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students away from passive compliance toward intrinsic motivation (Flores-Piñero et al., 2024; Ma, 2026).

Despite this strong teacher-led foundation, a critical divergence emerges within the peer ecosystem ( $M = 4.20$ ). While students report robust social interactions ( $M = 4.30$ ) and feel physically and psychologically safe ( $M = 4.28$ ), there is a distinct emotional deficit regarding targeted social support ( $M = 3.96$ ), which stands as the lowest index in the entire matrix. This statistical imbalance reveals that while the PE environment is active and socially lively, it lacks intentional prosocial scaffolding; peers are interacting frequently, but they are not consistently providing the task-based or emotional encouragement necessary to buffer vulnerable, anxious, or less-skilled classmates (Debeck, 2024; Chen, 2026). Without explicit collaborative structures, a highly interactive environment can inadvertently transform into an ego-involving climate where public performance visibility triggers social comparison and evaluation apprehension rather than fostering collective development and mutual reassurance (Chung, 2026).

This social strain is further exacerbated by systemic resource constraints within environmental factors ( $M = 4.07$ ). While the broader physical infrastructure such as the layout of facilities ( $M = 4.10$ ) and overall environmental conditions ( $M = 4.12$ ) is viewed favorably, the resource sub-dimension yields the lowest mean ( $M = 4.00$ ) and the highest individual variance ( $SD = 0.86$ ) across the study. This fragmented student experience regarding essential physical tools directly disrupts instructional fluidity. When a lack of equipment forces instructors to organize larger group subdivisions, it creates passive waiting intervals, cuts into active movement time, and increases off-task behavior. This logistical bottleneck ultimately compromises the pace of learning and forces educators to divert their energy away from supportive, individualized feedback and toward basic spatial management and behavioral control (Sliwa et al., 2017).

To cultivate an equitable and highly engaging learning climate, PE programs must transition from a reliance on an instructor's individual charisma toward intentional, structural systemic designs. Educators should actively integrate Peer-Assisted Learning



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(PAL) frameworks to deliberately incentivize and reward prosocial actions, effectively turning casual peer socialization into structured emotional support networks that protect anxious learners (Gumbo et al., 2017; Chen, 2026). Simultaneously, administrative interventions must prioritize optimizing the equipment supply chain to lower student-to-item ratios. Minimizing resource scarcity eliminates idle down-time, maximizes moderate-to-vigorous physical activity (MVPA), and frees instructors to move away from crowd management and fully focus on delivering high-quality, supportive instruction (Sliwa et al., 2017).

**2.** To what extent do students' perceptions of teacher effectiveness, peer interactions, and environmental conditions statistically predict their engagement levels in physical education settings?

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**Table 2.** *Pearson's Correlation Between Dimensions and Student Engagement Variables*

| Dimensions                             | Motivation and Engagement (Overall) | Autonomy | Competence | Relatedness | Behavioral Engagement | Emotional Engagement |
|----------------------------------------|-------------------------------------|----------|------------|-------------|-----------------------|----------------------|
| Teacher Effectiveness                  | .72**                               | .67**    | .68**      | .56**       | .67**                 | .70**                |
| Instructional Practices                | .70**                               | .66**    | .67**      | .56**       | .65**                 | .69**                |
| Interpersonal Interactions             | .68**                               | .65**    | .64**      | .54**       | .63**                 | .67**                |
| Peer Dynamics and Learning Environment | .80**                               | .71**    | .71**      | .82**       | .69**                 | .69**                |
| Social Interactions                    | .75**                               | .66**    | .67**      | .78**       | .65**                 | .65**                |
| Social Support                         | .72**                               | .64**    | .63**      | .78**       | .61**                 | .60**                |
| Safety in the Learning Environment     | .80**                               | .72**    | .72**      | .78**       | .71**                 | .71**                |
| Environmental Factors                  | .74**                               | .73**    | .67**      | .66**       | .65**                 | .66**                |
| Resources                              | .67**                               | .68**    | .59**      | .61**       | .58**                 | .58**                |
| Facilities                             | .73**                               | .72**    | .66**      | .65**       | .66**                 | .64**                |
| Conditions                             | .74**                               | .73**    | .67**      | .66**       | .65**                 | .66**                |

**Legend:** *p* values are rounded to two decimal places; \*\* indicates  $p < .001$ ;  $r > .30$  = weak,  $> .50$  = moderate,  $> .70$  = strong

The study examines the intricate relationships impacting student engagement in Physical Education (PE), highlighting strong correlations among various factors. Particularly, Motivation is significantly linked with Peer Dynamics and the Learning Environment ( $r = .80$ ,  $p < .001$ ), emphasizing the importance of security and peer connections. Other key correlations include Social Interactions ( $r = .75$ ,  $p < .001$ ) and Environmental Conditions ( $r = .74$ ,  $p < .001$ ), indicating that social ties and physical



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conditions enhance engagement. Autonomy is also linked to Environmental Factors and Safety ( $r = .72$ ,  $p < .001$ ), showing that students feel more autonomous in safe environments. Moreover, Competence relates to Environmental Factors and is improved by peer interactions ( $r = .71$ ,  $p < .001$ ).

Relatedness has a strong connection with Peer Dynamics ( $r = .82$ ,  $p < .001$ ) and is influenced by Teacher Effectiveness ( $r \approx .56-.57$ ,  $p < .001$ ). Behavioral engagement correlates with Safety ( $r = .71$ ,  $p < .001$ ) and Teacher Effectiveness ( $r = .67$ ,  $p < .001$ ), indicating that structured, safe learning environments are crucial. Emotional engagement shows similar links to Safety ( $r = .71$ ,  $p < .01$ ). Ultimately, the study asserts that a safe Learning Environment is essential for fostering all aspects of student engagement in PE, with positive peer dynamics playing a key role in motivation and relatedness.

**3.** To what extent do teacher effectiveness, peer interactions, and environmental adequacy influence the learning climate and student engagement in physical education classes?



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**Table 3**

*Multiple Linear Regression Predicting Motivation and Engagement (Overall) from Teacher Effectiveness, Peer Dynamics, and Environmental Adequacy*

| Predictor                                  | B    | SE B | $\beta$ | t     | p      | 95% CI for B | VIF  |
|--------------------------------------------|------|------|---------|-------|--------|--------------|------|
| (Constant)                                 | 0.28 | 0.05 | —       | 5.42  | < .001 | [0.18, 0.38] | —    |
| Teacher Effectiveness (Overall)            | 0.26 | 0.01 | 0.27    | 18.03 | < .001 | [0.23, 0.29] | 1.84 |
| Peer Dynamics and the Learning Environment | 0.39 | 0.01 | 0.42    | 27.49 | < .001 | [0.36, 0.41] | .02  |
| Safety in the Learning Environment         | 0.27 | 0.01 | 0.32    | 20.68 | < .001 | [0.25, 0.30] | 1.99 |

**Note. Model Summary:**  $R = .88$ ,  $R^2 = .77$ , Adjusted  $R^2 = .77$ , RMSE = .32| **ANOVA:**  $F(3, 1950) = 2175.24$ ,  $p < .001$ | **Note.**  $N = 1954$ . All predictors significant at  $p < .001$ . No violations of multicollinearity were detected ( $VIF < 5$ ).

The multiple regression analysis revealed a significant model explaining 77% of the variance in student motivation and engagement ( $F(3, 1950) = 2175.24$ ,  $p < .001$ ). Key predictors were identified as Peer Dynamics and Learning Environment ( $\beta = .42$ ), Safety in Learning Environment ( $\beta = .32$ ), and Teacher Effectiveness ( $\beta = .27$ ). While teaching quality is important, peer interactions and perceptions of safety have a greater impact on student engagement. Correlational analysis showed strong positive relationships between these factors, but regression analysis clarified predictive strength without implying causation. The findings suggest that improving peer relationships, safety, and teaching effectiveness can enhance student motivation and engagement, shifting focus from solely positive teaching practices to fostering peer dynamics and supportive environments.



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**Table 4.**

*Joint Display of Quantitative Predictors and Qualitative Insights on Student Engagement*

| Key Dimension         | Quantitative Evidence (Predictive Strength) | Qualitative Theme                           | Representative Student Quotes                                                                                                                                         | Mixed-Methods Meta-Inference                                                                                                                                                                                                                                                        |
|-----------------------|---------------------------------------------|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Peer Dynamics         | Strongest Predictor=.42, $p < .001$         | Social Safety & Belonging                   | "It feels more like bonding than just exercise."<br><br>"Interaction with classmates allows me to anticipate going to class."                                         | Confirmation & Expansion: The statistical dominance of peer dynamics is explained by the qualitative finding that social connection transforms PE from a "requirement" into a "social event." Peer validation acts as the primary driver of affective engagement.                   |
| Environmental Factors | Moderate Predictor=.32, $p < .001$          | Infrastructural Constraints as Demotivators | "It is super draining to play under the sun... I hope there's an indoor space next time."<br><br>"The worst thing is that the area is crowded... it's a school quad." | Contextual Nuance: While students rate environmental importance lower than peers statistically, qualitative data reveals it acts as a "hygiene factor." Physical discomfort (heat/crowding) creates a biological barrier that overrides motivation, regardless of teaching quality. |



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|                       |                                       |                                         |                                                                                                                                              |                                                                                                                                                                                                                                                                                       |
|-----------------------|---------------------------------------|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Teacher Effectiveness | Significant Predictor=.27, $p < .001$ | The Facilitator of Psychological Safety | "Creates a vibe that is more positive and easy to be with."<br><br>"When someone struggles, they offer helpful advice instead of criticism." | Functional Refinement: Although the teacher is the statistically "weakest" of the three predictors, qualitative data suggests their role is foundational. The teacher sets the "vibe" that allows positive peer dynamics to occur, suggesting an indirect pathway to engagement.      |
| Overall Model         | $R^2 = .77$ (77% Variance Explained)  | Holistic Interplay                      | "Most of the physical activities need an interaction with our classmates... thats why we need to get along."                                 | Integration: Engagement in higher education PE is less about "instructional delivery" (the teacher) and more about the "ecosystem" (peers and environment). High variance explained ( $R^2 = .77$ ) confirms that these three factors comprehensively capture the student experience. |

The integration of quantitative predictors and qualitative narratives in Table 4 offers a compelling expansion of Achievement Goal Theory (AGT) within the context of higher education Physical Education. While AGT traditionally emphasizes the teacher's role in establishing a motivational climate, the current study's regression analysis reveals that **Peer Dynamics** (beta = .42) serve as the primary architect of the perceived climate for university students. This aligns with the qualitative findings where students described supportive peer interactions as "bonding" rather than just exercise, effectively shifting



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the environment from a *Performance Climate* characterized by social comparison and judgment to a *Mastery Climate* rooted in collaboration and mutual support<sup>4</sup>.

Although Teacher Effectiveness remains a significant predictor ( $\beta = .27$ ), the data suggests that the teacher's influence is foundational rather than direct. As noted in the qualitative themes, teachers "create the vibe", but it is the peer group that sustains the psychological safety required for engagement. When peers are inclusive and cooperative, they reduce the "fear of failure" associated with public physical performance, thereby fulfilling the AGT prerequisite of viewing errors as "opportunities to learn" rather than sources of embarrassment. Conversely, negative peer behaviors such as teasing immediately instate a Performance Climate, triggering withdrawal and anxiety regardless of the teacher's competence. Thus, for higher education students, the "Mastery Climate" is less of an instructional strategy delivered by the teacher and more of a social construct negotiated among peers. This finding corroborates recent meta-analyses suggesting that peer support acts as a distinct and powerful motivational determinant, independent of instructional leadership

#### 4. What are the primary factors that motivate or deter student engagement and active participation in Physical Education activities?

##### The Environment: Space, Heat, and Equipment

The physical environment significantly shapes student willingness to participate, with overcrowding and extreme heat serving as major deterrents. One student lamented, *"The worst thing is that the area is crowded by other students since it's a school quad,"* while another expressed frustration with the weather: *"For sure the heat. It is super draining to play under the sun... I hope there's an indoor space next time."* Additionally, equipment scarcity limited engagement, as one participant noted, *"There aren't enough balls or mats for everyone, which can slow down the class."*



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### Peer Influence: Encouragement vs. Exclusion

Peer dynamics are a primary driver of motivation. Supportive classmates transform PE into a bonding experience, as one student shared: *"My interactions with classmates greatly affect my enjoyment... When my classmates are supportive... I feel more confident."* Another added that *"it feels more like bonding than just exercise."* However, negative interactions significantly deter participation: *"If there's teasing, lack of cooperation, or poor sportsmanship, it can make the experience less enjoyable and make me hesitate to participate fully."*

### Teacher Support: Participation and Passivity

Teachers are pivotal in creating an inclusive environment. Students feel seen when instructors are encouraging, with one recounting, *"My PE teacher creates a positive and supportive learning environment by encouraging everyone to do their best."* Students also valued fairness and constructive feedback, noting that good teachers *"encourage everyone"* and *"offer helpful advice instead of criticism"* when a student struggles.

### Activity Design and Personal Confidence

Activity design can either inspire or inhibit action. Repetitive routines tend to dampen interest, as one student noted: *"Doing the same activities too often makes the class feel less enjoyable and can lead to a boring routine."* Personal barriers like pain or shyness also lead to withdrawal. One student shared, *"My motivation decreases when I feel pain in my body,"* while another confided, *"I didn't really socialize with them much because I'm still a bit shy."*

### The Emotional Atmosphere: Anticipation vs. Avoidance

The emotional atmosphere defines whether students look forward to PE or avoid it. While positive peer interactions enhance the experience, some students find social energy *"overwhelming."* The teacher's demeanor is critical in balancing this; students



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emphasized that a teacher's *"positive vibe and approachability"* help cultivate the psychological safety needed to overcome emotional barriers and engage fully.

5. What specific recommendations do students have for improving the learning climate in Physical Education, and how do these recommendations relate to the identified key factors?

### **Diversifying Activities and Promoting Participant Choice**

Participants consistently expressed a desire for novelty and autonomy to combat boredom. They requested *"more chances to try different sports and activities"* and suggested that teachers *"maybe try more different games or activities so it doesn't feel the same every week."* Research supports that such variety and choice align with Self-Determination Theory, enhancing intrinsic motivation.

### **Enhancing Physical Facilities and Environmental Comfort**

Poor physical conditions act as major barriers to engagement. Participants specifically noted that *"a roofed gym would be good so it's not hot, especially since it's super hot summer,"* and called for *"more shaded areas, better sports equipment, and a smoother playing surface."* These requests align with findings that thermal discomfort and lack of safe infrastructure negatively impact performance and physiological readiness.

### **Strengthening Collaboration Through Group Activities and Inclusivity**

To build community and reduce social divides, participants advocated for frequent group rotations. They suggested that *"teachers could mix groups more so no one feels left out"* and noted that *"doing more team-building activities... would help us get to know each other better and reduce cliques."* Additionally, they emphasized that *"setting clear rules about sportsmanship and respect"* is essential to prevent teasing.



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## Participant-Centered and Responsive Teaching Approaches

Students need adaptive instruction that supports individual needs. They urged teachers to “*encourage the students by making them feel that physical education is fun*” and to provide “*accurate videos that demonstrate the steps... so we can follow quickly.*” Furthermore, they highlighted the importance of growth, requesting “*more personalized feedback during activities*” rather than general instruction.

## Fostering Positive Teacher–Participant Relationships

The emotional connection between teacher and student is vital. Frustration with communication gaps led one participant to plead, “*Please do listen to the students... when a student has a question... the prof doesn’t answer properly.*” Conversely, others noted that “*having a good relationship and interaction with students would contribute to his effectiveness,*” underscoring the value of mutual respect and trust.

## Designing Non-Competitive and Inclusive Activities

Critiquing the overemphasis on winning, participants requested inclusive tasks accessible to all abilities. They suggested that teachers “*incorporate more cooperative games, emphasize sportsmanship and mutual support*” and “*focus on skill development rather than just competition.*” This shift creates a mastery-oriented climate where self-worth is not tied solely to outperforming others.

## Integrating Participant Feedback and Promoting Adaptability

A key recommendation involves co-created learning experiences. One participant explicitly stated: “*Use student feedback. Ask students what activities they enjoy or struggle with. Use feedback to adjust lesson plans and make the class more engaging.*” This participatory approach increases student agency and allows teachers to be responsive to real-time class needs.



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## Discussion

This study fundamentally reframes the understanding of student engagement in higher education Physical Education (PE) by revealing that the classroom "ecosystem", specifically peer dynamics and environmental safety weighs heavily on student motivation than instructional delivery alone. While students perceived their teachers as highly effective, the regression model identified Peer Dynamics as the strongest unique predictor of engagement ( $\beta = .42$ ), suggesting that for university students, PE is less about acquiring skills in isolation and more about the social safety negotiated among classmates. Positive peer interactions transform the learning space from a performance-oriented arena of judgment into a mastery-oriented environment of "bonding," where social connection reduces the anxiety associated with public physical exertion. Conversely, the absence of supportive peer relations immediately instates a barrier to participation, regardless of how competent the teacher may be.

Furthermore, the study establishes that the physical environment acts as a non-negotiable gatekeeper to learning, with Safety in the Learning Environment serving as the second strongest predictor ( $\beta = .32$ ). Qualitative insights illuminate that "biological barriers" such as extreme heat, overcrowding, and lack of equipment override psychological motivation; simply put, students cannot cognitively engage if they are physically depleted or thermally uncomfortable. Although Teacher Effectiveness appeared as the statistically weakest predictor ( $\beta = .27$ ), the findings clarify that the teacher's role remains foundational rather than diminished. Teachers "set the vibe" that allows positive peer dynamics to flourish, acting as architects of the psychological safety necessary for students to take risks. Ultimately, with these three factors explaining 77% of the variance in engagement ( $R^2 = .77$ ), the study confirms that meaningful PE experiences are not delivered solely by an instructor but are co-constructed through a holistic interplay of safe facilities, supportive peers, and responsive teaching.



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## Conclusion

This study explores the diverse learning climate in higher education Physical Education (PE) by examining teacher effectiveness, peer dynamics, and environmental factors through a mixed-methods approach. Quantitative findings indicate that these three domains positively influence student motivation and engagement, with peer interactions being the strongest predictor. Regression analysis reveals that these variables account for 77% of the variance in student engagement, highlighting their interconnected roles in shaping the PE experience. Qualitative insights further validate these findings, showcasing student experiences and emphasizing how supportive teaching, respectful peer relationships, and adequate facilities enhance motivation, while overcrowded conditions and lack of inclusivity impede it. The study underscores that effective teaching is crucial for fostering engagement, but social and environmental factors are equally significant. Key aspects include emotional safety, peer support, and sufficient resources, which are essential for an engaging and equitable PE climate. Recommendations to improve student engagement involve strengthening peer connections, enhancing environmental resources, and increasing student involvement in activity design. Overall, this research contributes to the understanding that student engagement in PE is influenced by relational, instructional, and structural systems, advocating for a holistic and inclusive learning environment that supports growth and wellness.

## Recommendations

Recommendations emphasize the importance of fostering a positive and inclusive learning environment in physical education (PE). Students should actively contribute by supporting peers and expressing their needs for engagement. PE teachers are encouraged to utilize learner-centered strategies, provide varied activities, and manage group dynamics to enhance participation. Higher education administrators should improve PE facilities and invest in resources while supporting faculty development. Future research should focus on the long-term impact of various factors on PE engagement, considering diverse educational contexts and proposing intervention-based strategies for effective teaching.



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