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Strengthening future educators: How school climate shapes academic resilience in Physical Education teacher education students

Fortaleciendo a los futuros educadores: Cómo el clima escolar moldea la resiliencia académica en los estudiantes de formación docente de Educación Física

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Abstract

Educators today face relentless challenges, making academic resilience crucial for success. However, limited research has examined how school climate, a multidimensional construct shaping students' experiences, influenced resilience among Physical Education Teacher Education (PETE) students. This gap was particularly evident across cultural and educational contexts, leaving institutions without clear strategies to nurture resilience in future educators. This study addressed this gap by investigating the influence of school climate on the academic resilience of 515 PETE students in selected higher education institutions across three countries. It also examined whether perceptions of school climate and academic resilience varied by sex/gender identity or country of origin. Multiple regression was employed to determine the predictive influence of school climate dimensions on academic resilience, while one-way ANOVA was used to assess differences in perceived school climate and academic resilience across sex/gender identity and country. Findings revealed no significant differences across these variables. However, overall, school climate positively influenced academic resilience. Interestingly, the physical safety dimension showed a negative association, suggesting complexities in how students perceived safety within their environments. Additionally, group cohesion and teacher motivation did not significantly influence resilience, challenging common assumptions about their universal importance. These results underscored the nuanced role of school climate in fostering resilience, prompting higher education institutions to reevaluate their policies and practices. By nurturing inclusive relationships, addressing overlooked dimensions, and creating supportive learning environments, schools can better prepare PETE students to navigate challenges. This study filled a critical research gap and provided actionable insights for building resilience among future physical educators.

Keywords: academic resilience, higher education, physical education, school climate.

Resumen

Los educadores de hoy enfrentan desafíos incesantes, lo que hace que la resiliencia académica sea crucial para el éxito. Sin embargo, la investigación limitada ha examinado cómo el clima escolar, un constructo multidimensional que moldea las experiencias de los estudiantes, influyó en la resiliencia entre los estudiantes de Educación Física (PETE). Esta brecha fue particularmente evidente en los contextos culturales y educativos, dejando a las instituciones sin estrategias claras para fomentar la resiliencia en los futuros educadores. Este estudio abordó esta brecha investigando la influencia del clima escolar en la resiliencia académica de 515 estudiantes de PETE en instituciones de educación superior seleccionadas en tres países. También examinó si las percepciones del clima escolar y la resiliencia académica variaban según el sexo/identidad de género o país de origen. Se empleó una regresión múltiple para determinar la influencia predictiva de las dimensiones del clima escolar en la resiliencia académica, mientras que se utilizó ANOVA unidireccional para evaluar las diferencias en el clima escolar percibido y la resiliencia académica según el sexo/identidad de género y el país. Los hallazgos no revelaron diferencias significativas entre estas variables. Sin embargo, en general, el clima escolar influyó positivamente en la resiliencia académica. Curiosamente, la dimensión de seguridad física mostró una asociación negativa, lo que sugiere complejidades en cómo los estudiantes percibían la

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seguridad dentro de sus entornos. Además, la cohesión grupal y la motivación de los docentes no influyeron significativamente en la resiliencia, lo que desafía las suposiciones comunes sobre su importancia universal. Estos resultados subrayaron el papel matizado del clima escolar en el fomento de la resiliencia, lo que impulsó a las instituciones de educación superior a reevaluar sus políticas y prácticas. Al fomentar relaciones inclusivas, abordar dimensiones descuidadas y crear entornos de aprendizaje propicios, las escuelas pueden preparar mejor a los estudiantes de PETE para enfrentar los desafíos. Este estudio llenó un vacío crítico en la investigación y brindó información práctica para desarrollar la resiliencia entre los futuros educadores físicos.

Palabras clave: resiliencia académica, educación superior, educación física, clima escolar.

Introduction

The cultivation of a favorable school climate holds great importance in the field of education and the growth of students, including those aspiring to become physical education teachers. The establishment of a healthy school environment serves as the foundational basis for a wide range of educational, social, and psychological results (Izaguirre et al., 2023). The cultivation of a sense of safety, trust, and belonging within an educational environment fosters a secure emotional and social foundation for education students, hence creating an environment that is conducive to effective learning (Rusticus et al., 2023). In such a given context, it is probable that students will exhibit higher levels of engagement, motivation, and receptiveness towards the exploration of novel concepts (Jirout et al., 2022). Consequently, this phenomenon contributes to the improvement of their scholastic achievements and cognitive growth, thereby cultivating a lasting passion for acquiring knowledge. In addition to scholastic pursuits, a favorable educational setting significantly influences the development of students' personal attributes and psychological welfare. Values like respect, compassion, and openness are ingrained, fostering constructive interpersonal interactions and the ability to resolve conflicts (Sekerci & Yilmaz, 2021). Additionally, it serves as a protective mechanism against the adverse impacts of stress and anxiety, thereby enhancing the mental well-being and resilience of students (Franco et al., 2023). Over time, a favorable educational setting provides students with the essential social and emotional skills required for both personal and professional achievements, enabling them to become accountable and involved members of society within an ever-expanding

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global context (Mousena & Raptis, 2021). Moreover, it establishes the foundation for cultivating robust collaborations between educators, parents, and the community, promoting a comprehensive educational framework that enriches the overall caliber of the educational endeavor and contributes to the welfare of all involved parties (Kim & Gentle-Genitty, 2020). Therefore, the promotion of a pleasant school environment plays a crucial role in molding both the individual outcomes of students and the overall educational landscape. This ensures that schools function as nurturing, empowering, and transforming spaces where students can excel intellectually, socially, and emotionally.

The multidimensionality of school climate

The significance of school climate as a measure of educational excellence is widely acknowledged (Domínguez et al., 2019). Multiple scholars claim that a favorable climate is linked to positive outcomes in both cognitive aspects, such as motivation, academic satisfaction, and academic achievement (Kalkan & Dağlı, 2022), as well as affective-emotional aspects, including overall psychological well-being, life satisfaction, and self-esteem (Aldridge et al., 2020; Yu et al., 2023). Despite the fact that this evidence has been acknowledged for over a century, the scientific and educational world has shown an increasing interest in delving deeper into this concept during the past two decades (Escalante Mateos, Goñi Palacios, et al., 2020). Numerous scholarly inquiries have mostly concentrated on the identification of characteristics that cultivate a favorable school climate, also known as a climate that facilitates efficient learning and enhances individual well-being and personal development (Maxwell et al., 2017). The examination of school environment has frequently been conducted within the context of school development and reform initiatives that prioritize successful conflict resolution, school effectiveness, and interpersonal relationships (Hidayati, 2023). Nevertheless, despite the extensive body of research dedicated to examining this phenomenon, identifying an effective methodology remains challenging due to the intricate and diverse nature of school environment, which has been scrutinized through several theoretical frameworks and research methodologies. Furthermore, due to the various conceptualizations of school climate, there lacks a cohesive theoretical framework supporting the diverse measures conducted, and an agreement has not been reached on its various characteristics (Domínguez et al., 2019; Thapa et al., 2013). Several authors

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and institutions in the English-speaking world have examined various dimensions of the construct of school climate. These scholars argue that school climate can be broadly categorized into four domains: safety, relationships, environmental-structural aspects, and teaching-learning (Cohen et al., 2009). Each of these domains can be further subdivided into different dimensions, which have the greatest theoretical support (Bravo-Sanzana et al., 2023; Grazia & Molinari, 2021; Yu & Jiang, 2022). Furthermore, according to Escalante Mateos et al. (2020), a holistic approach in measuring school climate is subdivided into nine domains: (1) *student-teacher relationships*, (2) *rules*, (3) *teacher's expectations*, (4) *environmental-structural aspects*, (5) *peer relationships*, (6) *physical safety*, (7) *group cohesion*, (8) *methodological resources*, and (9) *teacher's ability to motivate*.

Student-teacher relationship is referred when there is an establishment of a strong student-teacher connection within the classroom entails fostering trust and mutual respect between the teacher and student (Gálvez-Nieto et al., 2022). Furthermore, *rules* are usually the establishment of a secure and well-organized setting. Hence, a positive school climate encompasses an environment in which individuals experience a sense of physical and emotional security, alongside the presence of well-defined and consistently enforced regulations to uphold order and discipline (Fekadu, 2019). Meanwhile, *teacher's expectations* hold for students involve their ideas pertaining to academic performance, behavior, and potential, hence exerting a substantial influence on students' educational experiences (Aydın & Ok, 2022; Sun, 2021). Moreover, *environmental-structural aspects*, in which the maintenance of school facilities plays a crucial role in establishing a favorable school atmosphere for students, as they provide the essential infrastructure for a secure, enjoyable, and accommodating educational setting (Oluremi & Olubukola, 2013). Also, *peer relationships* encompass the intricate network of social connections, exchanges, and dynamics that manifest among students within the context of an educational setting (Long et al., 2021). The connections inside the school are distinguished by reciprocal respect, collaboration, empathy, and inclusiveness, thereby fostering a supportive and peaceful environment (Kalkan & Dağlı, 2022). In addition, *physical safety* encompasses the state in which students are guaranteed safeguarding against bodily harm, incidents, or potential

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dangers while their presence within the confines of the educational institution (Caven, 2022; Kutsyuruba et al., 2015). Further, *group cohesiveness* is a concept that pertains to the robust perception of solidarity, collaboration, and interpersonal bonds among students who belong to different social circles or networks (Ganotice et al., 2022; Yang & Lin, 2022). Furthermore, *methodological resources* encompass a range of tools, approaches, and procedures utilized by teachers to establish and sustain a learning environment that is encouraging, inclusive, and conducive to the overall well-being and academic achievement of all students (Forsberg et al., 2021). Lastly, *teacher's ability to motivate* refers to the capacity of a teacher to inspire and encourage students plays a crucial role in fostering a favorable atmosphere within the educational institution (Han & Yin, 2016).

The emergence of academic resilience

In the recent years, the concept of *resilience* has been conceptualized as the capacity to endure and rebound from challenging circumstances (Sang, et al., 2020). In a similar vein, the concept of *academic resilience* (ARS) refers to a student's capacity to effectively manage challenges that possess a substantial and enduring nature, hence exerting a notable impact on their educational progress (Cui et al., 2023; Skedsmo & Huber, 2023). Educational experts have presented several definitions of academic resiliency, which relates to the potential of students from lower socioeconomic strata to overcome educational problems and achieve academic achievement, despite these obstacles' students face (Jin et al., 2022; Yan & Gai, 2022). Numerous studies have characterized academic resilience as the ability to continue in the face of adversities experienced within an educational atmosphere, while also achieving outstanding performance in school (Backmann et al., 2019; Ross et al., 2022). Nevertheless, research has demonstrated that students who have faced significant obstacles in their educational pursuits demonstrate increased levels of resilience in the academic environment (Ang et al., 2022; Wang, 2021). Highly resilient students demonstrate active engagement in the process. Individuals exhibit a notable resilience towards the formidable obstacles encountered in the realm of academia, and this characteristic has demonstrated a substantial capacity to forecast positive consequences, including heightened motivation and scholastic attainment (Abdolrezapour et al., 2023).

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Furthermore, it has been observed to correlate with diminished intentions to withdraw from academic pursuits and elevated levels of contentment with one's life (Vidić et al., 2023; Ye et al., 2021).

Disparities on perceived school climate and academic resilience

Several researchers have successfully demonstrated that a notable discrepancy exists in students' perceptions of school atmosphere based on gender identity (Ioverno & Russell, 2022; Rekienė & Pakrošnis, 2021). The research conducted by (Turhan & Akgül, 2017) shown that female students had a more favorable perception of the school climate in comparison to their male counterparts. This finding was derived from a sample of 1094 students attending 21 secondary schools located in the Elazığ province of Turkey. Similarly, the research conducted by Fredrick et al. (2022) examined the perceptions of school environment among a sample of 309 boarding students, with 60% identifying as female and 36% identifying as sexual minority. The study findings indicated a statistically significant disparity in the perception of school climate based on gender and sexual orientation. This interpretation is prone to significant subjectivity, as it is contingent upon the prevailing events and situations within schools (Rekienė & Pakrošnis, 2021; Rohatgi & Scherer, 2020). It is worth noting that students within the same class may possess varying perceptions of the school climate. In relation to academic resilience, there exists a variation in the resilience levels among learners, dependent on their gender identity (Yu, et al., 2020; Yalcin-Siedentopf et al., 2021). On the other hand, other studies have been undertaken that have found no statistically significant disparity in academic resilience based on gender (Jillani et al., 2023; Pai & Sekhar, 2023). This observation demonstrates that the development of resilience in many cultures is contingent upon the specific societal requirements within those cultures. In addition, there have been some research inquiries conducted to examine and compare school climate (Izaguirre et al., 2023; Yang et al., 2013) and the levels of academic resilience across different countries (Coronado-Hijón, 2017; García-Crespo et al., 2021; Pramudhita et al., 2023; Wills & Hofmeyr, 2019). One notable study conducted in the United States, as elucidated by Mills (2021), revealed a substantial disparity in the perceptions of campus climates among students of different racial backgrounds, specifically white and black individuals, and the manners in which these

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climates are facilitated by their educators and administrators. There exists a notable disparity in the manner in which students perceive the school atmosphere, specifically in relation to cultural, traditional, and societal norms.

Objectives of the Study and Hypotheses Formulation

Despite growing interest in academic resilience, there is a noticeable scarcity of research examining the multidimensionality of school climate and its influence on resilience, particularly among Physical Education Teacher Education (PETE) students. This gap becomes more pronounced in cross-cultural contexts where varying educational systems and cultural dynamics may influence how school climate dimensions are perceived and their relationship with students' academic resilience. To address this gap, the present study aimed to investigate the direct influence of school climate and its specific dimensions on the academic resilience of PETE students. Furthermore, the study sought to explore whether significant differences existed in the perceived school climate and levels of academic resilience across gender identity and country of origin. By focusing on the multidimensional aspects of school climate, this research aimed to provide a deeper understanding of its role in influencing academic resilience, offering valuable insights for higher education institutions to strengthen support systems for PETE students. Based on the existing literature, the study aimed to test the following hypotheses:

H₁: Overall school climate has no direct influence to academic resilience;

H_{1a}: Student-teacher relationships have no direct influence to ARS;

H_{1b}: Rules have no direct influence to ARS;

H_{1c}: Teacher's expectations have no direct influence to ARS;

H_{1d}: Environmental-structural aspects have no direct influence to ARS;

H_{1e}: Peer relationships have no direct influence to ARS;

H_{1f}: Physical safety have no direct influence to ARS;

H_{1g}: Group cohesion have no direct influence to ARS;

H_{1h}: Methodological resources have no direct influence to ARS; and,

H_{1i}: Teacher's ability to motivate have no direct influence to ARS.

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Methods

Research Design

The study employed a quantitative, predictive-correlational research design with a strong focus on tests of difference and predictive analyses to examine the influence of school climate and its multidimensional domains on the academic resilience of PETE students. Specifically, the study tested for significant differences in perceived school climate and academic resilience based on sex/gender identity and country of origin. Lastly, the study explored the influence of the specific dimensions of school climate on academic resilience.

Participants, Sampling Technique, and Sample Size

The participants of the study are undergraduate students pursuing a degree in Teacher Education specializing in Physical Education from selected higher education institutions in the Philippines, Indonesia, and India during the Academic year 2022-2023. In this regard, the respondents were selected by using *Purposive Sampling Technique*. Additionally, the present study has been guided by a formulated selection criterion to yield the most accurate and reliable data from the respondents:

- A. A student currently enrolled pursuing a Teacher Education degree in Physical Education;
- B. Regular or irregular student;
- C. Either straight male and/or female and/or LGBTQIAP+ member; and
- D. Ages 18 years old and above.

Table 1 displays the demographic profiles of the respondents. Majority of the respondents are female compared to male [$N_{\text{FEMALE}} = 261(50.7\%)$, $N_{\text{MALE}} = 244(47.4\%)$]. In terms of age, most of the respondents falls under 19 years old with an age mean of $\bar{X} = 19.74$ [$N_{19\text{YO}} = 149(28.9\%)$, $N_{18\text{YO}} = 114(22.1\%)$, $N_{21\text{YO}} = 108(21.0\%)$, $N_{20\text{YO}} = 94(18.3\%)$, $N_{23\text{YO}} = 25(4.9\%)$, $N_{22\text{YO}} = 20(3.9\%)$, $N_{24\text{YO}} = 5(1.0\%)$]. Lastly, most of the respondents are from the Philippines [$N_{\text{PHILIPPINES}} = 214(41.6\%)$, $N_{\text{INDONESIA}} = 168(32.0\%)$, $N_{\text{INDIA}} = 133(25.8\%)$].

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Table 1. Demographic profiles

Variables	Items	N(%)
Sex/Gender Identity	Male	244(47.4%)
	Female	261(50.7%)
	LGBTQIA+	10(1.9%)
Age ($\bar{X}$ = 19.74)	18	114(22.1%)
	19	149(28.9%)
	20	94(18.3%)
	21	108(21.0%)
	22	20(3.9%)
	23	25(4.9%)
	24	5(1.0%)
Country	Philippines	214(41.6%)
	Indonesia	168(32.6%)
	India	133(25.8%)

Furthermore, detailed demographics is illustrated in Table 2 and 3. In Table 2, it can be observed that most of the respondents from the Philippines are female, followed by male and LGBTQIA+ respondents constituting 41.55% of the overall study sample. On the one side, majority of the respondents from Indonesia and India are predominantly male, followed by female constituting 32.62% and 25.83% of the overall study sample, respectively. Meanwhile, in Table 3, it can be seen that most of the respondents in the Philippines and Indonesia are under 19 years old constituting 41.55% and 32.62% of the overall total sample, while respondents from India are 18 and 19 years old, constituting 25.83% of the overall total sample.

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Table 2. Detailed cross-tabulation (country vis-à-vis sex)

Country	Male(%)	Female(%)	LGBTQIAP+(%)	Total(%)
Philippines	43(20.1%)	161(75.23%)	10(4.67%)	214(41.55%)
Indonesia	118(70.24%)	50(29.76%)	0(0.00%)	168(32.62%)
India	83(62.41%)	50(37.59%)	0(0.00%)	133(25.83%)
N(%)	244(47.38%)	261(50.68%)	10(1.94%)	515(100.00%)

Table 3. Detailed cross-tabulation (country vis-à-vis age)

Age	Philippines	Indonesia	India	Total(%)
18(%)	42(19.63%)	34(20.24%)	38(28.57%)	114(22.14%)
19(%)	60(28.04%)	51(30.36%)	38(28.57%)	149(28.93%)
20(%)	43(20.09%)	32(19.05%)	19(14.29%)	94(18.25%)
21(%)	50(23.36%)	34(20.24%)	24(18.05%)	108(20.98%)
22(%)	9(4.21%)	7(4.16%)	4(3.00%)	20(3.88%)
23(%)	8(3.74%)	8(4.76%)	9(6.77%)	25(4.85%)
24(%)	2(0.93%)	2(1.19%)	1(0.75%)	5(0.97%)
N(%)	214(41.55%)	168(32.62%)	133(25.83%)	515(100%)

Instruments

The questionnaires were floated via online survey using Google Forms. The online survey questionnaire is subdivided into three sections:

1. The first section obtained the demographic characteristics of the respondents, such as gender, age, and country of origin. The second section of the questionnaire is the Multidimensional School Climate Scale (PACE-33) by Escalante Mateos et al. (2020). It is a 33-item scale that measures perceived school climate of students and is subdivided into nine subscales: physical safety, rules, student-teacher relationships, peer relationships, group cohesion, environmental-structural aspects, teacher's ability to motivate, teacher's expectation, and methodological resources. The responses are recorded on a 5-point Likert-type scale, ranging from 1 (disagree) to 5 (totally agree).
2. Lastly, the third section of the survey questionnaire is the 6-item Academic Resilience Scale (ARS-6) by Martin and Marsh (2006). It is a unidimensional short attitude scale with six items that measures students' resilience in the face of adversity, stress, and academic pressure (statement sample e.g., *"I think I'm good at dealing with schoolwork pressures."*). Respondents' answers are encoded on a 7-point Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree).

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Data Analysis

Each subscale on the PACE-33 and ARS-6 was subjected to a normality and reliability test, as well as a bivariate correlation, as shown in Table 4. Based on the estimations of normality, the majority of the scales acquired a threshold value of [-2, 2], suggesting that the data exhibit a normal distribution. Furthermore, the findings from the reliability test demonstrate a commendable level of reliability, as seen by the Cronbach's Alpha (CA) values ranging from .76 to .86. These results suggest that the instruments employed in this study are suitable for the purpose of investigation. Finally, a comprehensive examination of the relationship between all subscales of the PACE-33 and ARS-6 revealed a significant positive correlation ($p < .01$). Moreover, as previously mentioned, the data exhibit a normal distribution, suggesting that a parametric test is appropriate for examining the association between the two variables and assessing the significant differences in SC and ARS based on gender and country of origin. In this regard, Pearson-r and one-way analysis of variance (ANOVA) has been used. Furthermore, the Multiple Regression analysis was used to determine the direct influence of SC, and its subdimensions, to ARS.

Table 4. Normality estimates, reliability test, and bivariate correlation

Variable	Mean $\pm$ SD	SE	Skew	Kurt	1	2	3	4	5	6	7	8	9	10
STR	4.05 $\pm$.77	.034	-.653	-.237	(.76)									
RUL	4.51 $\pm$.69	.030	-2.052	.5678	.61**	(.81)								
TE	4.64 $\pm$.56	.024	-1.862	3.690	.56**	.75**	(.76)							
ESA	3.74 $\pm$.86	.038	-.560	.239	.61**	.65**	.61**	(.86)						
PR	3.74 $\pm$.90	.040	-.402	-.482	.57**	.51**	.35**	.45**	(.86)					
PS	1.70 $\pm$.81	.036	1.919	4.236	-.13**	-.35**	-.28**	-.17**	-.11**	(.77)				
GC	4.18 $\pm$.74	.032	-1.244	2.305	.64**	.65**	.51**	.55**	.60**	-.27**	(.85)			
MR	4.20 $\pm$.76	.033	-1.362	3.123	.64**	.72**	.64**	.63**	.47**	-.22**	.71**	(.76)		
TAM	4.48 $\pm$.70	.031	-2.184	6.746	.69**	.80**	.75**	.68**	.45**	-.30**	.72**	.86**	(.86)	
ARS	4.79 $\pm$ 1.06	.047	-.480	.105	.34**	.38**	.41**	.46**	.50**	-.16**	.47**	.50**	.46**	(.83)

Note: Sig. value $p < .05$; SC- School climate, STR- Student-teacher relationships, RUL- Rules, TE- Teacher's expectations, ESA- Environmental-structural aspects, PR- Peer relationships, PS- Physical safety, GC- Group cohesion, MR- Methodological resources, TAM- Teacher's ability to motivate, ARS- Academic resilience.

Ethical Statement

The study adhered to strict ethical protocols and was exempted from formal ethical clearance due to its nature as an anonymous online survey involving no physical

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intervention or identifiable information. Data was collected via Google Forms, where participants were informed about the study's purpose, inclusion criteria, and benefits. Participation was strictly voluntary, and respondents could withdraw without consequences. Minor discomfort from sensitive questions was acknowledged, and no monetary compensation was provided. Data were securely transferred to a password-protected Excel file and stored on a USB drive for three months before being permanently deleted. Anonymity and confidentiality were rigorously maintained, ensuring no identities were collected or traceable. Respondents also had the option to withdraw or request a debriefing at any time.

Results

The findings from the One-Way ANOVA analysis reveal a striking consistency in how PETE students perceive school climate and exhibit academic resilience, regardless of their gender identity or country of origin. With no significant differences observed in school climate scores [$F(2, 512) = 1.34, p = .264$] and academic resilience scores [$F(2, 512) = 2.21, p = .110$] across sex/gender identity groups, it suggests that straight male, female, and LGBTQIAP+ respondents similarly experience their school environments. Likewise, when comparing students from the Philippines, Indonesia, and India, the results showed no significant variance in school climate [$F(2, 512) = .44, p = .642$] and academic resilience [$F(2, 512) = .40, p = .669$] scores. This uniformity is notable and perhaps reflects the universal importance of a supportive educational environment—one that transcends cultural and gender boundaries—fostering a sense of stability and resilience in students. Furthermore, these results highlight a deeper narrative that resilience and school climate are not significantly influenced by demographics such as sex/gender identity or geography, emphasizing their role as universal experiences that connect students across borders and identities. The absence of disparities suggests that educational institutions provide consistent environments that nurture students' academic resilience, allowing them to adapt and thrive despite challenges. This finding encourages educators and policymakers to focus on strengthening these universal dimensions of school climate to ensure that all students, irrespective of their background, feel equally supported and empowered to succeed.

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Table 5. Comparison on school climate and academic resilience with respect to gender and country: one-way ANOVA analysis

			Sum of squares	df	Mean square	F	Sig.
Gender	School climate	Between groups	.725	2	.363	1.337	.264
		Within groups	138.821	512	.271		
		Total	139.547	514			
	Academic resilience	Between groups	4.925	2	2.463	2.213	.110
		Within groups	569.646	512	1.113		
		Total	574.571	514			
Country	School climate	Between groups	.241	2	.121	.444	.642
		Within groups	139.305	512	.272		
		Total	139.574	514			
	Academic resilience	Between groups	.900	2	.450	.402	.669
		Within groups	573.671	512	1.120		
		Total	574.571	514			

The results of the Pearson-r correlation analysis presented in Table 6 highlight significant relationships between school climate and academic resilience among PETE students. Overall, school climate exhibited a high positive correlation with academic resilience [$r(513) = .54, p < .05$], suggesting that as students perceive their school environment to be supportive and favorable, their ability to cope with academic challenges increases. Among the specific dimensions of school climate, peer relationships [$r(513) = .50, p < .05$] and methodological resources [$r(513) = .50, p < .05$] demonstrated high positive correlations with academic resilience. This underscores the importance of strong peer networks and practical teaching tools in helping students build confidence and adaptability. Similarly, group cohesion [$r(513) = .47, p < .05$] and environmental-structural aspects [$r(513) = .46, p < .05$] showed moderate positive correlations, emphasizing the role of collaboration and well-maintained school facilities in fostering resilience. Additionally, teacher expectations [$r(513) = .41, p < .05$] and teacher's ability to motivate [$r(513) = .46, p < .05$] exhibited moderate positive correlations with academic resilience, indicating that educators' support and encouragement are vital for helping students overcome academic challenges. Interestingly, physical safety showed a low negative correlation with academic resilience [$r(513) = -.16, p < .05$]. While physical safety is critical, this suggests that overly controlled or rigid environments may unintentionally limit students' ability to develop resilience by reducing opportunities to navigate manageable challenges. Therefore, the findings reveal that a supportive school climate is highly associated with

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academic resilience. These relationships highlight the importance of fostering a positive, inclusive, and resourceful school environment to successfully empower students to manage academic challenges.

Table 6. School Climate vis-à-vis Academic Resilience: Pearson-r correlation analysis

Correlations		
	Academic Resilience	
Overall School Climate	Pearson correlation	.536**
	Sig. (2-tailed)	.000
Student-teacher relationships	Pearson correlation	.359**
	Sig. (2-tailed)	.000
Rules	Pearson correlation	.383**
	Sig. (2-tailed)	.000
Teacher's expectations	Pearson correlation	.411**
	Sig. (2-tailed)	.000
Environmental-structural aspects	Pearson correlation	.455**
	Sig. (2-tailed)	.000
Peer relationships	Pearson correlation	.499**
	Sig. (2-tailed)	.000
Physical safety	Pearson correlation	-.160**
	Sig. (2-tailed)	.000
Group cohesion	Pearson correlation	.472**
	Sig. (2-tailed)	.000
Methodological resources	Pearson correlation	.502**
	Sig. (2-tailed)	.000
Teacher's ability to motivate	Pearson correlation	.464**
	Sig. (2-tailed)	.000

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

The results of the multiple regression analysis presented in Table 7 provide critical insights into the direct influence of school climate and its dimensions on academic resilience (ARS). The overall model demonstrated a significant relationship between school climate and academic resilience, with $F(9, 505) = 37.192, p < .001$, and an R^2 value of 0.399. This indicates that school climate, as a whole, accounts for 39.9% of the variance in academic resilience. When examining the specific dimensions of school climate, several constructs emerged as significant predictors of academic resilience. Notably, peer relationships ($\beta = .439, t = 7.997, p < .001$) had the strongest positive influence, highlighting the critical role of supportive peer networks in fostering resilience among students. Additionally, teacher expectations ($\beta = .403, t = 3.693, p < .001$) and methodological resources ($\beta = .398, t = 4.084, p < .001$) were significant positive contributors, underscoring the importance of teachers' belief in their students

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and the availability of effective teaching tools in enhancing academic resilience. Other significant predictors included environmental-structural aspects ($\beta = .243, t = 3.896, p < .001$), rules ($\beta = -.460, t = -4.494, p < .001$), and student-teacher relationships ($\beta = -.248, t = -3.380, p = .001$). Interestingly, while the relationships between rules and student-teacher relationships were significant, their negative coefficients suggest that overly strict rules or strained teacher relationships may hinder students' resilience. On the other hand, physical safety ($\beta = -.076, t = -1.550, p = .122$), group cohesion ($\beta = .145, t = 1.752, p = .080$), and teacher's ability to motivate ($\beta = .043, t = 3.240, p = .746$) did not significantly influence academic resilience. This finding implies that while these dimensions are important elements of the school climate, they may not directly contribute to students' resilience in this study's context. Therefore, the findings emphasize that specific components of school climate are pivotal in supporting academic resilience. Conversely, overly rigid rules and strained student-teacher relationships may undermine this resilience. These insights underscore the importance of fostering a balanced, supportive, and resource-rich school environment that prioritizes positive peer interactions and teacher support to enhance students' ability to overcome academic challenges.

Table 7. School climate and academic resilience: multiple regression analysis and hypotheses testing

Hypothesis	Regression weights	Beta Coefficient	R^2	F	t	p	Decision
H_1	SC $\rightarrow$ ARS	-	.399	37.192	-	.000	Rejected
H_{1a}	STR $\rightarrow$ ARS	-.248	-	-	-3.380	.001	Rejected
H_{1b}	RUL $\rightarrow$ ARS	-.460	-	-	-4.494	.000	Rejected
H_{1c}	TE $\rightarrow$ ARS	.403	-	-	3.693	.000	Rejected
H_{1d}	ESA $\rightarrow$ ARS	.243	-	-	3.896	.000	Rejected
H_{1e}	PR $\rightarrow$ ARS	.439	-	-	7.997	.000	Rejected
H_{1f}	PS $\rightarrow$ ARS	-.076	-	-	-1.550	.122	Accepted
H_{1g}	GC $\rightarrow$ ARS	.145	-	-	1.752	.080	Accepted
H_{1h}	MR $\rightarrow$ ARS	.398	-	-	4.084	.000	Rejected
H_{1i}	TAM $\rightarrow$ ARS	.043	-	-	3.24	.746	Accepted

Note: Sig. value $p < .05$; SC- School climate, STR- Student-teacher relationships, RUL- Rules, TE- Teacher's expectations, ESA- Environmental-structural aspects, PR- Peer relationships, PS- Physical safety, GC- Group cohesion, MR- Methodological resources, TAM- Teacher's ability to motivate, ARS- Academic resilience.

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Discussion

Initially, it was noted that there were no statistically significant disparities in school environment based on gender. This conclusion contradicted Fredrick et al. (2022) and Ioverno and Russell (2022), who found that female students often perceive school environments as more positive. However, Escalante Mateos, et al. (2020) demonstrated that resilience can mediate these differences, making gender-based variations less pronounced when students are supported by positive peer and teacher relationships. Similarly, no notable disparity was identified in academic resilience based on gender, aligning with findings by Amoadu et al. (2024), who suggested that academic resilience is influenced more by school culture and teacher support than gender. Moreover, the lack of significant variation in school climate perceptions based on place of origin challenges earlier findings by Tewari and Shukla (2021), who emphasized cultural influences on school experiences. However, these results align with Wong et al. (2021) highlighting that school climate can transcend cultural differences with strong institutional support. Similarly, this study's finding that academic resilience does not differ significantly across countries resonates with the work by Rohatgi et al. (2022), which suggested that institutional resources and student support mechanisms minimize regional disparities.

The strong positive relationship between school climate and academic resilience further supports findings by Manzano-Sánchez et al. (2021), who reported that peer relationships and teaching resources are significant predictors of student resilience and well-being. High correlations between dimensions such as peer relationships and methodological resources emphasize the pivotal role of collaborative networks and resourceful teaching environments in empowering students. This aligns with Zysberg and Schwabsky (2021), who identified self-efficacy as a mediating factor between school climate and academic outcomes. The results of this study are still viewed as equivocal, so a similar study should be conducted. Interestingly, physical safety demonstrated a low negative correlation with academic resilience, suggesting that overly rigid or controlled environments may undermine students' ability to develop resilience. Also, students' academic resilience weakens when they feel unsafe in the classroom (Lacoe, 2020). This contradicts the work of other researchers who have found

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that exposure to adversity, such as threats to their physical safety, can actually strengthen students' capacity for academic resilience (Argo Widiharto et al., 2022; Lin et al., 2022). On one hand, these findings are highly different from the findings of Lobo (2023) in which the positive school environment has no significant relationship with academic resilience. Additionally, this contradicts the findings by (Vaid et al., 2023), who argued that adversity can strengthen resilience in some contexts. It also aligns with studies on the social-ecological theory of resilience, emphasizing the balance between challenge and support in fostering adaptive skills (Capp et al., 2023).

Lastly, the multiple regression analysis results revealed that dimensions such as student-teacher relationships, teacher expectations, and peer relationships were significant predictors of academic resilience. These findings align with Long et al. (2021), who found that supportive relationships and a sense of belonging positively influence adolescent mental health and resilience. Conversely, dimensions like group cohesion and physical safety showed no direct influence, suggesting their contribution may be indirect or context-dependent. This study underscores the multidimensional school climate's complex yet critical role in fostering academic resilience. While prior research has examined isolated dimensions, this work highlights the need for holistic approaches integrating peer relationships, instructional quality, and environmental support. Given the limited empirical studies exploring these relationships collectively, this investigation serves as a preliminary inquiry and emphasizes the need for future research to validate these findings across broader cultural and institutional settings.

Conclusion

This study aimed to examine the influence of multidimensional school climate on the academic resilience of PETE students while investigating whether perceptions of school climate and resilience varied across sex/gender identity and country of origin. The findings revealed no significant differences in school climate and academic resilience scores based on sex/gender or place of origin, contradicting earlier studies that reported disparities influenced by demographic factors. This result underscores the universal nature of school climate as a critical factor that consistently fosters resilience among students, regardless of their cultural or gender backgrounds. It suggests that

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PETE students share similar perceptions of their school environments and resilience levels when exposed to educational settings that promote inclusivity, support, and equitable opportunities for personal growth. These insights challenge existing assumptions and emphasize the role of educational institutions in providing consistent and nurturing school climates that allow students to thrive.

Furthermore, the study established that overall school climate exerts a significant and direct influence on academic resilience, accounting for a substantial portion of its variance. Key dimensions of school climate, such as peer relationships, teacher expectations, methodological resources, and environmental-structural aspects, emerged as significant contributors to academic resilience. These findings highlight the importance of fostering positive peer interactions, maintaining clear teacher expectations, and ensuring the availability of well-structured teaching resources and conducive learning environments. Interestingly, dimensions such as physical safety, group cohesion, and teacher motivation did not demonstrate significant direct influence, suggesting that their impact on resilience may be more contextual or indirect. This nuanced result adds depth to the understanding of school climate and its components, encouraging educators and policymakers to adopt holistic approaches focusing on dimensions with the most substantial influence on resilience while addressing safety and group cohesion gaps.

In light of these findings, this study advocates for educational institutions to prioritize the creation of supportive and inclusive school climates while implementing resilience-building programs for PETE students. Such initiatives can equip students with essential life skills, adaptability, emotional well-being, and problem-solving abilities to navigate challenges in both academic and professional settings. Comprehensive teacher training programs are equally vital, empowering educators to establish welcoming classrooms, promote emotional intelligence, and address diverse student needs effectively. Despite its valuable contributions, this study recognizes its limitations, including the geographic scope restricted to the Philippines, Indonesia, and India and the absence of additional moderating variables such as socioeconomic status. Therefore, future research is encouraged to validate these findings across broader populations and incorporate new variables to enhance understanding of the

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multidimensional relationship between school climate and academic resilience. Ultimately, this study bridges a significant gap in the literature and provides actionable insights for educators and policymakers to create empowering educational environments that strengthen academic resilience among future physical education teachers.

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