# Academic resilience among Indonesian secondary students: implications for alternative learning design in Physical Education

*Resiliencia académica en estudiantes indonesios de educación secundaria: implicaciones para el diseño de aprendizaje alternativo en Educación Física*


## Authors

Sumardi [1]
Ach. Rasyad [1]
Zulkarnain [1]
Sri Wahyuni [1]
Endah Wahyuningsih [2]
Mukari [2]

[1]Universitas Negeri Malang (Indonesia)
[2]Universitas Brawijaya (Indonesia)

Corresponding author:
Sumardi
sumardi.2101419@students.um.ac.id



Received: 16-04-26
Accepted: 02-05-26

## How to cite in APA

Sumardi, S., Rasyad, A., Zulkarnain, Z., Wahyuni, S., Wahyuningsih, E., & Mukari, M. (2026). Academic resilience among Indonesian secondary students: implications for alternative learning design in Physical Education. *Retos, 80,* 455-466. https://doi.org/10.47197/retos.v80.119261



## Abstract

Introduction: Academic resilience is an important resource for adolescent school adaptation and may offer useful pedagogical insight for physical education.
Objective: This study aimed to describe the academic resilience profile of Indonesian junior secondary students and to discuss cautiously how this profile may inform pedagogical reflection and future research on alternative learning design in physical education.
Methodology: A quantitative descriptive cross-sectional design was employed with 558 junior secondary students. Data were collected using a 24-item academic resilience questionnaire and analyzed descriptively.
Results: Students generally showed moderate to relatively high academic resilience. Commitment/Persistence was the strongest dimension, whereas Composure was the weakest, and most students were classified in the moderate or high category.
Discussion: The findings indicate the relevance of more student-centered, cooperative, supportive, and gradually challenging approaches in physical education.
Conclusion: Academic resilience profiles may provide an empirical basis for designing more adaptive physical education learning for junior secondary students.



## Keywords

Academic resilience; junior secondary students; physical education; alternative learning design; student-centered learning.



## Resumen

Introducción: La resiliencia académica es un recurso importante para la adaptación escolar en la adolescencia y puede ofrecer aportes pedagógicos valiosos para la educación física.
Objetivo: Este estudio tuvo como objetivo perfilar la resiliencia académica de estudiantes indonesios de educación secundaria básica y examinar sus implicaciones pedagógicas para el diseño de aprendizaje alternativo en educación física.
Metodología: Se empleó un diseño cuantitativo descriptivo de corte transversal con 558 estudiantes de secundaria básica. Los datos se recopilaron mediante un cuestionario de resiliencia académica de 24 ítems y se analizaron de forma descriptiva.
Resultados: Los estudiantes mostraron, en general, una resiliencia académica de nivel moderado a relativamente alto. Compromiso/Persistencia fue la dimensión más fuerte, mientras que Compostura fue la más baja, y la mayoría de los estudiantes se ubicó en las categorías moderada o alta.
Discusión: Los hallazgos indican la relevancia de enfoques más centrados en el estudiante, cooperativos, de apoyo y gradualmente desafiantes en educación física.
Conclusión: Los perfiles de resiliencia académica pueden proporcionar una base empírica para diseñar experiencias de educación física más adaptativas en estudiantes de secundaria básica.



## Palabras clave

Educación alternativa; resiliencia académica; estudiantes de secundaria básica; educación física; diseño de aprendizaje alternativo; aprendizaje centrado en el estudiante.

## Introduction

Academic resilience is an important psychological and educational resource for students during adolescence. It refers to students' capacity to sustain effort, remain engaged, recover from academic difficulties, and respond adaptively to learning challenges. For junior secondary students, this capacity is particularly important because early adolescence is marked by rapid academic, emotional, and social transitions. At this stage, students are expected to adjust to increasing academic demands, peer comparison, evaluation, and more complex learning expectations. Therefore, understanding students' academic resilience profiles can provide useful descriptive information for educators who seek to create more supportive and developmentally responsive learning environments (Carroza-Pacheco et al., 2025; Srem-Sai et al., 2025).

Recent studies have shown that academic resilience is associated with learning motivation, self-regulated learning, academic well-being, family support, and academic performance among secondary school students. In the Indonesian context, academic resilience has also received increasing attention in measurement-oriented research. Sembiring et al. (2021), for example, provided measurement model data of academic resilience among secondary students in East Java and reported evidence of validity and reliability using confirmatory factor analysis. Rahmawati et al. (2024) also validated an Academic Resilience Scale for Indonesian university students, highlighting the importance of culturally appropriate measurement tools for assessing students' adaptive capacity in academic settings (Hidayah et al., 2022; Rahmawati et al., 2024; Sembiring et al., 2021; Suud et al., 2024). The article by Sembiring et al. reports data from Garum Middle Seminary High School students in Blitar, East Java, and provides validity and reliability evidence through CFA; the IEEE entry for Rahmawati et al. describes validation of an academic resilience scale for Indonesian university students.

However, academic resilience may not develop evenly across all dimensions. Students may demonstrate relatively strong persistence in completing learning tasks, while still experiencing difficulties in maintaining composure under pressure, evaluation, or failure. This distinction is important because resilience is not merely a general tendency to survive academic challenges, but a multidimensional capacity involving confidence, perceived control, emotional regulation, and sustained commitment. Previous Indonesian research in Retos also emphasized the relevance of self-control and academic resilience in relation to students' performance-related contexts, suggesting that persistence and emotional regulation are meaningful psychological resources when students face demanding academic and sport-related situations (Sembiring et al., 2021; Wahyudin et al., 2023; Wahyudin, Ramli, Chusniyah, Eva, Oktasari, Mufaridah, Andriani, Stevani, Soejanto, & Hikmy, 2026). The Retos article by Wahyudin et al. is listed as examining self-control, academic resilience, and sports performance among Indonesian vocational students, with several authors affiliated with State University of Malang.

Although the present study focuses on general academic resilience rather than physical education-specific variables, its findings may still offer a theory-informed basis for pedagogical reflection in physical education. Physical education is a learning context in which students often encounter challenge, feedback, cooperation, performance expectations, and emotional responses to success or failure. In contemporary secondary schooling, physical education is increasingly viewed not only as a subject concerned with motor competence, physical fitness, or sports performance, but also as a pedagogical space in which students may develop engagement, self-regulation, confidence, social responsibility, and adaptive responses to challenge (Fu et al., 2025; He et al., 2025; Teychenne et al., 2026; White et al., 2024).

It is important to clarify, however, that this study does not directly measure physical education participation, instructional models, motivational climate, classroom experience in physical education, physical activity level, or physical education-specific learning outcomes. Therefore, the relevance of physical education in this article is framed as a theory-informed pedagogical reflection and a direction for future research, rather than as direct evidence of physical education-specific effects. This clarification is necessary because the study uses a quantitative descriptive cross-sectional design and descriptive analysis. Thus, the findings should not be interpreted as evidence that physical education directly shapes students' academic resilience or that a particular physical education instructional model is effective (Pérez-Guerrero et al., 2024; Savitz & Wellenius, 2023).

Within this perspective, recent scholarship has highlighted the educational value of student-centered, meaningful, and alternative pedagogies in physical education, including cooperative learning, project-

based learning, sport education, physical literacy-oriented instruction, authentic assessment, and technology-enhanced teaching. These approaches are increasingly valued because they allow physical education to address not only physical outcomes, but also cognitive, affective, and social development. In a related Retos study involving Physical Education students, Putri et al. (2026) positioned physical education as a field connected not only to sport participation, but also to broader developmental capacities such as career adaptability. Although their study focused on higher education, it supports the broader view that physical education contexts may be discussed in relation to students' adaptive development (Araya-Hernández et al., 2025; Bernate et al., 2026; Putri et al., 2026). The Retos page for Darma Putri et al. describes the article as investigating gender, athletic status, and career adaptability among Physical Education students, and Dialnet lists several authors as affiliated with State University of Malang.

An important gap remains in the current literature. Many studies in physical education have examined learning outcomes, motor skills, motivation, physical activity, psychosocial development, and performance-related variables, but fewer studies have used students' academic resilience profiles as a descriptive basis for reflecting on how physical education learning environments might be designed more supportively. In the Indonesian junior secondary school context, evidence on students' academic resilience profiles remains limited, particularly when discussed in relation to future pedagogical reflection in physical education. This gap is especially relevant because Indonesian studies on academic resilience have largely focused on measurement validation, academic adaptation, or older student populations, while descriptive profiling among junior secondary students remains relatively underdeveloped (Rahmawati et al., 2024; Sembiring et al., 2021; Wahyudin, Ramli, Chusniyah, Eva, Oktasari, Mufaridah, Andriani, Stevani, Soejanto, Hikmy, et al., 2026).

Accordingly, this study aims to describe the academic resilience profile of Indonesian junior secondary students and to discuss its theory-informed implications as a basis for future research on alternative learning design in physical education. The study does not claim that physical education directly improves academic resilience, nor does it test the effect of any physical education instructional model. Instead, it provides a descriptive profile of students' academic resilience, particularly their Commitment/Persistence and Composure, as a basis for generating pedagogical reflection and future research directions for supportive and alternative learning environments in physical education (Savitz & Wellenius, 2023; Wahyudin et al., 2026).

## Method

### *Research Design and participants*

This study employed a quantitative descriptive cross-sectional survey design. Such a design is appropriate when the purpose of the study is to describe the current profile of a population at a single point in time rather than to establish causal relationships (Savitz & Wellenius, 2023; Xueying et al., 2025). The analytic sample consisted of 558 Indonesian junior secondary school students. Because the participants were reached through accessible school networks and voluntary online participation, the study used a non-probability convenience sampling approach. Therefore, the findings should be interpreted as descriptive of the participating students rather than as nationally representative estimates. The demographic profile of the participants is presented in Table 1.

Table 1. Characteristics of the participants (n = 558)

| Variable | Category | n | % |
|---|---|---|---|
| Gender | Male | 219 | 39.2 |
| | Female | 339 | 60.8 |
| Grade level | Grade VII | 351 | 62.9 |
| | Grade VIII | 88 | 15.8 |
| | Grade IX | 119 | 21.3 |
| School level | Junior secondary school | 558 | 100.0 |

### *Instrument*

Academic resilience was measured using a slightly modified version of an Indonesian Academic Resilience Scale used in the previous measurement study "How is Student Resilience in Academic Activities? Measurement in Indonesia" by Wahyudin et al. (2023). The source scale was constructed to assess students' perceived resilience in school-related academic activities among Indonesian junior secondary school students. The scale was based on the four Cs framework of academic resilience proposed by Martin & Marsh (2003), namely Confidence, Control, Composure, and Persistence. The source instrument consisted of 24 items rated on a 5-point Likert scale and was previously administered to 599 Indonesian junior secondary school students. The previous study provided initial psychometric evidence for the Indonesian school context, including adequate internal consistency, with Cronbach's alpha = .89, and Rasch-based dimensionality evidence, with raw variance explained by measures of 44.4% (Wahyudin et al., 2023).

In the present study, minor wording adjustments were made to ensure that the items were suitable for the participating junior secondary students and consistent with the descriptive profiling purpose of the study. Because the source scale was developed and administered in Indonesian, no cross-language translation or back-translation procedure was required. Instead, the adaptation focused on wording refinement, scoring consistency, and alignment between the items and the four academic resilience dimensions. The questionnaire used a 5-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. Higher scores indicated higher academic resilience. The final instrument consisted of 24 items organized into four dimensions: Confidence, Control, Composure, and Persistence. Confidence was measured using Items 1–8, Control using Items 9–14, Composure using Items 15–18, and Persistence using Items 19–24. The possible total score ranged from 24 to 120. In the present sample, the adapted scale showed good internal consistency, with Cronbach's alpha = .892. The use of this instrument was justified by its theoretical alignment with the four Cs model and by previous Rasch-based psychometric evidence from Indonesian junior secondary students. The blueprint of the instrument is presented in Table 2.

Table 2. Blueprint of the academic resilience instrument

| Dimension | Item numbers | Number of items | Possible score range |
|---|---|---|---|
| Confidence | 1–8 | 8 | 8–40 |
| Control | 9–14 | 6 | 6–30 |
| Composure | 15–18 | 4 | 4–20 |
| Commitment/Persistence | 19–24 | 6 | 6–30 |
| Total | 1–24 | 24 | 24–120 |

In the present junior secondary school sample, the instrument showed good internal consistency with a Cronbach's alpha of .892. Recent psychometric discussion emphasizes that Cronbach's alpha is best interpreted as a sample-specific indicator of internal consistency, rather than as a fixed property of the instrument itself (Edelsbrunner et al., 2025).

## *Procedure*

Data were collected through an online self-administered questionnaire using a Google Forms-based questionnaire link. The questionnaire link was distributed through accessible junior secondary school networks in Indonesia after institutional research permission had been obtained. The study was conducted in 2025 under institutional research permission No. 37/UN32.1/TU/2024. The participating students were recruited from 21 junior secondary schools across ten Indonesian provinces: Banten, Batam, Jakarta, West Java, Central Java, East Java, Bali, East Nusa Tenggara, North Sulawesi, and Papua.

Before completing the questionnaire, students were provided with brief information about the purpose of the study, the voluntary nature of participation, the confidentiality of their responses, and their right to decline participation. Because the participants were junior secondary school students, participation was based on school-accessible recruitment procedures, parental or guardian permission coordinated through the school context, and students' voluntary assent before completing the questionnaire. No coercion was used, and students were informed that their participation or non-participation would not affect their academic standing.

The inclusion criteria were students enrolled in Grade VII, Grade VIII, or Grade IX at the junior secondary school level, willingness to participate voluntarily, and completion of all questionnaire items. Responses were excluded if participants were not junior secondary school students, submitted incomplete responses, or provided responses that could not be retained for analysis. A total of 599 initial responses were obtained, and after screening, 558 complete and valid junior secondary school responses were retained for the final analysis. This resulted in an analytic retention rate of 93.2%. Because the questionnaire link was distributed through accessible school networks rather than through a fixed sampling frame of eligible students, an exact formal response rate could not be calculated. All included cases contained complete responses across the 24 items; therefore, no missing-data imputation was required. To protect confidentiality, identifying information was removed from the analytic file before statistical analysis, and the data were reported only in aggregate form.

### *Data analysis*

Data analysis was conducted using descriptive statistics in accordance with the profiling purpose of the study. Before analysis, the dataset was screened to retain only complete and valid responses from junior secondary school students. The final analytic dataset consisted of 558 students. Because all retained cases had complete responses across the 24 academic resilience items, no missing-data imputation was required.

Total academic resilience scores were computed by summing the responses to all 24 items, with a possible score range from 24 to 120. Dimension-level scores were calculated by summing the items within each dimension: Confidence, Control, Composure, and Commitment/Persistence. Because the dimensions contained different numbers of items, comparisons across dimensions were based not only on total dimension scores but also on mean-per-item scores.

The data were summarized using observed minimum and maximum scores, means, standard deviations, medians, frequencies, and percentages. Descriptive summaries were also produced by gender and grade level to provide additional information about the distribution of academic resilience among the participating students. These subgroup descriptions were not intended to test statistical differences, but to provide a clearer descriptive profile of the sample.

Because the aim of this study was to describe the academic resilience profile of Indonesian junior secondary students rather than to test causal hypotheses or examine physical education-specific variables, no inferential or causal analysis was conducted. Accordingly, the findings are interpreted as descriptive patterns within the participating sample and should not be understood as evidence of causal relationships, PE-specific effects, or nationally representative estimates

### *Ethical Considerations*

Ethical considerations were carefully observed throughout the study because the participants were junior secondary school students. The study was conducted after institutional research permission had been obtained under No. 7.2.2/UN32.1/TU/2024. Because the participants were minors, the research procedure involved school-accessible permission procedures, parental or guardian permission coordinated through the school context, and students' voluntary assent before participation. Students were informed that participation was voluntary, anonymous, and that they could decline or withdraw without any academic consequence.

The questionnaire did not collect personally identifiable information in the analytic dataset. All responses were used solely for research purposes and analyzed in aggregate form. The dataset was screened before analysis, and only complete and valid junior secondary school responses were retained. To protect privacy, identifying information was removed from the analytic file, and no individual student, school, or respondent could be identified in the reporting of the findings.

### *Limitations*

Several limitations should be acknowledged when interpreting the findings of this study. First, although the study discusses implications for physical education, the dataset did not directly measure physical education participation, teaching models, physical activity levels, or PE-specific learning experiences. Accordingly, the discussion related to physical education should be interpreted as a theory-informed pedagogical reflection rather than as direct evidence of PE-specific causal relationships. Second, the

study employed a cross-sectional design, which provides only a snapshot of students' academic resilience at one point in time and therefore does not allow conclusions about directionality, change over time, or causal mechanisms. Third, the data were collected using a self-report questionnaire, which may be influenced by response bias, social desirability, or differences in how students interpreted the items, and this may have led to either overestimation or underestimation of resilience scores. Fourth, the study relied on a non-probability convenience sample, so the findings should be interpreted cautiously and cannot be generalized to all Indonesian junior secondary school students. In addition, the dataset did not include several contextual variables that may be relevant to physical education settings, such as instructional practices, school climate, or students' actual engagement in movement-based learning. Despite these limitations, the study still provides a useful descriptive profile of academic resilience among junior secondary students and offers an evidence-informed basis for considering more adaptive and student-centered pedagogical approaches in physical education.

## Results

### *Overall profile of academic resilience*

The analysis of the participating junior secondary students showed that the total academic resilience scores ranged from 42 to 112, within a theoretical range of 24 to 120. The mean total score was 83.06 (SD = 13.45), with a median of 85.00. When converted into an average item score, the result was 3.46 out of 5, indicating that the students' responses were, on average, above the midpoint of the scale. Overall, these findings suggest that the participating students tended to demonstrate a moderate-to-relatively high level of academic resilience.

Table 3. Descriptive statistics for total academic resilience scores (n = 558)

| Variable | Value |
|---|---|
| Theoretical score range | 24–120 |
| Observed score range | 42–112 |
| Mean | 83.06 |
| Standard deviation | 13.45 |
| Median | 85.00 |
| Mean per item | 3.46 |

### *Distribution across resilience categories*

As a supplementary descriptive summary, the total scores were also examined using the academic resilience categories embedded in the analytic dataset. As presented in Table 4, the largest proportion of students fell into the moderate category (51.1%), followed by the high category (36.6%), while 12.4% were classified in the low category. Taken together, 87.6% of the students were classified in the moderate or high range.

Table 4. Distribution of students across academic resilience categories

| Category | n | % |
|---|---|---|
| Low | 69 | 12.4 |
| Moderate | 285 | 51.1 |
| High | 204 | 36.6 |
| Total | 558 | 100.0 |

### *Dimension-level profile of academic resilience*

To obtain a more detailed profile, the four dimensions of academic resilience were examined separately. Because the dimensions contained different numbers of items, cross-dimension comparison was based primarily on the mean per item. As shown in Table 5, the highest mean per item was found for Commitment/Persistence (M = 22.29, SD = 4.16; mean per item = 3.71), followed by Control (M = 21.13, SD = 4.08; mean per item = 3.52), Confidence (M = 27.02, SD = 4.74; mean per item = 3.38), and Composure

(M = 12.62, SD = 2.63; mean per item = 3.15). Thus, the strongest relative tendency in this sample was found in Commitment/Persistence, whereas the lowest relative score was found in Composure.

Table 5. Descriptive statistics by dimension of academic resilience

| Dimension | Mean | SD | Median | Mean per item |
|---|---|---|---|---|
| Confidence | 27.02 | 4.74 | 28.0 | 3.38 |
| Control | 21.13 | 4.08 | 21.5 | 3.52 |
| Composure | 12.62 | 2.63 | 13.0 | 3.15 |
| Commitment/Persistence | 22.29 | 4.16 | 23.0 | 3.71 |

### *Descriptive patterns by gender*

A further descriptive examination was conducted across gender groups. As presented in Table 6, female students showed a slightly higher mean academic resilience score (M = 84.14, SD = 13.30) than male students (M = 81.37, SD = 13.53). The median score was also higher among female students (86.0) than among male students (84.0). These differences are reported descriptively only and were not subjected to inferential testing in the present study.

Table 6. Descriptive statistics for academic resilience by gender

| Gender | n | Mean | SD | Median | Min | Max |
|---|---|---|---|---|---|---|
| Male | 219 | 81.37 | 13.53 | 84.0 | 46 | 107 |
| Female | 339 | 84.14 | 13.30 | 86.0 | 42 | 112 |

### *Descriptive patterns by grade level*

Descriptive statistics were also examined across grade levels. As shown in Table 7, the highest mean score was observed among Grade VIII students (M = 84.01, SD = 12.56), followed by Grade VII students (M = 83.68, SD = 12.40) and Grade IX students (M = 80.51, SD = 16.52). The Grade IX group also showed the largest standard deviation, indicating greater variability in resilience scores within that group.

Table 7. Descriptive statistics for academic resilience by grade level

| Grade level | n | Mean | SD | Median | Min | Max |
|---|---|---|---|---|---|---|
| Grade VII | 351 | 83.68 | 12.40 | 86.0 | 47 | 110 |
| Grade VIII | 88 | 84.01 | 12.56 | 83.5 | 53 | 112 |
| Grade IX | 119 | 80.51 | 16.52 | 84.0 | 42 | 108 |

### *Summary of descriptive findings*

Taken together, the findings indicate that the participating Indonesian junior secondary students generally demonstrated moderate to relatively high academic resilience, with the strongest relative scores appearing in Commitment/Persistence and the lowest in Composure. The subgroup descriptions further suggest modest variation across gender and grade level, although these patterns were not tested inferentially in the present study.

From the perspective of later pedagogical interpretation, the combination of relatively strong persistence and comparatively lower composure under pressure provides an important descriptive basis for considering more supportive, student-centered, and gradually challenging approaches in physical education. In other words, the results do not directly test physical education variables, but they do identify student characteristics that may be relevant when discussing alternative learning design in physical education.

## Discussion

The present study found that Indonesian junior secondary students generally demonstrated a moderate-to-relatively high profile of academic resilience. Most students were classified in the moderate or

high category, suggesting that the participating students generally reported a workable capacity to remain engaged with academic demands. However, the dimension-level findings showed that academic resilience was not equally strong across all dimensions. Commitment/Persistence, reported as Persistence in the instrument, emerged as the strongest dimension, whereas Composure showed the lowest relative score. This finding is consistent with previous studies showing that academic resilience is associated with academic performance, learning motivation, self-regulated learning, academic well-being, and support systems among students (Carroza-Pacheco et al., 2025; Srem-Sai et al., 2025; Suud et al., 2024).

This pattern is important because it indicates that students may be more prepared to persist in learning tasks than to remain emotionally steady under pressure. In practical terms, the students appeared relatively willing to continue working, complete assignments, and sustain effort when facing academic demands. At the same time, the lower score in Composure suggests that students may experience greater difficulty maintaining calmness, emotional control, or steadiness when facing pressure, evaluation, uncertainty, or challenging learning situations. Previous Indonesian measurement research has also shown that academic resilience can be examined as a measurable student characteristic in the school context, with evidence of reliability and dimensionality (Sembiring et al., 2021). Recent validation work in Indonesia further confirms the importance of culturally appropriate academic resilience measurement for understanding students' adaptive capacity in educational settings (Rahmawati et al., 2024).

The finding that Commitment/Persistence was the strongest dimension may also be interpreted alongside recent Indonesian work on persistence-related constructs. For example, grit has been discussed as a psychological resource involving sustained effort and consistency in pursuing goals, which is conceptually relevant to students' ability to remain engaged in learning despite difficulty (Andrianie et al., 2025). In a related Indonesian study, academic resilience was also discussed in connection with self-control and performance-related demands in academic and sport-related contexts, suggesting that persistence, emotional regulation, and self-management are meaningful resources when students face challenging learning situations (Wahyudin et al.,2026). However, the present findings remain descriptive and should not be interpreted as evidence that these constructs are identical.

The descriptive subgroup findings add additional nuance, but should be interpreted carefully. Female students showed a slightly higher mean academic resilience score than male students, while Grade IX students showed a lower mean score and greater variability than Grade VII and Grade VIII students. However, because these subgroup patterns were reported descriptively and were not subjected to inferential testing, they should not be interpreted as statistically confirmed group differences. Their function in this study is to provide a broader descriptive picture of the participating students rather than to establish gender- or grade-level effects.

The findings should be interpreted cautiously because the study used a descriptive cross-sectional design and did not test causal relationships. The results do not show that a specific learning environment, teaching strategy, or physical education model caused the observed academic resilience profile. Rather, the findings indicate a student profile characterized by relatively stronger Commitment/Persistence and comparatively lower Composure. Therefore, the most appropriate interpretation is that the students may have sufficient willingness to persist, but may still need supportive conditions to manage pressure, evaluation, and emotionally demanding learning situations.

This profile may suggest that students could benefit from learning environments that combine challenge with support. Students who are willing to persist may respond well to structured, meaningful, and progressively challenging learning tasks. However, because Composure was the weakest dimension, excessive pressure, public comparison, overly competitive evaluation, or emotionally demanding learning situations may not be optimal for all students. Supportive learning environments may therefore be important because they can help students sustain effort while also reducing unnecessary anxiety, fear of failure, and emotional pressure. This interpretation is consistent with research suggesting that student resilience is shaped not only by individual resources, but also by contextual supports such as family support, self-regulated learning, and broader learning conditions (Laksmi, 2026; Srem-Sai et al., 2025; Sucipto et al., 2021; Suud et al., 2024; Zulkarnain & Dalle, 2021).

In the context of physical education, supportive learning environments may be particularly relevant because PE often includes performance situations, peer interaction, visible comparison, and immediate

feedback. Cooperative learning may offer one promising direction because it has been associated with affective, cognitive, physical, and social learning outcomes in PE (Boke et al., 2025). Similarly, authentic assessment in school PE has been discussed as a way to connect evaluation with meaningful learning, feedback, and teaching practice rather than relying only on performance-dominated assessment situations (Hurtado-Guerrero et al., 2025). These approaches may be relevant to students with relatively strong persistence but weaker composure because they can provide opportunities to remain engaged while reducing excessive evaluative pressure.

A supportive motivational climate may also be important for students who need help maintaining composure. Recent research on empowering motivational climate in PE has examined its relationship with secondary school students' life skills development, suggesting that the emotional and motivational quality of PE environments matters for broader student development (Xue et al., 2026). Enjoyment, attitudes toward PE, activity, and self-concept are also important during the transition to secondary school, indicating that students' experiences in PE may shape how they respond to challenge, feedback, and participation (Jarvis & Rainer, 2025). However, these studies should be used only as supporting literature, because the present study did not directly measure PE-specific climate, enjoyment, attitudes, or learning outcomes.

In relation to physical education, the findings should be understood as a hypothesis-generating basis rather than direct empirical evidence of physical education effects. The present study did not measure physical education participation, instructional models, motivational climate in PE, classroom experience in PE, physical activity level, or PE-specific learning outcomes. Therefore, the findings do not demonstrate that physical education directly improves academic resilience, nor do they prove that any specific PE model is effective for strengthening resilience.

Nevertheless, the identified resilience profile may be useful for future PE research. Physical education is a learning context in which students often encounter challenge, cooperation, feedback, performance situations, comparison, success, and failure. Therefore, future studies should examine whether specific pedagogical models in PE are associated with students' academic resilience profiles, particularly their persistence and composure. For example, future research could investigate whether cooperative learning, mastery-oriented instruction, project-based learning, authentic assessment, or empowering motivational climates in PE are related to higher persistence and better composure among junior secondary students (Boke et al., 2025; Hartanto et al., 2025; Hurtado-Guerrero et al., 2025; Xue et al., 2026).

Project-based learning may be especially relevant for future research because it allows students to engage in sustained tasks, collaborate with peers, experience visible progress, and complete learning products over time. In PE, project-based learning has been applied, for example, in volleyball learning to improve cognitive and psychomotor learning outcomes (Hartanto et al., 2025). Although that evidence does not directly address academic resilience, it suggests that project-based PE may provide structured and meaningful learning situations in which persistence and composure can be investigated more directly in future studies.

Physical education can also be viewed as a developmental context rather than only a space for motor performance. For instance, recent research involving Physical Education students has examined adaptive developmental capacities such as career adaptability, suggesting that PE-related contexts can be discussed in relation to broader psychological and developmental outcomes (Putri et al., 2026). In addition, technology-enhanced pedagogy in PE has been discussed as a way to connect engagement, learning, and lifelong physical activity (Martín-Rodríguez & Madrigal-Cerezo, 2025). These studies support the idea that future PE research may examine not only physical or technical outcomes, but also students' adaptive capacities, including resilience-related characteristics.

Future research should also consider physical activity and broader psychological mechanisms with caution. School-based physical activity has been examined in relation to academic achievement among children and adolescents, while broader evidence has also linked physical activity with mental health through various mediating and moderating mechanisms (He et al., 2025; White et al., 2024). However, the present study did not measure physical activity or mental health outcomes. Therefore, these references should be understood as a rationale for future PE-specific investigation, not as evidence that the present academic resilience profile was caused by PE or physical activity.

Overall, the contribution of this study lies in providing a descriptive profile of academic resilience among Indonesian junior secondary students. The main empirical pattern was a moderate-to-high resilience profile, with stronger Commitment/Persistence and weaker Composure. The cautious pedagogical interpretation is that students may benefit from supportive, structured, cooperative, and progressively challenging learning environments. For physical education, this finding should be treated as a direction for future research rather than as evidence of PE-specific effects. Future studies should directly examine PE-specific variables, such as instructional model, motivational climate, teacher feedback, peer interaction, perceived competence, enjoyment, physical activity level, and PE learning outcomes, to determine whether and how particular pedagogical models are associated with students' academic resilience profiles.

## Conclusion

This study found that Indonesian junior secondary students generally demonstrated moderate to relatively high academic resilience, with Commitment/Persistence emerging as the strongest dimension and Composure as the weakest. These findings suggest that many students are willing to remain engaged and persist in learning tasks, but may be less steady when facing pressure or evaluative situations.

From a pedagogical perspective, the findings provide an empirical basis for considering alternative learning design in physical education, particularly approaches that are more student-centered, cooperative, supportive, and gradually challenging. The contribution of this study lies not in demonstrating the direct effect of PE on academic resilience, but in showing that students' resilience profiles may help inform the design of PE learning environments that better match their characteristics. Future research should examine these implications more directly by incorporating PE-specific variables, instructional climate measures, and intervention-based comparisons of alternative PE models.

## Acknowledgements

The authors gratefully acknowledge the support provided by the Indonesian Education Scholarship(Beasiswa Pendidikan Indonesia –BPI, funded and managed by the Center for Higher Education Funding and Assessmen(Pusat Pembiayaan dan Asesmen Pendidikan Tinggi –PPAPT) and the Ministry of Higher Education, Science, and Technology of the Republic of Indonesia(Lembaga Pengelola Dana Pendidikan –LPDP)/Indonesian Endowment Fund forEducation.

## Financing

Indonesian Education Scholarship (BPI), Center for Higher Education Funding and Assessment (PPAPT), and Indonesian Endowment Fund for Education (LPDP).

## References

Andrianie, S., Wiyono, B. B., Atmoko, A., Setiyowati, A. J., Hidayah, N., Ramli, M., & Aren, M. (2025). Grit scale development and validation using rasch model: cross-cultural adaptation. *Retos*, *73*, 104-115. https://doi.org/10.47197/retos.v73.112440

Araya-Hernández, A., Castro-Dávila, A., Barraza-Gómez, F., Andrades-Tapia, F., & Hinojosa-Torres, C. (2025). Efectos de una intervención sociomotriz en la convivencia y el desarrollo integral en Educación Física escolar. *Retos*, *73*, 987–1004.

Bernate, J., Villamil, I. A., & Rubiano, E. Y. (2026). Educación Física y deporte como herramientas para el desarrollo de competencias emprendedoras y sociales: una revisión sistemática. *Retos*, *77*, 70–82.

Boke, H., Aygun, Y., Tufekci, S., Yagin, F. H., Canpolat, B., Norman, G., Prieto-González, P., & Ardigò, L. P. (2025). Effects of cooperative learning on students' learning outcomes in physical education: a meta-analysis. *Frontiers in Psychology*, *16*, 1508808.

Carroza-Pacheco, A. M., León-del-Barco, B., & Bringas Molleda, C. (2025). Academic performance and resilience in secondary education students. *Journal of Intelligence*, *13*(5), 56.

Edelsbrunner, P. A., Simonsmeier, B. A., & Schneider, M. (2025). The Cronbach's alpha of domain-specific knowledge tests before and after learning: A meta-analysis of published studies. *Educational Psychology Review*, *37*(1), 4.

Fu, Q., Li, L., Li, Q., & Wang, J. (2025). The effects of physical activity on the mental health of typically developing children and adolescents: a systematic review and meta-analysis. *BMC Public Health*, *25*(1), 1514.

Hartanto, amri, & Darmawan, A. T. A. (2025). Project-based learning model for volleyball to improve students' cognitive and psychomotor learning outcomes. *Retos*, *65*, 1032-1044. https://doi.org/10.47197/retos.v65.111742

He, H., Yang, Y., Sun, J., Wang, F., Zhang, W., & Zhu, F. (2025). Effects of school-based physical activity on academic achievement in children and adolescents: a systematic review and meta-analysis. *Frontiers in Public Health*, *13*, 1651883.

Hidayah, N., Fauzan, L., Wahyuni, F., & Hanafi, H. (2022). Conceptual Development of Online Psychological Assessment Training Design for Guidance and Counseling Teachers on the Academic Life of High School Students. *International Journal of Interactive Mobile Technologies*, *16*(6).

Hurtado-Guerrero, M., Espoz-Lazo, S., Yáñez-Sepúlveda, R., Soto-González, M., Castro-Dávila, A., Galeano-Rojas, D., Valdivia-Moral, P., & Hinojosa-Torres, C. (2025). Instruments and strategies for authentic assessment in school Physical Education: a systematic review. *Retos*, *73*, 784-797. https://doi.org/10.47197/retos.v73.117462

Jarvis, S., & Rainer, P. (2025). Enjoyment of physical education during transition to secondary school: links with attitudes, activity, and self-concept in Welsh adolescents. *Cogent Education*, *12*(1), 2584915.

Laksmi, N. (2026). *The strengthening critical thinking literacy : Through mentoring system non-formal education in Indonesia*. *29*(2025), 17–25.

Martín-Rodríguez, A., & Madrigal-Cerezo, R. (2025). Technology-enhanced pedagogy in physical education: Bridging engagement, learning, and lifelong activity. *Education Sciences*, *15*(4), 409.

Martin, A. J., & Marsh, H. W. (2003). *Academic resilience and the four Cs: Confidence, control, composure, and commitment*.

Pérez-Guerrero, E. E., Guillén-Medina, M. R., Márquez-Sandoval, F., Vera-Cruz, J. M., Gallegos-Arreola, M. P., Rico-Méndez, M. A., Aguilar-Velázquez, J. A., & Gutiérrez-Hurtado, I. A. (2024). Methodological and statistical considerations for cross-sectional, case–control, and cohort studies. *Journal of Clinical Medicine*, *13*(14), 4005.

Darma Putri, R., Indreswari, H., Hidayah, N., Hambali, I., Dwi Krisnanda, V., Hayati, R., & da Costa, A. (2026). Exploring the impact of gender and athletic involvement on career adaptability in Physical Education students. *Retos*, *75*, 652-661. https://doi.org/10.47197/retos.v75.118203

Rahmawati, H., Hutagalung, F. D., Harsiati, T., & Purwasih, J. H. G. (2024). Validation of an Academic Resilience Scale for Indonesian University Students. *2024 IEEE International Symposium on Consumer Technology (ISCT)*, 142–147.

Savitz, D. A., & Wellenius, G. A. (2023). Can cross-sectional studies contribute to causal inference? It depends. *American Journal of Epidemiology*, *192*(4), 514–516.

Sembiring, M., Murwani, D., Pali, M., & Hitipeuw, I. (2021). Measurement model data of academic resilience for students in senior high school of middle seminary. In *Data in Brief*. Elsevier. https://www.sciencedirect.com/science/article/pii/S2352340920315481

Srem-Sai, M., Arthur, F., Salifu, I., Amoadu, M., Obeng, P., Agormedah, E. K., Jnr, J. E. H., & Schack, T. (2025). Modelling the associations between students' academic resilience, learning motivation, self-regulated learning and academic well-being in Ghana. *Acta Psychologica*, *258*, 105278.

Sucipto, Wiyono, B. B., Rasyad, A., Dayati, U., & Purwito, L. (2021). The contribution of individual characteristics of managers to the success of equivalency education programs of the community learning center in Indonesia. *Sustainability*, *13*(19), 11001.

Suud, F. M., Agilkaya-Sahin, Z., Na'Imah, T., Azhar, M., & Kibtiyah, M. (2024). The impact of family social support on academic resilience in Indonesian and Turkish students: the mediating role of self-regulated learning. *International Journal of Adolescence and Youth*, *29*(1), 2361725.

Teychenne, M., Sousa, G. M., Baker, T., Liddelow, C., Babic, M., Chauntry, A. J., France-Ratcliffe, M., Guagliano, J., Christie, H. E., & Tremaine, E. M. (2026). Domain-specific physical activity and mental health: an updated systematic review and multilevel meta-analysis in a combined sample of 3.3 million people. *British Journal of Sports Medicine*, *60*(4), 267–285.

Wahyudin, H., Ramli, M., Chusniyah, T., Eva, N., Oktasari, M., Mufaridah, H., Widi Andriani, M., Stevani, H., Soejanto, L. T., & Hikmy, B. J. (2026). The role of self-control in enhancing academic resilience and sports performance in Indonesian vocational students. *Retos*, *74*, 916-929. https://doi.org/10.47197/retos.v74.118146

Wahyudin, H., Ramli, M., Chusniyah, T., Eva, N., Oktasari, M., Mufaridah, H., Andriani, M. W., Stevani, H., Soejanto, L. T., Hikmy, B. J., Malang, N., Jakarta, U. N., & Wahyudin, H. (2026). *The role of self-control in enhancing academic resilience and sports performance in Indonesian vocational students Authors Resumen How to cite in APA Palabras clave Keywords*. *2026*, 916–929.

Wahyudin, H., Ramli, M., & Oktasari, M. (2023). How is Student Resilience in Academic Activities? Measurement in Indonesia. *Proceedings Series of Educational Studies*, 40–49.

White, R. L., Vella, S., Biddle, S., Sutcliffe, J., Guagliano, J. M., Uddin, R., Burgin, A., Apostolopoulos, M., Nguyen, T., & Young, C. (2024). Physical activity and mental health: a systematic review and best-evidence synthesis of mediation and moderation studies. *International Journal of Behavioral Nutrition and Physical Activity*, *21*(1), 134.

Xue, W., Fan, R., Xie, C., Ling, Y., Zou, M., & Xie, X. (2026). The impact of empowering motivational climate in physical education on secondary school students' life skills: a self-system model of motivational development. *BMC Psychology*.

Xueying, L., Xiaoping, K., Chunhua, C., Xicheng, W., Meixia, S., Guopeng, Z., Chang, G., & Zihan, P. (2025). Basics of designing and steps of implementing cross-sectional studies in general practice and primary care. *Chinese General Practice Journal*, *2*(2), 100064.

Zulkarnain, Z., & Dalle, J. (2021). Web-based learning environment and learners' achievement: Mediating role of learners' enjoyment. *Eurasian Journal of Educational Research*, *2021*, 397–421.

## Authors' and translators' details:


| | | |
|---|---|---|
| Sumardi | sumardi.2101419@students.um.ac.id | Author |
| Ach. Rasyad | achrasyadpls@gmail.com | Author |
| Zulkarnain | zulkarnain.fip@um.ac.id | Author |
| Sri Wahyuni | sri.wahyuni.fip@um.ac.id | Author |
| Endah Wahyuningsih | endahw_@student.ub.ac.id | Author |
| Mukari | mukari@student.ub.ac.id | Author |