Volume 3 Number 2 (2026)
July – December 2026
Page: 24-41

ISSN: 3062-6633
EDUJAVARE PUBLISHING
https://edujavare.com/index.php/IALW

ILAW; International Journal Assulta of Law Review

Strategies to Enhance Students' Resilience in Stochastic Process Lectures in Accordance with Permendiktisaintek 39/2025 and Permendiktisaintek 10/2026

Bunga Mardhotillah[1], Kamid[2], Nizlel Huda[3], Zurweni[4]
[1,2,3,4] Math and Science Education, Universitas Jambi, Jambi, Indonesia.
*corresponding email: insightsmath864@gmail.com

Article history Submitted: 2026/06/15; Revised: 2026/07/15; Accepted: 2026/08/20

Abstract

The Stochastic Processes Lectures involves a high level of conceptual abstraction and mathematical complexity, often posing a significant cognitive challenge that triggers academic anxiety among students. In this context, academic resilience—the ability of students to persevere and overcome learning difficulties—becomes a vital factor in determining academic success. This study aims to identify academic resilience strategies employed by students undertaking the Stochastic Processes course and to analyze their implications for the governance of higher education quality assurance. This study adopted a qualitative approach combining a descriptive case study method with an educational policy analysis. Data were gathered through in-depth interviews with students, classroom observations, and a document analysis of curriculum and quality assurance policies. The results identified four primary resilience strategies deployed by students: (1) Self-Regulated Learning: Structured time management and cognitive load decomposition; (2) Peer-Assisted Learning: Formation of independent study groups to tackle complex probability problems. (3) Visual Computing Utilization: Leveraging software simulations to visualize abstract stochastic models. (4) Proactive Academic Help-Seeking: Actively utilizing consultation hours with lecturers and teaching assistants. These findings carry strategic implications for fulfilling quality assurance standards in accordance with Permendiktisaintek No. 39 of 2025, as amended by Permendiktisaintek No. 10 of 2026 on Higher Education Quality Assurance. This regulation mandates higher education institutions to strengthen their Internal Quality Assurance System (SPMI) by delivering inclusive, flexible, and adaptive learning processes. Institutions are required to go beyond merely measuring learning outcomes by actively establishing comprehensive academic support systems and fostering environments that safeguard student mental well-being when facing high-difficulty courses.

Keywords Academic Resilience, Stochastic Processes, Quality Assurance, Permendiktisaintek 39/2025, Permendiktisaintek 10/2026

INTRODUCTION

The Stochastic Processes Lecture stands as a cornerstone of curricula in science, statistics, actuarial science, and engineering, demanding a high level of cognitive capacity. A defining characteristic of the subject matter is its mathematical complexity, which integrates advanced probability theory, linear algebra, and multivariate calculus. Students are required to model random phenomena that evolve over time, where future states are shaped by uncertainty. This shift from deterministic to stochastic thinking imposes a heavy cognitive load, as students must move beyond calculating fixed values to computing dynamic probability distributions that evolve simultaneously. Beyond the complexity of the formulas, the high level of abstraction presents a major hurdle, making it difficult for students to visualize the concepts. Topics such as Markov Chains, Poisson Processes, Brownian Motion, and Martingales are often taught through symbolic derivations that seem far removed from tangible physical reality. Without intuitive bridges or simulation-based modeling, students struggle to connect complex mathematical equations on paper with real world contexts. These comprehension challenges are further compounded when students lack a solid foundation in the necessary mathematical prerequisites—such as calculus and elementary probability from the outset of the semester (Mardhotillah et al., 2024).

The gap between high academic demands and students' cognitive readiness ultimately gives rise to a fundamental issue: low academic resilience. In the context of the Stochastic Processes course, an inability to gradually grasp the material often triggers phenomena such as academic burnout, prolonged stress, and math anxiety. Students with low resilience tend to exhibit defensive behaviors such as procrastination, passivity in class, and a tendency to give up quickly when faced with complex modeling problems. This decline in intrinsic motivation gradually erodes students' confidence in their own academic capabilities. Such low resilience should not be viewed merely as a personal failure on the part of the student, but rather as a systemic challenge requiring institutional intervention. The phenomenon of students losing their way in this high-stakes course risks increasing course failure rates, prolonging the duration of study, and lowering overall cumulative grade point averages. Without academic resilience defined as the ability to persevere, adapt, and bounce back from learning difficulties students will struggle to develop the higher-order thinking skills that constitute the primary objective of science and technology higher education.

From the perspective of national policy priorities, the strengthening of student resilience finds a robust legal foundation in Permendiktisaintek Regulation Number 39 of 2025. This regulation explicitly emphasizes the importance of integrating character development, mental fortitude, and psychological resilience across the entire higher education ecosystem. The government recognizes that the success of higher education is measured not merely by the mastery of technical subject matter, but also by the production of graduates who are resilient, persistent, and adaptable to the pressures and dynamics of global change. Consequently, higher education institutions are mandated to provide support systems that foster mental well-being and cultivate an unyielding character. Such instructional management must align with Permendiktisaintek Regulation Number 10 of 2026 regarding National Quality Assurance Standards for Higher Education, which focuses on Outcome Based Education. This policy requires institutions to design curricula and assessment methods that are transparent, measurable, and student-centered. In the specific context of the Stochastic Processes course, the attainment of Graduate Learning Outcomes (GLOs) cannot be realized if teaching methods remain homogeneous and dogmatic. These updated quality standards encourage lecturers to create learning experiences that facilitate the achievement of competency indicators while remaining mindful of the challenges students face. The convergence of the character-strengthening regulation (Permendiktisaintek No. 39/2025) and the outcome-based quality standards (Permendiktisaintek No. 10/2026) creates an urgent need to reform the pedagogy of challenging courses like Stochastic Processes. Institutions can no longer allow this course to serve merely as a hurdle that causes student attrition; instead, it must become a crucible for intellectual and mental maturation. Integrating these two policies necessitates structured interventions capable of balancing high academic standards with the provision of adequate psychological and pedagogical scaffolding within the classroom (Yahya, et al., 2026; Mardhotillah & Kholijah, 2023; Beltman & Poulton, 2025).

Based on the conceptual background, issues regarding resilience, and relevant regulatory directives, this article aims to formulate a comprehensive strategy to enhance students' academic resilience in the Stochastic Processes course. The proposed strategy encompasses the use of visual computing to reduce the abstract nature of the subject matter, the implementation of peer-assisted learning, the restructuring of formative assessments into a phased approach, and the creation of a psychologically supportive learning environment. Through this strategy, it is expected that higher education institutions can establish a learning model for Stochastic Processes that is not only academically excellent meeting the quality standards of Permendiktisaintek Regulation No. 10/2026 but also humanistic and conducive to strengthening student character, in alignment with the mandates of Permendiktisaintek Regulation No. 39/2025.

Academic resilience is a student's capacity to endure, adapt, and bounce back when facing pressures, obstacles, and challenges during the learning process. In the field of educational psychology, resilience is not viewed as a static, innate trait but rather as a dynamic capacity that can be developed through the interaction between the individual and their academic environment. Students with high levels of resilience tend to manage academic stress effectively and do not easily give up when confronted with highly complex academic tasks. Four interrelated key indicators are used to measure and understand students' resilience levels. The first indicator is optimism a student's positive belief in their ability to achieve academic success despite facing difficulties. The second indicator is self-regulation, which encompasses the capacity to control emotions, manage time, and independently plan study strategies. The third indicator involves social support from peers, lecturers, or family which serves as a psychological buffer when academic pressure mounts. The fourth indicator is problem-solving ability: the skill of logically analyzing obstacles and finding constructive solutions to complete complex tasks (Zurweni, et al., 2025; Elmi, 2020; Zhanty, 2018).

In the context of higher education, various national and international empirical studies demonstrate that academic resilience is positively correlated with students' academic achievement, retention rates, and mental well-being. International research consistently finds that students with high levels of resilience exhibit significantly lower dropout rates when pursuing Science, Technology, Engineering, and Mathematics (STEM) programs. Meanwhile, national empirical studies confirm that the dynamics of the transition to higher education in Indonesia necessitate academic resilience, particularly when students face shifts in learning styles requiring full autonomy alongside rigorous academic standards. The Stochastic Processes course serves as a key arena where students' academic resilience is put to the ultimate test. A defining characteristic of this course is its integration of advanced probability theory with dynamic temporal dimensions. Students frequently encounter difficulties stemming from the highly abstract nature of the material ranging from Markov Chain modeling and Poisson Processes to Queueing Theory which demands the synthesis of concepts from multivariate calculus and linear algebra. Without keen mathematical intuition, students often experience a cognitive overload that triggers academic anxiety (Setiawan, et al., 2020; Sari & Komarudin, 2024).

Despite being considered a challenging course, Stochastic Processes holds vital relevance and urgency in the advancement of modern science, particularly within the fields of Statistics and Data Science. Stochastic modeling serves as a fundamental basis for developing machine learning algorithms, analyzing financial risks, modeling epidemiology, and optimizing smart network systems. Mastering stochastic concepts enables aspiring data scientists not only to interpret static data but also to predict and model the behavior of complex, real-world systems characterized by uncertainty. The heavy academic workload associated with this quantitative course necessitates a higher education policy framework capable of addressing students' mental and academic needs. At the national level, Regulation of the Minister of Education, Culture, Research, and Technology (Permendiktisaintek) Number 39 of 2025 introduces regulations focused on character development, mental well-being, and the strengthening of student resilience. This policy affirms that higher education institutions bear the responsibility of creating a learning environment that supports student mental health while fostering the development of resilient and adaptive learners (Yahya, et al., 2026; Mardhotillah, et al., 2024; Constantinescu, 2024).

In alignment with these regulations, Permendiktisaintek Regulation No. 10 of 2026 mandates higher education quality assurance based on Outcome Based Education (OBE). This regulation emphasizes the importance of meeting learning process standards that are interactive, holistic, integrative, scientific, and student-centered. Collectively, these regulations require lecturers and institutions to establish measurable learning outcomes without compromising process quality or the flexibility of humanistic teaching methods. A content analysis of these two policies reveals a complementary synergy between character-building aspects (Permendiktisaintek No. 39/2025) and academic achievement quality standards (Permendiktisaintek No. 10/2026). Higher education institutions are required to balance the attainment of highly competitive graduate competency standards with the provision of academic support systems that safeguard students' psychological well-being. Flexibility in formative assessment and curriculum alignment are crucial mandates to ensure that the learning process does not isolate students experiencing learning difficulties (Yahya, et al., 2026).

Although both domains possess a robust theoretical and regulatory foundation, a significant research gap persists in current higher education literature. Most prior studies tend to separate national education policy analysis from pedagogical action research conducted at the classroom level. Existing research on resilience generally addresses generic psychological issues without specifically linking them to the challenges inherent in highly demanding courses such as Stochastic Processes. The scarcity of studies directly integrating national policy mandates (Permendiktisaintek No. 39/2025 and No. 10/2026) with context specific pedagogical strategies for resilience presents an opportunity for the novelty contribution offered by this article. This study aims to bridge that gap by formulating an instructional intervention strategy for Stochastic Processes that not only reduces student academic failure rates but also actively fosters indicators of student self-resilience, in alignment with national higher education frameworks for quality assurance and character development.

METHODS

This study employs a policy analysis approach combined with conceptual analysis. Policy analysis serves as the analytical lens to examine the normative content and strategic direction of recent higher education regulations. Meanwhile, conceptual analysis is used to articulate, align, and integrate the concept of academic resilience into the pedagogical framework for teaching Stochastic Processes a subject known for its high cognitive load. To produce a comprehensive synthesis, the study implements a three-stage, sequential, and complementary approach: (1) Regulatory Document Analysis: This stage focuses on content analysis of key legal documents specifically Permendiktisaintek Number 39 of 2025 (regarding character development and resilience) and Permendiktisaintek Number 10 of 2026 (regarding Outcome-Based Education/OBE learning quality standards). The analysis identifies key articles, institutional mandates, achievement indicators, and obligations to provide academic support systems for students; (2) Systematic Literature Review: This stage maps the empirical and theoretical research landscape regarding student resilience in higher education, particularly within Science, Technology, Engineering, and Mathematics (STEM) fields. The literature review identifies four primary resilience indicators: optimism, self-regulation, social support, and problem solving; (3) Pedagogical Strategy Synthesis: This stage bridges the findings from the regulatory analysis and literature review with the practical teaching of Stochastic Processes. The synthesis involves formulating curricular and instructional interventions, such as the use of visual computing tools, problem-based scaffolding, and peer-assisted learning, designed to reduce the abstract nature of the subject matter while simultaneously fostering student resilience indicators (Mardhotillah & Kholijah, 2023; Yahya, et al., 2026; Daniilidou, et al., 2025; Ramadhona, et al., 2024; Godsk & Moller, 2020).

Table 1. Research Instrument

Dimensions of resilience	Pedagogical Intervention (Stochastic Process)	Main Regulatory Framework	Educational Quality Implications
Self Regulation	Staged module distribution (chunking) and weekly reflective journals.	Regulation of the Minister of Higher Education, Science, and Technology No. 39/2025 (Character & Independence)	Enhancement of self-efficacy and self-directed learning retention.

Problem Solving	Real-world case modeling based on visual computer simulation.	Regulation of the Minister of Higher Education, Science, and Technology No. 10/2026 (OBE Learning Process)	Achievement of Higher-Order Thinking Skills (HOTS).
Social Support	Formation of Peer-Assisted Learning (PAL) groups and integrated practical sessions.	Regulation of the Minister of Higher Education, Science, and Technology No. 39/2025 (Mental Well-being)	Reducing math anxiety through a peer support system.
Academic Optimism	Gradual formative assessment (low-stakes assessment) & constructive feedback.	Regulation of the Minister of Higher Education, Science, and Technology No. 10/2026 (Flexible Assessment Standards)	Maintaining learning motivation and preventing learned helplessness.

The primary instrument developed in this study is the Strategy-Regulation Alignment Matrix. This matrix serves as a tool for assessing conceptual validity, ensuring that every formulated pedagogical intervention is not only effective from an instructional standpoint but also grounded in a precise legal basis. Through this methodological framework, the research findings are expected to demonstrate logical coherence, possess a robust formal-legal foundation, and be practically applicable for instructors of quantitative courses in higher education.

FINDINGS AND DISCUSSION

Regulation of the Minister of Higher Education, Science, and Technology (Permendiktisaintek) Number 39 of 2025 marks a paradigm shift in Indonesian higher education by positioning mental resilience and character building as the primary foundations of the academic ecosystem. This regulation explicitly mandates higher education institutions to integrate the strengthening of soft skills, resilience, and adaptability into both their curriculum structures and student services. Key provisions of the policy require the provision of academic support systems and mental health support to prevent academic burnout. This underscores that student success is no longer measured solely by cognitive achievement, but also by psychological resilience when facing complex academic challenges. Complementing this focus on character building, Permendiktisaintek Number 10 of 2026 establishes an Outcome-Based Education (OBE) quality assurance framework through the refinement of National Higher Education Standards. The regulation emphasizes curriculum flexibility and integration to ensure that graduate learning outcomes remain relevant to evolving times and industry needs. The policy necessitates a reorientation of the learning process shifting from a traditional, lecturer centered approach to active, student centered learning. Furthermore, the regulation governs the alignment of teaching methods, credit loads (SKS), and measurable assessment mechanisms to ensure the holistic attainment of competencies.

The synergy between these two policies necessitates a reset of pedagogical approaches for challenging courses such as Stochastic Processes. Permendiktisaintek No. 10/2026 mandates the establishment of rigorous learning outcomes regarding the mastery of dynamic probability theory and stochastic modeling. However, achieving these high standards must not be pursued dogmatically at the expense of students' mental well-being. This is where Permendiktisaintek No. 39/2025 serves as a counterbalance, mandating that the fulfillment of demanding learning outcomes be accompanied by instructional scaffolding that is humanistic, inclusive, and supportive of student resilience. Regarding curriculum integration and classroom intervention, the implementation of these regulations drives a transformation in teaching and assessment methods. The learning outcome standards set by Permendiktisaintek No. 10/2026 are operationalized through adaptive methods such as visual computational simulations and project based learning designed to reduce the abstract nature of stochastic material. Concurrently, the mandates of Permendiktisaintek No. 39/2025 are realized through the use of staged formative assessments (low stakes assessments) and peer-assisted learning systems. This approach allows students to learn from failure without the fear of drastic grade penalties, thereby directly fostering self-regulation and academic optimism.

At the institutional level, the convergence of Permendiktisaintek Regulations No. 39/2025 and No. 10/2026 mandates an update to the Internal Quality Assurance System (SPMI) at every higher education institution. The evaluation of learning quality is no longer limited to mere graduation rates or average exam scores; it now encompasses assessments of academic anxiety levels and the availability of student learning support facilities. By integrating resilience indicators into internal quality audit documents, institutions ensure that high graduation standards in quantitative science courses are achieved through a learning process that safeguards mental well-being and fosters the character of lifelong learners.

Implementing strategies to enhance student resilience in the Stochastic Processes Lecture requires a holistic approach that encompasses the classroom environment, the curriculum, and institutional support systems. The following is a comprehensive explanation of these three strategic levels:

1. Pedagogical strategies, specifically classroom level interventions focus on transforming daily learning experiences to alleviate math anxiety and reduce excessive cognitive load: (1) Case-Based Learning (CBL): This approach grounds highly abstract stochastic concepts (such as Markov Chains or Poisson Processes) in real-world applications—such as hospital queue modeling, stock price movement prediction, or data traffic algorithms. By recognizing practical relevance, students' perceptions of the material's difficulty shift from viewing it as merely complex formulas to seeing it as a problem-solving tool, directly fostering optimism and intrinsic motivation; (2) Collaborative Learning: Forming structured study groups creates a safe space for students to discuss ideas, dissect dynamic probability problems, and explain concepts to one another without anxiety. This structure strengthens social support, as peer networks serve as an emotional buffer when students encounter roadblocks in mathematical derivations; (3) Scaffolded Problem-Solving: This approach breaks complex modeling problems down into tiered sub-tasks. Instructors provide intensive initial support (e.g., modeling frameworks or visual computational code simulations) and gradually reduce assistance as student understanding grows. This process cultivates (4) self-regulation and problem-solving skills while preventing learned helplessness (a tendency to give up quickly due to a perceived lack of capability); (5) Mindfulness and Stress Management: Integrating brief stress-management techniques (such as 2–3 minute breathing exercises before quizzes or cognitively reframing failure) helps lower students' physiological tension. These interventions enhance psychological resilience, enabling students to remain calm and focused when tackling material that imposes a high cognitive load (Mardhotillah & Kholijah, 2023; Mardhotillah, et al., 2024; Ates & Polat, 2025; Zurweni, et al., 2025; Naeem & Mushibwe, 2025; Awais, et al., 2023).
2. Curriculum Strategy: Strategies at the curricular level ensure that resilience building possesses formal legitimacy and is recognized within the instructional structure: (1) Integration of Resilience Learning Outcomes into the Semester Learning Plan (RPS): The RPS is designed not only to include Course Learning Outcomes (CPMK) based on technical subject mastery but also to explicitly integrate sub-outcomes regarding attitudes and character such as adaptability to feedback, persistence in solving complex problems, and teamwork. This provides clear guidance to both lecturers and students that the process of overcoming

learning challenges is a recognized indicator of academic success. (2) Process Based Assessment: The assessment system shifts from a reliance on a single final exam (high stakes summative assessment) toward a balanced weighting that includes incremental formative assessments (low stakes assessments). Evaluation encompasses the tracking of problem-solving progress, assignment revision portfolios, and self reflection journals. This approach signals that errors during the learning process are a natural dynamic that can be rectified, thereby sustaining student motivation (Yahya, et al., 2026; Elmi, 2020; Mardhotillah & Kholijah, 2023; Mardhotillah, et al., 2024; Zurweni, et al., 2025; Beltman & Poulton, 2025; Constantinescu, 2024).

3. Institutional Strategy: This strategy establishes a structured academic support ecosystem outside the classroom: (1) Academic Mentoring and Counseling Program: The study program provides structured consultation hours facilitated by peer tutors senior students who have successfully completed the Stochastic Processes Lecture while also optimizing the role of Academic Advisors. These mentors offer both technical guidance and contextually relevant moral support. (2) Student Support Services Aligned with Permendiktisaintek Standards: Campus service units are aligned with the mandates of Permendiktisaintek No. 39/2025 (character building and well-being) and Permendiktisaintek No. 10/2026 (process quality standards). The institution provides a Student Psychological/Counseling Service Center integrated with the Internal Quality Assurance System (SPMI). This service ensures early detection for students experiencing severe academic anxiety and guarantees that all intervention processes are documented and periodically evaluated in accordance with national quality standards (Yahya, et al., 2026; Godsk & Moller, 2025; Mardhotillah, et al., 2024).

Aligning the strategy to enhance student resilience in the Stochastic Processes course with Permendiktisaintek Regulation Number 39 of 2025 and Permendiktisaintek Regulation Number 10 of 2025 (2026) ensures the legal and substantive sustainability of the intervention. The following matrix maps the operational linkages between pedagogical, curricular, and institutional strategies and the relevant articles of these national regulations.

Table 2. The Operational Linkages between Pedagogical, Curricular, and Institutional Strategies

Category of Strategy	Spesific Intervention	Reference of The Regulation of The Minister of Higher Education, Science and Technology Number (Permendiktisaintek) No. 39 of 2025	Reference of The Regulation of The Minister of Higher Education, Science and Technology Number (Permendiktisaintek) No. 10 of 2026	Substantive & Quality Implication
Case-Based Learning (CBL) & Computation Simulation	Articles (pasal) 8 & 12: Development of adaptive character, critical reasoning, and resilience in problem-solving.	Articles 14 & 16: Standards for an interactive, holistic, and problem-based (student-centered) learning process.	Articles 14 & 16: Standards for an interactive, holistic, and problem-based (student-centered) learning process.	Reducing the abstract nature of stochastic material, and enhancing optimism and problem-solving skills (HOTS).
Collaborative Learning / Peer-Assisted Learning	Articles 10 & 15: Strengthening soft skills, collaboration, and social support systems among students.	Article 15: A form of group learning that prioritizes the active participation of learners.	Article 15: A form of group learning that prioritizes the active participation of learners.	Reducing math anxiety through a peer support system and an inclusive learning climate.
Scaffolded Problem Solving & Coping Mechanism	Article 18: Protection of mental health (student well-being) and prevention of academic burnout.	Article 18: Use of pedagogical scaffolding to support the depth of the material.	Article 18: Use of pedagogical scaffolding to support the depth of the material.	Strengthening indicators of self-regulation and psychological resilience.

Category of Strategy	Spesific Intervention	Reference of The Regulation of The Minister of Higher Education, Science and Technology Number (Permendiktisaintek) No. 39 of 2025	Reference of The Regulation of The Minister of Higher Education, Science and Technology Number (Permendiktisaintek) No. 10 of 2026	Substantive & Quality Implication
Integrating Resilience Indicators into The Semester Learning Plan (RPS)	Articles 5 & 7: Mandate to integrate the attainment of attitudinal traits, mental resilience, and character values into the curriculum.	Articles 8 & 9: Graduate Learning Outcome (GLO) standards and the alignment of measurable Sub-Course Learning Outcomes (Sub-CLOs).	Articles 8 & 9: Graduate Learning Outcome (GLO) standards and the alignment of measurable Sub-Course Learning Outcomes (Sub-CLOs).	Providing formal recognition that resilience is acknowledged as an indicator of academic quality.
Process Oriented Assesstment	Article 14: Fostering an academic climate conducive to the processes of growth, development, and learning evaluation.	Articles 22 & 24: Standards for learning assessment that are educational, authentic, objective, and transparent.	Articles 22 & 24: Standards for learning assessment that are educational, authentic, objective, and transparent.	Shifting students' mindset from merely focusing on exam grades to appreciating the learning process.
Mentoring Program & academic counceling	Articles 20 & 22: Obligation for Higher Education Institutions to provide structured guidance, counseling, and character-building facilities.	Article 28: Standards for quality-assured academic facilities, infrastructure, and support services.	Article 28: Standards for quality-assured academic facilities, infrastructure, and support services.	Providing an early warning system for students showing signs of high academic anxiety.

Category of Strategy	**Spesific Intervention**	**Reference of The Regulation of The Minister of Higher Education, Science and Technology Number (Permendiktisaintek) No. 39 of 2025**	**Reference of The Regulation of The Minister of Higher Education, Science and Technology Number (Permendiktisaintek) No. 10 of 2026**	**Substantive & Quality Implication**
Integration of SPMI with student services	Article 25: Periodic evaluation of the level of psychological well-being and the attainment of character.	Articles 31 & 35: Internal Quality Assurance System (SPMI) in monitoring learning effectiveness.	Articles 31 & 35: Internal Quality Assurance System (SPMI) in monitoring learning effectiveness.	Ensure that resilience support is auditable and integrated into the higher education quality evaluation cycle.

The matrix above affirms that enhancing academic resilience is not merely an optional program but a constitutional obligation for higher education institutions. Permendiktisaintek No. 39/2025 establishes an affective and psychological foundation by safeguarding student well-being and fostering resilient character, while Permendiktisaintek No. 10/2026 provides cognitive operational standards and quality assurance through Outcome-Based Education (OBE). By anchoring these three strategic levels within the relevant articles, course instructors and study program administrators gain a robust legal basis to restructure teaching methods, design formative assessments, and allocate academic support resources for students.

The implications of integrating academic resilience strategies into Stochastic Processes instruction span three key domains theoretical, practical, and policy as follows: (1) Theoretical Implications: This study offers a novel conceptual contribution to the literature on academic resilience in higher education: Contextualizing Resilience within the Advanced STEM Domain: This research extends the scope of academic resilience theory previously studied predominantly as a general psychological construct into a construct specific to the context of quantitative courses characterized by high cognitive load. The findings demonstrate that resilience is not merely a static personality trait but a dynamic capacity that can be cultivated through instructional design. Integrating Cognitive Load and Psychological Resilience: This study bridges Cognitive Load Theory (Sweller) with the Academic Resilience Framework (Martin). It reveals that pedagogical interventions reducing extraneous cognitive load (such as the use of visual computing) directly trigger indicators of students' affective resilience, such as optimism and self-regulation. Bridging Macro Level Policy and Micro Level Pedagogy: This research addresses a gap in the literature by providing a conceptual framework that explicitly links national policies on quality assurance and character development to actual teaching practices within advanced mathematics classrooms. (2) Practical Implications (Guidelines for Lecturers): For lecturers teaching the Stochastic Processes course, the findings of this study offer operational guidelines for designing and managing an adaptive class: Redesigning the Instructional Approach (Simulation-First Approach): Lecturers are advised to alter the sequence of material delivery introducing abstract topics (such as Markov Chains or Brownian Motion) via visual computational simulations (Python/R/Matlab) to build intuitive understanding before proceeding to rigorous mathematical formulations and proofs. Restructuring the Assessment System (Low Stakes Iterative Assessment): Reducing the dominance of grades derived from a single high-stakes summative exam and shifting the weighting toward incremental formative assessments, such as improvement oriented weekly quizzes, code-modeling portfolios, and reflective journals. Rapid feedback mechanisms enable students to learn from failure without the fear of a drastic grade penalty. Implementing Pedagogical Scaffolding: Providing step by step problem solving guidance (scaffolded problem sets) that breaks down complex modeling problems into tiered sub-tasks, as well as establishing structured Peer-Assisted Learning (PAL) groups within the classroom. (3) Policy Implications (Recommendations at the Study Program Level): For Study Program Heads and Quality Control Groups, this study provides strategic direction for implementing Permendiktisaintek No. 39/2025 and Permendiktisaintek No. 10/2026. This includes: Aligning Semester Learning Plans (RPS) with the OBE Curriculum integrating Course Learning Outcome Sub-components (Sub-CPMK) focused on mental resilience, teamwork, and self regulation into the RPS for challenging quantitative courses, ensuring that meeting Outcome-Based Education (OBE) quality standards does not overlook affective aspects. Establishing a Study Program-Based Academic Support System providing structured tutorial sessions led by specially trained senior student peer tutors, and implementing an early warning system to identify students experiencing high academic anxiety prior to midterm examinations. Integrating Well being Indicators into the Internal Quality Assurance System (SPMI) incorporating instruments to evaluate student mental well being and stress levels in high-risk courses into the university's annual Internal Quality Audit (AMI) cycle, thereby enabling sustainable, evidence-based quality improvement in learning.

CONCLUSION

Efforts to enhance students' academic resilience in the Stochastic Processes course require a comprehensive instructional redesign that integrates both cognitive and affective dimensions. Given its high level of abstraction and significant cognitive load, this course is no longer effectively taught using conventional, formula memorization oriented instructional approaches. The key strategies formulated involve structured interventions at three levels: the classroom pedagogical level utilizing case-based learning, visual computational simulations, scaffolded problem-solving, and peer-assisted learning; the curricular level aligning the Semester Learning Plan (RPS) with Outcome Based Education (OBE) principles and implementing phased formative assessments; and the institutional level establishing an integrated academic mentoring and counseling system.

The success of this overall strategy hinges on emphasizing the close integration of national policies with actual classroom pedagogical practices. Higher education regulations must not remain mere administrative documents within the bureaucracy; instead, they must be transformed into operational guidelines for the interactions between lecturers and students. The legal frameworks established by Permendiktisaintek No. 39/2025 (on character building and mental health) and Permendiktisaintek No. 10/2026 (on learning quality standards) provide a solid legal basis for recognizing the development of psychological resilience as an integral component of academic quality assurance. The synergy between these two national policies underscores a new paradigm: rigorous graduate competency standards must be accompanied by the provision of humanistic learning scaffolding. When lecturers design a Stochastic Processes module, this policy integration dictates that reducing failure rates should not be achieved by lowering material complexity, but rather by strengthening students' capacity and mental resilience in solving intricate quantitative problems. Consequently, the academic quality demanded by the quality assurance framework is maintained without compromising student well-being. At the study program level, this convergence of policy and pedagogy is realized by strengthening the Internal Quality Assurance System (SPMI) to make it more inclusive and responsive. Program administrators and quality assurance units are responsible for ensuring that the academic environment surrounding challenging courses incorporates early warning systems for math anxiety and academic stress. Support provided by academic advisors and senior peer tutors serves as a tangible mechanism for bridging government regulatory mandates with the students' practical emotional and technical needs. The effectiveness of this policy pedagogical integration also contributes to achieving national educational goals: producing STEM (Science, Technology, Engineering, and Mathematics) graduates who are not only technically proficient but also possess the character of lifelong learners. The experience of grappling with, adapting to, and ultimately mastering complex subject matter such as Stochastic Processes serves as a crucible for students to internalize resilience indicators, including self-regulation, optimism, and problem-solving abilities. These affective skills become invaluable social and professional assets when graduates face the dynamics and uncertainties of the modern workforce.

While this article has established a comprehensive conceptual framework and policy analysis, it is acknowledged that the findings remain limited to theoretical study, regulatory analysis, and a synthesis of existing literature. Consequently, future research efforts should shift toward empirical studies to directly test the effectiveness of the formulated pedagogical strategies. Quantitative research employing quasi experimental designs or Classroom Action Research is essential to measure the impact of visual computing and scaffolded problem-solving on reducing student stress levels and improving learning outcomes. Furthermore, future empirical agendas should include longitudinal evaluations of student resilience indicators before and after the implementation of these learning interventions. Utilizing validated academic resilience instruments, combined with qualitative analysis of student and instructor perceptions, will provide a richer empirical picture of the dynamics underlying changes in learning attitudes. Comparative studies across different study programs or higher education institutions could also be conducted to examine how variations in academic culture and the availability of support facilities influence the successful implementation of Permendiktisaintek No. 39/2025 and No. 10/2026. Transforming the learning experience in the Stochastic Processes course through an academic resilience approach redefines the meaning of success in higher education. Universities cease to be mere venues for the cold transfer of quantitative knowledge; instead, they become environments for growth that humanize the individual and forge the mental resilience of the younger generation. By integrating national policy commitments, adaptive pedagogical designs, and sustained empirical validation, Indonesian higher education institutions can produce scientists and data professionals who are not only intellectually excellent but also resilient and steadfast in the face of contemporary challenges.

REFERENCES

Ates, H. & Polat, M. (2025). Leveraging Augmented Reality and Gamification for Enhanced Self-Regulation in Science Education. Education and Information Tecnologies 30, 17079 - 17110.

Awais, A., Fu, N. & Jones, S. (2023). Developing Students' Resilience During The Crisis: A Moderated Model Linking College Support, Study Demands, Student Resilience, and Students' Change-oriented Behaviours. Higher Education Quarterly 78, 565 - 585.

Beltman, S. & Poulton, E. (2025). Strategies Teachers Use to Maintain Motivation. Teaching and Teacher Education 155: 104882, 1 - 12.

Constantinescu, M. (2024). Resilience and Student Integration in Higher Education. Revista Romaneasca Pentru Educatie Multidimensionala, 16 (4), 497 - 508.

Daniilidou, A., Nerantzaki, K. & Stavropoulou, G. (2025). Pathways to Happiness and Resilience Among University Students: Understanding The Role of Belongingness and Academic Engagement. International Journal of Applied Positive Psychology 10: 30, 1 - 25.

Elmi, C. (2020). Integrating Social Emotional Learning Strategies in Higher Education. European Journal of Investigation in Health. Psychology and Education 10, 848 - 858.

Godsk, M. & Moller, K. L. (2025). Engaging Students in Higher Education with Educational Technology. Education and Information Technologies 30, 2941 - 2976.

Mardhotillah, B. (2012). Correlational Analysis of Internet Usage Behavior regarding the Academic and Extracurricular Achievements of High School Students in Batang Hari Regency. Khazanah Intelektual: Jurnal Gema Litbang, 1 (14), 441 - 450.

Mardhotillah, B., Kamid, K., Huda, N. & Zurweni, Z. (2024). Bibliometric and Network Analysis: Case-Based Learning Model Based on Statistical Entrepreneurship to Strengthen Data Analysis Ability and Resilience of Mathematics Students. Formatif: Jurnal Ilmiah Pendidikan MIPA, 14 (1), 223 - 238.

Mardhotillah, B. & Kholijah, G. (2023). Implementation of Project-Based Learning with e-Module Development in a Mathematical Entrepreneurship Course to Enhance Students' Data Analysis Skills and Resilience. Journal on Education, 5 (4), 17856 - 17867.

Mardhotillah, B., Syafmen, W., Multahadah, C. & Elisa, E. (2024). Brown-Forsythe Test on the Assessment of Project Outcomes by Students Specializing in Pure Mathematics, Applied Mathematics, and Statistics in a Research Methodology Course. Multi Proximity: Jurnal Statistika, 3 (2), 80 - 86.

Naeem, N. & Mushibwe, C. P. (2025). Navigating Digital Worlds: a Scoping Review of Skills and Strategies for Enhancing Digital Resilience Among Higher Education Students on Social Media Platforms. Discover Education, 4: 39, 1 - 15.

Rahmawati, R. & Mardhotillah, B. (2024). Proportion Test of Character Differences by Gender Based on Graphology among Adolescents and Pre-marital Adults. Multi Proximity: Jurnal Statistika, 3 (2), 98 - 114.

Ramadhan, A. K., Sipni, D. M., Wibowo, S. D. & Mardhotillah, B. (2024). Analysis of the Influence of Dietary Habits, Physical Activity, and Stress Levels on the Body Mass Index (BMI) of Mathematics Students (FST UNJA, 2020–2023). Multi Proximity: Jurnal Statistika, 2 (2), 107 - 117.

Ramadhona, R., Sutrisman, H., Padua, S., Sicat, A., Kusumo, B. & Simanjuntak, R. (2024). The Effect of Growth Mindset on Student Academic Resilience: Comparative Studies in Indonesia and Malaysia. Darussalam: Journal of Psychology and Educational, 3 (2), 107 - 122.

Sari, D. P. & Komarudin, K. (2024). The Relationship Between Coping Strategies and Resilience for Students with People-Pleaser Tendencies. JIST, 5 (9), 4641 - 4650.

Setiawan, N. C. E., Sutrisno, S., Munzil, M. & Danar, D. (2020). Introduction to STEM (Science, Technology, Engineering, and Mathematics) and the Development of Lesson Plans to Initiate Chemistry Learning Using the Semester Credit System (SKS) in Madiun City. Lumbung Inovasi: Journal of Community Service, 5 (2), 56 - 64.

Yahya, S. D., Syamsuri, H., Baso, M. I. H. M., Haryanti, S., Sahel, S., Dju, N. L., Somad, A., Arifin, L. O. M., Amril, A., Rosita, R., Karmilah, K., Ayu, J. D., & Fatmawati, F. (2026). A New Paradigm for Higher Education Quality Assurance: A Study of Permendiktisaintek Number 39 of 2025. Bandung: Media Sains Indonesia.

Yuniati, T. & Mardhotillah, B. (2024). Analysis of the Relationship between Gender and Personality Based on Graphology Using the Median Test. Multi Proximity: Journal of Statistics, 3 (2), 87 - 97.

Zhanty, L. S. (2018). The Contribution of Mathematical Resilience to Students' Academic Performance in the Mathematical Statistics Course. Mosharafa Journal, 7 (1), 85 - 94.

Zurweni, Z., Fachrudin, F., Saputra, W. S., Lestari, S., Yusriyah, K., Liliani, E., Agustiyanto, A. & Mardhotillah, B. (2025). Did Digital Learning Orientation, e-Learning Implementation and Creativity Reinforce Students Innovation Culture? International Journal of Data and Network Science 10, 337 - 350.