

Psychological Mechanisms in the Implementation of Self-Directed Learning Regarding Generation Z Students' Self-Efficacy in Islamic Education

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Abstract

This study examines how Self-Regulated Learning (SRL) shapes academic self-efficacy in Generation Z students in Islamic Religious Education and Character Education (PAI & BP) classes. The design is qualitative-dominant mixed-methods: quantitative data supply a contextual baseline; qualitative data carry the main analytical weight. The research site is SMA Praja Nusantara in West Sumatra, a semi-military boarding school where students have no routine access to electronic devices. This condition makes SRL both harder and, arguably, more consequential. Forty-three students participated in the quantitative component; four were selected for in-depth interviews based on post-test score profiles. Pre–post score comparisons showed statistically significant change in both the SRL group and the comparison group (paired t-test, $p < 0.001$). That result, however, understates what actually happened: aggregate scores flattened differences that mattered. Thematic analysis drawing on observations, semi-structured interviews, and learning documentation analyzed through Braun and Clarke's framework identified six themes: a shift in the locus of learning control, externalization of cognition through mind mapping, widespread difficulty with self-monitoring, domain-specific self-efficacy gains, SRL as a resilience mechanism, and gradual adaptation. Tentative patterns also pointed to SRL's role in the internalization of religious values, though the evidence for this is limited and warrants further investigation. The SRL–self-efficacy link is neither direct nor consistent across students. It works through psychological mechanisms that vary by individual, domain, and context. These findings extend Rahman et al. by tracing an alternative pathway and by testing Bandura and Zimmerman's reciprocity postulates under real boarding school conditions rather than assumed ones. Practical implications for PAI pedagogy in similar settings are discussed.

Keywords: *self-regulated learning*; academic self-efficacy; Generation Z; semi-military boarding school.

Introduction

Secondary education in Southeast Asia has faced challenges over the past decade, including declining academic engagement, rising mental health issues, and high dependence on digital media (OECD, 2019; UNICEF Indonesia, 2021). In Indonesia, this situation is exacerbated by the socio-emotional vulnerability of adolescents. The Ministry of Health (2022) notes a 6% prevalence of emotional disorders among the 15–24 age group. KPAI (2024, 2025) recorded 1,052 cases of child rights violations related to bullying as of November 2025, with 26 children dying as a direct result. Under these conditions, students' ability to regulate their learning process is not just an academic matter. It is a matter of psychological survival.

Self-regulated learning (SRL), according to Pintrich¹ and Zimmerman,² , is a construct that describes a learner's capacity to plan, monitor, and evaluate their learning process. Many researchers consider SRL to be a psychological resource. However, in practical terms in Indonesia, the findings are inconclusive, as reported by Maryani et al.,³ , who examined a strong correlation between SRL and creative thinking among elementary school students during the pandemic ($R = 0.856$). Conversely, Santoso et al.,⁴ found that among 295 students at the Indonesian Open University, *online* SRL and *online learning self-efficacy* were significantly correlated, but neither was significantly associated with academic performance. Nurfaidah et al. found no significant association between SRL and critical thinking skills among 107 fourth- to sixth-grade elementary school students in Sulawesi ($r = -0.053$; $p = 0.586$).⁵ Some of these research findings indicate that the success of SRL is influenced by the institutional context in which it is implemented.

¹ Paul R Pintrich, "The Role of Goal Orientation in Self-Regulated Learning," ed. Monique Boekaerts, Paul R Pintrich, and Moshe B T - Handbook of self-regulation Zeidner (San Diego, CA: Academic Press, 2000), 451–502, <https://doi.org/10.1016/B978-012109890-2/50043-3>.

² Barry J Zimmerman, "Becoming a Self-Regulated Learner: An Overview," *Theory into Practice* 41, no. 2 (2002): 64–70.

³ Ika Maryani, Ulfa Estriningrum, and Zalik Nuryana, "Self-Regulated Learning and Creative Thinking Skills of Elementary School Students in the Distance Education during the COVID-19 Pandemic," *Creativity Studies* 16, no. 2 (2023): 496–508, <https://doi.org/10.3846/cs.2023.15278>.

⁴ Harry B Santoso et al., "Learners' Online Self-Regulated Learning Skills in Indonesia Open University: Implications for Policies and Practice," *Education Sciences* 12, no. 7 (2022): 469, <https://doi.org/10.3390/educsci12070469>.

⁵ Andi Nurfaidah et al., "Critical Thinking and Self-Regulated Learning in Indonesia Primary Schools: Grade, Gender, Mediation," *Journal of Educational Research*, 2026, <https://doi.org/10.1080/00220671.2026.2640076>.

In addition, a construct closely related to SRL is academic self-efficacy. Bandura (1997) defines it as an individual's belief in their ability to organize and carry out actions to achieve goals.⁶ Islamic Religious Education (PAI) views self-efficacy as not merely a matter of cognition. It intersects with spiritual and moral dimensions. Tanti et al. (2025) found that Islamic values predicted online learning satisfaction more strongly than technological ease among 3,270 PTKI students.⁷ Salim et al. (2024) documented that a *blended learning* approach in PAI significantly increased self-efficacy among 258 high school students ($CR = 8.282$). PAI learning has its own motivational ecosystem that involves religious and affective dimensions.⁸

Among Generation Z, this problem has a unique dimension: those born after 1997 live in a paradox on one hand, they grow up amid digital media saturation, yet they exhibit high rates of academic procrastination and *fear of missing out* (FOMO). Mirawati et al.,⁹ & Sulistiyo,¹⁰ Note that Generation Z faces real psychological vulnerabilities. Self-efficacy serves as a key variable bridging these pressures. Sihombing and Juliana highlight its role in digital detox intentions,¹¹ Fitriati et al. Self-efficacy determines how Generation Z students manage both digital and academic demands simultaneously, influencing learning engagement.¹²

The most effective empirical contribution to the intersection of SRL, self-efficacy, and PAI comes from Rahman et al., who analyzed data from 600 Indonesian high school students using SEM. The results indicate that self-efficacy does not directly influence PAI learning outcomes ($p = 0.761$) but instead operates entirely through self-regulation as a

⁶ Albert Bandura, *Self-Efficacy: The Exercise of Control* (New York: W. H. Freeman, 1997).

⁷ Tanti et al., "Faith Meets Technology: Navigating Student Satisfaction in Indonesia's Islamic Higher Education Online Learning," *Jurnal Ilmiah Ilmu Terapan Universitas Jambi* 9, no. 2 (2025): 695–708, <https://doi.org/10.22437/jiituj.v9i2.41513>.

⁸ Salim et al., "The Impact of Blended Learning as an Educational Innovation on Student Character Building in Islamic Religious Education," *Qubahan Academic Journal* 4, no. 3 (2024): 139–51, <https://doi.org/10.48161/qaj.v4n3a739>.

⁹ Mirawati et al., "Self-Management Strategy of Students in Facing FOMO Challenges and Increasing Social Media Involvement in Islamic Boarding School," *Nazhruna: Jurnal Pendidikan Islam* 8, no. 1 (2025): 1–16, <https://doi.org/10.31538/nzh.v8i1.129>.

¹⁰ Eko Sujadi and Urip Sulistiyo, "Smartphone Addiction, Religiosity, and Academic Procrastination among College Students: The Mediating Role of Self-Esteem and Self-Regulated Learning," *Psychological Science and Education* 30, no. 1 (2025): 67–80, <https://doi.org/10.17759/pse.2025300105>.

¹¹ Sabrina O Sihombing and Juliana Juliana, "Digital Detox Intention among Indonesian Generation Z: The Role of Eudaimonic Values, Subjective Norms, Perceived Information Overload, and Self-Efficacy," *Societies* 16, no. 2 (2026): 54, <https://doi.org/10.3390/soc16020054>.

¹² Aulia Fitriati et al., "The Intention of Generation Z to Use Mobile Learning: The Role of Self-Efficacy and Enjoyment," *Turkish Online Journal of Distance Education* 26, no. 1 (2025): 85–100, <https://doi.org/10.17718/tojde.1445234>.

mediator ($p = 0.017$). This finding raises questions that have not yet been fully addressed. If self-efficacy requires self-regulation to produce learning outcomes, what mechanisms enable the structured implementation of SRL to build self-efficacy as an outcome in its own right? Bandura anticipated this reciprocal relationship. However, the reverse pathway from SRL to the development of self-efficacy has rarely been empirically examined, particularly in Indonesia, and even less so through qualitative approaches that can reveal its psychological mechanisms in depth.

This study examines this issue within a context that has received little research attention: semi-military boarding schools. SMA Praja Nusantara in West Sumatra combines the national curriculum with a military-style discipline program facilitated by TNI/Polri personnel. Sukung et al.,¹³ characterize this configuration through three pillars: discipline oriented toward national defense, religious guidance, and a structured *reward-punishment* system. The most striking distinction is the strict restriction on device access, limited only to Saturday nights at 10:00 PM and Sundays from 10:00 AM to 5:00 PM. Students, the majority of whom were born between 2007 and 2009 and belong to Generation Z, spend six out of seven days a week without digital connectivity.

This situation creates a “limited-digital” environment, a setting where the assumption of full connectivity no longer holds, even though that very assumption underlies much of the literature on Generation Z. Findings by Manindjo et al.,¹⁴ indicate that autonomy is a crucial psychological resource in structured boarding school environments. Omar Fauzee et al. (2026) found that self-efficacy and intrinsic value affect the success of SRL strategies in Malaysian boarding schools.

The discussion above highlights three research gaps. *First*, the direction of the relationship from SRL to the development of self-efficacy, that is, the reverse direction examined by Rahman, has not been extensively explored through qualitative approaches. *Second*, the learning dynamics of Generation Z under structural digital restrictions remain under-researched, even though the assumption of full digital connectivity underpins much of the literature on this cohort. *Third*, the variation in SRL findings in Indonesia calls for

¹³ Arwildayanto Sukung, Ikhfan A Razak, and Sitti Amay, “Fostering Student Discipline in Boarding Schools toward Industry 4.0,” *International Journal of Innovation, Creativity and Change* 12, no. 8 (2020): 420–32.

¹⁴ Zelmy A Manindjo, Vidya Anindhita, and Fitri Ariyanti Abidin, “Parental Psychological Control, Autonomy Frustration, and Psychological Well-Being among Boarding School Adolescents,” *Journal of Education and Learning* 17, no. 2 (2023): 262–70, <https://doi.org/10.11591/edulearn.v17i2.20734>.

an approach that can uncover the specific conditions under which the SRL–self-efficacy relationship emerges or fails to emerge. Questions such as these are better answered through qualitative exploration.

The study was guided by two questions: (1) How do Generation Z students with different self-efficacy profiles experience the implementation of the SRL model in Islamic Education (PAI) classes at a semi-military boarding school, and what changes in self-efficacy emerge? (2) What psychological mechanisms explain the relationship between SRL implementation and the development of self-efficacy in this context? The implementation of the SRL model is positioned as the learning context experienced by the participants; thus, aspects of its implementation are addressed as part of the first question, rather than as a separate question

Research Methodology

This study employs a *qualitative-dominant mixed-methods* approach as described by Johnson & Onwuegbuzie¹⁵ and Morse.¹⁶ The qualitative component is *the main strand*, while the quantitative component serves as *a contextual baseline*. Both data sets are integrated during the interpretation phase through *joint display*.¹⁷ This study is not a test of SRL effectiveness. Its focus is on exploring mechanisms in a context that has rarely been studied.

The research site was SMA Praja Nusantara in West Sumatra, a semi-military boarding school with 232 students in nine parallel classes. Access to mobile devices is restricted on Saturday evenings (10:00 PM) and Sundays (10:00 AM–5:00 PM). This context combines three characteristics that rarely appear together in the Indonesian educational literature: military-style discipline, intensive religious instruction, and restrictions on digital connectivity.

The principal investigator is not a faculty member at the school where the research was conducted. Field access was obtained through professional connections with the

¹⁵ R Burke Johnson and Anthony J Onwuegbuzie, “Mixed Methods Research: A Research Paradigm Whose Time Has Come,” *Educational Researcher* 33, no. 7 (2004): 14–26, <https://doi.org/10.3102/0013189X033007014>.

¹⁶ Janice M Morse, “Approaches to Qualitative-Quantitative Methodological Triangulation,” *Nursing Research* 40, no. 2 (1991): 120–23, <https://doi.org/10.1097/00006199-199103000-00014>.

¹⁷ Michael D Feters, Leslie A Curry, and John W Creswell, “Achieving Integration in Mixed Methods Designs—Principles and Practices,” *Health Services Research* 48, no. 6 Pt 2 (2013): 2134–56, <https://doi.org/10.1111/1475-6773.12117>.

school. The researcher is an education practitioner familiar with the context of Islamic Education. This familiarity can enhance analytical sensitivity, but it also carries the risk of confirmation bias. To manage this, the researcher maintains a reflective journal and involves a *peer debriefer* from outside the data collection team.

The quantitative component involved two classes selected through *cluster sampling*. Class XII. A ($n = 21$) received SRL-based instruction, while Class XII.B ($n = 22$) received conventional instruction as a descriptive comparison group. There were 43 students. Individual *random assignment* was not possible because the school maintained the existing class structure.

The qualitative component involved three participants from the SRL group. They were selected *purposively* using the principle of *maximum variation sampling* (Patton, 2015): Participant B (high post-test score), Participant A (moderate post-test score), and Participant C (low post-test score). The participants' profiles were determined after the intervention. This means that the resulting qualitative claims are not about initial conditions that determine responses to SRL, but rather about how students with different post-intervention profiles describe their experiences. One participant from the comparison group (high self-efficacy profile) was also interviewed as an initial contrast. The uneven number of qualitative participants across conditions is a limitation of this study.

The SRL group received PAI & BP instruction based on Zimmerman's three-phase model¹⁸ On the topic "Social Etiquette: Fostering Relationships and Respecting Neighbors' Rights," The intervention consisted of two active sessions, or a total of four 45-minute meetings, over four weeks (October 27 – November 17, 2025). The "phase" phase was conducted through stimulus videos and individual *goal* setting. The "performance control" phase utilized group work. Five groups were formed via a digital *spinner*, created *mind maps*, and then presented them. The "*self-reflection*" phase used a *True-or-False quiz that required* reasoning based on evidence. The comparison group received expository instruction on the same material from the same teacher.

The PAI Academic Self-Efficacy Scale consists of 30 five-point Likert items. This scale measures Bandura's three dimensions: *magnitude* (items 1–10), *generality* (items 11–20), and *strength* (items 21–30), with a score range of 30–150. Content validity was

¹⁸ Zimmerman, "Becoming a Self-Regulated Learner: An Overview."

assessed by three experts: two PAI lecturers and one educational psychology lecturer. Internal consistency reliability could not be reported in this study because access to the raw data was closed at the final writing stage. The instrument's psychometric properties need to be retested in a replication study.

The qualitative component utilized three instruments. *First*, an observation sheet to record the implementation of the three phases of SRL. *Second*, a semi-structured interview guide with 12 core questions regarding SRL experiences, goal setting, mind mapping, self-monitoring, and changes in self-perception. *Third*, learning documents (lesson plans, teaching materials, student *mind maps*, and quiz sheets) for triangulation.

The pre-test was conducted on October 27, 2025; the intervention sessions took place on November 3 and 10; the post-test was held on November 17; and in-depth interviews were conducted two weeks after the post-test. Each interview session lasted 45–60 minutes, was recorded, and transcribed verbatim. The principal investigator observed every SRL group learning session.

Quantitative data were analyzed using SPSS 29 with descriptive statistics, a normality test (*Kolmogorov-Smirnov*), a homogeneity test (*Levene's test*), and a *paired-sample t-test* to assess changes within each group. This analysis was descriptive in nature and did not serve as a test of effectiveness. Qualitative data were analyzed using Braun and Clarke's six-phase thematic analysis.¹⁹ Coding was performed manually using Zimmerman's three-phase SRL and Bandura's three dimensions of self-efficacy as *sensitizing concepts*, while remaining open to inductively emerging themes. Quantitative and qualitative results were then juxtaposed in a *joint display* to identify points of convergence, divergence, and complementarity between the two data sources.

The four criteria proposed by Lincoln and Guba were applied. *Credibility* was ensured through triangulation of sources and methods. *Transferability* was supported through *thick description*. *Dependability* was ensured through *an audit trail*. *Confirmability* was ensured through a reflective journal and two *peer debriefing* sessions with fellow educational psychology researchers. *Peer debriefing* resulted in two revisions to the theme labels: "ownership of the learning process" became "shift in the locus of control of learning," and "use of *mind maps*" became "externalization of cognition

¹⁹ Virginia Braun and Victoria Clarke, "Using Thematic Analysis in Psychology," *Qualitative Research in Psychology* 3, no. 2 (2006): 77–101.

through *mind mapping*.” The latter revision was important to include the artifacts' affective function as it emerged from the data.

Because the researcher had no access to an Institutional Review Board, this study was not submitted for IRB review. The researcher acknowledges this limitation. In place of a formal review, four safeguards protected participants: the school principal granted written permission for the study to proceed; parents or guardians of participants in the qualitative phase gave written consent; each interviewee consented to being recorded and was told they could withdraw at any point; and participants were identified in the report only by code (Participant A, B, C).

Results and Discussion

Descriptive Mapping of Changes in Self-Efficacy Scores

As a starting point for mechanistic exploration, changes in academic self-efficacy scores for both groups were described descriptively. [Table 1](#) presents descriptive statistics along with the results of *the paired t-test* for each group.

Table 1
Descriptive Statistics of Self-Efficacy Scores and Paired t-Test Results in the SRL and Control Groups

Group	n	Pre-test M (SD)	Post-test M (SD)	Δ Mean	t	p
SRL	21	128.10 (11.82)	133.57 (12.42)	+5.47	8.02	< 0.001
Control	22	111.14 (16.06)	122.05 (16.16)	+10.91	6.31	< 0.001

Note: Scores on the PAI Academic Self-Efficacy Scale range from 30 to 150. Δ Mean is the difference between the post-test and pre-test means within the same group.

This mapping revealed three patterns that are important for qualitative exploration. The pre-test scores of the SRL group were significantly higher than those of the comparison group by 16.96 points. This means that the two groups were not on equal footing from the start. Next, both groups showed a significant change in scores from pre-test to post-test. Interestingly, the increase was actually greater in the comparison group (+10.91) than in the SRL group (+5.47).

There are three reasons why this data cannot be used as an indicator of comparative effectiveness. The *baseline* differences are too large. The SRL group started at 85% of the maximum scale, so a *ceiling effect* is likely. Furthermore, the direction of change is

actually opposite to the hypothesis. More importantly for this study, this pattern suggests that aggregate instruments do not capture the true dimensions of change experienced by students. The following qualitative data explores this possibility.

Implementation of the Three Phases of SRL in PAI Instruction

Triangulation of observational data, learning documents, and interviews indicates that Zimmerman's three phases of SRL,²⁰ operate in an integrated manner in Islamic Education (PAI) lessons on the topic "*Social Etiquette: Fostering Relationships and Respecting Neighbors' Rights.*"

The forethought phase. The teacher begins the lesson with a reflective video on social connections and neighborly etiquette. Students are then asked to summarize the video's moral message and set their own learning *goals*. Based on observations, most students were able to identify key values such as respecting neighbors, maintaining communication, and building harmonious relationships as their own learning goals. Two core activities of this phase take place: activation of prior knowledge and goal setting.²¹

Performance control phase. Students were divided into five groups using a digital *spinner*. Each group works on a different subtopic within the same theme: the meaning of social bonds in Islam, neighbors' rights, social etiquette in the digital age, ways to maintain social bonds during conflict, and the Islamic vision of a harmonious society. Each group creates a *mind map* that includes core concepts, supporting evidence, behavioral examples, and contextual applications, and then presents it during an intergroup Q&A session. This activity involved three core processes of the *performance control* phase: *strategic planning* in creating the mind map, self-management in dividing roles, and self-control and self-observation during the presentation. Variations in self-confidence were quite evident. Some students explained the material with confidence and concrete examples. Others remained hesitant in front of the class.

Self-reflection phase. The *True or False* quiz was designed in an unconventional way. Each answer must be accompanied by reasoning based on religious principles, Islamic values, social norms, or personal experience. The statements were also deliberately crafted to test both conceptual understanding and social sensitivity. For example, does visiting a sick neighbor count as maintaining social ties? Do a neighbor's

²⁰ Zimmerman, "Becoming a Self-Regulated Learner: An Overview."

²¹ Zimmerman, "Becoming a Self-Regulated Learner: An Overview."

rights include the obligation to help one another? Analysis of the answer sheets reveals variations in the depth of *self-evaluation* that align with participants' self-confidence profiles. High-profile students provide systematic explanations that link religious principles to personal experiences, whereas students with moderate to low profiles tend to offer shorter justifications. This pattern reflects the two core processes of the *self-reflection* phase: *self-judgment* and *self-reaction*.

Qualitative Profiles of Three Participants

Analysis of interviews with selected participants revealed three contrasting profiles in their experiences with SRL. The three profiles are presented using anonymous codes to protect participant confidentiality.

Participant B demonstrated relatively strong conceptual articulation skills and frequently used terminology borrowed from learning, including the terms *self-evaluation* and *self-monitoring*. They described SRL as a more structured learning framework:

"For me, learning through SRL has been very helpful. I feel more organized in my studies because every step, from setting goals to reflecting, makes me more aware of my own learning process. It feels like I'm not just receiving the material, but truly taking ownership of it." (Participant B)

Participant B described the increase in their self-confidence in considerable detail. They were able to cite specific situations in which SRL helped them, particularly during presentations: "*Because I had created a mind map and engaged in self-monitoring, I was able to explain things fluently and with greater confidence.*" In fact, their self-confidence had already been quite high before the intervention. However, they still felt that SRL offered something new: a way to self-assess the effectiveness of their learning strategies. She did not previously possess this kind of self-assessment ability, or *meta-skill*.

Participant A demonstrated consistent incremental progress. The language used was simpler yet reflective, with the frequent use of the words "pretty good" and "more" suggesting an awareness of incremental changes. At first, Participant A found it difficult to set learning goals:

"At first, I wasn't used to setting my own goals; usually, the teacher explains them. But after trying it, it turned out to be helpful because I came to know what I needed to achieve during the learning process." (Participant A)

After participating in SRL learning, Participant A reported an increase in confidence during discussions and presentations:

"After using SRL, I've become more confident about asking questions when I don't understand something. During discussions, I'm also more confident about sharing my opinions because I already have my own notes and mind map." (Participant A)
A concrete example of this occurred during a discussion assignment on neighbors' rights: "*Usually I stay quiet, but this time I was brave enough to explain the part of the mind map I created myself.*" Participant A's growth in self-confidence appears to be *task-specific*, tied to the concrete artifacts they have produced.

Participant C's growth was limited but tangible. Their language tended to be hesitant. Words like "somewhat," "a little," "still," and "sometimes" frequently appeared in their interview. Such word choices can be interpreted as a sign that their self-confidence is still developing. Their greatest difficulty arose during the *forethought* phase.

"When I had to set learning goals at the beginning, I was a bit confused because usually the teacher explains it. But after it was explained again, I was able to set goals, even though they were still simple." (Participant C)

His progress is more evident in cognitive areas, such as understanding the material through mind maps, than in social areas, such as presentations and discussions. He stated, "*I feel most confident when I understand the material from a mind map, because it's easier to see the key points. Presentations still make me nervous.*" However, there is a small but significant shift. Although still limited in speaking up in class, Participant C has moved from being passive to being a bit more confident: "*I'm more willing to try than just stay silent.*" During a group discussion on socializing, he tried to explain a small part he understood from his *mind map*, "*even though I was still nervous.*"

These three participants experienced SRL in very different ways. Participant B's growth was horizontal, in the sense that it enriched the metacognitive repertoire they already possessed. Participant A experienced more expansive growth, particularly in academic courage. Meanwhile, Participant C experienced foundational growth, namely, building the basic courage to try. A single aggregate score cannot capture nuances like these.

Themes Suggesting Psychological Mechanisms

A thematic analysis of interview transcripts, observation sheets, and learning documents revealed six themes describing potential mechanisms underlying the relationship between SRL and self-efficacy in the context of Islamic Education (PAI) at a semi-military boarding school. These themes are exploratory in nature. The limited number of qualitative participants makes it more appropriate to understand these six

themes as initial propositions rather than as a list of confirmed mechanisms. Further research with a larger sample and more balanced comparisons is needed to test them.

In addition to the six main themes, the analysis also revealed one additional observation: the potential role of SRL in the internalization of religious values. Empirical support for this is still limited, so this observation is discussed as a supplementary note following the elaboration of the main themes. [Table 2](#) summarizes the six themes, with further elaboration provided in the following section.

Table 2
Six Themes Suggesting Psychological Mechanisms

Theme	Description
Shift in the Locus of Control of Learning	Transition from the teacher as the determiner of the direction of learning to the student as the active manager of their own learning process.
Externalization of Cognition through Mind Mapping	Mind maps serve as cognitive tools that can be revisited and act as a source of self-confidence.
Universal Challenges in Self-Monitoring	Even high-scoring participants struggled to assess their understanding objectively; self-monitoring appears to require repeated practice.
Domain-Specific Growth in Self-Efficacy	Growth in self-efficacy is not uniform but varies by task type (understanding material, mind mapping, presentations, discussions).
SRL as a Resilience Mechanism	Participants described a shift in their relationship with mistakes, moving from a fear of being wrong to the courage to try.
Gradual Adaptation	SRL requires a period of adaptation before participants can integrate its framework into their learning practices.

Shift in the Locus of Control of Learning

All three participants cited the pattern of “usually the teacher decides” as their starting point. They then described the transition to a state where they began to manage the direction of their own learning. Participant B expressed this most clearly: *“I don’t just receive the material, but actually manage it.”* This shift is psychological in nature. What emerges is a subjective experience of ownership over the learning process, not merely compliance with SRL procedures.

Externalization of Cognition through *Mind Mapping*. For participants, a *mind map* is more than just a cognitive strategy. It is a physical artifact that can be held and referred back to. Participant A mentioned that *mind maps* help them remember key points. Participant C uses them as a guide during presentations: “*It’s a little easier because I have my own notes.*” This kind of externalization of cognition provides a concrete anchor. Participants build a sense of competence from the results of their own work, which they can literally hold in their hands.

Universal Challenges in *Self-Monitoring*. All three participants, including Participant B, who scored high on the post-test, cited *self-monitoring* as the most difficult aspect of SRL. Participant A described it candidly: “*The hardest part is self-monitoring, because sometimes I feel like I understand when I actually don’t.*” This finding implies something important. *Self-monitoring* does not seem to emerge automatically from SRL implementation. It is a distinct skill that requires explicit, repeated practice.

Domain-Specific Growth in Self-Efficacy. Increases in self-confidence are not uniform across task dimensions. Participant A is more confident in *mind mapping* and presentations but remains hesitant regarding *self-monitoring*. Participant C demonstrates high self-efficacy in understanding material through *mind maps* but remains nervous during presentations. This pattern aligns with Bandura's framework of magnitude, generality, and strength.²² Self-efficacy develops differentially, not as a single aggregate.

Participants described a shift in their relationship with mistakes. Participant A: “*Even if I make a mistake, I know which parts need to be corrected, so my doubts diminish.*” Participant B: “*Every mistake becomes part of the process.*” Participant C, though still hesitant, demonstrated a fundamental shift: “*I’m more willing to try than just to sit back.*” All three described a learning orientation that views mistakes as diagnostic information rather than evidence of failure. In the literature on motivation, this type of orientation is known as a *mastery orientation*.²³

The phrase “*at first... but eventually*” appeared consistently throughout the interviews. Participant A: “*At first I was a bit confused, but eventually I came to understand what I needed to do.*” Participant C: “*After practicing frequently, I began to be able to review my own lessons.*” SRL requires a period of adaptation before its

²² Bandura, *Self-Efficacy: The Exercise of Control*.

²³ Carol S Dweck, “Motivational Processes Affecting Learning,” *American Psychologist* 41, no. 10 (1986): 1040–48, <https://doi.org/10.1037/0003-066X.41.10.1040>.

framework can be integrated into learning practices. This has methodological implications. Brief interventions risk capturing only the initial transitional confusion, rather than the more substantive effects following internalization.

Early Indications of the Internalization of Religious Values

In addition to the six main themes, the analysis revealed preliminary indications that SRL in the context of Islamic Education may operate not only cognitively but also affectively and spiritually. Participant B stated: *"I now better understand the meaning of maintaining relationships and respecting neighbors not merely as theory, but as values that must be applied in daily life."* This observation aligns with the literature, indicating that the religious dimension constitutes a distinctive motivational ecosystem within PAI.²⁴ However, the support consists of only one explicit citation. Therefore, this claim is presented as a preliminary observation that still requires further exploration using instruments specifically designed to examine the dimension of value internalization.

Discussion

Integration of Quantitative and Qualitative Findings

The central question of this study is how the implementation of SRL interacts with the development of academic self-efficacy, a question best answered by exploring mechanisms rather than comparing effectiveness. Thus, the integration of quantitative and qualitative data is oriented toward identifying convergences, divergences, and complementarities between patterns of change in aggregate scores and participants' experiential narratives. [Table 3](#) presents a joint display that juxtaposes these two types of findings.

Table 3
Joint Display: Comparison of Quantitative and Qualitative Findings

Aspect of Findings	Quantitative Data	Qualitative Data	Type of Integration
Changes in self-confidence in the SRL group	Increase in aggregate scores (+5.47; $t = 8.02$; $p < 0.001$)	Three participants described changes in different aspects (metacognitive, expansive, and foundational)	Complementarity: quantitative measures capture the direction of change; qualitative measures reveal the heterogeneity of the dimensions

²⁴ Salim et al., "The Impact of Blended Learning as an Educational Innovation on Student Character Building in Islamic Religious Education."

Participant C's post-test score remained low	Aggregate scores indicate persistent uncertainty	Participant C reported a shift in attitude from passive to 'willing to try.'	Divergence: aggregate scores do not capture the growth that participants experienced as meaningful
Domain-specific growth patterns	30-item aggregate score	Growth varies across task dimensions (understanding material vs. presentation vs. self-monitoring)	Complementarity: aggregate measures obscure domain-specific patterns identified qualitatively
Self-monitoring challenges	Not reflected in the aggregate score	All three participants cited this as the most difficult part	Divergence: a crucial dimension absent from quantitative instruments
Gradual adaptation	Not evident in the two-time-point measurements	The phrase 'at first... but eventually' appeared consistently	Divergence: pre-post measurements do not capture the time dimension of adaptation

The patterns emerging from *the joint display* point to an important methodological conclusion. Aggregate quantitative measures capture that changes have occurred, but not how or in what dimensions. The comparison group even showed a larger increase in scores (+10.91) than the SRL group (+5.47). From the perspective of conventional "effectiveness testing, this pattern would be considered a violation of the hypothesis. However, within a mechanistic exploration framework, the question of whether SRL's impact is uniform is less productive than the question of the types of changes students experience.

This pattern aligns with the findings of Rahman et al.,²⁵ which indicates that the relationship between self-efficacy, self-regulation, and Islamic Education learning outcomes is not linear but rather mediated. This study complements theirs from a different direction. While Rahman examined the path from self-efficacy and self-regulation to learning outcomes, this study explores the reverse path: from SRL, psychological mechanisms, and self-confidence to learning outcomes. Both directions are consistent with Bandura's reciprocity postulate,²⁶ but are rarely examined side by side in the same context.

²⁵ Rahman et al., "The Role of Self-Regulation as an Intervening Variable in the Influence of Self-Efficacy on the Learning Outcomes of Islamic Religious Education."

²⁶ Salim et al., "The Impact of Blended Learning as an Educational Innovation on Student Character Building in Islamic Religious Education."

Psychological Mechanisms of SRL–Self-Efficacy

The six identified themes do not stand alone. They are interrelated in three main configurations: the externalization of cognition as an anchor *for evidence of mastery*, *self-monitoring* as a skill resistant to brief interventions, and domain-specific growth as a measurement challenge.

The externalization of cognition as an anchor for evidence of mastery. All three participants described *mind maps* not merely as cognitive tools, but as physical evidence of competence that could be referred back to. Participant C, whose post-test score remained low, used *mind maps* to build confidence during presentations. This pattern aligns with Bandura’s conceptualization of *enactive mastery experience*. What is new in this finding is the observation that artifacts of experience, not just the experience itself, become a source of enduring confidence.²⁷ However, this finding must be interpreted with caution. Why did Participant C remain nervous during the presentation, even though they already had *a mind map*? The data suggest that the externalization of cognition supports self-confidence in the cognitive dimension more strongly than in the social-evaluative dimension. This implies that *mastery evidence* is not a monolithic category; rather, it is contextual and domain-specific.

Self-monitoring is a challenging skill. All three participants, including Participant B, who scored high on the post-test, cited *self-monitoring* as the most difficult aspect of SRL. This observation aligns with Santoso et al.,²⁸ who reported weaknesses in the *task strategies* and *help-seeking* dimensions of SRL implementation. An assumption often implicit in SRL-based learning design is that students will naturally monitor their own understanding. The data from this study suggest that this assumption needs to be re-examined. Even within a structured SRL framework, participants still struggled to calibrate their understanding. This implies that *self-monitoring* needs to be explicitly taught as a distinct skill.

Growth in domain-specific areas is a measurement challenge. Growth in self-confidence appears to vary across task dimensions. Participant A improved in *mind mapping* and discussion but remained hesitant regarding *self-monitoring*; Participant C scored high on material comprehension but felt nervous during presentations. This pattern

²⁷ Bandura, *Self-Efficacy: The Exercise of Control*.

²⁸ Santoso et al., “Learners’ Online Self-Regulated Learning Skills in Indonesia Open University: Implications for Policies and Practice.”

is an empirical illustration of the three-dimensional efficacy framework.²⁹ The methodological implication is that the 30-item aggregate scale used in this study may obscure three distinct qualitative growth trajectories within a single numerical score. Future research requires instruments designed as differentiated subscales for each task dimension within PAI.

Theoretical and Practical Implications

This study makes three theoretical contributions. *First*, it empirically maps how the SRL–self-efficacy reciprocity, conceptualized by Bandura³⁰ and Zimmerman³¹ operates through identifiable mechanisms. *Second*, it demonstrates that *mastery experience* and *self-monitoring* need to be understood in context and in domain-specific terms. *Third*, it complements the Rahman et al.,³² by examining different pathway directions within the Indonesian educational context.

Four practical implications for Islamic Education pedagogy within the disciplinary context: (1) the *forethought* phase requires explicit *scaffolding*, with stimulus videos and preliminary discussions serving as one model; (2) *self-monitoring* needs to be taught as a distinct skill through *self-assessment* rubrics, reflective journals, or metacognitive discussions; (3) limiting access to devices can be utilized to deepen visual-collaborative strategies such as *mind mapping*, while providing space for student autonomy in goals and strategies; and (4) principle-based reflective evaluation formats, such as the *True or False* quiz developed in this study, can be adapted for other PAI topics as an assessment mechanism that supports *self-judgment*.

Limitations and Directions for Future Research

This study has seven limitations. *First*, the sample size for the quantitative data ($n = 43$) and the number of qualitative participants ($n = 4$) were limited, so the primary focus is on exploring mechanisms rather than generalizing patterns. *Second*, the intervention duration, equivalent to four sessions over four weeks, likely captured only the initial adaptation phase, as emphasized by Susanto et al., who noted that SRL develops through

²⁹ Bandura, *Self-Efficacy: The Exercise of Control*.

³⁰ Bandura, *Self-Efficacy: The Exercise of Control*.

³¹ Zimmerman, "Becoming a Self-Regulated Learner: An Overview."

³² Rahman et al., "The Role of Self-Regulation as an Intervening Variable in the Influence of Self-Efficacy on the Learning Outcomes of Islamic Religious Education."

long-term programs. *Third*, the selection of qualitative participants based on post-test score profiles means this study can only describe how students with different post-intervention profiles recount their experiences, rather than the initial conditions that determine their response to SRL.

Fourth, the single-location setting limits transferability; replication across modern Islamic boarding schools, integrated Islamic schools, or general boarding schools is needed to distinguish mechanisms specific to the semi-military context from more general ones. *Fifth*, the aggregate self-efficacy scale is not sensitive to domain-specific growth, making instruments differentiated by task dimension in Islamic Education a methodological necessity, as this study demonstrates. Sixth, the qualitative data from the comparison group included only one participant, so comparative claims across learning conditions cannot yet be made systematically. Seventh, the internal consistency reliability of the self-efficacy instrument cannot be reported because access to the raw data was closed at the final writing stage; replication studies should report Cronbach's alpha coefficients, ideally for the *magnitude*, *generality*, and *strength* sub-scales.

The four most urgent directions for future research are: (1) replication with a larger sample and an intervention lasting at least one semester; (2) longitudinal studies mapping the trajectory of self-efficacy throughout the implementation of SRL; (3) multi-site comparative studies between semi-military boarding schools, Islamic boarding schools, and integrated Islamic schools; and (4) the development of self-efficacy instruments differentiated by task dimension in Islamic Education.

Conclusion

This study examines how the *self-regulated learning* (SRL) model interacts with the development of academic self-efficacy in Islamic Religious Education classes at SMA Praja Nusantara in West Sumatra, a semi-military boarding school with structurally restricted access to mobile devices. As a *mixed-methods* study with a qualitative focus, the study's primary aim is not to test the intervention's effectiveness but to explore the psychological mechanisms linking SRL implementation to the subjective experiences of Generation Z students in this unique educational environment.

Three main findings can be summarized. *First*, Zimmerman's SRL model can be implemented in Islamic Education instruction within a disciplinary context. Still, it requires explicit *scaffolding*, particularly during the *forethought* phase, as students are

accustomed to teacher-centered instruction. *Second*, the integration of quantitative and qualitative data through *joint display* indicates that aggregate self-efficacy scores capture that changes occur, but not how or on which dimensions those changes operate. This observation makes questions about mechanisms more productive than questions about comparative effectiveness at this exploratory stage. *Third*, thematic analysis yielded six exploratory themes describing potential mechanisms in the SRL–self-efficacy relationship: a shift in the locus of learning control, externalization of cognition through *mind mapping*, universal challenges in *self-monitoring*, domain-specific growth in self-efficacy, SRL as a resilience mechanism, and gradual adaptation. Preliminary indications of SRL's role in the internalization of religious values also emerged, though with limited empirical support. These six main themes and one additional observation should be treated as propositions requiring verification in larger samples and more diverse institutional contexts before they can be claimed as generalized mechanisms.

The main theoretical contribution of this study lies in the empirical mapping of the psychological mechanisms underlying the relationship between SRL and self-efficacy in the context of Islamic Education. This line of research complements the work of Rahman et al. from a different perspective and empirically examines Bandura and Zimmerman's reciprocity postulate. Methodologically, this study demonstrates that measuring aggregate self-efficacy risks obscuring the heterogeneity of domain-specific growth identified qualitatively. This highlights a clear need to develop more sensitive instruments. Practically, these findings guide PAI teachers within the discipline to design effective SRL implementation: providing explicit metacognitive *scaffolding*, utilizing concrete artifacts such as *mind maps*, using principle-based reflective evaluation formats, and appreciating the time-consuming nature of the adaptation process.

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