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DEEP LEARNING SELF-REGULATION STRATEGIES OF INDONESIAN LEARNERS OF ENGLISH AS A FOREIGN LANGUAGE

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Abstract: *In many Indonesian EFL classrooms, students still rely on teacher-directed, exam-oriented routines with limited explicit instruction on self-regulated learning. Self-Regulated Learning (SRL) strategies are critical for academic success, especially in English as a Foreign Language (EFL) contexts. In Indonesia, however, there remains limited research on the deep learning self-regulation strategies used by EFL learners and the impact of gender and academic grade level. This study explores the deep learning self-regulation strategies Indonesian higher education students use in learning English, focusing on gender and grade level differences. Using the Deep Learning Strategies Questionnaire (DLS-Q) and semi-structured interviews, the results show a moderate use of SRL strategies, with Basic Learning Strategies being the most frequent. These strategies involve task planning, goal setting, and self-monitoring. Summarizing and activating prior knowledge were more often utilized by male students through Basic Learning and Deep Information Processing Strategies compared to female students. On the other hand, females appeared to prefer Social Strategies such as group discussions and collaboration with peers. These, along with the lack of variation with grade level, were not significant from a statistical standpoint. This research proposes that employing Deep Learning Self-Regulated Learning (SRL) strategies, using visuals and reflective tools, may enhance student engagement during EFL instruction.*

Keywords: self-regulated learning; deep learning strategies; EFL Learners; gender differences

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INTRODUCTION

Self-regulation of learning in EFL is an important factor for academic achievement in higher education. It involves a set of cognitive, metacognitive, motivational, and behavioural processes that students use to regulate and control their learning. The appropriate use of self-regulated strategies is associated with higher levels of language proficiency and better school performance (Şeker, 2016). Among such strategies are metacognitive strategies, which imply planning, controlling, and regulating one's own learning process and have been highlighted as facilitating language development (Flavell, 1979). (Habók et al., 2022) found that metacognitive awareness among students is positively associated with academic achievement and language proficiency.

Besides the main advantages of self-regulated learning (SRL), the differences between the genders in language learning strategies have grabbed the attention of many scholars. Studies show differences between male and female learners and how both of them approach learning a language, as females tend to prefer collaborative, communicative approaches that match their social and emotional skills (Tran, 2021). On the other hand, males gravitate towards an individualistic, competitive, and performance-oriented approach (Rahmawati & Ummah, 2020). Knowing these differences based on gender is important in order to shape a male and female-specific educational framework that blends well with the requirements of both learners and enhances their language learning.

The Indonesian context presents a unique set of challenges and opportunities in studying SRL in EFL learning. Several studies have explored the application of SRL strategies among Indonesian learners, particularly in light of the various educational settings and contexts in which they learn. Nadeak and Kuswandono (2024) highlight motivational factors and contextual challenges faced by students at a private university, suggesting that targeted interventions, such as integrating SRL strategies, are crucial for enhancing their engagement and performance in English language learning. In the context of higher students' self-regulated learning experience. Several researchers (Hartono & Diasti, 2023; Mahmud & German, 2021) in their studies show that the shift to online education affects students' ability to regulate their learning. Despite this expanding body of work, critical gaps remain, as current Indonesian research underexplores deep-learning self-regulation strategies (DLS) that foster higher-order comprehension and critical reflection, and no study concurrently examines how gender and academic grade level influence the use of these strategies.

The importance of SRL in enhancing the educational experiences of Indonesian EFL learners cannot be overstated, especially as the education system grapples with ongoing shifts in learning modalities. Addressing the gap outlined above constitutes the novelty of the present study. Focusing explicitly on deep learning self-regulation strategies and analyzing them through the joint lenses of gender and grade level. This study is designed to analyze the research by answering two core questions:

1. What learning strategies are preferred by Indonesian students of higher education in English as a foreign language?
2. How do gender and grade level impact the application of Deep learning Self-Regulation Strategies by Indonesian students in Learning English?

Addressing these questions is important because they explore the broader strategic tendencies of the learners as well as the potential influences that could shape the effectiveness of SRL strategies during language learning. With the focus on these questions, this research aims to illuminate educators, policymakers, and researchers who are interested in improving the language learning journey of Indonesian students in relation to the understanding of self-regulated learning strategies in the context of gender and academic progression.

LITERATURE REVIEW

Concept of Self-Regulated Learning (SRL)

Self-Regulated Learning (SRL) is a complex term that empowers individuals to organize their learning through strategies that improve their studying and promote better results. It is an active process in which the learner sets objectives and tracks advancement while reflecting on the experience cognitively, motivationally, and emotionally (Panadero, 2017; Dignath & Veenman, 2020(Porras, 2021).

Zimmerman's self-regulation model illustrates a cyclic process consisting of forethought, which encompasses goal-setting and strategy formulation; performance, which includes self-monitoring and self-instruction; and self-reflection, which comprises self-evaluation and self-reaction (Rosyada & Sundari, 2021); Pourdana & Tavassoli, 2022). This rigor enables the learners to plan their goals, evaluate their strategies, and assess their outcomes. Particularly, Zimmerman argues that self-efficacy and the belief in one's capabilities affect the approach a learner takes toward challenges and self-regulation (Cerezo et al., 2019; Üner et al., 2020).

Self-regulated learning is not just concerned with metacognition; rather, it embraces all motivational and behavioral aspects of learning (Zimmerman, 1990). SRL is enhanced by self-efficacy since high self-efficacy relates to the successful implementation of self-regulation strategies that allow different learners to gain more effective control over their own educational process (Lin et al., 2023). Self-efficacy refers to the belief in one’s capabilities significantly influencing motivation and learning behaviors (Bandura & Wessels, 1994).

Education had once been a towering figure in educational psychology. Among the earliest contributions is Pintrich’s comprehensive framework of self-regulated learning (SRL). SRL is an active process whereby learners define goals, monitor progress, and regulate their behaviors to reach educational objectives. The following are Pintrich’s framework requirements: cognition, metacognition, motivation, and context. Their

interplay significantly affects academic accomplishment and failure (Pintrich, 2004; Schunk, 2005). SRL is defined as a cyclical process featuring metacognitive strategies, as well as motivational beliefs and environmental contexts, and those who are good at learning continuously appraise and adapt what they are doing in their learning. SRL has three stages: forethought, goal setting, performance or self-monitoring, and self-reflection (Schunk, 2005). These phases even engage in an interrelationship to coordinate, which helps the self-managing learners through their educational journey (Pintrich, 2004; Wigfield et al., 2005).

Deep Learning in Language Acquisition

Deep learning is central to language acquisition as it obtains deep-level retention and mastery of a language. The concept of deep learning was first proposed by Ference Marton and Roger Säljö. Deep learning provides support for language acquisition by facilitating Higher-Order Thinking as opposed to surface learning, which can be thought of as memorizing. Surface learning emphasizes understanding, critical thinking, and application (Marton & Säljö, 1976). Deep learning, concerning language learning, fosters a higher level of linguistic competence by motivating learners to interact with the language beyond rote memorization of words and grammatical rules. It is about comprehending the deeper structure of the language and using it in real, context-based situations (Ismail et al., 2023; Ritonga et al., 2022).

Deep learning requires learners to organise information cognitively and process it on multiple levels. Language acquisition means understanding and communicating in ways that surpass basic comprehension and blend new information with what learners already know (Cerezo et al., 2019; Apridayani & Teo, 2021). Research indicates that, compared to passive learning approaches, deep learning enhances problem-solving capabilities and contributes to much more pronounced long-term retention of language knowledge (Panadero et al., 2021; Üner et al., 2020).

Deep learning increases motivation and engagement by making the language learning tasks more personally relevant to the learners. In an EFL situation, learners who perceive language learning as important are more likely to deeply process language material. This aligns with self-determination theory, which focuses on intrinsic motivation as a crucial component of learning (Ismail et al., 2023; Heydarnejad et al., 2022). EFL learners who are motivated willingly to learn English because they consider it important for personal or career advancement are more likely to participate in deep learning activities like reflective journaling, peer discussions, or project-based language use (Ritonga et al., 2022; Kumar et al., 2023).

In terms of behavior, deep learning motivates students to become more active in their learning. Specifically, in the language learning process, this involves activity self-evaluation, problem solving, self-reflection, and language use of varying levels of complexity, all of which demand the application of language knowledge (Fostervold et al., 2022; Golub et al.,

2019). For English as a foreign language (EFL) learners, behavioral engagement with the language through speaking, group work, and writing assists in gradual mastery of the language. Engaging actively and behaviorally with the learning process enhances skill mastery, understanding of the language, and contextually understanding the relevant cultures.

The self-regulation learning skills of EFL students are improved through deep learning methods such as self-assessment and collaborative learning. EFL students who employ deep learning not only acquire language skills but also develop important lifelong learning metacognitive skills. Such learners are noted to be more resilient and persistent, and flexible in their strategy adjustment to feedback, which positively aids language learning (Kumar et al., 2023; Ritonga et al., 2022). In addition, deep learning enables the development of learners' critical thinking skills and language learners to tackle language problems in an insightful and flexible way (Takarroucht, 2022).

Deep Learning Self-Regulation Strategies

The frameworks for self-regulated learning (SRL) discussed by scholars include different approaches that learners may utilize to improve their studying and learning results. Under this categorization, four overarching stratagems have arisen: Basic strategies of self-regulated learning, strategies involving visual elaboration and summarization, strategies for deep information processing, and strategies for socially regulated learning. All these strategies are important for improving students' academic participation and performance (Panadero et al., 2021).

Basic learning self-regulation strategies have three phases that repeat in cycles: The first phase is called preparatory, where learners plan and analyze tasks. The second phase is called performance, where learners complete the tasks and track their progress. Finally, in the appraisal phase, learners assess the results and reflect on their strategies and their effectiveness (Panadero, 2017). Students not only performed better academically, but also improved their self-regulation skills due to adopting these strategies, becoming more organized and disciplined in regulating their learning tasks (Panadero et al., 2021; Cerezo et al., 2019). These foundational strategies provide the structure that encourages cognitive engagement, creating the potential for more sophisticated techniques in subsequent learning.

Visual Elaboration Strategies increase understanding by integrating visuals with learning activities. This could include diagrams, charts, and conceptual maps, which assist learners in organizing and connecting complex chunks of information. Visual aids allow learners to appreciate the connections between concepts, which enhances understanding and memory. Students with visual elaboration aids became more cognitively engaged and learned more because these aids enhanced information processing (Panadero et al., 2021; Cerezo et al., 2019). Because visual aids are included, the brain is better able to process,

store information, and memory retrieval is easier when dealing with more complex and abstract ideas.

Deep Information Processing Strategies encompass terms where students link new information to their prior knowledge, try to apply it in real-world contexts, or think of varying responses to an academic challenge (Panadero et al., 2021). Active learners who challenge themselves to question the material provided, summarize it, and use other forms of deeper cognitive processing can understand and improve their self-regulation far better than other learners (Üner et al., 2020); The aforementioned strategies help learners think deeper, critique the information, and integrate it, thereby ensuring the learner can apply the knowledge long-term, which is important in mastering complex topics.

Social Learning Self-Regulation Strategies are collaborative learning frameworks in which students work with other learners or with instructors, thus enabling the learning process to occur socially(Panadero et al., 2021). Cooperative strategies such as group work, peer teaching, and class discussions stimulate students and, at the same time, enable them to take charge of their learning through active engagement and responsibility (Mbarute et al., 2023). The social dimension of learning is important for providing emotional support and fostering community, thus helping students connect with the learning experience (Mahalingam & Yunus, 2016). This social engagement helps create an active learning context in which students share insights, clarify concepts, and support each other (Heydarnejad et al., 2022; Smyth et al., 2018). The implementation of these strategies helps students develop practical communication skills and improve their ability to work in teams, which are critical for their education and future careers.

These four strategies are: Basic Learning Strategies, Visual Elaboration Strategies, Deep Information Processing Strategies, and Social Learning Self-Regulation Strategies. This complexity can be explained with a constructive approach that considers cognitive, visual, and social aspects. Indeed, teachers are better positioned to help students develop self-regulation skills when learning strategies are adapted to self-regulation, as social, cognitive, and visual skills are integrated. In mastering and adapting these strategies, students will come to own their learning and develop habits that promote learning for life.

METHOD

Research Design

This study employs an explanatory sequential mixed methods design as described by John W. Creswell and Timothy C. Guetterman (2018). Thus, in this case, collecting quantitative data as a first step was primary, followed by qualitative data collection to explain the first step's results. The combination of quantitative and qualitative data enhances understanding of the studied phenomena by allowing the researcher to move beyond a surface explanation, improving the analysis and insights.

Within this study framework, the Deep Learning Strategies Questionnaire (DLS-Q) developed by (Panadero et al., 2021) was used as the principal tool for assessing deep learning self-regulation strategies in language learners. This questionnaire has been validated and contains relevant elements that assess different self-regulation processes. In this study, self-regulation quantitative metrics and the corresponding quantitative assessment of the self-regulation actions are obtained through the DLS-Q. In this case, quantitative data are supplemented with qualitative data obtained from interviews to explore learners' self-regulation skills from different perspectives.

Participants

This study involved 172 students from the English Education Department of a private university in the southeastern region of Sulawesi and included 137 females and 35 males from different academic levels (1st, 3rd, 5th, and 7th semesters). In the quantitative phase of the research, total sampling was employed in which all the participants filled out the Deep Learning Strategies Questionnaire (DLS-Q). In the qualitative phase, based on self-reported strategy use, gender, and academic level, 8 students were purposefully selected to provide more focused insight into their perceptions. This method allowed us to obtain summary descriptions and detailed descriptions.

Table 1.
Distribution of students according to grade level

Grade level	Number of participants	%
1st	45	26%
3rd	44	26%
5th	37	22%
7th	46	27%

Data Collection and Analysis

This study relied on two primary instruments to collect quantitative and qualitative data. The first instrument was a self-regulated learning DLS-Q deep learning strategies questionnaire. The DLS-Q is a self-administered instrument consisting of 30 items. It is designed to assess a range of self-regulated strategies. The DLS-Q has four primary categories of strategies. The first, Basic Learning Self-Regulation Strategies, has a reliability of $\alpha = 0.85$; The second, Visual Elaboration and Summarising Strategies, has a reliability of $\alpha = 0.84$. The third, Deep Information Processing Strategies, has a reliability of $\alpha = 0.85$. The last category is Social Learning Self-Regulation Strategies, which has a reliability of $\alpha = 0.64$. For each item, the participants selected a response on a scale of 1 to 5, and the data were analysed by determining the means (M) and standard deviations (SD) of each strategic category. Responses were then grouped into three levels: high, 3.5-5.0; medium, 2.5-3.4; and low, 1.0-2.4. An independent t-test and ANOVA were applied to assess the differences observed in DLS across gender and academic grade levels.

The second instrument employed in this research study was a semi-structured interview, which was conducted after the quantitative phase. For the interviews, a purposive sample of 8 participants was balanced along the dimensions of gender, grade level, and the self-reported use of self-regulation strategies (high, medium, and low). The interviews aimed to gain qualitative insights into students' perceptions of the strategies they used and their views on how these strategies impacted their learning processes. The interview questions focused on the following themes: i) Which strategies has your lecturer taught you to learn English? ii) Do you employ any of these strategies? If yes, which ones? If not, are there other strategies you use? iii) Which strategies do you think should be implemented by your lecturer to enhance your English skills? and iv) What learning strategies would you suggest to a friend who wanted to improve their English skills?. These interviews were recorded on audio, transcribed, and subsequently analyzed to identify patterns and extract deeper insights into how self-regulation strategies were used, particularly concerning gender and academic grade level.

RESULTS AND DISCUSSION

Results

The Deep Learning Self-Regulation Strategies Used by Students

The students reported utilizing a variety of deep learning self-regulated strategies through their English language experiences. Table 2 below shows that students' overall use of DLS is categorized as medium (M=3.32), with each strategy falling within the medium range: Basic learning strategies (M=3.46), visual elaboration (M=3.16), deep Information processing (M=3.38), and social learning self-regulation (M=3.29).

Table 2.
Students' reported use of deep self-regulated learning strategies

Strategy type	M	(SD)
Basic Learning Strategies	3.46	(.98)
Visual Elaboration	3.16	(.44)
Deep Information Processing	3.38	(.66)
Social learning self-regulation	3.29	(.68)
Overall strategy use	3.32	(.22)

Overall, students' engagement with deep learning SRL strategies remains moderate. Basic Learning Strategies emerged as the most prominent, while Visual Elaboration Strategies were the least frequently used.

Basic Learning Strategies

Basic learning self-regulation strategies refer to cyclical phases of preparation, performance, and appraisal, which guide students in managing their learning effectively. The survey results indicated a mean score of 3.46, categorizing this strategy as a medium.

Specifically, the highest (M=3.76) was found for reviewing and evaluating their work, showing strong engagement in the appraisal phase. In the preparatory phase, students demonstrated solid engagement with task analysis and planning (M=3.60) and (M=3.55), respectively. During the performance phase, students actively monitored their progress, with (M=3.42) and (M=3.32), suggesting they regularly check their progress and ensure their actions align with the initial plan. However, the self-assessment phase received the lowest score (3.26), suggesting that while students understand its importance, they may not always utilize these tools consistently.

Visual Elaboration Strategies

Visual elaboration strategies like diagrams, graphs, concept maps, and tables are a form of visual aid that help organise and retrieve information more effectively. The score for visual elaboration strategies was (M=3.16), placing it in the medium category. The highest score (M=3.36) was for creating graphs or diagrams while studying, indicating that students occasionally use these visual tools to understand the material. However, students were less inclined to organize information in tables (M= 2.91), indicating that they do not find this method particularly useful. Additionally, some students wrote short summaries (M=3.31) for assessment tasks, but others only summarized when prompted by the teacher (M=3.00). The creation of concept maps and diagrams to relate concepts was also rated relatively low (M=3.29) and (M=3.27) respectively, showing that these strategies are not widely used.

Deep Information Processing Strategies

Deep information processing strategies are essential for effective knowledge acquisition, as students are involved in connecting new information to existing knowledge and restructuring that knowledge. These strategies activate cognitive processes such as relating new material to prior knowledge, applying knowledge to real-life situations, and considering different alternatives to academic problems. The score for deep information processing strategies was (M= 3.38), categorizing it as medium. The highest scores were for relating what they learn to their own ideas (M=3.68) and linking study material to prior knowledge (M=3.64), indicating a strong integration of new and existing knowledge. Students also showed interest in applying their learning to real-life situations, with scores of (M=3.57) and (M=3.27) for seeking practical applications of the content. However, strategies like thinking of alternatives (M=3.05) and relating ideas from different subjects (M=3.21) were used less frequently.

Social Learning Self-Regulation Strategies

Social Learning Self-Regulation strategies emphasize that learning occurs in social contexts, where co-regulation and socially shared regulation are influenced by interactions

with peers and teachers. These strategies are crucial in collaborative environments, where group work is common. The score for social learning self-regulation strategies was (M=3.29), placing it in the medium category. The highest score (M=3.68) was found for discussing ideas, highlighting the importance of collaboration. Students also sought feedback from peers (M=3.16) and teachers (M=3.42) after underperforming. However, participation in class discussions with teachers was lower (M=2.82), indicating less frequent engagement. Additionally, taking notes during presentations received a moderate score (M=3.28), reflecting its usefulness for clarity.

Results of the Independent Samples t-test Examining Deep Learning and Gender

Table 3 presents the results of the comparison between male and female students using various deep learning strategies. The data contains the mean and standard deviation (SD) for every strategy type, in addition to the calculated t-values and p-values for the difference in male and female participants' data, for the given strategies, as well as the t-values and p-values for the statistical significance of the difference between male and female participants. The studied strategies comprise the Basic Learning, Visual elaboration, Deep information processing, and Social learning self-regulation strategies.

Table 3.
Result of independent-samples t-test examining DLS and gender

Strategy type	Male		Female		T	p
	M	SD	M	SD		
Basic Learning Strategies	3.79	.43	3.38	.20	2.21	.03
Visual elaboration strategies	3.03	.26	3.20	.22	-2.01	.05
Deep information processing strategies	3.63	.33	3.21	.19	3.33	.001
Social learning self-regulation strategies	3.37	.43	3.39	.34	0.06	.94
Overall strategies use	3.43	.10	3.29	.07	0.96	.37

Overall, male respondents provided slightly higher average responses than female respondents across all types of strategies, with some categories exhibiting significant differences. Specifically, males scored higher in Basic Learning strategies (male M=3.79 vs. female M=3.38, t=2.21, p=0.03) and Deep Information Processing strategies (male M=3.63 vs. female M=3.21, t=3.33, p=0.001). In contrast, females slightly outscored males in social learning self-regulation (female M=3.39 vs. male M=3.37, t=0.06, p=0.94). No significant gender differences were found in overall strategies used (male M=3.43 vs. female M=3.29, t=0.96, p=0.37). These results suggest no significant gender differences in the overall use of learning strategies.

Grade Level

This study investigated whether the students' DLS choice varied by grade level. In general, the survey results revealed that all grade levels in the medium category were 1st (M=3.27), 3rd (M=3.35), 5th (M=3.35), and 7th (M=3.29).

Table 4.
Students' strategies used between grade levels

Strategy types	**1st semester**		**3rd semester**		**5th semester**		**7th semester**	
	M	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
Basic Learning	3,41	.37	3.52	.33	3.50	.31	3.37	.20
Visual elaboration	3,0	.22	3.17	.27	3.16	.26	3.22	.24
Deep information processing strategies	3,37	.41	3.38	.41	3,42	.42	3.37	.37
Social learning self-regulation strategies	3,31	.26	3.34	.27	3,32	.25	3.22	.21

Table 4 indicates that only basic learning strategies are classified in the high category, especially in the first semester (*M*=3.50) and the fifth semester (*M*=3.50). The use of all strategies in each grade level fits in the moderate category. However, the grade level employing the least technique is in the first semester in visual elaboration strategies (*M*=3.0).

Table 5.
Result of ANOVA between grade level

Source of Variation	**Sum of Squares**	**Df**	**Mean Square**	**F**	**P-value**	**F crit**
Between Groups	0,01925	3	0,006416667	0,304047	0,821969	3,490295
Within Groups	0,25325	12	0,021104167			
Total	0,2725	15				

Based on the results of the ANOVA analysis presented in Table 5, it can be concluded that there is no significant difference in the use of learning strategies between grade levels. The obtained P-value is 0.82196, which is greater than the significance level of 0.05. This indicates that the variation between these groups is not large enough to demonstrate a significant difference in the use of learning strategies such as Basic Learning, Visual Elaboration, Deep Information Processing Strategies, and Social Learning Self-Regulation Strategies.

Students' Perception of Deep Learning Self-Regulated Learning Strategies

The semi-structured interviews with a select group of 8 students provided valuable qualitative insights into their perceptions of self-regulation strategies. Students reported

that the strategy used by lecturers was group discussion. Students 1 "*the strategy the lecturers use in teaching mostly group discussion and presenting paper in front of the class."* Students 8' lecturers *"gave us presentation tasks for class discussion."* In terms of strategies used, most of the students reported using Basic Learning Strategies, Social Learning Self-Regulation Strategies, and Deep Information Processing Strategies in their language learning. The high and moderate students' categories regularly reviewed and evaluated their work, actively monitored their progress, and engaged in discussions with peers to enhance their understanding. Additionally, they sought feedback from lecturers, showing a proactive approach to improving their learning outcomes. These students also emphasized the importance of collaboration and felt that interacting with classmates was essential for reinforcing their learning.

Students displaying diminished interaction with DLS, in contrast, voiced doubts regarding the utility of these methods and tended to employ them only when instructed to do so during lectures. These students described difficulty with the consistent use of self-regulation techniques. Adaptations to self-regulation, without external structure, were minimal for this group. Several students cited challenges, such as poor understanding of their learning processes and low motivation, as major obstacles to actively engaging with self-regulation. These learners accepted the fact that although the strategies were important and valuable, there was no motivation to implement them for consistent cross-task application, especially outside of the classroom.

Moreover, students who reported lower levels of engagement with the DLS also expressed comparable feelings of frustration and being overwhelmed within the context of the learning process. Students 3 and 4 noted that they had *"I haven't thought about managing or mapping ideas, especially when the lecturer asks about my idea."* in the learning, highlighting a lack of deep learning strategies. This group of students articulated that more detailed self-regulation strategies would help increase both their awareness and motivation. They felt that clear guidance on planning, implementing, and assessing their language learning would help them tackle their educational challenges and improve their performance. These insights indicate that an appropriately adapted approach to self-regulation could provide substantial aid to students who fail to use these strategies.

In addition to the strategies they personally use, students also shared valuable recommendations for their peers on how to improve English language learning. Several students emphasized the importance of mutual motivation and regular discussions as key strategies for success. Student 2 said, *"It helps a lot when we study together, and we can share our ideas. If my friend gets motivated, I feel motivated too."* Students supported this view and added that working together enhances learning and helps maintain motivation, especially when learning challenging concepts. Students recommended that their classmates improve their self-set study and discipline levels. Student 5 emphasized, "*I think managing time well is key. If we set a study schedule and stick to it, it makes everything easier and less stressful."* It

was a common theme in interviews. Students stressed that having a clear and set study schedule, showing discipline, and following the study plan strongly contributed to achieving better results in mastering the language over time.

Discussion

This study sheds light on deep learning self-regulation strategies employed by higher education students in Indonesian in learning English as a Foreign Language (EFL). While self-regulated learning (SRL) is essential in the process of acquiring a language, the results show that students tend to rely mostly on a combination of deep learning strategies, using different types across varying frequencies. Additionally, the study shows the impact of gender alongside the academic level in the use of SRL, contributing to the understanding of SRL's workings in the Indonesian context of EFL.

Deep Learning Self-Regulation Strategies: A Medium Engagement

The study aimed to explore the strategies Indonesian higher education students prefer in learning English as a foreign language, mainly focusing on deep learning self-regulation strategies. The results revealed that students' overall use of deep learning self-regulation strategies was moderate, with each strategy type falling within the medium range. Among the four types of strategies examined: basic learning, visual elaboration, deep information processing, and social learning self-regulation. Basic Learning Strategies involve planning, monitoring, and evaluating learning processes, which aligns with the findings in our study, where task planning and self-assessment were the most frequently used.

Students demonstrated the highest engagement with basic learning strategies like task planning and tracking progress, which are important in developing independent learning skills. As Panadero et al. (2021) note, these strategies enable learners to set actionable goals and evaluate if and how their efforts are translating into progress towards their learning objectives. Self-regulation has been found to be critical for independent learning in(Teng et al., 2021; Sun & Zhang, 2022); Sun et al., 2021), and it includes the awareness of one’s cognitive processes and the ability to control the learning activities (Teng et al., 2021; Sun et al., 2021). Teaching planning and monitoring strategies have been targeted to give EFL learners the ability to evaluate their strengths and weaknesses, thus improving learning as documented in (X. Wang & Gunaban, 2023; Yang et al., 2022; Y. Zhang et al., 2022).

Basic learning strategies enable students to set clear goals and develop structured approaches for task completion, identifying the steps necessary to achieve desired outcomes and allocating time and resources effectively (Hao & Hua, 2024; Haataja et al., 2021). Furthermore, integrating strategies such as self-monitoring has been shown to

enhance students' awareness of their progress, encouraging them to adjust their approaches based on real-time feedback (Haataja et al., 2021; Yang et al., 2022).

The moderate engagement with visual elaboration strategies, such as creating diagrams and summarizing information, suggested that visual aids were not universally integrated into students' study routines. Research shows that learners who possess a high level of task awareness are better equipped to choose appropriate comprehension strategies that complement their use of diagrams and summaries (Higgs et al., 2023). The integration of visual strategies is affected by cognitive and affective factors, including learner motivation, emotional state, and enjoyment. Foreign Language Enjoyment (FLE) significantly correlates with higher engagement and positive outcomes, suggesting that strategies promoting enjoyment could enhance the effectiveness of visual elaboration methods (Li, 2023; Hu et al., 2022).

Deep information processing strategies also showed moderate levels of engagement. These strategies include activating prior knowledge, real-world application of learning, and brainstorming multiple ways of addressing academic challenges (Panadero et al., 2021). This indicates that while students seem to meaningfully integrate information, more advanced knowledge and thinking skills are needed for deep understanding and more nuanced critical thinking. Deep learning in EFL (English as a Foreign Language) is important for grasping the language and its sociocultural contexts. The application of deep information processing strategies, critical thinking, summarization, and self-questioning helps foster self-regulation and language competence (Jiang, 2022). The processes of active questioning and summarization strengthen the grasp of the material and retention of the material, while appropriate instructional support and interactivity aid deeper comprehension. Adopting instructional frameworks that emphasize collaborative discussion and active participation is productive (Jiang, 2022). Moreover, the use of technology in the classroom, like gamification and collaborative learning, enhances motivation for deep learning while improving the overall pedagogical landscape, resulting in better educational outcomes (Nong et al., 2023).

The study indicates that students in Indonesian higher education mainly used basic learning strategies, showing only a moderate level of involvement in deeper learning and social strategies. Although these students can connect new information, there is a clear need to motivate them to complete more complex cognitive tasks and engage more actively in class discussions. By enhancing visual elaboration and deep information processing techniques, along with boosting interactions between students and lecturers, we could significantly improve the overall learning experience. Instructional methods that focus on task planning and collaborative feedback not only encourage independent learning but also help develop the higher-order thinking skills essential for effective communication in English (Loon et al., 2021; W. Zhang & Wilson, 2023).

Gender and Grade Level Differences: Insight into Strategy Preferences

Findings of this study reveal varying strategy preferences of male and female students in learning English as a Foreign Language (EFL). Male students reported a higher usage of basic learning strategies and deep information processing strategies, reflecting their inclination towards structured and cognitive-intensive approaches to learning. This is consistent with a study by Yaguarema et al. (2022), which established that males tend to relate new information to prior knowledge and implement concepts practically actively, which may improve their academic performance. Likewise, (Zárate-Santana et al., 2021) established that male students frequently employ preparation and performance strategies, reflecting their systematic and judgmental learning habits. In addition, Li (2024) supported this by suggesting structured collaborative group work as particularly appropriate for male students due to their sequential and systematic approach to learning.

On the other hand, female students showed a slightly higher inclination toward social learning self-regulation strategies, though this difference was not statistically significant. The finding that females tend to utilize social strategies more frequently aligns with existing literature highlighting their collaborative learning style. (Yu, 2024) emphasized female students' engagement in social learning strategies through extracurricular language activities, underscoring their preference for socially interactive contexts. This trend is further supported by (Sani & Ismail, 2021) and (Alhaysony, 2017), who reported a consistent pattern of female ESL/EFL learners favouring social and interactive strategies across diverse cultural contexts. (C. Wang et al., 2021) also highlighted females' proficiency in collaborative learning environments, reinforcing the observation of their affinity for social strategies. (Arooj et al., 2022) Similarly, the collaborative and interactive nature of social learning strategies is preferred by female learners.

In examining grade level differences, the study found no differences in applying self-regulated deep learning strategies across the first, third, fifth, and seventh semesters. Contrary to expectations from previous literature, this study's results indicated a more consistent increase in strategy use, given the increasing academic exposure and experience. Prior studies by Bećirović et al. (2021) and Yustitiasari (2020) proposed a movement from simple to more sophisticated metacognitive strategies concerning academic progression. However, this study showed that self-regulated learning strategies, specifically deep learning strategies, do not seem to evolve with academic advancement as once suggested. This underscores the lack of self-regulated deep learning strategies accompanied by a structured framework in the teaching framework at all grade levels.

The lack of significant variation in deep learning strategy implementation across grades is concerning from an educational practice perspective. (Jiang, 2022) contends that self-regulated learning strategies are unlikely to develop autonomously with an increase in academic exposure, suggesting that teaching these strategies must be developmentally appropriate for each educational tier. This issue is compounded by (Chen, 2022) who

asserts that the deployment of advanced learning strategies tends to increase with academic progression. Based on the findings of this study, there appears to be an enduring gap in the educational framework where the curriculum lacks the necessary elements to scaffold the development of profound learning strategies, resulting in stagnated growth.

It is crucial to consider instructional design and teaching methodologies in tertiary education. As pointed out, instructional strategies have to vary to suit gender differences in how students prefer to learn (Matsuo, 2024; Johnson, 2018). Male students, on the other hand, should be taught through structured conceptual tasks and their application. In addition, the lack of notable improvement in strategy use as students progress through the grades indicates a need for sustained, step-by-step instruction in deep learning strategies. There is a need for more explicit teaching and enforcement of deep learning strategies in educational policies and practices (Nourazar et al., 2022; Elghotmy, 2023). Independent learning can be achieved through appropriate instructional scaffolding which also ensures that students possess the requisite skills for success in their studies (Martin et al., 2018; Dawn et al., 2011).

CONCLUSION

This study investigated Deep Learning Self-Regulated (DLS) strategies with gender and grade level differences in Indonesian higher education EFL students. Findings indicated that students primarily applied Basic Learning Strategies with lesser use of Deep Information Processing and Social Learning Strategies. Visual Elaboration Strategies were the least utilized. Male participants used basic and Deep Information Processing Strategies more, and females slightly favored Social Learning Strategies, although these differences were not significant. There were no meaningful differences across grade levels, and qualitative results indicated that participants with high engagement regularly monitored their learning, and other students needed to be supported. This study sheds light on the gender and academic level differences in self-regulated learning strategies (SRL) in the EFL context. Its primary limitations stemmed from the bias of self-reported data, the cross-sectional design that does not account for changes over time, and the focus on reporting in EFL. Self-reported data bias, a lack of longitudinal design, and culture and context need more attention in the design of further research that aims to track the development of self-regulated learning strategies over time and teach the strategies more efficiently. Educators are encouraged to explicitly teach DLS strategies, use visual aids, incorporate reflective activities, and integrate technology to foster deeper engagement and self-regulation in learning.

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