

The role of self-regulated learning in literal comprehension among adult learners in private universities in Indonesia

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ABSTRACT

There is a lack of empirical research on the role of self-regulated learning (SRL) in literal reading comprehension among adult learners, particularly in non-Western contexts such as Indonesia. Most previous studies have examined SRL in broader educational settings, leaving a limited understanding of how self-regulation supports specific literacy skills, especially literal comprehension. This study, therefore, investigates the effect of SRL on the literal reading performance of adult learners in a private university in Indonesia and examines how different levels of SRL influence learning outcomes after instruction. This study employed a quasi-experimental design involving 48 adult learners. Participants were categorized into high-SRL and low-SRL groups using the self-regulation questionnaire (SRQ). Data were collected through pre-test and post-test assessments of literal reading comprehension. Descriptive statistics were used to examine changes in literacy scores, while inferential analyses, including paired t-tests, independent t-tests, and correlation analysis, were conducted to determine the significance of differences between the two groups and the relationship between variables. The findings revealed that the mean score increased from 68.50 in the pre-test to 76.83 in the post-test, indicating an improvement of 8.33 points after instruction. A moderate positive correlation ($r = 0.655$) was also identified between pre-test and post-test scores while controlling for SRL, suggesting that learners with higher SRL tended to achieve better reading performance. However, the relative influence of SRL on post-instruction performance appeared slightly reduced, indicating that instructional support may help lower-SRL learners narrow the performance gap.

Keywords: adult learners; literal comprehension; self-regulated learning

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INTRODUCTION

Habits play a crucial role in shaping human behavior, including reading practices, as repeated exposure and engagement with texts can gradually form automatic and sustained patterns of reading activity. In educational settings, reading habits are strongly linked to literacy development because they encourage continuous interaction with texts, which in turn supports the growth of comprehension skills and knowledge acquisition. Moreover, well-established reading habits contribute to the development of

independent learning behaviors, as students become more capable of managing their own learning processes without constant external guidance. However, despite the recognized importance of reading habits, many students still exhibit inconsistent and irregular reading practices, which hinder their ability to develop deeper levels of comprehension. This inconsistency often results in limited engagement with texts, reducing opportunities to practice critical and analytical reading skills. As a consequence, students may struggle to move beyond surface-level understanding and fail to construct meaningful interpretations of the material they read. This issue becomes increasingly problematic in academic contexts where reading is not simply an autonomous activity, but rather a complex process that requires active cognitive engagement, strategic thinking, and sustained motivation (Miranda et al., 2023; Rusmiati & Agustin, 2024; Sholeh, 2019; Sulaiman et al., 2020).

Reading comprehension is widely recognized as a complex process that involves interaction between readers and texts. Through this interaction, readers construct meaning by connecting textual information with their prior knowledge and cognitive strategies. However, many learners still experience difficulties in understanding texts at a deeper level, particularly when they lack structured learning strategies to guide their reading process. Without effective strategies, students may focus only on surface-level decoding rather than developing meaningful comprehension. Previous studies highlight that developing reading habits can significantly enhance reading performance and comprehension outcomes (Burns et al., 1996; Galang et al., 2023; Sholeh, 2018). Nevertheless, the challenge remains that many adult learners still rely on passive reading practices and limited metacognitive awareness when engaging with academic texts. This problem becomes more critical in higher education settings, where students are expected to process complex information independently. Therefore, understanding the factors that support effective reading comprehension is essential for improving students' literacy performance.

Adult students are expected to be independent learners, taking charge of their own educational journey. Independent learners are students who assume responsibility for their learning process, which includes grasping the material, maintaining motivation, and working with teachers to create a supportive learning environment. This highlights the essential role of teachers in guiding independent learning by providing the necessary support and structure to ensure students are not isolated in their efforts. Independent learners are skilled in setting both short-term and long-term goals, planning their actions to reach these goals, staying motivated, and focusing on their progress. They use a variety of learning strategies, adjust them as needed, monitor their progress, seek help from peers or teachers, and evaluate their success against their goals.

However, Morris (2019), in his study on self-directed learning in adult education, did not specifically examine how these independent learning traits develop in learners when applied to particular academic subjects or language skills. Similarly, Nurjanah et al. (2021), in their research on self-regulated learning (SRL) strategies in literal reading courses, primarily discussed the importance of SRL strategies but did not explore in depth how these independent learning characteristics are developed among learners across different learning contexts. Consequently, earlier research has not sufficiently examined how these independent learning characteristics specifically influence reading comprehension in particular learning contexts. As a result, there remains a limited understanding of how self-regulatory abilities shape literacy development among adult learners, especially in language learning environments.

SRL offers a conceptual framework that may address these challenges by enabling learners to actively manage their learning processes. SRL emphasizes goal setting, monitoring progress, and evaluating learning outcomes, allowing students to take greater responsibility for their academic development. According to Zimmerman's SRL model (Schunk & Zimmerman, 1997; Zimmerman, 2008), learners engage in three cyclical phases: forethought and planning, performance monitoring, and performance reflection. These phases help learners organize their strategies, maintain motivation, and evaluate their learning effectiveness. When applied to reading activities, SRL can help students regulate their comprehension processes and improve their ability to extract meaning from texts (Lau, 2020; Qi, 2021; Rusmiati & Agustin, 2024). However, the implementation of SRL in reading

instruction is not always consistent, and students may vary significantly in their ability to apply self-regulation strategies. This variation raises important questions about how different levels of SRL influence reading comprehension outcomes.

The research gap addressed in this study can be explained in three aspects. First, there is limited empirical research on the role of SRL in literal adult learners' literal understanding of written texts, particularly in non-Western contexts such as Indonesia. Although university students are generally expected to operate at interpretive or critical reading levels, many still struggle to accurately identify explicit information, main ideas, and factual details in academic texts. These difficulties indicate that weaknesses at the literal comprehension level may still persist and can influence higher-level reading processes. However, most previous studies have examined SRL in general learning contexts rather than focusing on how it supports foundational reading skills in adult learners. Second, while the benefits of SRL are widely recognized, its sustained influence on reading comprehension after instruction remains insufficiently explored. Lastly, this study examines the influence of SRL across different levels by comparing high-SRL and low-SRL groups, providing insights into how varying self-regulation abilities affect reading performance and support the development of foundational comprehension skills.

The decision to identify and compare high and low SRL groups in this research is driven by several key factors. First, adult learners often exhibit significant variation in their self-regulation abilities and learning strategies. By categorizing participants into high and low SRL groups, the study is able to distinguish between those who are more effective at managing their learning processes and those who may face challenges in doing so. This differentiation provides a more nuanced understanding of how SRL influences reading comprehension outcomes. Second, focusing on high and low SRL groups allows for targeted interventions. By comparing learners with different levels of self-regulation, the research aims to uncover which strategies are most effective for each group, helping educators design more tailored approaches to improve literacy skills. Third, the study seeks to explore the correlation between SRL and literal comprehension. Given that SRL encompasses a range of processes, for example, goal setting, self-monitoring, and self-assessment, examining high versus low SRL groups offers a clearer picture of how these processes specifically contribute to reading comprehension, particularly at the literal level, which forms the foundation for more complex forms of understanding.

Based on this background, the present study aims to examine the significant effect of self-regulated learning on adult learners' literal reading comprehension in Indonesia. By analyzing the habits, challenges, and strategies the students employed during the learning process, this research seeks to unlock the potential for reading success through effective self-regulation techniques. Here are two questions to answer in this study:

1. How does SRL influence the literal comprehension skills of adult learners in Indonesia, particularly when comparing learners with high and low levels of SRL proficiency?
2. How do learning habits, challenges, and strategies differ between high-SRL and low-SRL adult learners, and how do these differences contribute to their reading comprehension outcomes?

LITERATURE REVIEW

Self-regulated learning

Enhancing students' reading comprehension through self-regulated learning (SRL) largely depends on learners' ability to regulate their cognitive, motivational, and behavioral processes during learning activities. SRL refers to learners' active participation in managing their learning by setting goals, monitoring progress, and evaluating outcomes. According to Zimmerman's model of self-regulated learning, effective learners regulate their learning through systematic planning, strategy use, and reflection on their performance (Schunk & Zimmerman, 1997; Zimmerman, 2008). Although the model mainly emphasizes cognitive processes, successful self-regulated learners are also able to manage emotional and motivational factors while completing learning tasks. Students with well-developed self-regulation skills are more likely to exhibit persistence, strategic learning behavior, and

higher academic achievement, whereas those who struggle with self-regulation often experience difficulties in sustaining progress. Previous studies have indicated that SRL plays a significant role in improving academic outcomes across various disciplines, including reading comprehension (Lau, 2020; Qi, 2021). Therefore, SRL has been widely recognized as an important framework for fostering independent learning. The SRL model describes learning as a cyclical process consisting of three major phases: forethought and planning, performance monitoring, and performance reflection, which collectively support learners in regulating their learning processes effectively.

In the forethought and planning phase, students evaluate their learning tasks and set specific goals to achieve them. When encountering new subjects, they need to determine the most effective approach and prioritize their objectives. Goal setting is a powerful method for managing student behavior. For example, students might aim to achieve high exam scores and develop a thorough understanding of the subject. Short-term goals, such as mastering a topic within a designated period, act as intermediate steps towards long-term goals, like receiving an “A” on an exam. Furthermore, during the performance monitoring phase, students apply specific strategies to address learning tasks and assess the effectiveness of these strategies and their motivation in relation to their goals. However, they may revert to familiar strategies when facing difficulties with new ones. Teachers should provide targeted feedback to promote the use of new strategies rather than relying on fallback options. Finally, in the reflection on performance phase, students assess how well their strategies worked and evaluate their performance. They need to manage their emotions regarding their progress and use this reflection to set future goals, thereby continuing the self-regulated learning cycle (Schunk & Zimmerman, 1997; Zimmerman, 2008).

Literal reading

Reading proficiency encompasses several components, including word reading and language comprehension. Word reading focuses on recognizing and manipulating individual words in isolation, while language comprehension involves grasping word meanings, interpreting sentences, drawing inferences, and analyzing text structures. Reading skills are segmented into various levels, each demanding mastery of particular elements, which in turn affects the selection of learning materials (Galang et al., 2023; Galiza, 2022). Literal reading, the foundational level, focuses on recalling or retelling facts from a text, including understanding word meanings, identifying the main idea, paraphrasing, and sequencing events. Interpretive reading, the next level, involves deriving significance from a text, making comparisons, drawing conclusions, and reasoning based on tone, purpose, and attitude. The third level, critical reading, emphasizes evaluating and judging information based on evidence, perspectives, and standards. The highest level, creative reading, involves engaging deeply with a text, rethinking ideas, and responding in diverse ways (Galang et al., 2023; Sholeh et al., 2020; Ya’acob et al., 2020).

This literal comprehension involves retrieving clear and explicit information from a text. This process includes analyzing the text word by word, identifying individual words, and understanding their meanings when combined into phrases and sentences. Literal reading comprehension should encompass context, facts, and sequence within a text. Context refers to the overall picture formed by the correlation of facts; facts are the specific details provided in the text, and sequence denotes the chronological order of events. This level of comprehension demands that students accurately identify word meanings and vocabulary, extract information, and paraphrase the text. Mastery of these skills is expected upon completing a literal reading course (Nurjanah, 2023; Nurjanah et al., 2021; Rusmiati & Agustin, 2024).

Table 1*Literal Reading Mind Map (Burns et al., 1996)*

LITERAL READING COMPREHENSION				
	Right there questions	Think and Search	On My Own	Author and You
Purpose:	Find explicit answers directly from the text.	Locate and connect different pieces of information within the text.	Draw from background knowledge or personal experiences.	Reflect on the text and express it in own words.
Question Phrases/ types of questions	• "According to the passage..." • "How many...?" • "Who is...?"	• Identify the main idea. • Understand causes of specific events. • Compare and contrast different elements.	• "In your opinion..." • "Based on your experience..." • "Think about someone or something you know..."	• "The author implies..." • "The passage suggests..." • "The speaker's attitude..."

Table 1 illustrates the literal reading mind map proposed by Burns et al. (1996), which categorizes question types used to assess students' literal reading comprehension. The table identifies four categories: right there, think and search, on my own, and author and you. Each category represents different ways students interact with text, ranging from locating explicit information to connecting ideas and reflecting on personal understanding. These categories are supported by typical question prompts that guide students in identifying facts, determining main ideas, comparing information, and expressing interpretations.

Thus, the table functions as a conceptual framework that links literal comprehension skills with the types of questions used to evaluate students' understanding of a text. The literal reading map also outlines key components for assessing literal comprehension, including identifying vocabulary meaning, recognizing explicit facts, understanding context, and determining the sequence of events. These components represent fundamental skills that enable students to retrieve directly stated information from a text and process explicit content systematically. In addition, literal comprehension involves strategies such as "right there," "think and search," "on my own," and "author and you," which guide students in locating information, connecting ideas, using prior knowledge, and reflecting on texts. Altogether, these strategies support students' engagement with texts at a basic level and help build a strong foundation for deeper comprehension (Burns et al., 1996; Nurjanah, 2023; Ramli et al., 2018; Rusmiati & Agustin, 2024).

METHOD

This study applies a framework for examining relationships between variables within a specific educational context. This study was carried out involving adult learners at a private university, where variations in SRL may influence reading literacy outcomes. Considering practical classroom conditions and the inability to assign participants, a quasi-experimental approach was considered appropriate randomly. Therefore, the study compares high- and low-SRL groups through pre-test and post-test measurements to identify differences in reading literacy improvement after an instructional intervention.

The independent variable in this study is the level of SRL among students, categorized into high and low. The dependent variable is the students' reading literacy, measured by pre-test and post-test scores. Participants were selected based on their willingness to participate in the study. A total of 48 students were involved. They were then grouped into two categories based on their SRL levels, which were determined using a validated SRL measurement tool, namely the self-regulation questionnaire (SRQ). As illustrated in Figure 1, the histogram shows a diverse distribution of SRL scores ranging from approximately 10 to 72, with notable peaks around scores of 12, 32, and 56. To classify participants objectively, a median split of the SRL scores was applied as the cut-off criterion. Students whose scores were below the median were categorized as low SRL, while those scoring above the

median were categorized as high SRL, ensuring a balanced distribution of participants between the two groups.

The research procedure begins with administering a pre-test to all participants to assess their baseline reading literacy skills. After the pre-test, an instructional intervention integrating SRL strategies into reading activities was implemented during the reading class sessions. The intervention focused on guiding students through SRL phases, including goal setting before reading, monitoring comprehension during reading, and reflecting on learning outcomes after completing the tasks. Students were encouraged to apply strategies such as identifying key information, summarizing passages, and evaluating their understanding of the text. The intervention was conducted over several instructional sessions using the same reading materials, learning tasks, and SRL-guided activities for all participants. In this study, the term *uniformly applied* means that both high-SRL and low-SRL groups received identical instructional procedures, materials, duration, and classroom guidance from the instructor. This approach ensured that any differences in reading improvement could be more clearly attributed to variations in students' SRL levels rather than differences in instructional treatment.

After the intervention, a post-test is conducted using the same reading literacy test to measure any changes in students' reading literacy levels. For data analysis, descriptive statistics are calculated to determine the average pre-test and post-test scores for each SRL group. Inferential statistics, such as t-tests or analysis of variance (ANOVA), are then used to assess whether there are significant differences in the reading literacy improvements between the high SRL and low SRL groups.

Hypothesis

Primary Hypothesis (H_1): There is a significant difference in the improvement of literal reading skills between students with high SRL and those with low SRL after an intervention aimed at enhancing reading literacy.

Null Hypothesis (H_0): There is no significant difference in the improvement of literal reading skills between students with high SRL and those with low SRL after the intervention.

Data analysis procedure

The data analysis procedure for this study includes several key steps. First, descriptive statistics will be calculated, including the mean, standard deviation, and standard error of the mean for both the pre-test and post-test scores. This provides an overview of the central tendency and variability of the data. Next, normality testing will be performed using either the Shapiro-Wilk or Kolmogorov-Smirnov test to assess whether the pre-test and post-test scores follow a normal distribution, which is important for selecting the appropriate statistical tests.

For within-group comparisons, a paired t-test will be employed to examine differences between pre-test and post-test scores within both the high SRL and low SRL groups. This analysis is intended to determine whether significant improvements in reading literacy occurred following the intervention in each group. To assess differences between groups, an independent t-test will be conducted to compare the post-test scores of the high SRL and low SRL groups. This analysis aims to identify whether SRL levels influence improvements in reading literacy. Finally, a Pearson correlation analysis will be performed to investigate the relationship between pre-test and post-test scores while controlling for SRL. This analysis will provide deeper insights into how SRL levels may affect changes in reading literacy performance, thereby offering a clearer understanding of the role of self-regulation in literacy development.

Instruments

This study utilized two instruments: the SRQ and a literal reading comprehension test. The SRQ measured students' levels of SRL and was used to classify participants into high-SRL and low-SRL groups. It included Likert-scale items assessing goal setting, self-monitoring, strategy use, and self-reflection. The reading test evaluated students' ability to identify explicit information such as main

ideas, factual details, vocabulary meaning, and sequence of events. It was administered as both a pre-test and a post-test. Content validity was ensured through expert review, while reliability was examined using internal consistency analysis, indicating that the instruments were sufficiently reliable.

FINDINGS

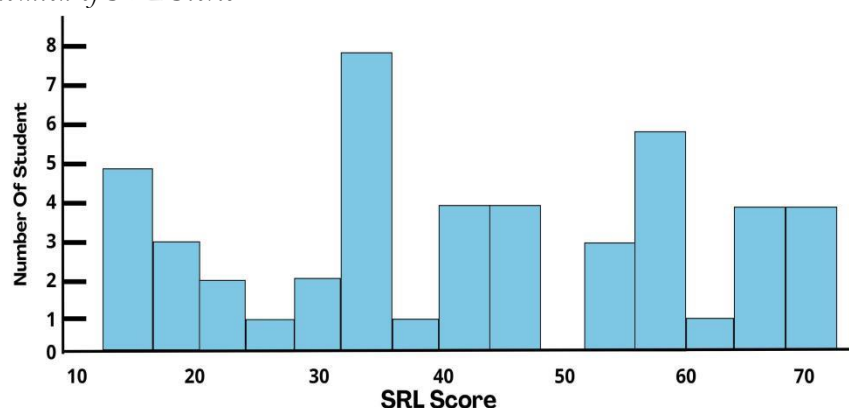
The presentation of data in this part is to answer two main problems of this study: a) What is the critical effect of SRL on the literal comprehension skills of adult learners in Indonesia? and b) How do the habits, challenges, and strategies employed by adult learners during the learning process influence their reading success through SRL?

Students SRL

The SRQ was administered to 48 students to categorize them into high and low SRL groups. Participation was voluntary, and the students were grouped according to their SRL levels, as determined by a validated SRL measurement tool, the following is the distribution of the questionnaire:

Figure 1

Distribution of SRL Scores



The histogram provides a clear visualization of the distribution of SRL scores among students. On the x-axis, the SRL scores range from approximately 10 to 72, while the y-axis indicates the number of students within each score range. The distribution reveals a concentration of students in the lower SRL range, between scores of 10 and 20, suggesting a significant number of students with lower self-regulation abilities. A notable peak occurs around the score of 32, where several students are clustered, indicating a moderate level of self-regulation. Another prominent peak appears around the score of 56, representing a larger group of students with higher SRL abilities. The distribution extends up to 72, showing a smaller number of students with very high SRL scores. Additionally, the histogram highlights gaps in certain score ranges where no students fall, as well as clusters where multiple students have similar scores. The peaks at scores 12, 32, and 56 are particularly striking, reflecting key patterns in students' self-regulation capabilities.

The score of SRL, pretest and posttest of literal reading

Table 2

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest of Literal Reading	68.50	48	15.687	2.264
	Posttest of Literal Reading	76.83	48	15.044	2.171

From Table 2, we can analyze the comparison between pretest and posttest scores of literal reading ability, where the pretest mean is 68.50, and the posttest mean is 76.83. This shows an

improvement in the mean score from pretest to posttest, indicating an overall increase in literal reading skills after intervention. The pretest standard deviation is 15.687, while the posttest standard deviation is slightly lower at 15.044. This suggests that the posttest scores are slightly more consistent compared to the pretest scores. Meanwhile, the standard error mean for the pretest is 2.264, and for the posttest, it is 2.171. The smaller values indicate relatively low variability in sample means. Overall, the higher posttest mean, and slightly reduced standard deviation suggest that the intervention was effective in improving literal reading skills for the sample group, with less variability in their performance after the intervention.

Table 3

Descriptive Statistics

	Mean	Std. Deviation	N
Pretest of Literal Reading	68.50	15.687	48
Posttest of Literal Reading	76.83	15.044	48
SRL	1.50	.505	48

Table 3 shows that pretest of literal reading mean is 68.50. This indicates that the average score of students on the pretest of literal reading is 68.50. This is a baseline measure of their reading comprehension before any intervention or instruction. Relatively high standard deviation (15.687) suggests there is considerable variability in the students' pretest scores. This means the students had differing levels of literal reading comprehension prior to the intervention, with some scoring much higher or lower than the mean.

The sample consists of 48 students. This size is relatively small but reasonable for analysis, providing a moderate degree of reliability for the descriptive statistics. The average posttest score of 76.83 indicates that, on average, the students' literal reading skills improved after the intervention. The difference between the pretest and posttest means ($76.83 - 68.50 = 8.33$) suggests a positive effect of the instruction or intervention aimed at improving literal reading. The standard deviation is slightly lower than the pretest (15.044 compared to 15.687), indicating a slightly reduced variability in the posttest scores. This implies that the students' performance became more uniform after the intervention, though there is still notable variability.

In case of SRL, the mean score of 1.50 suggests that SRL is likely categorized into two levels, low and high. Given the proximity of the mean to 1.50 and a standard deviation of 0.505, it seems that students were almost evenly split between low and high SRL levels. The standard deviation of 0.505 is relatively low, indicating that most of the students are close to the two SRL categories (likely coded as "1" for low and "2" for high). This suggests that the sample is almost evenly distributed between the two SRL categories.

The increase in mean scores from 68.50 (pretest) to 76.83 (posttest) suggests that the intervention or instruction had a positive impact on students' literal reading skills. Both the pretest and posttest have high standard deviations (around 15), indicating considerable variability in students' reading comprehension levels. However, the posttest standard deviation is slightly lower, suggesting that the intervention helped reduce variability in students' performance to some extent. With an average SRL score of 1.50 and a standard deviation of 0.505, it is inferred that students are almost evenly split between low and high SRL levels. This balance will likely provide insights into how students with different SRL levels performed in both the pretest and posttest.

The data presented in Table 5 demonstrate a significant improvement in students' literal reading abilities after the intervention, evidenced by the rise in mean scores from pretest to posttest. The high standard deviations indicate significant variability in performance, although there is a slight reduction in variability after the intervention. Finally, the SRL data suggests an even split between high and low SRL students, providing an interesting foundation for further analysis on how SRL affects reading comprehension.

Table 4
Correlation Analysis

Variables	Pretest Literal Reading	Posttest Literal Reading	SRL
Pretest Literal Reading	1	.655	.421
Posttest Literal Reading	.655	1	.384
SRL	.421	.384	1

Table 5
Correlation between variables

Control Variables		Pretest of Literal Reading	Posttest of Literal Reading
SRL	Pretest of Literal Reading	Correlation	1.000
		Significance (2-tailed)	.655
		Df	.000
	Posttest of Literal Reading	Correlation	0
		Significance (2-tailed)	45
		Df	.655

Table 4 displays the result of pretest of literal reading and posttest of literal reading (Controlled by SRL) that correlation coefficient is 0.655, significance (p-value) is 0.000, and the degrees of freedom (df) is 45. The table provides us with valuable insights into the relationships between these variables. The correlation coefficient is 0.655 which shows a strong positive correlation between the pretest and posttest scores of literal reading. A correlation of 0.655 means that students who performed well on the pretest also tended to perform well on the posttest. Similarly, students who achieved low score on the pretest were likely to perform poorly on the posttest.

The strong positive correlation suggests that while some improvement occurred between the pretest and posttest, the relative ranking of students remained consistent, meaning those who started strong remained strong, and those who started weak remained weaker after the intervention. The p-value of 0.000 indicates that this correlation is statistically significant. In other words, the relationship between pretest and posttest scores is not due to chance. This significance implies that there is a real and reliable relationship between the two test performances, strengthened by students' SRL levels.

Table 5 also shows the relationships among SRL, pretest scores, and posttest scores of literal reading comprehension. The results indicate a moderate positive correlation between pretest and posttest scores ($r = 0.655$, $p < .01$), suggesting that students who performed well in the pretest also tended to perform well in the posttest. Additionally, SRL shows positive correlations with both pretest and posttest scores, indicating that higher levels of self-regulated learning are associated with better reading performance. However, the correlation between SRL and posttest scores appears slightly lower than the relationship observed in the pretest, suggesting that the strength of the relationship becomes relatively weaker after instructional intervention. This finding supports the claim in the abstract that the influence of SRL slightly decreases after instruction, possibly because instructional support helps lower-SRL learners improve their reading performance.

The fact that the correlation between pretest and posttest is observed while controlling for SRL shows that SRL (low or high) has an impact on the relationship between the two tests. SRL influences both pretest and posttest performance, but it doesn't completely override the individual differences in students' reading abilities. That is, students with higher SRL likely performed better in both tests, while lower SRL students performed more poorly, leading to the strong correlation between pretest and posttest scores. The correlation shows that SRL plays a significant role in influencing how well students perform on both the pretest and posttest of literal reading. Since SRL is controlled in the correlation analysis, we can infer that students with higher SRL likely had better performance in both the pretest and posttest. However, it also shows that individual student ability (represented by consistent pretest-posttest scores) remains a key factor. The high correlation between pretest and

posttest also suggests consistency in performance. This means that despite interventions or changes in instruction, the students' reading abilities before and after the intervention were still closely related. Students who had high scores before the intervention maintained relatively high scores afterward, likely due to higher SRL levels, while those with lower SRL and lower initial scores showed less improvement.

The strong positive correlation (0.655) between the pretest and posttest of literal reading demonstrates that SRL (whether low or high) plays a significant role in both initial reading performance and post-intervention improvement. High SRL students likely performed better on both tests, showing more improvement in their reading abilities, while low SRL students struggled more, maintaining lower scores on both tests. The significant correlation highlights the importance of SRL in improving students' reading comprehension, and future interventions might aim to specifically boost SRL to further enhance reading outcomes. This analysis indicates that SRL is a key factor in students' reading comprehension, but individual reading ability is also crucial, as evidenced by the strong pretest-posttest relationship.

The effect of SRL on the literal comprehension skills of adult learners in Indonesia

The study demonstrated a critical and positive effect of SRL on the literal comprehension skills of adult learners in Indonesia. Key findings from the analysis support this conclusion. First, the pretest and posttest results revealed an improvement in students' literal reading comprehension. The mean score for the pretest was 68.50, while the posttest mean score increased to 76.83, indicating an 8.33-point improvement following the SRL intervention. This suggests that SRL strategies contributed to enhancing the students' reading abilities. Additionally, the variability in posttest scores was slightly lower than in the pretest, with the standard deviation reducing from 15.687 to 15.044. This decrease in variability indicates that students' performance became more consistent after the intervention, suggesting that SRL not only improved comprehension but also helped standardize the level of improvement among participants.

Further, the correlation analysis between the pretest and posttest scores revealed a moderate to strong positive relationship ($r = 0.655$), with a statistically significant p-value of 0.000. This strong correlation indicates that the improvement in reading comprehension was attributable to SRL, rather than being a result of chance. It also suggests that students who performed well initially tended to maintain or further improve their scores, while those with lower initial scores showed less improvement, highlighting how SRL benefits students with stronger foundational skills more than those who are struggling. Finally, when controlling for SRL, the correlation between pretest and posttest scores remained significant, reinforcing the idea that SRL influences both the initial comprehension levels and the improvements made after the intervention. Specifically, students with higher SRL abilities showed greater gains in their literal comprehension skills, demonstrating that SRL helps students not only maintain high performance but also enhance their reading ability over time.

Students' habits, challenges, and strategies through SRL in reading class

The habits, challenges, and strategies employed by adult learners during the learning process significantly impacted their reading success through SRL. The study highlights that successful learners with high levels of SRL tend to develop key habits that support their academic success, particularly in reading comprehension. One important habit is consistent goal setting, which plays a central role in SRL. These learners are likely to set clear, specific goals for their reading tasks, such as mastering a chapter or identifying key details in a passage. They regularly monitor their progress toward these goals, staying focused and motivated throughout the learning process. This structured approach helps them improve both comprehension and retention of information. Additionally, high SRL learners are adept at self-monitoring and adjusting their strategies when challenges arise. If they encounter difficulties in understanding the material, they typically employ various strategies, such as re-reading, summarizing, or asking questions, to address these challenges. This ability to evaluate and adjust their

learning strategies allows them to stay on track with their comprehension goals and ultimately enhances their literal comprehension skills.

In contrast, learners with low SRL face significant challenges in regulating their learning effectively. These students may struggle with basic tasks such as setting appropriate goals, tracking their progress, or reflecting on their learning experiences. As a result, their performance on reading comprehension tasks tends to be more inconsistent. They may find it difficult to identify gaps in their understanding, leading to lower engagement with the material and less improvement in their reading abilities. Furthermore, emotional and motivational challenges often complicate their learning process. For example, students with low SRL may experience frustration or a lack of motivation, especially when they do not see immediate progress in their reading skills. These emotional barriers can undermine their persistence and hinder productive self-reflection, making it harder for them to maintain the motivation needed to improve their comprehension.

The strategies employed by high and low SRL learners further illustrate the differences in their approach to learning. Learners with high SRL levels are more likely to employ active reading strategies, such as highlighting key points, taking notes, or posing questions about the text to engage with the material more deeply. They also make time for reflection, considering whether they have met their reading goals and adjusting their approach if necessary. Seeking feedback from peers or instructors is another common strategy among high SRL learners, as it helps them refine their understanding and improve their reading strategies. Effective time management is another hallmark of high SRL, allowing these learners to balance reading with other commitments and engage with the material more consistently. In contrast, low SRL learners tend to rely on fewer or less effective strategies. They may read passively without engaging deeply with the content or give up easily when faced with difficulties, without attempting to adjust their reading strategies or seek help. This lack of strategic engagement limits their ability to improve their literal comprehension skills.

The paired t-test showed a significant improvement in reading literacy scores from pre-test to post-test in both high-SRL and low-SRL groups, indicating that the intervention had a positive effect on students' reading literacy overall. The mean score increased from 68.50 in the pre-test to 76.83 in the post-test, showing an improvement of 8.33 points. The correlation analysis revealed a strong positive correlation between pre-test and post-test scores ($r = 0.655$, $p = 0.000$), suggesting that students' initial reading abilities were related to their final performance, moderated by their SRL levels. Furthermore, the comparison between the high-SRL and low-SRL groups indicated that students with higher SRL demonstrated greater improvement in their reading scores compared to those with lower SRL. This difference in performance between the groups suggests that SRL levels significantly influenced the effectiveness of the intervention. Thus, the null hypothesis (H_0) is rejected and the alternative hypothesis (H_1) is supported, indicating that SRL levels significantly influenced the improvement of reading literacy, with students who had higher SRL showing greater progress in their reading skills after the intervention.

The findings demonstrate that SRL significantly contributes to the improvement of adult learners' literal reading comprehension. Students with higher levels of SRL showed greater progress in reading performance compared to those with lower SRL levels after the instructional intervention. The results also reveal that students' initial reading abilities are positively related to their post-intervention performance. These outcomes indicate that SRL not only supports reading development but also influences the effectiveness of instructional interventions. Overall, differences in SRL proficiency among learners play an important role in shaping variations in literacy improvement and learning outcomes in reading comprehension.

DISCUSSION

The results of this study underscore the significant role of SRL in improving literal comprehension among adult learners. The positive correlations between SRL and literacy outcomes, particularly the moderate positive relationships observed between SRL and both pretest and posttest literacy scores, indicate that students who exhibit higher levels of self-regulation are more likely to achieve better

results in literacy assessment. [Herwiana \(2023\)](#) suggests SRL can impact how teaching and learning activities are carried out in the classroom. It is noted that instructors' ability to apply SRL is linked to their pedagogical skills and commitment to student-centered learning. But he suggests that they either lack awareness or have insufficient knowledge of SRL, and their expertise as experienced lecturers does not necessarily correlate with their understanding of SRL.

Implementing SRL can indeed present challenges for educators, especially in terms of lesson planning and the selection of suitable reading materials that align with SRL strategies ([Ramli et al., 2018](#)). Lecturers need to design materials that not only focus on the content but also on encouraging students' self-regulated behaviors. However, [Sutiono \(2022\)](#) argues that despite these challenges, the benefits outweigh the difficulties, as students are more likely to achieve reading proficiency through SRL. By empowering students to take ownership of their reading, educators can promote long-term skills that extend beyond the classroom, ultimately contributing to the success of the learning process. SRL is considered beneficial as it provides various advantages across its different phases. Although lecturers may face challenges in preparing learning materials and planning lessons, implementing SRL in the literal reading classroom is worthwhile ([Lau, 2020](#); [Qi, 2021](#); [Ramli et al., 2018](#); [Sutiono et al., 2022](#)).

The correlation between SRL and literacy scores underscores the significance of fostering self-regulation skills in adult learners. SRL involves metacognitive, motivational, and behavioral processes that enable learners to plan, monitor, and evaluate their learning ([Qi, 2021](#)). The moderate correlation (approximately 0.655) between SRL and pretest literacy suggests that students who enter a learning environment with strong self-regulatory skills are better equipped to perform well, even before formal instruction begins. This implies that interventions aimed at improving SRL could lead to better initial comprehension levels. The correlation between SRL and literacy scores underscores the significance of fostering self-regulation skills in adult learners. SRL has been shown to have a positive impact on literacy development, as it equips learners with essential skills such as goal setting, strategic planning, self-monitoring, and self-evaluation. [Lau \(2020\)](#) argues that SRL fosters learners' ability to engage deeply with texts and actively manage their reading comprehension processes. By utilizing metacognitive strategies, adult learners are able to monitor their understanding and adapt their approach to literacy tasks accordingly. The moderate correlation (approximately 0.655) between SRL and pretest literacy further supports this, indicating that learners with well-developed self-regulatory skills tend to perform better in literacy assessments even before formal instruction begins.

SRL refers to the metacognitive, motivational, and behavioral processes through which learners actively manage their learning by planning, monitoring, and evaluating their progress. According to [Qi \(2021\)](#), SRL not only improves learners' cognitive processes, such as planning and monitoring, but also enhances their motivational and behavioral engagement. When learners are motivated to take control of their learning journey, they are more likely to persist through challenges, which in turn positively influences literacy outcomes. [Ramli \(2018\)](#) echoes this sentiment, noting that learners who actively engage in self-regulated behaviors exhibit stronger literacy performance as they are better able to navigate complex texts, identify knowledge gaps, and seek resources that support their learning.

The correlation between SRL and pretest literacy suggests that students who enter a learning environment with strong self-regulatory skills are better equipped to perform well, even before formal instruction begins. This correlation highlights the importance of SRL in equipping learners with the tools to manage their learning independently. As [Sutiono et al. \(2022\)](#) point out, SRL empowers learners to take charge of their learning process, particularly in reading, where comprehension and retention require ongoing self-monitoring. Therefore, learners who enter a classroom with pre-existing SRL skills are more likely to engage productively with new material and display stronger initial comprehension, even in the absence of formal instruction.

This implies that interventions aimed at improving SRL could lead to better initial comprehension levels. [Qi \(2021\)](#) suggests that targeted interventions designed to foster SRL in adult learners can produce meaningful improvements in literacy outcomes. In his research conducted in Shanghai, [Qi \(2021\)](#) found that students were generally well trained in strategies for understanding,

retaining, and summarizing information, yet they rarely applied control strategies during the learning process. From a cognitive strategy perspective, students frequently employed elaboration strategies to deepen their understanding, while memorization strategies were used less frequently. In addition, the learners demonstrated a strong interest and enjoyment in reading activities.

Empirically, Qi's (2021) findings indicate that several SRL components, including metacognitive processes for understanding and recalling information, metacognitive strategies for summarizing, control strategies, elaboration strategies, and a positive attitude toward reading, contributed positively to students' reading literacy development. Conversely, reliance on memorization strategies was found to have a negative effect on reading performance. These findings theoretically reinforce the role of SRL as a multidimensional construct that supports literacy development through active cognitive and metacognitive engagement. By developing SRL strategies such as reflective thinking, strategic monitoring, and goal-oriented planning, learners can enhance their ability to understand and retain information from the beginning of instruction. Therefore, instructors are encouraged to integrate SRL-supporting practices into their curriculum to help adult learners achieve stronger literacy proficiency from the early stages of learning.

The similar positive effects revealed by Lau (2020) suggest that SRL instructional content effectively enhances reading outcomes, irrespective of the type of instructional approach implemented. SRL not only equips students with essential self-regulation skills but also improves their overall reading performance, irrespective of whether it is applied in a traditional or modern instructional setting. This is because SRL fosters active engagement in the learning process, allowing students to plan, monitor, and evaluate their own reading progress. By doing so, learners can develop deeper comprehension skills, adapt their strategies to the complexity of the text, and gain more from their reading experience. SRL's flexibility allows it to be integrated effectively with various instructional methods, leading to similar positive outcomes across different learning environments.

Students generally preferred SRL instruction over traditional instruction. Both Lau (2020) and Qi (2021) found that learners showed a preference for SRL-based instruction because it encouraged more autonomy and ownership of their learning. Unlike traditional approaches that are often teacher-centered, SRL allows students to take a more active role in managing their reading tasks, which leads to increased motivation and engagement. This preference for SRL instruction can be attributed to its focus on personal growth and self-directed learning, which are particularly appealing to students seeking to become more independent readers.

However, some researchers emphasized that teacher-led explanations should not be disregarded, despite the positive reception to SRL instruction. Both Lau (2020) and Qi (2021) acknowledge that some students feel that teacher-directed explanations remain crucial, particularly when dealing with complex reading materials or new concepts. Rusmiati and Agustin (2024) also emphasize that while SRL enhances learners' independence, teachers still play a vital role in scaffolding students' understanding through direct instruction, particularly at the initial stages of learning. Similarly, Sutiono et al. (2022) argue that a balanced approach, where SRL is integrated with teacher guidance, offers the best of both worlds by promoting student autonomy while ensuring that essential foundational knowledge is effectively delivered (Lau, 2020; Qi, 2021; Rusmiati & Agustin, 2024; Sutiono et al., 2022).

Lau (2020) discovered that SRL intervention programs positively influenced students' prior knowledge, motivation, and reading comprehension, demonstrating the practical benefits of SRL instruction in diverse cultural settings. This finding aligns closely with this research, as it emphasizes the potential of SRL to enhance literal comprehension. By applying SRL strategies, adult learners can better activate prior knowledge and sustain motivation, leading to improved comprehension skills, particularly in reading contexts where learners often face unique challenges.

Moreover, the correlation between SRL and posttest literacy (approximately 0.584) supports the idea that SRL continues to play a vital role in the learning process, influencing how well students assimilate and apply new knowledge. SRL remains a key factor in students' ability to internalize and apply new information over the course of their studies. According to Mohammadzadeh and Sarkhosh

(2018), SRL enables learners to take charge of their own learning by engaging in processes such as goal-setting, self-monitoring, and reflecting on their progress, which enhances the depth and retention of their understanding. This ability to self-regulate becomes particularly valuable as students encounter new and more complex material, allowing them to adjust their learning strategies to better meet the demands of the course. [Sulisworo et al. \(2020\)](#) further support this, noting that students who demonstrate higher SRL capabilities are more likely to perform well in literacy tasks, as they can adapt their approaches when faced with challenging content.

The slightly weaker correlation compared to the pretest may indicate that while SRL is crucial, other factors such as instructional quality, content difficulty, and student engagement also contribute to literacy development during the course of study. The difference in correlation strength between pretest and posttest results may reflect the increasing influence of other variables as the course progresses. [Mohammadzadeh and Sarkhosh \(2018\)](#) suggest that while SRL lays a strong foundation for learning, the quality of instruction, particularly in terms of how well teachers support and guide students, can significantly impact literacy development. Additionally, [Sulisworo et al. \(2020\)](#) highlight that content difficulty and the complexity of reading materials introduced during the course may challenge students, requiring not only SRL but also effective instructional strategies and student engagement to maintain literacy progress. As students face more difficult texts, their ability to self-regulate becomes just one part of a broader set of skills and supports needed for success ([Mohammadzadeh & Sarkhosh, 2018; Sulisworo et al., 2020](#)). The significant correlation between pretest and posttest literacy scores highlights the stability of literacy skills over time. Students who start with higher literacy skills are likely to maintain their performance advantage, reflecting the cumulative nature of literacy development. This finding suggests that initial assessments can be predictive of future performance, allowing educators to identify students who may require additional support early on ([Scollon, 2014](#)).

The correlation between SRL and posttest literacy scores reaffirms SRL's critical role in facilitating learning, even after formal instruction has begun. This demonstrates that SRL not only helps students acquire new knowledge but also enhances their capacity to adapt and retain what they have learned throughout their studies. [Mohammadzadeh and Sarkhosh \(2018\)](#) stress that the SRL processes of goal setting, self-monitoring, and reflection are essential for students to develop deep learning strategies, making SRL especially important as students encounter more complex content. This enables learners to take control of their learning trajectory, allowing them to adjust their strategies as needed, which is vital for maintaining progress over time.

The importance of additional factors, however, the slightly lower correlation in posttest results suggests that while SRL remains important, it is not the sole determinant of success in literacy. As the course progresses, factors such as instructional quality, content difficulty, and student engagement also significantly contribute to literacy outcomes. [Sulisworo et al. \(2020\)](#) reinforce this idea, arguing that high SRL alone may not be sufficient to tackle increasingly challenging material without the support of well-structured instruction and active engagement. For instance, as texts become more complex, the way instructors present the material and scaffold learning becomes crucial to maintaining student performance. [Mohammadzadeh and Sarkhosh \(2018\)](#) similarly point out that teacher guidance plays a significant role in supplementing SRL, particularly when students face difficulties that exceed their independent capabilities.

The variation in correlation strength highlights the need to integrate SRL with other instructional supports in literacy education. While SRL enables learners to maintain autonomy, motivation, and persistence as they progress, it is not sufficient on its own to ensure optimal learning outcomes. The role of teachers becomes increasingly important in providing structured guidance, clarifying complex materials, and fostering active student engagement. Previous studies also emphasize that an effective literacy learning environment requires a balance between students' self-regulation and appropriate instructional support.

For instance, [Lau \(2020\)](#) and [Qi \(2021\)](#) found that SRL strategies significantly improve reading comprehension by encouraging learners to plan, monitor, and evaluate their reading processes.

Similarly, [Mohammadzadeh and Sarkhosh \(2018\)](#) reported that SRL promotes deeper learning by enabling students to regulate their cognitive and motivational processes. However, other studies highlight that SRL alone may not fully explain literacy improvement. [Sulisworo et al. \(2020\)](#) argue that instructional quality and teacher guidance remain essential factors in supporting literacy development. In comparison with these studies, the present findings indicate that while SRL contributes to students' reading progress, instructional support may help reduce performance gaps among learners with different levels of self-regulation. Therefore, to ensure sustained progress, educators must design instruction that integrates SRL strategies with structured guidance and engaging learning environments.

The study's normality tests revealed that SRL and posttest literacy scores deviated from a normal distribution, while pretest literacy scores did not. These deviations could have implications for the interpretation of the findings and the choice of statistical methods. For instance, the skewed distribution of SRL scores may indicate that a significant number of students either struggle with or excel in self-regulation, with fewer students in the middle range. Similar patterns have been observed in previous studies of adult learners, where SRL abilities often vary widely due to differences in academic background, motivation, and learning experience ([Morris, 2019](#); [Sulisworo et al., 2020](#)). In contrast, some studies report more balanced distributions of SRL among younger learners or structured classroom settings ([Zimmerman, 2008](#)), suggesting that adult learners may display greater variability in self-regulation skills. This diversity reflects the heterogeneous characteristics of adult learners and indicates that SRL development may occur unevenly across individuals.

The deviation from normality in posttest literacy scores might also indicate that the intervention or instruction impacted students unevenly, with some benefiting more than others. Previous research has reported similar outcomes, where instructional interventions improved reading performance but produced different levels of improvement among students due to variations in prior knowledge, motivation, and strategy use ([Lau, 2020](#); [Qi, 2021](#)). Additionally, [Nurjanah et al. \(2021\)](#) found that SRL-based reading strategies may enhance comprehension for many learners, but the degree of improvement often depends on learners' initial reading ability and engagement with the learning process. Compared with studies that report more uniform improvements after SRL instruction, the present findings suggest that instructional support may particularly assist lower-SRL learners in narrowing the performance gap with higher-SRL peers. Understanding these nuances is crucial for designing instructional interventions that are inclusive and effective for diverse groups of learners, especially in adult education contexts.

These findings carry important implications for adult education, particularly in designing instructional strategies that support SRL. Educators should consider incorporating metacognitive strategies, goal-setting exercises, and self-assessment opportunities into their teaching practices to foster SRL among students. Additionally, the strong relationship between pretest and posttest literacy scores indicates that early assessment data may be utilized to customize instruction according to individual student needs, thereby ensuring that all learners receive adequate support to succeed.

CONCLUSION

This study confirms that SRL plays an important role in supporting the literal reading comprehension of adult learners. In addressing the first research question, the findings show that SRL has a positive effect on students' literal comprehension skills. The improvement in the mean score from pretest to posttest indicates that students' reading performance increased after the instructional intervention. Moreover, the correlation analysis demonstrates that students with higher SRL tend to achieve better reading outcomes, suggesting that self-regulation strategies such as goal setting, self-monitoring, and reflection contribute to improved comprehension performance. Regarding the second research question, the study also reveals that students' habits, challenges, and learning strategies influence their reading success through SRL. Learners with higher SRL demonstrate productive learning habits, including setting clear learning goals, monitoring their progress, and applying strategies such as re-reading, summarizing, and questioning the text. In contrast, students with lower SRL tend to

experience difficulties in maintaining motivation, regulating their learning process, and applying effective reading strategies. These differences highlight the importance of developing students' self-regulation abilities in reading instruction.

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CONFLICT OF INTEREST STATEMENT:

The authors declare that there is no conflict of interest regarding the publication of this research.

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