

## **PROFILING STUDENTS' SELF-REGULATION IN SCIENCE LEARNING AMONG MIDDLE SCHOOL STUDENTS IN URBAN AREAS**

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### **ABSTRACT**

Students often face challenges in studying science due to the need to independently absorb and process large amounts of knowledge. To address this, developing students' ability to control and monitor their learning independently is essential. This study investigates self-regulation in science learning among middle school students in urban areas through a quantitative survey-based approach. A 27-item self-regulation questionnaire with a 5-point Likert-type response format was administered to 139 students in Jakarta and West Java, with 64% from grade 7 and 36% from grade 8. The questionnaire demonstrated high reliability (Cronbach's Alpha = 0.995) and validity. Descriptive statistics revealed that 26.62% of students exhibit Very High self-regulation, 58.99% High, and 14.39% Moderate. These findings indicate that urban middle school students possess well-developed self-regulatory abilities, which can significantly enhance their science learning outcomes. This study contributes to the understanding of self-regulation in science education, providing a foundation for educators and policymakers to design targeted strategies that strengthen self-regulated learning. Future research could explore its impact across different educational settings or evaluate interventions to improve specific aspects of self-regulation in science learning.

**Keywords:** *self-regulation, science learning, middle school, urban education.*

## **INTRODUCTION**

Classroom learning contexts vary in complexity (Moote, 2019). With the rapid development of information, student behavior has also become diverse (National Research Council, 2000). Some students feel curious about the phenomena that occur, some do not. In addition, scientists argue that students have difficulty studying science because they have to independently absorb large amounts of knowledge (Solé-llussà et al., 2021). Therefore, developing students' ability to control and monitor their learning independently is necessary. This way, they will know what they need to learn, why they need to know it, and how they can gain that knowledge (Sha et al., 2012). This ability to control and monitor what they need to learn, the reason why they need to learn it, and the strategy of how they can gain that knowledge is called self-regulation.

Self-regulation and motivation are essential for students' learning, especially in the context of 21st-century education, which requires students to be more active and engaged in the learning process (student-centered) (Tanti et al., 2020). The scope of science in junior high school focuses on observing natural phenomena and their applications in daily life, as well as addressing issues related to productive competence and the expansion of abstract concepts. Learning abstract concepts often presents challenges for students in understanding science lessons. Therefore, students need to develop a positive attitude toward the subject. These attitudes significantly influence their self-regulation and motivation in learning. Additionally, learning independence is a crucial aspect of the learning process. Independent learning is essential for all teenagers, including both students and non-students, as it fosters responsibility, self-organization, and discipline while also enhancing their ability to learn (Patriot & Laksono, 2024).

Students' self-regulation plays a critical role in interdisciplinary tasks (Zheng et al., 2020). Zimmerman, 1989, 2002; Zimmerman & Schunk, 2001 operationalized self-regulated learning (SRL) as a dynamic and cyclical process consisting of three phases: forethought, performance, and self-reflection. In the forethought phase, learners prepare for the task by analyzing its requirements and setting specific goals, which then guide their subsequent actions and behaviors. During the performance phase, learners implement strategies to control and monitor their cognitive processes, influencing the progress or stagnation of the task. Finally, in the self-reflection phase, learners evaluate their learning outcomes and optimize their responses based on internal or external feedback. Self-reflection can either foster momentum or create obstacles for future self-regulated learning efforts.

Central to this concept is the idea of agency, suggesting that individuals possess self-beliefs that enable them to exert control over their thoughts,

emotions, and actions (Bandura & National Ins of Mental Health, 1986). What distinguishes “self-regulated” individuals is not their reliance on learning methods carried out separately from social influences, but rather their personal drive, persistence, and adaptive abilities (Zimmerman, 1989). In summary, self-regulated learners are characterized by their active involvement in shaping and directing their own learning experiences.

Despite increasing recognition of the importance of psychosocial factors in education, there is still a lack of research in Indonesia that specifically examines how factors such as self-regulation influence students' learning processes, especially in the context of science education. These gaps become more apparent when focusing on middle school students in urban areas, where unique challenges and opportunities may shape their learning experiences. To address this gap, the primary aim of this study was to profile the students’ self-regulation among middle school students in urban areas. Therefore, this study aims to contribute valuable insights into the development of targeted interventions and educational strategies that support students' academic growth in these settings.

**METHODS**

This study employs a quantitative research approach using the survey method. The data were analyzed using percentage calculations, following Creswell's framework (2016). The research was conducted in schools located in Jakarta and West Java, targeting middle school students in grades 7 (89 students) and 8 (50 students) from three schools in these regions. A total of 139 students participated in this study, representing the entire research population. The primary data collection instrument was a self-regulation questionnaire specifically designed for science learning. This questionnaire had been previously developed and demonstrated high validity and reliability, with a Cronbach's alpha coefficient of 0.995. The instrument consisted of 27 items. Items with a 5-point Likert scale consisting of five possible responses which are 1 (Strongly disagree), 2 (Disagree), 3 (Neutral), 4 (Agree), and 5 (Strongly agree). The questions were structured based on self-regulated learning indicators. The sample items can be seen in Table 1.

**Table 1.** Self-regulation Indicators

Aspect	Statement	Scale				
		5 (strongly agree)	4 (agree)	3 (neutral)	2 (disagree)	1 (strongly disagree)
Learning Strategy	I repeat the material being studied when studying science.					

Aspect	Statement	Scale				
		5 (strongly agree)	4 (agree)	3 (neutral)	2 (disagree)	1 (strongly disagree)
Time and Effort Management	I try to concentrate when studying science so as not to miss important points in science topics.					
Self-evaluation	I try to solve questions to test my understanding of the science topics I am studying.					

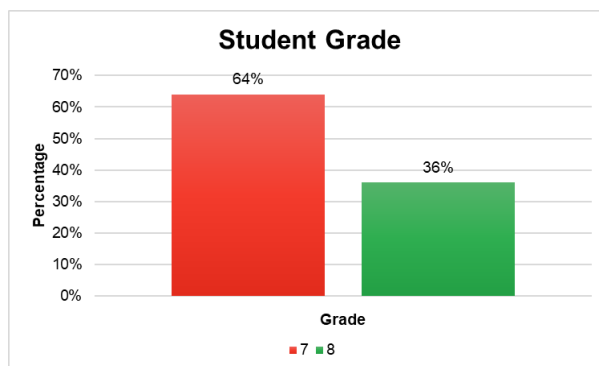
Data collected were analyzed statistically by using Microsoft Excel 2016. Microsoft Excel was used to analyze the percentage that each students get and categorize into very low, low, moderate, high, and very high. The criteria of self-regulated learning based on the percentage (%) can be seen in Table 2.

**Table 2.** The criteria of self-regulation based on the percentage (%)

No.	Interval	Criteria of self-regulation
1	81% - 100%	Very high
2	61% - 80%	High
3	41% - 60%	Moderate
4	21% - 40%	Low
5	0% - 20 %	Very low

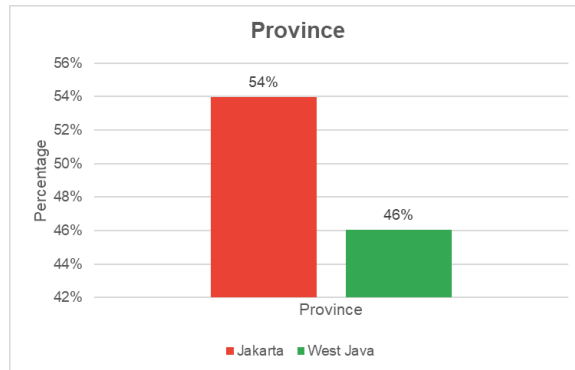
## RESULTS AND DISCUSSION

Based on the questionnaire distributed online via Google Forms, a total of 139 students from grades 7 and 8 participated as respondents. These students were from two different provinces: Jakarta and West Java. Of the total respondents, 89 were from grade 7, while 50 were from grade 8. The percentage distribution of students by grade level is presented in Figure 1.



**Figure 1.** Students' Grade

The respondents were all from urban areas in the two provinces, with 75 students from Jakarta and 64 students from West Java. The percentage distribution of respondents by province is shown in Figure 2.



**Figure 2.** Province

Descriptive analysis was conducted to summarize and describe the data, providing insights into the patterns, trends, and characteristics observed within the sample population. The results of this analysis are presented in Table 3.

**Table 3.** Descriptive Analysis

<i>Mean</i>	<i>Median</i>	<i>Mode</i>	<i>Standard Deviation</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Count</i>
98.24	98	108	14.94	62	132	139

Based on the data presented in Table 3, the mean score of students' self-regulation, which encompasses three key aspects; learning strategies, time and effort management, and self-evaluation is 98.24. The maximum observed score is 132, while the minimum is 62. Additionally, the standard deviation of 14.94 indicates moderate variability in the self-regulation levels among the students, suggesting diverse individual differences in how students manage their learning processes. Some students might excel in managing their learning, while some students still struggle.

Following the descriptive analysis, data tabulation was conducted to classify students into five categories: very low, low, moderate, high, and very high levels of self-regulation. The percentage distribution for each category was calculated to provide a clearer understanding of the overall trends and the proportion of students falling into each group. The student's classification based on each category can be seen in Table 4.

**Table 4.** Student Self-Regulation Level

<i>Scale</i>	<i>Category</i>	<i>Frequency</i>	<i>Percentage</i>
81% - 100%	Very High	37	26.62%
61% - 80%	High	82	58.99%
41% - 60%	Moderate	20	14.39%
21% - 40%	Low	0	0.00%
0 - 20%	Very Low	0	0.00%

The analysis of students' self-regulation levels, as shown in Table 4, reveals that most students exhibit high to very high levels of self-regulation. The scale of 81% - 100% categorized as very high level shows a total of 37 students (26.62%) indicating that these students consistently use self-regulation strategies effectively in their learning. Meanwhile, the majority of students, 82 students (58.99%) are categorized as having high self-regulation. This suggests that these frequently employ self-regulation strategies, though not as consistently as those in the "very high" category. Additionally, a smaller portion of students, 20 students (14.39%), demonstrate moderate levels of self-regulation. These students occasionally use self-regulation strategies but may lack consistency or struggle with some aspects of self-regulation. There is no students who fall into low and very low categories, indicating that all students exhibit at least moderate levels of self-regulation. The absence of students in the "low" and "very low" categories suggests that the overall self-regulation levels among the sample are relatively strong. This distribution reflects positively on the student's ability to manage their learning processes and could imply that existing educational practices are supporting the development of self-regulation effectively.

The findings provide valuable insights into the self-regulation profiles of students in urban areas, specifically in the context of science learning. The majority of students (58.99%) demonstrated high levels of self-regulation, while an additional 26.62% exhibited very high levels. This suggests that urban students in the sample possess strong abilities to manage their learning through effective strategies, time and effort management, and self-evaluation. These results may reflect the influence of urban educational environments, which often provide greater access to resources, structured learning opportunities, and exposure to competitive academic settings (Wood, 2023). Self-regulated learning is characterized by students' independence, where they take responsibility for their learning and are intrinsically motivated to complete their studies. Their improved learning outcomes are driven not by external

encouragement but by their own determination and effort (Patriot & Laksono, 2024). Furthermore, Velayutham et al. (2011, 2013) stated that students' self-regulation is also influenced by their motivation. However, it remains unclear whether self-regulation is more significantly affected by internal motivation or external motivation.

This study underscores the importance of fostering self-regulation as a critical skill for science learning, particularly in urban contexts, and provides a foundation for future research and the development of tailored educational programs to support diverse learner needs. However, this research is limited to students who are in urban areas. Further research can be carried out by taking students in non-urban areas as samples to analyze the differences in self-regulation between students in urban and non-urban areas.

## CONCLUSION

This study has profiled the self-regulation levels of middle school students in urban areas, focusing on their science learning processes. The findings of this study provide valuable insights into the self-regulation profiles of students in urban areas, specifically in the context of science learning. The majority of students (58.99%) demonstrated high levels of self-regulation, while an additional 26.62% exhibited very high levels. This suggests that urban students in the sample possess strong abilities to manage their learning through effective strategies, time and effort management, and self-evaluation. These results underscore the positive impact that urban educational environments can have on fostering self-regulated learning. However, the presence of a moderate proportion of students with only average levels of self-regulation suggests the need for targeted interventions to support and enhance these skills in less proficient learners. Future research could expand on this work by exploring the psychosocial and environmental factors influencing self-regulation in rural or suburban areas, as well as examining the effectiveness of interventions designed to enhance these skills across various demographic groups.

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