

# Do self-efficacy and self-regulated learning influence student engagement in gen z students?

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### Abstract

Lack of enthusiasm, confidence, and frustration when facing difficult tasks affects the student engagement of Generation Z students. This study aims to analyze the influence of self-efficacy and self-regulated learning on the student engagement of Gen Z students. This study uses an explanatory quantitative approach. The sampling technique used is proportionate stratified random sampling with a sample size of 395 Gen Z students aged 18–24 years at Universitas Negeri Semarang. The scales used in this study were the self-efficacy scale, the self-regulated learning scale, and the student engagement scale. The hypothesis test results showed that self-efficacy and self-regulated learning simultaneously had a significant effect on student engagement ( $R^2 = 0.577$ ;  $p < 0.001$ ), which means that these two variables were able to explain 57.7% of the variation in student engagement. Further research is recommended to examine other factors that influence Gen Z students' engagement in order to obtain a more comprehensive model.

## Introduction

Generation Z students aged 18-24 are part of the generation born between 1997-2012 and are known as digital natives, namely the generation that grew up and developed with digital technology (Syahrial, E. H., & Harefa, 2025). The characteristics of Gen Z, who are close to technology, accustomed to multitasking, and like fast-paced and visual communication, form a different learning style compared to previous generations (Evriza, E., & Ridwan, 2025). The appropriate use of technology has been proven to increase student engagement in learning activities, both in class, online discussions, and collaborative projects (Rahman, E. Y., et al., 2024). However, the use of technology alone does not automatically guarantee engagement, learning strategies are needed that can direct the potential of Gen Z students to obtain active and meaningful learning experiences.

Student engagement is an important indicator of the quality of the learning process in higher education (Tahir, I., & Fatima, 2023). Student engagement refers to student involvement in academic activities, reflected through behavioral, emotional, and cognitive engagement (Heilporn, G., et al., 2024). This engagement plays a role in improving academic success, learning experiences, and the development of social and collaborative skills (Lin, 2018). Therefore, the level of student engagement, especially among Generation Z, is a crucial factor in supporting the achievement of learning objectives in higher education.

Fredricks, J. A., et al., (2016) explain that student engagement is one of the main drivers of academic success and the development of individual potential. Student engagement includes three main dimensions, namely behavioral, emotional, and cognitive involvement. Behavioral engagement is reflected through active participation, attendance, adherence to academic rules, and effort in completing assignments (Saqr., 2023). Emotional engagement is demonstrated through interest, a sense of belonging to the campus environment, and positive emotional responses to academic activities (Wang, X., et al., 2025). Meanwhile, cognitive engagement refers to students' commitment to understanding the material, their use of effective learning strategies, and their persistence in facing academic challenges (Alam, A., & Mohanty, 2024).

However, research shows that not all Generation Z students have optimal levels of student engagement. Several studies have found that student engagement remains moderate to low, characterized by passive participation in lectures and limited academic interaction (Wu, H., et al., 2025). These findings indicate that student engagement remains an issue that requires attention in the context of higher education learning. Student engagement is influenced by both internal and external factors. Internal factors include self-efficacy, interest, motivation, mindfulness, and personal goals (Hidayah, 2022). External factors include the learning environment, task difficulty, lecturer support, and peer support (Bond, M., et al., 2020). Among these internal factors, self-efficacy and self-regulated learning are important variables that have the potential to strengthen student engagement in the learning process.

Self-regulated learning is understood as a self-directed learning process in which individuals consciously use internal motivation as well as cognitive, metacognitive, and behavioral strategies to monitor and control their learning progress (Zimmerman, 1990). Gen Z students with high cognitive engagement tend to employ self-directed learning strategies that support in-depth conceptual understanding (Thomas, C. L., & Allen, 2020). Research by Zakiah, N. Z., et al., (2024) shows that the implementation of self-regulated learning correlates with higher behavioral engagement, while regulation and motivation also strengthen students' emotional engagement (Sriwiyanti, et al., 2025). Thus, self-regulated learning acts as an internal mechanism that encourages sustained academic engagement.

Furthermore, self-efficacy also plays a crucial role in increasing student engagement. According to Bandura, (1986), self-efficacy is an individual's belief in their ability to carry out the actions necessary to achieve specific goals. In an academic context, self-efficacy refers to a student's belief in their ability to manage and complete coursework according to established standards (Salim, F., & Fakhurrozi, 2020). Students who have high self-efficacy can encourage increased academic achievement and the ability to overcome academic problems (Pambudi, A. T., et al., 2019). Self-efficacy has three dimensions: magnitude (the difficulty of the task), strength (the strength of the belief), and generality (the scope of the belief across situations). Students with high self-efficacy tend to set more challenging goals, demonstrate persistence in the face of obstacles, and exert optimal effort in completing tasks (Saks, 2024).

Although previous studies have examined the relationship between self-efficacy, self-regulated learning, and student engagement, several research gaps remain. Most studies tend to examine these variables separately, resulting in limited analysis of their combined influence on student engagement. Furthermore, research specifically focusing on Generation Z students as a group with unique learning characteristics influenced by the digital environment remains limited. Empirical evidence in the context of higher education, particularly in Indonesia, that simultaneously examines the role of self-efficacy and self-regulated learning in predicting student engagement is also relatively limited. Therefore, further research is needed to gain a more comprehensive understanding of the interaction of these internal factors in shaping the engagement of Generation Z students.

Based on this background, the research problem can be formulated as follows: student engagement among Generation Z students is suboptimal and is suspected to be influenced by internal factors, particularly self-efficacy and self-regulated learning. Therefore, this study aims to analyze the influence of self-efficacy and self-regulated learning on student engagement in Generation Z students. The proposed hypothesis is that self-efficacy and self-regulated learning have a significant influence on student engagement. This study is expected to contribute to the development of the literature by presenting empirical evidence regarding psychological factors that influence student engagement, especially in the context of Generation Z students.

## Methods

### Design

This study used a quantitative approach with a correlational design to examine the influence of self-efficacy and self-regulated learning on student engagement in Generation Z students.

### Participants

The population in this study was 32,201 Generation Z students from the 2023–2025 intake at Semarang State University. The sample size of 395 students was obtained through proportional stratified random sampling, consisting of 123 students from the 2023 intake, 135 students from the 2024 intake, and 137 students from the 2025 intake. The sample criteria for this study were active undergraduate Generation Z students from the 2023–2025 intake, aged 18–24.

### Instruments

The research instrument used consisted of three scales: a self-efficacy scale, a self-regulated learning scale, and a student engagement scale. The self-efficacy scale was developed based on Bandura, (1997) theory with three indicators: magnitude, strength, and generality. An example of a statement in the magnitude indicator is "I am confident in my ability to complete academic tasks ranging from easy to difficult levels of difficulty." For the strength indicator, an example statement is "I am confident in completing assignments despite facing academic challenges." For the general indicator, an example statement is "I am confident in various academic contexts that I have already understood."

The self-regulated learning scale refers to Zimmerman, (1990) theory, which includes three indicators: metacognitive, motivational, and behavioral. An example statement for the metacognitive indicator is "I consciously plan my learning style before starting a learning activity." For the motivation indicator, an example statement is "I have an inner drive to achieve my learning goals." For the behavioral indicator, an example statement is "I organize my study time regularly." Furthermore, the student engagement scale is based on Fredericks' theory as cited in Gunuc, S., & Kuzu, (2015), which consists of three indicators: behavioral engagement, emotional engagement, and cognitive engagement. An example statement for the behavioral engagement indicator is "I attend lectures on schedule." For the emotional engagement indicator, an example statement is "I am interested in learning the lecture material." Meanwhile, for the cognitive engagement indicator, an example statement is "I connect new material with my prior knowledge."

All instruments used a four-point Likert scale, ranging from "strongly disagree" to "strongly agree." Before being used in data collection, the instruments underwent validity and reliability testing. Construct validity was assessed through expert judgment to ensure each item measured the relevant aspects of the variables being studied. Reliability was measured using Cronbach's alpha coefficient. The test results showed that the self-efficacy scale

consisted of 22 valid items ( $\alpha = 0.923$ ), the self-regulated learning scale consisted of 24 valid items ( $\alpha = 0.876$ ), and the student engagement scale consisted of 22 valid items ( $\alpha = 0.909$ ), all of which demonstrated high levels of reliability.

### Procedure

Data were collected using a self-administered questionnaire from January 21, 2026, to February 4, 2026. Participating respondents were individuals who met the research criteria and had expressed their willingness to participate through informed consent prior to completing the questionnaire.

### Data Analysis

Descriptive statistical analysis was used to describe and analyze the data obtained. Furthermore, multiple linear regression analysis was used to test the hypotheses, both partially and simultaneously. The t-test was used to test partial effects, the F-test to test simultaneous effects, and the coefficient of determination ( $R^2$ ) to determine the contribution of the independent variables to the dependent variable. Prior to the regression analysis, the data were first tested using a submersion test, which included tests for normality, linearity, multicollinearity, and heteroscedasticity. The test results indicated that all assumptions were met, making the data suitable for further analysis. All data processing and analysis were performed using IBM SPSS version 27 software. All instruments used a four-point Likert scale ranging from "strongly disagree" to "strongly agree". Validity and reliability tests were conducted through tryouts with 50 different respondents from the main sample. The test results showed that the self-efficacy scale consisted of 22 valid items ( $\alpha = 0.923$ ), the self-regulated learning scale consisted of 24 valid items ( $\alpha = 0.876$ ), and the student engagement scale consisted of 22 valid items ( $\alpha = 0.909$ ), which indicated high reliability. Descriptive statistical analysis was used to describe and analyze the collected data. Then, multiple linear regression analysis was used to test the hypothesis to determine the influence of variables both partially and simultaneously. Data analysis was assisted by IBM SPSS version 27 software.

### Results

The following are the results of descriptive analysis related to the level of self-efficacy, self-regulated learning, and student engagement in Gen Z students at Universitas Negeri Semarang in Table 1.

**Table 1.** Descriptive Statistical Analysis

No.	Variable Indicator	N	M	SD	Category
1.	Self-efficacy	395	63,5	8,48	Medium
	Magnitude	395	26,8	3,83	Medium
	Strength	395	21,0	3,03	Medium
	Generality	395	15,7	2,90	Medium
2.	Self-regulated learning	395	70,7	8,95	Medium
	Metacognitive	395	22,7	3,91	Medium
	Motivational	395	27,5	3,44	Medium
	Behavioral	395	20,4	3,16	Medium
3.	Student engagement	395	70,4	8,04	Medium
	Behavioral engagement	395	26,6	2,94	Medium
	Emotional engagement	395	24,8	3,63	Medium
	Cognitive engagement	395	18,9	2,54	Medium

In general, all variables and indicator of self-efficacy, self-regulated learning, and student engagement were in the moderate category. Self-efficacy had a mean of 63.5 (SD = 8.48), self-regulated learning had a mean of 70.7 (SD = 8.95), and student engagement had a mean of 70.4 (SD = 8.04). Next, a multiple regression analysis was conducted to examine the influence of self-efficacy and self-regulated learning on student engagement. Table 2 summarizes the results of the research hypothesis testing.

**Table 2.** Multiple Linear Regression Analysis

No.	Predictor	$\beta$	t	Sig (p)	R	R <sup>2</sup>	F	Sig (p)
1.	Self-efficacy	0.595	15.995	<.001	0.628	0.394	255.840	<.001
	Magnitude	0.466	4.085	<.001				
	Strength	1.030	6.750	<.001				
	Generality	0.297	2.074	0.039				
2.	Self-regulated learning	0.651	20.839	<.001	0.725	0.525	434.279	<.001
	Metacognitive	0.225	2.160	0.031				
	Motivational	1.158	12.140	<.001				
	Behavioral	0.694	5.791	<.001				
3.	Self-efficacy and self-regulated learning				0.759	0.577	266.969	<.001

Self-efficacy significantly influenced student engagement ( $R = 0.628$ ,  $R^2 = 0.394$ ,  $F(1, 393) = 255.840$ ,  $p < .001$ ). Self-regulated learning also significantly influenced student engagement ( $R = 0.725$ ,  $R^2 = 0.525$ ,  $F(1, 393) = 434.279$ ,  $p < .001$ ). Simultaneously, self-efficacy and self-regulated learning had a significant effect on student engagement ( $R = 0.759$ ,  $R^2 = 0.577$ ,  $F(2, 392) = 266.969$ ,  $p < .001$ ).

## Discussion

The analysis results show that self-efficacy has a significant influence on Gen Z students' student engagement. This indicates that student engagement in academic activities is closely related to their ability to believe in their own abilities. More specifically, all three self-efficacy indicators contributed significantly, with the strength indicator being the most dominant. This suggests that students with strong self-efficacy tend to have higher levels of engagement. Meanwhile, the magnitude and generality indicators also play a role in reflecting students' confidence in facing varying levels of task difficulty and the consistency of their self-confidence across diverse situations.

These findings suggest that the higher the self-efficacy of Gen Z students, the higher their level of engagement in academic activities. Suryokusumo, A. N. C., & Khoirunnisa, (2026) state that student engagement can be shaped through self-confidence and a proactive attitude in the academic environment. Students with strong beliefs in their abilities tend to be more persistent, persistent, and remain actively engaged despite facing academic challenges. High self-efficacy also helps students reduce distracting negative thoughts, so they are better able to maintain focus and engagement in the learning process (Situmorang, D. D. B., et al., 2018). The strength indicator indicates that an individual's ability to convince themselves to complete academic tasks and overcome obstacles contributes most significantly. Agustina, F. R., & Rusmawati, (2022) also stated that students with higher character strengths tend to be better able to manage stress, cope with pressure, and adapt to challenging situations, thus

maintaining good academic performance. Thus, the strength of self-efficacy serves not only as a motivational factor but also as a regulatory mechanism in dealing with academic demands.

Furthermore, the significance of the magnitude indicator indicates that confidence in facing task difficulty encourages Gen Z students to avoid academic challenges. Students with high magnitude tend to view difficult tasks as challenges to be overcome, rather than threats to be avoided Ainiyah & Nugrahani, (2025). The generality indicator shows that the ability to generalize self-efficacy across academic contexts contributes to broadening students' sense of competence. Academic self-efficacy can be generalized across various task contexts. Thus, generality contributes to broadening students' sense of competence across academic contexts, ultimately strengthening their overall level of engagement.

Testing self-regulated learning also showed a significant influence on student engagement among Gen Z students. This indicates that students' ability to independently manage their learning process plays a crucial role in enhancing academic engagement. More specifically, all indicators of self-regulated learning contribute, with motivational indicators being the most dominant. Students with a strong drive to learn, persistence, and a clear goal orientation tend to demonstrate higher levels of engagement. Furthermore, metacognitive and behavioral indicators also play a role in supporting engagement through the ability to control cognitive processes and consciously regulate learning behavior.

These findings indicate that the stronger Gen Z students' self-regulated learning abilities, the higher their level of engagement in higher education. Doo, M. Y., & Bonk, (2020) revealed that students with high levels of self-regulation are better able to adapt to various learning environments and demonstrate more consistent academic engagement. Furthermore, students with strong self-regulation tend to demonstrate proactive attitudes in interacting with lecturers, peers, and learning materials to achieve academic goals (Hafsah, H., et al., 2024). The application of self-regulated learning also enables students to manage their learning process systematically and purposefully, thus enabling them to better manage academic stress adaptively (Novarizka, S., et al., 2025). Therefore, self-regulated learning is an important strategy for increasing student engagement.

Based on indicator analysis, all aspects of self-regulated learning contribute to student engagement. Motivational indicators show the greatest contribution, indicating that the internal drive to achieve learning goals plays a significant role in increasing student engagement. Yusoff, S. H. M., & Saefudin, (2025) stated that the ability to regulate learning motivation is related to more comprehensive engagement in academic activities. Furthermore, the learning process is characterized not only by intention but also by active involvement and the application of knowledge in academic and professional contexts. Therefore, Generation Z students' learning motivation is influenced by both internal and environmental factors.

Metacognitive indicators indicate that students' ability to consciously plan, monitor, and evaluate their learning process contributes to academic engagement. An, D., et al., (2024) stated that metacognition has a positive effect on engagement, with students who actively manage their learning process tending to be more engaged. The planning, monitoring, and reflection phases are an important cycle in fostering active engagement. Students with good metacognitive control tend to have higher engagement. Furthermore, behavioral indicators indicate that the ability to effectively manage time and the learning environment contributes to student engagement. Xu, J., Li, J., & Yang, (2024) stated that strategies such as time planning, self-monitoring, and the use of adaptive learning strategies have a positive relationship with engagement. Students who are able to manage their time effectively demonstrate that they have consistently pursued the learning process and are responsible for their academic achievements. Therefore, time management skills are a strategic component in developing academic character.

Simultaneously, self-efficacy and self-regulated learning have demonstrated a significant influence on student engagement among Gen Z students. This finding indicates that student

engagement is the result of the interaction between self-beliefs and learning regulation capacity. An individual's belief in their abilities influences their choice of actions, persistence, and responses to academic challenges (Jamaluddin, A., et al., 2025). Students with high self-efficacy tend to be more diligent, active, and consistent in completing assignments, resulting in increased engagement.

The results of this study also confirm that self-regulated learning is a stronger predictor than self-efficacy because it directly influences actual learning behavior. Self-regulated learning is reflected in active participation, persistence, deep thinking strategies, and commitment to assignments (Yue, D., & Mohd Saad, 2025). Furthermore, this ability can also strengthen self-efficacy because success in managing the learning process will increase students' self-confidence (Martincová, J., et al., 2025). Thus, self-efficacy acts as an internal psychological factor, while self-regulated learning becomes a strategic mechanism that guides learning behavior. The combination of the two provides a more comprehensive explanation of the level of student engagement among Gen Z students and emphasizes the importance of higher education interventions that focus not only on increasing self-confidence but also on developing sustainable learning regulation strategies.

### **Implications**

These findings contribute to the development of guidance and counseling studies and educational psychology in understanding student engagement of Generation Z students. In addition, this study opens up opportunities for the development of self-efficacy and self-regulated learning based interventions and serves as a basis for further research.

### **Limitations and future directions**

This research is still limited to two internal factors: self-efficacy and self-regulated learning, so other factors that could potentially influence student engagement have not been comprehensively examined. Therefore, further research is recommended to integrate other variables to gain a more comprehensive understanding.

### **Conclusion**

The results of the study indicate that self-efficacy, self-regulated learning, and student engagement of Gen Z students at Universitas Negeri Semarang are in the moderate category, both overall and in each dimension. Inferentially, self-efficacy and self-regulated learning each have a significant influence on student engagement, and simultaneously both contribute to explaining variations in student engagement. These findings confirm that student engagement is influenced by students' self-confidence and ability to manage the learning process independently and strategically. Therefore, students need to improve their self-efficacy and self-regulated learning to support more optimal learning engagement.

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### **Author Contribution Statement**

The following are the contributions of each author: RN, research idea, data collection, and data analysis; MM, research idea development, and research quality check.

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