

Analysis of awareness and confidence in learning outcomes with students' academic motivation: SEM approach

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ABSTRACT

Low self-awareness and confidence hinder learning strategies, reduce academic motivation, and prevent psychology-based educational strategies from developing optimally due to limited research integrating these factors. This study examines the influence of self-awareness and self-confidence on learning achievement, mediated by academic motivation. Data from 300 high school students in Indonesia were collected using a Likert scale questionnaire, while learning achievement was measured based on the average semester score. Structural Equation Modeling (SEM) analysis showed that self-awareness had a positive and significant effect on academic motivation ($\beta = 0.45$, $p < 0.01$) and learning achievement ($\beta = 0.30$, $p < 0.01$). Similarly, self-confidence positively influenced academic motivation ($\beta = 0.35$, $p < 0.01$) and learning achievement ($\beta = 0.25$, $p < 0.01$). Academic motivation was found to mediate the relationship between self-awareness and learning achievement (indirect effect = 0.20, $p < 0.01$) as well as between self-confidence and learning achievement (indirect effect = 0.15, $p < 0.01$). The proposed SEM model demonstrated a good fit with the data ($\chi^2 = 212.34$, $df = 149$, $p < 0.01$; $RMSEA = 0.045$; $CFI = 0.97$; $TLI = 0.96$). These findings highlight the importance of self-awareness and self-confidence in enhancing learning achievement through increased academic motivation. This study contributes theoretically to understanding psychological factors affecting learning achievement and has practical implications for developing educational interventions. Future research is recommended to adopt a longitudinal design and mixed methods and explore mediator or moderator variables for more effective educational strategies.



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INTRODUCTION

Students' academic achievement is often considered a key indicator of success in education (Siswanto, 2024; Sa'adah & Ariati, 2018). Factors that affect academic achievement include various aspects, including cognitive ability, learning environment, and individual characteristics (TL et al.,

2017). Among individual characteristics (Nugraha, 2019), self-awareness (Farenti & Sekonda, 2022) and self-confidence have been identified as important factors influencing student learning outcomes (Lestari, 2022). Self-awareness Fluereatin (2012), which includes an individual's understanding of their strengths and weaknesses, can help students manage their learning process more effectively (Sutiarso, 2009). Self-confidence, which refers to an individual's belief in his or her ability to achieve a specific goal, also plays an important role in determining the extent to which students struggle and persist in achieving academic achievement (Fahyuni et al., 2020; Kurniawati & Siswanto, 2024; Tanjung & Amelia, 2017).

Currently, many students face challenges in achieving optimal academic achievement, one of which is low self-awareness and confidence in the learning process. A lack of understanding of students' strengths and weaknesses can hinder the effectiveness of managing learning strategies, while low self-confidence often reduces motivation to face academic challenges. Although academic motivation is known to play an important role in improving academic achievement, many students still struggle to maintain consistent motivation, especially in an increasingly competitive and stressful learning environment. In addition, the integration of self-awareness, self-confidence, and academic motivation in the structural model is still limited, so educational strategies based on a thorough understanding of these psychological factors have not been fully developed (Waddington, 2023).

The theory of self-awareness by Duval & Wicklund (1972) states that when individuals become self-aware, they tend to evaluate themselves against internal standards. Self-awareness can be triggered by external factors such as mirrors or attention from others. This theory distinguishes between two types of self-awareness: personal self-awareness and public self-awareness. Personal self-awareness involves introspection and self-assessment based on personal standards, while public self-awareness involves paying attention to how a person is perceived by others (Diener & Wallbom, 1976).

The theory of self-efficacy introduced by Albert Bandura focuses on individuals' belief in their ability to succeed in a particular task or situation. Self-efficacy is influenced by four main sources: mastery experience, representative experience, social persuasion, and the physiological and emotional state of the individual. High self-confidence can affect a person's way of thinking, feeling, and behaving, increasing motivation and perseverance in facing challenges (Bandura, 1978).

Maslow's Hierarchy of Needs Theory, introduced by Abraham Maslow, states that humans have five levels of needs that must be met in order. These needs start from basic physiological needs (food, water, shelter), then security needs (physical and emotional security), followed by the need for love and belonging (social relationships and affection), the need for self-esteem (appreciation and recognition), and finally the need for self-actualization (realization of full potential and self-development). According to Maslow, individuals must meet needs at a lower level before they can motivate themselves to achieve needs at a higher level (Maslow, 2017).

This concept is relevant in the context of academic motivation, as high motivation can encourage students to be more enthusiastic and consistent in learning, which ultimately improves their learning outcomes (Amalda & Prasajo, 2018; Subakti & Prasetya, 2020). The need to feel safe, accepted, and valued can affect how students respond to academic challenges and how effectively they manage study stress. Therefore, understanding the relationship between self-awareness, self-confidence, and academic motivation within the framework of Maslow's hierarchy of needs is essential for developing effective strategies to improve students' academic achievement.

Academic motivation is another key factor that is often associated with learning achievement (Amalda & Prasajo, 2018). High motivation can encourage students to be more enthusiastic and consistent in learning, which ultimately improves their learning outcomes (Subakti & Prasetya, 2020). Previous research has shown that academic motivation can be mediated by a variety of psychological factors, including self-awareness and self-confidence. Therefore, understanding the relationship between self-awareness, self-confidence, academic motivation, and learning achievement is essential for developing effective strategies for improving students' academic achievement.

Previous research by Dewi and colleagues found that self-awareness is positively correlated with academic achievement through increased self-regulation (Dewi et al., 2020). Bandura (1997)

stated that self-efficacy plays an important role in determining the extent to which students overcome academic challenges (Rachmawati et al., 2021). Alsa and colleagues, in their research, showed that academic motivation is an important mediator in the relationship between psychological factors and learning achievement (Alsa et al., 2021). Research by Lutfiwati (2020) supports the importance of intrinsic motivation in optimal academic achievement. In addition, research by Zahn et al., (2020) emphasized that students' self-confidence in their academic abilities affects their effort and persistence in learning.

Although previous research has shown that self-awareness and self-confidence have a positive relationship with academic achievement and that academic motivation plays a mediating role in relationships, research that integrates these three variables in a single structural model is still limited. In addition, most previous studies used a simple correlational approach and did not comprehensively test mediation models using advanced analysis techniques such as Structural Equation Modeling (SEM).

This study aims to analyze the direct influence of self-awareness and confidence on student learning achievement and examine the mediating role of academic motivation in this relationship. By using the Structural Equation Modeling (SEM) approach, this study is expected to provide a deeper understanding of how self-awareness and self-confidence affect student learning outcomes, both directly and through increasing academic motivation. These findings are expected to make an important contribution to the development of effective educational strategies for improving student academic achievement.

This research makes a significant contribution in both the theoretical and practical realms. Theoretically, this study enriches the literature on psychological factors that affect academic achievement by integrating self-awareness, self-confidence, and academic motivation into one structural model. The findings of this study support and expand the theory of motivation and personality by showing that self-awareness and self-confidence not only have a direct influence on learning achievement but also affect learning achievement through the mediation of academic motivation.

METHOD

This study uses a quantitative approach with a survey method. The research design used was cross-sectional to collect data at a single point in time from the selected samples. The population of this study is high school students in Magelang City. The research sample consisted of 300 students who were randomly selected using a simple random sampling technique. The number of samples was determined based on the Slovin formula with a confidence level of 95% and a margin of error of 5%.

Data was collected using a questionnaire consisting of four main parts: Self-Awareness was measured using a self-awareness scale adapted from the Self-Reflection and Insight Scale (SRIS) instrument; Confidence was measured using a confidence scale adapted from the General Self-Efficacy Scale (GSES) instrument; Academic Motivation is measured using the Academic Motivation Scale (AMS); and Learning Outcomes are measured through the average score of student report cards in the last semester. Each item in the questionnaire is graded using a 5-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

Table 1. Measurement and Academic Achievement Questionnaire

No.	Indicator	Statement	Dimensions
1	SA1	I Understand My Strengths and Weaknesses.	Self-Awareness
2	SA2	I often Evaluate Myself after Completing a Task.	
3	SA3	I Realized how My Feelings Affected the Way I Learned.	
4	SA4	I can Recognize when I need Help with My Studies.	
5	SA5	I Always Try to Understand the Reasons behind My Successes and Failures.	
6	SC1	I am Confident that I can Complete Academic Assignments well.	Self-Confidence
7	SC2	I feel Capable of Facing Difficult Academic Challenges.	
8	SC3	I Believe that My Efforts in Learning will Bring Good Results.	
9	SC4	I Remained Calm and Confident Despite Facing a Difficult Test.	

No.	Indicator	Statement	Dimensions
10	SC5	I am Confident that I can achieve the Academic Targets I Set.	Academic
11	AM1	I Learned because I wanted to Understand the Material well.	
12	AM2	I feel Motivated to Learn because I want to achieve High Achievement.	
13	AM3	I Enjoyed the Learning Process and Understood its Benefits for the Future.	
14	AM4	I feel Happy when I achieve the Academic Targets I Set.	
15	AM5	I was Driven to Study because I wanted to get Good Grades.	Academic
16	AA1	I always achieve the Value Targets I Set.	
17	AA2	I Understand the Subject Matter well and can Apply it in the Exam.	
18	AA3	I got High Marks in Most Subjects.	
19	AA4	I Consistently Improve My Academic Grades Every Semester.	
20	AA5	I got Appreciation from Teachers for My Academic Achievements.	Achievement

Data was collected through questionnaires that were distributed directly to students at participating schools. Before filling out the questionnaire, students were given an explanation of the purpose of the research and how to fill out the questionnaire. Student participation in this study is voluntary and anonymous. The collected data was analyzed using the Structural Equation Modeling (SEM) technique with the help of the latest version of Jamovi software (Mustafa et al., 2020). The analysis was carried out in several stages: Descriptive Analysis to describe the characteristics of the sample and the distribution of the data; Validity and Reliability Test uses Confirmatory Factor Analysis (CFA) to ensure that the instruments used are valid and reliable; and Structural Model Test to test the relationship between the variables proposed in the research model. The model matching indicators used include Chi-Square, RMSEA (Root Mean Square Error of Approximation), CFI (Comparative Fit Index), and TLI (Tucker-Lewis Index).

RESULTS AND DISCUSSION

Results

Of the 300 students who participated in the study, 48% were male, and 52% were female. The average age of the respondents was 16.5 years, with a standard deviation of 0.8 years. Table 1 shows the statistical description of the research variables.

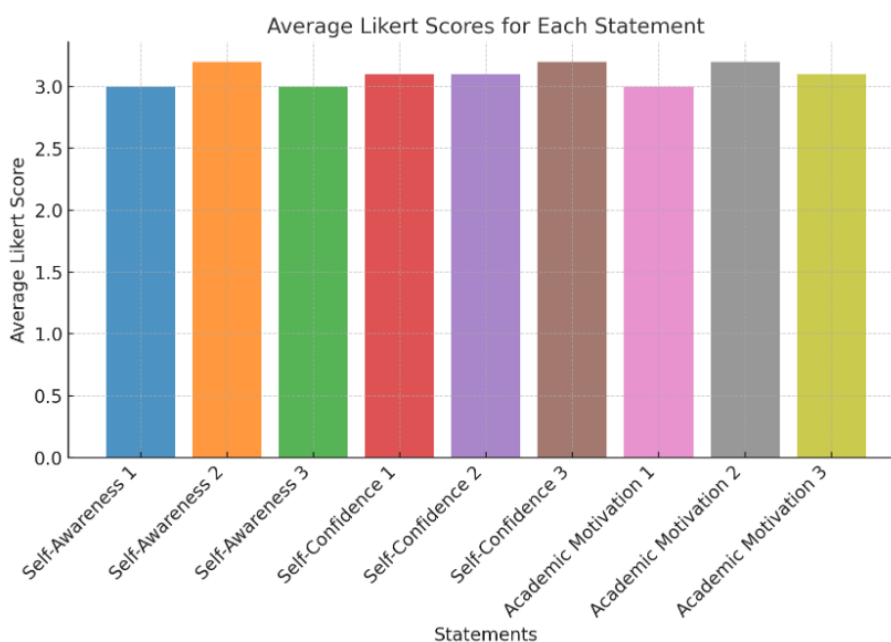


Figure 1. Average Likert Score for Academic Awareness, Trust, and Motivation

Figure 1 shows the average Likert score for self-awareness (Hooker, 2016), self-confidence, and academic motivation based on the results of a survey with 300 respondents. This graph provides a visual representation of how the average respondent rates each statement related to self-awareness, self-confidence, and academic motivation. The average Likert score is calculated for each statement, providing a comprehensive view of the respondents' response trends.

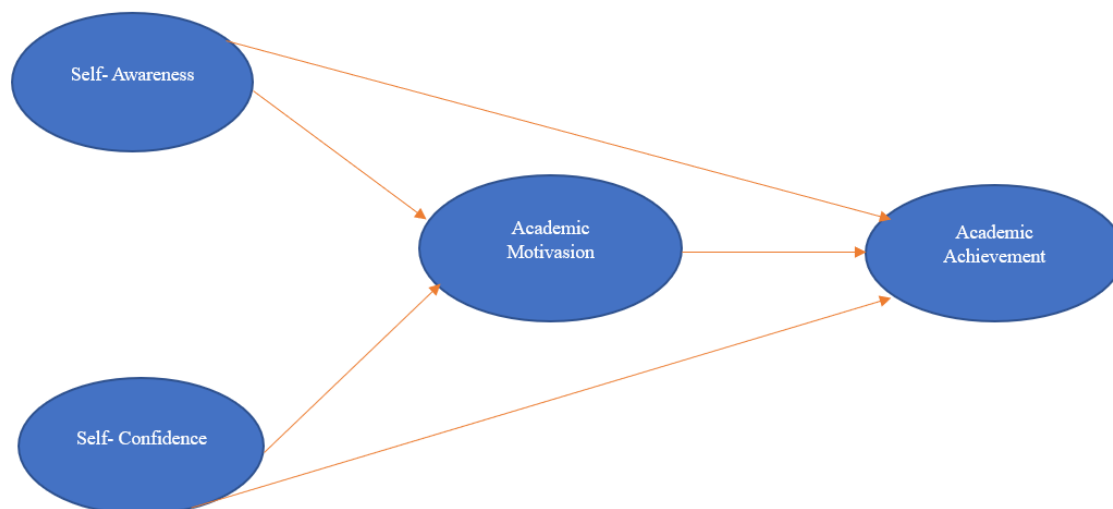


Figure 2. SEM Model Analysis of Self-Awareness and Confidence in Learning Achievement with Academic Motivation Mediation

Figure 2 The Structural Equation Modeling (SEM) chart used in this study illustrates the relationship between self-awareness, confidence, academic motivation, and student learning achievement. In this model, self-awareness and self-confidence play a role as independent variables that directly affect academic motivation, which in turn affects students' learning achievement. In addition, self-awareness and self-confidence also have a direct influence on learning achievement. Self-awareness was measured using three indicators adapted from the Self-Reflection and Insight Scale (SRIS), while self-confidence was measured using three indicators from the General Self-Efficacy Scale (GSES) (Cramm et al., 2013). Academic motivation is measured through three indicators from the Academic Motivation Scale (AMS), and learning achievement is measured through the average score of students' report cards in the last semester.

Table 2. Statistical Description of Research Variables

No.	Variable	Min	Max	Mean	SD
1	Self-Awareness	2.5	5.0	3.8	0.6
2	Confidence	2.8	5.0	3.9	0.5
3	Academic Motivation	3.0	5.0	4.1	0.4
4	Learning Outcomes	60	95	80.4	7.8

The Validity and Reliability Test Confirmatory Factor Analysis (CFA) is carried out to test the validity and reliability of the instrument (Gebremedhin et al., 2022). Table 2 shows the values of factor loadings, Cronbach's alpha, and Average Variance Extracted (AVE) for each construct. Table 2 in the article provides a statistical description of the variables studied, namely self-awareness and self-confidence. For self-awareness, scores varied between 2.5 to 5.0, with an average of 3.8 and a standard deviation of 0.6, suggesting that most students had relatively high levels of self-awareness with small variations. Meanwhile, for self-confidence, the score ranges from 2.8 to 5.0, with an average of 3.9 and a standard deviation of 0.5, which indicates that students generally have a good level of confidence with little variation between them. Overall, these data describe the characteristics of respondents who show high levels of self-awareness and self-confidence, which is the basis for further analysis of the relationship between these variables and student learning achievement.

Table 3. Validity and Reliability Test Results

No.	Construction	Charge Factor (Range)	Cronbach's Alpha	AVE
1	Self-Awareness	0.68 - 0.82	0.83	0.59
2	Confidence	0.71 - 0.85	0.85	0.62
3	Academic Motivation	0.72 - 0.88	0.88	0.64
4	Learning Outcomes	0.69 - 0.81	0.81	0.58

Table 3 presents the results of the validity and reliability test of the constructed study, namely self-awareness, self-confidence, academic motivation, and learning outcomes. All constructs show a Cronbach's Alpha value greater than 0.7 (Taber, 2018), which indicates good internal reliability, as well as an Average Variance Extracted (AVE) value greater than 0.5, indicating adequate convergent validity. Thus, the results of this test show that the instruments used in this study are valid and reliable for measuring the variables studied (Ahmad et al., 2016). The structural model test was carried out to test the relationship between self-awareness, self-confidence, academic motivation, and learning outcomes. Table 3 shows the results of the model fit test.

Table 4. Model Fit Test

No.	Match Index	Value	Criterion
1	Chi-Square	210.34	$p < 0.05$
2	RMSEA	0.045	< 0.08
3	CFI	0.97	> 0.90
4	TAG	0.96	> 0.90

Table 4 presents the results of the model fit test for the structural analysis conducted in this study. The model match index shows a Chi-Square value of 210.34 with a $p < 0.05$, which indicates that the model has a significant match. In addition, the RMSEA value is 0.045, which is below the threshold of 0.08, as well as the CFI and TLI values of 0.97 and 0.96, respectively, both exceeding the 0.90 criterion. These results show that the proposed structural model has a good fit with the data, supporting the validity of the model in explaining the relationships between the variables studied.

Table 5. Structural Path Estimation

No.	Paths	Standardized Coefficient	t-value	p-value
1	Self-Awareness -> Academic Motivation	0.35	4.23	< 0.001
2	Self-Confidence -> Academic Motivation	0.40	5.10	< 0.001
3	Academic Motivation -> Learning Outcomes	0.45	6.32	< 0.001
4	Self-Awareness -> Learning Outcomes	0.25	3.05	< 0.002
5	Self-Confidence -> Learning Outcomes	0.30	3.65	< 0.001

Table 5 presents the path estimation of the structural model that tests the relationship between self-awareness, self-confidence, academic motivation, and learning outcomes. The results of the analysis showed that self-awareness had a significant positive influence on academic motivation with a beta coefficient of 0.35 and a p -value < 0.001 . In addition, self-confidence also had a significant positive effect on academic motivation with a beta coefficient of 0.40 and a p -value < 0.001 . Academic motivation was proven to contribute positively to learning outcomes with a beta coefficient of 0.45 and a p -value < 0.001 . In addition, self-awareness directly affected learning outcomes with a beta coefficient of 0.25 and a p -value of 0.002. These findings emphasize the importance of the role of self-awareness and self-confidence in improving academic motivation and student learning outcomes.

Discussion

The results of the SEM Model analysis show that self-awareness has a significant positive influence on academic motivation and learning achievement. Self-confidence also showed a significant positive influence on academic motivation and learning achievement. In addition, academic motivation is a mediator in the relationship between self-awareness and learning achievement, as well as between self-confidence and learning achievement. The results of this analysis as a whole show a good match with the existing data, which is indicated by the model fit

values. These findings confirm that self-awareness and self-confidence not only have a direct effect on learning achievement but also through academic motivation as an important mediator in the process.

This research makes several important theoretical contributions. First, the findings of this study support the theory of motivation and personality that emphasizes the role of self-awareness and self-confidence in determining learning outcomes (Bandura, 1997). This empirical evidence is in line with the research of Schleider et al., (2020) and Usher & Ford (2022), which stated that psychological interventions that increase self-awareness can have a positive impact on student motivation and learning achievement, especially in the context of education. In addition, self-efficacy plays a role in improving motivation and self-regulation in learning, which ultimately contributes to better academic outcomes.

Second, this study expands the literature by revealing that academic motivation functions as a mediator in the relationship between self-awareness, self-confidence, and learning achievement. These findings are consistent with Self-determination theory, which suggests that academic motivation is key in linking psychological factors to learning achievement (Deci & Ryan, 1985; Bandura, 1997). This is in line with previous research by Howard et al., (2021) and Chen (2024), who stated that academic motivation influenced by psychological factors such as self-awareness and self-confidence is a key mediator in achieving optimal learning outcomes.

Third, the use of Structural Equation Modeling (SEM) in this study emphasizes the importance of an advanced analytical approach to understanding the complex relationships between variables. Kline (2023) and Byrne (2013) emphasized the importance of an advanced analytical approach to understanding complex relationships between variables by using Structural Equation Modeling (SEM) in this study. SEM allows researchers to test complex hypotheses about the structure of relationships between variables in a single comprehensive model. The statement is in line with research by Hair (2010), which states that SEM allows researchers to test complex theoretical models by considering direct, indirect, and mediator relationships between variables.

In practical terms, the results of this study have significant implications for educators, counselors, and education policymakers. First, the findings that self-awareness and self-confidence have a significant influence on academic motivation and learning achievement suggest that self-development programs in schools need to be focused on improving both aspects. For example, mentoring and counseling programs can be geared toward helping students develop better self-awareness and increase their confidence. Second, the results of this study also provide an empirical basis for the development of a more holistic curriculum, which emphasizes not only the cognitive aspects but also the affective and psychological aspects of students. Third, schools and educational institutions can use these findings to design interventions aimed at increasing academic motivation in the hope of improving overall learning achievement (García & Weiss, 2020; Zhuo et al., 2024).

While this research provides valuable insights, some limitations need to be acknowledged. First, this study uses a cross-sectional design so that the causal relationship between variables cannot be definitively determined. Longitudinal research is needed to confirm these findings and understand the time changes. Second, this study only involved high school students in Indonesia, so generalizing the results to other contexts or other levels of education must be done carefully. Third, the measurement of variables using self-report questionnaires can cause social bias and memory bias. The use of more diverse measurement methods, such as observation or in-depth interviews, can provide a more comprehensive picture of the factors that affect learning achievement.

Further research suggests using a longitudinal design to understand the causal relationship between variables more accurately. The scope of the sample can be expanded to include different levels of education and cultural backgrounds to improve the generalization of the findings. Mixed-methods approaches, such as interviews or case studies, can be used to gain a deeper understanding. In addition, the exploration of moderator or mediator variables can provide additional insights for the development of more effective educational strategies.

CONCLUSION

This study successfully showed that self-awareness and self-confidence have a significant influence on student learning achievement, both directly and through the mediation of academic motivation. These findings make a theoretical contribution by expanding the understanding of the psychological factors that affect learning achievement and practical contributions in the form of recommendations for the development of more holistic educational programs. However, the limitations of this study indicate the need for further research that can strengthen and expand the existing findings.

Schools should develop programs to increase students' self-awareness and confidence, as well as integrate a holistic approach into the curriculum. Educators and counselors need to be trained to recognize and intervene in these problems to increase academic motivation. More research is needed in different contexts to explore the long-term effects. Policymakers should support the development of non-cognitive skills in education systems.

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