The Relationship Between Student Self-confidence, AI Support, and Academic Achievement: A Study in the Psychology of Motivation and Learning

Evaristus Silitubun
STPK ST. Yohanes Rasul Jayapura, Indonesia
evansilitubun17@gmail.com

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ABSTRACT: This research explores the relationship between student self-confidence, artificial intelligence (AI) support, and academic achievement in the psychology of motivation and learning. In this digital era, AI technology is increasingly used in education to facilitate teaching-learning. This research examines How AI support can affect students' self-confidence and how it affects their academic performance. Data are collected from 80 students at STPK ST. Yohanes Rasul Jayapura, Thomas Aquinas College of Agriculture 100 people, and Papua International University 20 people, 120 via questionnaire. The research results show that students' self-confidence and AI support are essential in improving academic performance. Implementing AI technology in education not only helps deliver lesson material but also contributes to improving students' self-confidence. Therefore, schools and institutions of education recommend using AI technology as a learning strategy to maximize potential student academics.

INTRODUCTION

The main problem affecting students' academics is learning motivation, which refers to the encouragement within the student, such as curiosity and personal satisfaction (Meeter et al., 2020). Apart from that, there is the problem of less effective learning strategies (Gamage et al., 2021). Many students do not know the way of learning that best suits their learning style (Arini & Wahyudin, 2022). Some students learn more effectively with visual methods, while others do better with auditory or kinesthetic methods (Ishartono et al., 2021). Not knowing about this strategy can cause students to feel frustrated and less motivated, ultimately negatively impacting their academic achievement (Buehl, 2023). Another problem is that a conducive learning environment, including family, friends, and teachers' support, plays a vital role in students' academic success (Sethi & Scales, 2020). Students who receive emotional and academic support tend to be more motivated and better able to overcome academic stress, which can help students achieve their academic potential optimally (García-Martínez et al., 2021).

Then self-confidence is also essential to student academic success (Khanshan & Yousefi, 2020). High-confident students tend to be braver in facing challenges and more motivated to learn (Alfaiz et al., 2021). Self-confidence allows them not to be afraid to fail and see every challenge as an opportunity to learn and develop. They feel capable of overcoming obstacles and believe their efforts will produce positive results (Almasri, 2022). This helps them achieve better academic performance and develop essential social and emotional skills (Bear & Soltys, 2020). Apart from that, high self-confidence is also the main driver of student learning motivation. Students who believe in their abilities tend to be more diligent and persistent in completing school assignments (Wardani et al.,

2020). They have a favorable view of the learning process and do not give up easily when facing difficulties (Pence, 2022). Their intrinsic motivation to learn strengthens because they feel confident they can understand the material and achieve their academic goals.

Strong self-confidence also positively impacts them. They are more likely to participate actively in class discussions, presentations, and extracurricular activities (Herrera Granda et al., 2022). Self-confidence makes it easier for them to get along with peers and teachers. This creates a more dynamic and supportive learning environment where students motivate and help each other to achieve their best potential (Collie, 2022). On the other hand, AI support in education, such as virtual tutors and adaptive learning applications, offers new opportunities to improve the teaching and learning process (Lim et al., 2023). This virtual tutor can adjust teaching methods based on the individual needs of each student (Dai et al., 2023). For example, if a student is having difficulty understanding a particular mathematical concept, a virtual tutor can provide additional explanations, practice problems, and specific feedback (Malik et al., 2023). This makes the learning process more effective and efficient because attention can be focused on areas that need improvement.

Besides virtual tutors, adaptive learning applications significantly contribute to AI in education. This application uses advanced algorithms to analyze student performance and adjust course material according to their abilities and learning speed (Castonguay et al., 2023). This way, each student can learn at their own pace without feeling burdened by the speed of the class as a whole. Features such as adaptive quizzes, customized learning videos, and interactive assignments help create a more engaging and interactive learning experience (Khogali & Mekid, 2023).

However, despite the enormous potential of AI in education, several challenges must be overcome. One is the digital divide, where not all students have the same access to advanced technology (Steele, 2023). Additionally, there are concerns about data privacy and security, as AI applications often require access to students' personal information. Therefore, educators and policymakers need to ensure that the implementation of AI in education is carried out fairly, safely, and responsibly.

This research explores how artificial intelligence (AI) can influence students' self-confidence and academic performance. In this digital era, AI technology is increasingly used in various aspects of education, from virtual tutors to analysis of student learning data (Hamid et al., 2023). By utilizing AI, students can accept the bait. Faster and more personalized feedback is expected to help them understand the subject matter better and believe more in their academic abilities.

One critical aspect of this research is measuring the change in students' beliefs after they accept AI support. The high self-confidence self is often associated with motivation, more significant learning, and more active involvement in academic activities. When Students believe more in themselves, they tend to take the initiative to learn and are not afraid to face new challenges (Han et al., 2023). Therefore, using AI, students are expected to get the right tools to overcome uncertainty and doubt about their possible selves.

Previous research about the relationship between Student self-confidence, AI support, and achievement academics has shown exciting and relevant psychological motivation and learning results. Stavropoulou and Khansan explained in their research that student self-confidence, or self-confidence, is often assumed to be an important influencing factor in motivation and academic performance (Stavropoulou et al., 2023) (Khanshan & Yousefi, 2020). Wenjuan Guo also mentioned that self-confident students are more motivated to learn, overcome challenges, and achieve better results (Guo et al ., 2023). Studies previously show that self-confidence can increase student involvement in the learning process and help them develop effective learning strategies.

AI technology can give support personalization that helps students understand complex concepts, give bait to come back in real time and adapt learning materials according to individual

needs. Ramazan Yilmaz's research shows that using AI in education can increase motivation for Student learning by providing an environment that is more adaptive and responsive (Yilmaz & Karaoglan Yilmaz, 2023). Additionally, AI can help identify Student weaknesses and provide timely intervention. It can increase academic performance (Fesenmaier & Wöber, 2023). Studies conducted by Yilmaz show that students' self-confidence can reinforced with adequate AI support, which can increase academic performance. For example, students who feel supported by AI technology tend to have higher self-confidence in overcoming academic tasks, positively impacting their performance (Yilmaz & Karaoglan Yilmaz, 2023).

In conclusion, this research provides important insights into how technology-based interventions can facilitate educational attainment through increasing student self-confidence and motivation. This research will also examine how increasing self-confidence supported by AI impacts student academic achievement. Academic achievement can be measured in various ways, such as test scores, assignments, and class participation. With adequate AI support, students can achieve a deeper and more comprehensive understanding of the subject matter, ultimately reflected in their academic performance. Hopefully, this research will provide valuable insights for educators and policymakers about effectively integrating AI technology in education to support students' overall development.

METHODS

Design

The research uses a quantitative approach with survey methods. The research instrument includes a questionnaire that measures self-confidence, the use of AI support in learning, and student academic achievement regarding the psychology of motivation and learning. The data was analyzed using regression techniques to see the relationship between these variables.

Participants

The participants consist of 200 students. There are 80 students from STPK ST. St. John the Apostle Jayapura, 120 students from Thomas Aquinas College of Agriculture, and 20 students from Papua International University. The selection process was carried out using a multistage random sampling technique.

Instruments

Self-confidence, In this research is interpreted as the student's self-confidence as the object of study in their ability to solve problems, face different situations, organize and carry out necessary actions, and confidence in their ability to achieve the desired results. This scale consists of 24 statements, with the test results producing a reliability coefficient 0.756 (Nuraniza, 2022).

Student learning outcomes refer to academic achievement or abilities obtained after learning in context education. This result typically covers knowledge, skills, and attitudes acquired through lectures, assignments, projects, and various academic activities. This scale consists of 24 statements, with the test results producing a reliability coefficient of 0.845.

Support for Students in upgrading learning, optimizing time management, and facilitating the experience of more personalized academics, Adaptive Learning System, Additional Material Recommendations, Improvements in Academic Skills, Essay Analysis and Writing, Automated Transcription and Translation. AI Support for Students scale consists of 15 statements, with the test results producing a reliability coefficient of 0.596.

Psychology motivation and learning learn How motivation influences the learning process, somebody. Motivation is an internal or external force that drives someone to reach an objective,

whereas learning is a process in which a person obtains new knowledge, skills, or attitudes. Psychology motivation and learning are organized into 20 statements, with the test results producing a reliability coefficient of 0.888.

Data Analysis

The normality test checks whether data derived from the population is usually distributed. According to Duli (2019), the guidelines used in this normality test use the Kolmogorov-Smirnov test. The homogeneity test was carried out to test whether the population group variations were homogeneous. The homogeneity test was carried out using the Levene test.

In research, path analysis is used to analyze the pattern of relationships between variables to determine the direct or indirect effect of a set of variables (exogenous) on the dependent variable (endogenous). This study used path analysis to analyze the influence of self-confidence, AI support, academic achievement, and learning motivation.

RESULTS AND DISCUSSION

Results

Normality test

The normality test in this study aims to test the assumption that the sample distribution and the sample mean follow the population normality. The answer is considered normal by detecting the point spread.

Table 1. Summary of Research Variable Normality Test

No.	Variables	Sig.	Alpha	Ket
1	Self-Confidence (X_1)	0.332	0.05	Normal
2	AI Support (X_2)	0.285	0.05	Normal
3	Academic Achievement (X_3)	0.680	0.05	Normal
4	Psychology of Motivation and Learning (Y)	0.325	0.05	Normal

Homogeneity Test

The homogeneity test was carried out to see whether the research data came from the same variance (homogeneous). The homogeneity test aims to test whether a data group has the same variance among group members.

Table 2. Variables Homogeneity Test

No.	Variables	Sig.	Alpha	Ket
1	Self-Confidence (X_1)	0.236	0.05	Homogeneous
2	AI Support (X_2)	0.076	0.05	Homogeneous
3	Academic Achievement (X_3)	0.178	0.05	Homogeneous

Path Analysis

The SPSS program processes further analysis of the results of research-based formulation of the problem and the hypothesis to determine the magnitude of the coefficient of influence of variables exogenous to the endogenous variables, as well as the coefficient of influence of the exogenous variables with exogenous variables against other endogenous variables through path analysis.

Substructure 1

In this study, the first analysis looked at the influence of the students' self-confidence on AI Support in STPK ST. St. John the Apostle Jayapura, Thomas Aquinas College of Agriculture, and Papua

International University. To find out the value of the effect of the Student's self-confidence on AI support can be seen the following Table 3.

Table 3. Result of Sub Structure Path Structure Analysis 1

Variables	Path efficiency	T_{count}	Sig	R^2
Self-Confidence (X_1)	0.365	3.725	0.000	0.134

Substructure II

The student's self-confidence and AI support on academic achievement at STPK ST. St. John the Apostle Jayapura, Thomas Aquinas College of Agriculture, and Papua International University in the following Table 4.

Table 4. Results of Path Structure Analysis II

Variables	Path efficiency	T_{count}	Sig	F_{count}	Sig	R^2
Self-Confidence (X_1)	0.287	3.058	0.003	21.725	0.000	0.323
AI Support (X_2)	0.606	6.476	0.000			

Substructure III

To determine the value of the influence of self-confidence, AI support, and academic achievement on motivation and learning in STPK ST. St. John the Apostle Jayapura, Thomas Aquinas College of Agriculture, and Papua International University from Table 5.

Table 5. Results of Path Structure Analysis III

Variables	Path efficiency	T_{count}	Sig	F_{count}	Sig
Self-Confidence (X_1)	0.327	3.106	0.003	8.916	0.000
AI Support (X_2)	0.090	0.739	0.462		
Academic Achievement (X_3)	0.287	2.535	0.013		

Based on the data processing results, it is known that the path coefficient of 0.090, sig = 0.462 > 0.05, means that the AI support variable does not have a significant effect on students' performance in STPK ST. St. John the Apostle Jayapura, Thomas Aquinas College of Agriculture, and Papua International University, so a trimming test is carried out with the results according to Table 6 below. Based on the formula above, it is known that the contribution of other variables to learning motivation is 87.86%.

Table 6. Result of Path III Structure Analysis After Trimming Test

Variables	Path efficiency	T_{count}	Sig	F_{count}	Sig	R^2
Self-Confidence (X_1)	0.363	3.894	0.000	13.168	0.000	0.228
Academic Achievement (X_2)	0.335	3.589	0.001			

Table 7. Recapitulation of the Effect of Exogenous Variables on Endogenous Variables

No.	Information	%	%
1	Effect of X_1 on X_2	13.30	
2	Effect of X_1 on Y	13.17	
3	Effect of X_1 on X_3	8.20	
4	Effect of X_1 on Y through X_3	3.49	
	The total effect of X_1 on Y		38.16
5	Effect of X_2 on X_3	36.72	
6	Effect of X_2 on Y through X_3	1.83	
7	The total effect of X_2 on Y		38.55
8	The direct effect of X_3 on Y	11.22	
	The total effect of X_3 on Y		11.22
9	The magnitude of the influence of other variables	12.07	12.07
	Total	100	100

The results of the data analysis understudy can be described by the path analysis below.

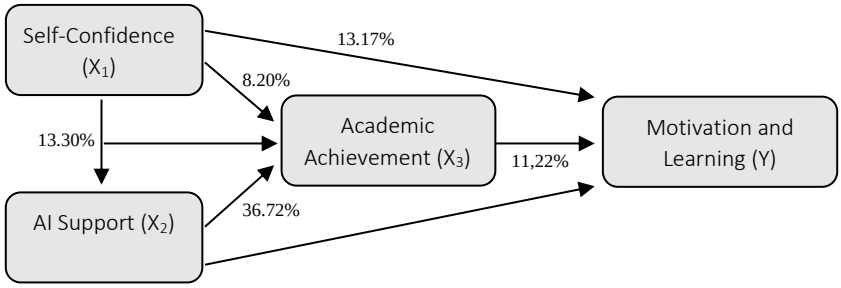

Figure 1. Correlation Percentage of Self-Confidence and AI Support on Academic Achievement Has an Impact on Motivation and Learning

The research results show a significant positive relationship between student self-confidence and academic achievement regarding learning motivation. Additionally, AI support was also found to influence student self-confidence positively. Students frequently use AI-based learning applications show increased self-confidence, improving their academic achievement. These findings indicate that integrating AI into learning can increase student motivation and academic performance.

Discussion

Student self-confidence, artificial intelligence (AI) support, and academic achievement are three critical factors in the psychology of motivation and learning. Students' self-confidence plays a vital role in determining how they face academic challenges. Students with high self-confidence tend to be more courageous in exploring subject matter, participate actively in class discussions, and do not give up easily when faced with difficulties. Conversely, students with low self-confidence may feel doubtful, tend to avoid challenges, and have a higher risk of experiencing academic failure.

AI support in education has become increasingly relevant in recent years. AI technology can provide personalized guidance, fast and precise feedback, and help students identify weaknesses and strengths. Artificial intelligence (AI) technology has brought a revolution in the field of education by providing personalized guidance to each student. Through extensive data analysis and machine learning algorithms, AI can adapt learning materials according to the needs and abilities of each student. This allows for a more effective and efficient learning experience, where students can learn at their own pace and focus on the needed areas.

In addition, AI can provide fast and precise feedback. In traditional learning systems, teachers may need time to assess and provide comments on student assignments. However, with the help of AI, this process can be accelerated significantly. For example, AI software can check an essay or math assignment in seconds, providing relevant corrections and suggestions. This rapid feedback allows students to immediately correct their mistakes and improve their understanding of the material studied.

Not only that, AI technology also helps students identify their weaknesses and strengths. With detailed data analysis, AI can track students' progress and identify patterns in their learning. For example, if a Student consistently experiences difficulty in a particular topic, the AI system can immediately recognize this problem and recommend additional resources or learning strategies. Conversely, if a Student shows excellence in a particular area, AI can direct them to more significant challenges to further their development.

Overall, AI technology offers great potential to improve the quality of education and provide a more personalized and practical learning experience. By leveraging AI capabilities, teachers can focus more on aspects of learning that require human interaction while students get the support they need to reach their full potential.

For example, AI-based learning platforms can analyze students' learning patterns and adapt teaching materials according to individual needs. Apart from that, AI can also help teachers identify students who need special attention and design more effective teaching strategies. With this support, students can feel more confident and motivated to achieve better academic achievements.

Combining student confidence and AI support can create a supportive and motivating learning environment. When students feel supported by adaptive technology and teachers who understand their needs, they are more likely to develop self-confidence. This, in turn, can positively impact their academic performance. Studies in the psychology of motivation and learning show that integrating emotional support and technology can increase students' intrinsic motivation, making them more enthusiastic and committed to achieving their academic goals. Thus, student self-confidence, AI support, and academic achievement are three elements that mutually support and strengthen each other in the educational process.

CONCLUSION

The research concludes that student self-confidence and AI support are essential in improving academic achievement. Implementing AI technology in education not only helps deliver lesson material but also contributes to increasing student self-confidence. Therefore, schools and educational institutions are encouraged to consider using AI technology as part of their learning strategies to maximize students' academic potential.

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AUTHOR CONTRIBUTION STATEMENT

All authors have read and approved the final version of the manuscript.

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