Exploring the Correlation between Students' Attitudes towards AI and Their Learning Outcomes

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ABSTRACT: This research study aims to investigate the intricate connection between students' attitudes toward Artificial Intelligence (AI) and the correlates of their learning outcomes. With the growing integration of AI in various educational settings, understanding how students perceive AI and how these perceptions correlate with their academic performance is of vital importance. This research employs a descriptive and correlational approach, combining surveys and learning outcomes data analysis to delve into the changing aspects of this relationship. By exploring students' attitudes toward AI, their acceptance levels, and their learning outcomes, this study seeks to provide insights that can inform educators, policymakers, and AI developers on optimizing AI's role in education for enhanced student success. Also, the findings indicate a significant relationship between students' attitudes toward AI and their learning outcomes, emphasizing the importance of considering these attitudes in understanding and predicting educational outcomes. One of the key recommendations is that institutions should consider integrating more comprehensive AI education into their curriculum to bridge the gap in actively seeking out information about AI. This proactive approach can contribute to a more informed and adaptive student body, ultimately fostering a positive and constructive environment for AI integration in education.

KEYWORDS: Artificial Intelligence, Attitudes, AI, Learning Outcome

I. INTRODUCTION

Integrating artificial intelligence (AI) into education has become an increasingly prominent topic in academic discourse. AI technologies offer diverse educational applications, from personalized learning support to automated grading systems. Technologies are becoming increasingly complicated and increasingly interconnected. Cars, airplanes, medical devices, financial transactions, and electricity systems all rely on more computer software than they ever have before, making them both harder to understand and, in some cases, harder to control (Wolff, J.2021). However, the extent to which students' attitudes towards AI impact their learning outcomes remains a subject of great interest and relevance. This study seeks to explore the correlation between students' attitudes toward AI and their learning outcomes in the context of Opol Community College. By investigating this relationship, we aim to contribute to a deeper understanding of how AI is perceived and embraced by students, and its potential implications for educational practice and policy.

While there is a growing body of research on AI in education and student attitudes towards technology, a notable research gap exists regarding the specific impact of students' attitudes towards AI on their learning outcomes within a community college setting. Previous studies have often focused on attitudes towards technology in general or have been conducted in different educational contexts. Additionally, while there is a well-established body of research on the broader factors influencing learning outcomes, the specific influence of AI attitudes in this regard remains less explored. The rapidly expanding population of generative AI tools will be important in fields ranging from education and marketing to product design. AI has become centre to many of today's largest and most successful companies, including Alphabet, Apple, Microsoft and Meta, where AI technologies are used to improve operations and outpace competitors (Burns, E.2023).

This research seeks to address this gap by examining the relationship between students' attitudes toward AI and their learning outcomes in the specific context of Opol Community College. By doing so, we can shed light on whether and how students' perceptions of AI technologies affect their educational experiences and achievements.

The theoretical framework for this study draws upon several key educational and psychological theories that are relevant to understanding the relationship between attitudes and learning outcomes.

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1. Social Cognitive Theory: Albert Bandura's Social Cognitive Theory emphasizes the role of personal, behavioral, and environmental factors in learning. In this context, it helps us understand how students' attitudes toward AI, which can be influenced by peers, instructors, and educational environments, may impact their learning outcomes.

2. Self-Determination Theory (SDT): Deci and Ryan's SDT focuses on motivation and autonomy in learning. It provides a lens through which we can examine how students' attitudes towards AI may relate to their intrinsic motivation and autonomy in the learning process, both of which can significantly impact learning outcomes.

II. METHODOLOGY

The research was conducted at Opol Community College. The study was carried out on a total target sample size of 300.

The researchers employed a descriptive and correlational research design because they deemed it a suitable framework to explore the relationship between the variables.

III. RESULTS AND DISCUSSION

Profile of the respondents in terms of sex, age, course, and year level

The respondent population is slightly skewed towards females, with the majority being in the 18 to 20 age group and pursuing BSBA degrees. Additionally, a significant proportion of respondents are in their Second Year of study. These demographic insights provide valuable context for interpreting the survey data and understanding the perspectives of the respondents.

The extent of students' Attitudes Toward AI in terms of knowledge and awareness, perceptions of AI in education, trust and reliability, interest and engagement, and attitudes towards AI in teaching

The provided data unveils a positive landscape regarding students' attitudes toward AI in education across various dimensions. With a mean score of 3.07 and a standard deviation of 0.68, students exhibit a high level of knowledge and awareness about AI, showcasing a solid understanding of its concepts and applications. Additionally, the mean score of 3.09 (SD: 0.67) for perceptions of AI in education reflects a positive outlook, indicating that students view AI as a valuable and beneficial tool in the educational context. Trust and reliability in AI also emerge as strong factors, with a mean score of 3.01 (SD: 0.71), suggesting that students generally trust and find AI to be reliable. Moreover, their high level of interest and engagement with AI, as indicated by a mean score of 3.06 (SD: 0.68), underscores an active curiosity and receptiveness to learning about and interacting with AI. Finally, the mean score of 3.03 (SD: 0.70) for attitudes towards AI in teaching highlights students' overall positive disposition toward AI's role in the educational process. With an average mean score of 3.05 (SD: 0.68) falling within the "High" category, the data collectively signifies a favorable environment for the integration of AI in education, emphasizing the importance of positive attitudes, trust, and engagement for the successful implementation of AI technologies in the educational landscape.

Moreover, Loeckx suggested that AI could be an effective learning tool that lessens the burdens of both teachers and students and offers effective learning experiences for students (J, Loeckx. 2016). In addition, to some extent, students as digital citizens are able to leverage AI to improve learning outcomes. Nonetheless, they may fail to use suitable AI techniques appropriately for a specific learning context, which would result in negative attitudes towards learning (K. Ijaz, et al. 2017).

Table 1. Summary of the extent of students' Attitudes Toward AI

Sub-variables	Mean	SD	Description	Interpretation
Knowledge and Awareness	3.07	0.68	Agree	High
Perceptions of AI in Education	3.09	0.67	Agree	High
Trust and Reliability	3.01	0.71	Agree	High
Interest and Engagement	3.06	0.68	Agree	High
Attitudes Towards AI in Teaching	3.03	0.70	Agree	High
Average	**3.05**	**0.68**	**Agree**	**High**
Legend:1.00-1.75 (Very Low), 1.76-2.50 (Low), 2.51-3.25 (High), 3.26-4.00 (Very High)				

Level of students' learning outcome in terms of knowledge retention, critical thinking, skills development, course completion, and career readiness

Table 2. Summary of the level of students' learning outcome

Sub-variables	Mean	SD	Description	Interpretation
Knowledge Retention	3.06	0.63	Agree	High
Critical Thinking	3.08	0.61	Agree	High

Skills Development	3.11	0.61	Agree	High
Course Completion	3.10	0.64	Agree	High
Career Readiness	3.04	0.67	Agree	High
Average	3.07	0.63	Agree	High
Legend:1.00-1.75 (Very Low), 1.76-2.50 (Low), 2.51-3.25 (High), 3.26-4.00 (Very High)				

The summarized data on students' learning outcomes reflects a consistently high level of achievement across various sub-variables. With a mean score of 3.06 (SD: 0.63) for knowledge retention, students demonstrate a commendable ability to retain and comprehend the information presented in their courses. Critical thinking skills, as indicated by a mean score of 3.08 (SD: 0.61), are also notably strong, emphasizing students' capacity to analyze and evaluate information critically. The mean score of 3.11 (SD: 0.61) for skills development highlights a positive trend in students acquiring and honing practical skills relevant to their academic pursuits. Moreover, the mean score of 3.10 (SD: 0.64) for course completion suggests a high level of commitment and successful progress through their academic programs. Additionally, with a mean score of 3.04 (SD: 0.67) for career readiness, students exhibit a strong foundation for transitioning into professional contexts. The overall average mean score of 3.07 (SD: 0.63) falls within the "Agree" category, emphasizing a consistently high level of students' learning outcomes across knowledge retention, critical thinking, skills development, course completion, and career readiness. This collective positive achievement underscores the effectiveness of the educational approach in fostering comprehensive and impactful learning experiences. More and more innovations and best practices are being applied in the direction of how artificial intelligence can change education such as systems, chatbots, semantic analysis, natural language processing, automatic scoring and feedback, audio games and vision-based robotics, problem-solving (Kahn and Winters, 2017).

Further, there is no doubt that AI is the inevitable future of a lot of industrial sectors but also the future of schools, universities, training centers (Dai and Ke, 2022) bringing them to the fourth education revolution (Seldon and Abidoye, 2018).

However, there's room for improvement in acknowledging AI's contribution to course completion rates. Overall, while students benefit from AI-enhanced education in various aspects, there's potential for further recognition and utilization of AI technologies in maximizing their learning outcomes and career readiness.

Significant mean difference in students' learning outcomes when they are grouped according to profile

The analysis reveals that there is no significant difference in students' learning outcomes when grouped according to profile. This suggests that factors such as sex, age, course, or year level do not have a notable impact on students' academic achievements or performance. This finding implies that regardless of demographic characteristics or academic background, students exhibit similar levels of learning outcomes, indicating a consistent educational experience across different profiles.

The application of artificial intelligence for normal education is still comparatively lacking, despite the fact that the integration of artificial intelligence and education has been extensively studied and practiced in the fields of basic education and higher education, and has made some progress (Liu & Bai, 2020). Artificial intelligence (AI) has brought new ways for improving teaching and learning process. However, there is a dearth of literature reviews that concentrate on the functions, effects, and implications of applying AI in the context of education (Ouyang et al., 2022).

Table 3. Mean difference in students' learning outcomes when they are grouped according to profile

Students' Learning Outcomes			
Profile	T-Value	P-Value	Decision on Ho
Sex	-.195	.845	Not Significant
Age	-.260	.795	Not Significant
Course	3.254	.001	Rejected
Year Level	-.051	.960	Not Significant
Significant if P-value <0.05			
Legend: Ho is rejected if Significant Ho is accepted if Not Significant			

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Significant correlation between students' attitudes towards AI and their learning outcomes

The data analysis indicates a significant relationship between students' attitudes towards AI and their learning outcomes, as evidenced by a Pearson correlation coefficient (r) of .422** with a p-value of .000. Since the p-value is less than 0.05, the null hypothesis, which suggests no significant relationship, is rejected. This implies that there is indeed a meaningful association between students' attitudes towards AI and their learning outcomes. Specifically, students' perceptions, beliefs, or behaviors related to AI correlate with their academic achievements or performance, highlighting the importance of considering attitudes towards AI in understanding and predicting students' educational outcomes.

Table 4. Correlation between students' attitudes towards AI and their learning outcomes

	Learning Outcomes		
	R-Value	P-Value	Decision on Ho
Students' Attitudes Towards AI	.422**	.000	Rejected
Significant if P-value <0.05			
Legend: Ho is rejected if Significant			
Ho is accepted if Not Significant			

CONCLUSIONS

Based on the findings of the study, the conclusions are drawn:

In conclusion, the demographic profile of the respondents indicates a slight skew towards females, with a majority falling within the 18 to 20 age group and pursuing BSBA degrees, with a significant portion in their Second Year of study. These insights provide valuable context for understanding the perspectives of the respondents. Analysis of students' attitudes towards AI reveals a generally positive outlook, although there are areas for improvement in information seeking, trust, and utilization of AI technologies. Despite this, instructional methods, resources, and assessments effectively foster academic and career development, with AI technologies notably aiding knowledge retention, critical thinking, skill development, and course completion. Notably, there is no significant difference in learning outcomes based on demographic profiles, indicating a consistent educational experience. Furthermore, a significant relationship exists between students' attitudes towards AI and their learning outcomes, emphasizing the importance of considering these attitudes in understanding and predicting educational outcomes. Overall, while students benefit from AI-enhanced education, there's room for further recognition and utilization of AI technologies to maximize learning outcomes and career readiness.

RECOMMENDATIONS

Based on the findings and conclusion of the study, the following recommendations are proposed:

1. Institutions should consider integrating more comprehensive AI education into their curriculum to bridge the gap in actively seeking out information about AI.

2. Educators should actively encourage students to explore and experiment with AI-driven study aids and tools.

3. Institutions should explore ways to enhance AI applications to better personalize learning experiences for students.

4. Educators and administrators should recognize and highlight the role of AI technologies in improving students' learning outcomes, including knowledge retention, critical thinking, skill development, and course completion.

5. Further research and evaluation are needed to better understand the impact of AI on education and learning outcomes.

6. Encourage interdisciplinary collaboration between AI experts, educators, and students to foster innovation and creativity in AI applications for education.

Efforts should be made to address students' concerns about the reliability of AI technologies.

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