Analyzing Factors Impacting Intention to Use AI-Powered Tools in the Education Field

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***Abstract*— This study investigates the various elements associated with and the consequences of Information Quality, Social Influences, Facilitating Conditions, Attitude Toward Using, Internet Experience, Self-Efficacy, and Intention to Use AI-powered educational tools. The inevitability of applying artificial intelligence (AI) in the education sector is evident due to the expanding AI market and the proliferation of AI-powered solutions. Numerous artificial intelligence (AI) tools have been integrated into education, shown by the utilization of GitHub Co-pilot and PyTorch, which facilitate the acquisition of coding skills. The research employed a Purposive sampling methodology for data collection and used Smart-PLS for data analysis. The data collection platform will utilize Google Forms, specifically in the Jabodetabek region of Indonesia, from April to July 2023 to ensure that respondents can contribute data remotely. The Structural Equation Modeling (SEM) data analysis employs SMART PLS as its primary analytical tool. The research model of this study comprises a total of nine variables. The variables under consideration encompass Information Quality, Social Influences, Perceived Usefulness, Perceived Ease of Use, Facilitating Condition, Internet Experience, Self-Efficacy, and Intention to Use. There are a total of nine hypotheses, with eight of them yielding significant results while one does not reach statistical significance.**

Keywords—AI-powered, Artificial Intelligence, Education

I. INTRODUCTION

In recent years, the rapid and remarkable advancements in artificial intelligence (AI) technology have ushered in a transformative era, with pervasive applications across diverse disciplines. Among these domains, the field of education stands out as a promising frontier for AI integration. The deployment of AI in education has sparked significant discourse concerning its potential to effectively address enduring challenges within the educational framework [1].

Education systems worldwide grapple with various challenges, including the need to cater to students with diverse learning styles and the improvement of teacher-student interactions. The integration of artificial intelligence holds the promise of substantial transformation by introducing personalized learning experiences tailored to individual needs and preferences. The ability to deliver customized instruction and interventions has the potential to revolutionize education, empowering educators to provide tailored support to students and thereby enhancing their educational outcomes [2].

Furthermore, the imperative to enhance student engagement represents a critical facet of AI's significance in education. The compelling nature of AI-powered tools lies in their dynamic and interactive features, which effectively captivate learners by presenting information in engaging formats and responding to their individual progress. AI-driven educational technologies have the potential to foster a genuine enthusiasm for learning through the facilitation of interactive and engaging learning experiences. This attribute carries significant implications for both academic achievement and the cultivation of lifelong learning.

The effective integration of AI technologies in educational settings hinges on factors that extend beyond their technological capabilities. The success of these innovations relies on the level of acceptance and willingness of individuals to adopt them. The phenomenon of technology adoption, often referred to as "intention to use," plays a pivotal role in determining the seamless integration of AI-powered technologies within educational environments. A comprehensive understanding of the various factors influencing user inclinations to utilize these technologies is crucial for guiding their design, development, and deployment.

The present research, titled "An Investigation into the Determinants of Intention to Utilize AI-Powered Tools," delves into the intricate interplay of several factors influencing individuals' intentions to adopt and utilize artificial intelligence in education. Participation in this endeavor substantially contributes to the burgeoning body of scholarly research on technology integration in the educational sphere. The study is grounded in an adapted Technology Acceptance Model (TAM) framework, meticulously tailored to accommodate the unique context of AI integration in education.

This study aims to yield valuable insights into the cognitive and environmental factors shaping people's desire to employ AI for educational purposes. By examining these dimensions, the research illuminates the drivers behind individuals' intentions to adopt this technology. The application of a customized Technology Acceptance Model (TAM) framework, specifically designed for Artificial Intelligence (AI) in education, is anticipated to offer a comprehensive understanding of the challenges and opportunities associated with the integration of technological innovations in pedagogical methods.

The implications of the study's findings are far-reaching and pertinent to various stakeholders, including scholars and researchers seeking to enhance their comprehension of technology integration in education. Additionally, educational practitioners and policymakers tasked with formulating effective strategies for implementing AI-driven educational technologies can derive actionable insights from this research. Ultimately, this study aims to provide guidance that facilitates the judicious and efficient incorporation of AI-powered technologies in educational

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settings, thus enhancing educational outcomes and learner experiences in light of technology's ongoing transformation of educational landscapes.

II. Literature Review

A. What is AI

Artificial intelligence (AI) refers to the computational replication of cognitive processes shown by human intelligence. This classification comprises various cognitive processes, including but not limited to learning, reasoning, problem-solving, perception, linguistic understanding, and decision-making. AI technologies aim to enhance the performance of tasks that have traditionally depended on human cognitive capacities. This will augment the machines' capacity to interpret data, adapt to unfamiliar situations, and enhance overall efficiency over time [3].

B. Information Quality

Based on the information presented in reference [4], the concept of "Information Quality" pertains to the extent to which the created information possesses the fundamental attributes of content, correctness, and format deemed necessary by the user. Within the framework of this study, the concept of "Information Quality" pertains to the accuracy and validity of the material or information produced by artificial intelligence (AI) technologies following the requirements and expectations of users. Furthermore, it pertains to the significance and comprehensiveness of the content or information disseminated using AI techniques.

C. Social Influences

Based on the citation presented in reference [5], the term "Social Influence" pertains to the degree to which a person considers prominent individuals as backing the adoption of a novel technique. According to [10], Multiple studies have shown that Social Influences do have influences on technology acceptance. This article introduces a theoretical framework that defines social influence as the degree to which an individual perceives that their significant peers endorse using AI tools in their educational endeavors for advantageous outcomes.

D. Perceived Ease of Use

As outlined in reference [6], perceived ease of use pertains to an individual's assessment of the degree of simplicity linked with adopting a particular technology. People tend to engage with various tools and assets when they perceive that doing so will amplify their productivity. Despite recognizing the potential value of specific tools or technologies, individuals might also entertain the notion that employing such resources could be demanding, prompting them to ponder whether the exertion needed is justified compared to the advantages gained from their utilization [6].

E. Perceived Usefulness

According to the source cited as [6], the degree to which a person believes that the introduction of a particular system would lead to an improvement in the way that they conduct their job duties. The Technology Acceptance Model (TAM) emphasizes the concept of "perceived usefulness," which highlights the critical role that user perceptions play in adopting specific technologies.

F. Facilitating Conditions

According to the information provided by the source [7], Facilitating Conditions are recognized as factors that make it simpler to participate in a particular activity. The author of the scholarly essay explores the potential role that conducive conditions might play in providing support for PC users.

In the context of this research study, the idea of a Facilitating Condition involves various aspects, such as providing help when confronted with difficulties involving hardware and software. These aspects include hardware, technical abilities, software, and the provision of assistance.

G. Internet Experience

According to [10], Multiple Studies have shown that Internet Experience has a significant relationship with technology acceptance.

The term "Internet Experience" is used in this study to refer to both the actual process of utilizing the Internet and the subjective experience associated with such utilization. The introduction of online experience into the Technology Acceptance Model (TAM) framework highlights the significance of technology-specific characteristics, such as perceived usefulness and simplicity of use, in influencing users' evaluations of technology.

H. Self-Efficacy

As stated by the source referenced [8], Self-Efficacy refers to individuals' perceptions of their capacity to achieve desired outcomes by their efforts. The development of self-efficacy occurs as individuals integrate into society. The phenomenon under consideration is subject to the influence of five key components: performance experiences, vicarious experiences, imagination, verbal persuasion, and physiological and emotional aspects.

Based on the findings of a study referenced as [8], it has been established that within the realm of education, students who possess elevated levels of academic self-efficacy exhibit a stronger propensity for setting goals, place a higher value on academic accomplishments, allocate double the amount of time to studying, attain superior grades, and express heightened levels of attention and control during the completion of homework tasks.

I. Intention to Use

Intention to use pertains to an individual's inclination or proposed course of action in adopting novel technology. Based on the Technology Acceptance Model (TAM), individuals who perceive technology as helpful and easy to use are more inclined to develop favorable intentions regarding its adoption. These intents, in turn, have a significant predictive power in determining the level of user engagement and utilization of the technology [6].

III. Methods

A. Model Building

Within this research's parameters are five discrete and autonomous variables. The variables being examined in this study encompass Self-efficacy (SE), Internet Experience (IE), Information Quality (IQ), Perceived Ease of Use (PEOU), Facilitating Condition, and Social Influence (SI). There are two mediator factors that can be identified, specifically Attitude Toward Using (ATU) and Perceived

Usefulness (PU). The ultimate variable under investigation in this research is the dependent variable, namely the Intention to Use AI Tools (ITU).

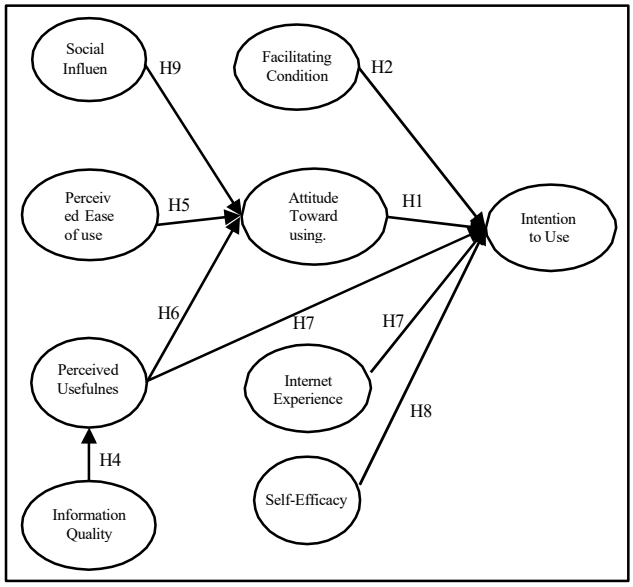

Fig.1. Research Model

B. Hypothesis Model.

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C. Data Sources

The primary data source utilized in this study was derived from a singular origin. The primary source of information utilized was a questionnaire in the form of a Google form. The information was distributed throughout Indonesia using several digital platforms and interpersonal communication. In order to participate in the poll, respondents must possess the Intention of utilizing AI-powered solutions within the education sector.

Hypothesis testing uses quantitative methodologies that involve analyzing data collected from respondents. The analysis in this study was conducted using data from 188 out of the initial 183 participants. Five participants explicitly said they did not intend to use AI-powered education solutions. The present study employed the methodology of purposive sampling. The data was gathered from April to July 2023 in chronological order. The predominant proportion of participants originates from Jabodetabek, Indonesia, encompassing Jakarta, Bogor, Depok, Tangerang, and Bekasi urban areas. The remaining participants are distributed across several regions of Indonesia. Jabodetabek is comprised of settlements that are contiguous with Jakarta. The towns mentioned above are situated on the outskirts of Jakarta.

D. Analysis Design and Hypothesis

The information was collected using a method known as judgment sampling, which involved administering a survey to a sample that had been purposefully chosen. The indications used for each variable in the methodology are spelled out in unmistakable detail in the questions. The researchers utilized the software program Smart PLS version 3.0 to conduct the statistical analysis for this investigation. The technique used was called Partial Least Squares Structural Equation Modeling (PLS-SEM). PLS (Partial Least Squares) and bootstrapping values were the primary things that were sought after in the course of this research.

This study examines a comprehensive set of nine variables, namely Social Influences (SI), Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Information Quality (IQ), Facilitating Condition (FC), Attitude Toward Using (ATU), Internet Experience (IE), Self-Efficacy (SE), and Intention to Use (ITU) as shown in Fig. 1. Table 1 thoroughly compiles variables, including queries, indicator codes, and references for each variable indication derived from different research investigations.

Hypothesis:

- Hypothesis 1: The construct referred to as Attitude Toward Using (ATU) significantly influences the phenomenon commonly referred to as Intention To Use (ITU).
- Hypothesis 2: The variable referred to as Facilitating Conditions (FC) significantly influences the variable commonly referred to as Intention to Use (ITU).
- Hypothesis 3: The Internet Experience (IE) variable exerts a notable influence on respondents' Intention to Use (ITU) scores.
- Hypothesis 4 argues that the variable known as Information Quality (IQ) substantially impacts the measure known as Perceived Usefulness (PU).
- Hypothesis 5 posits that the variable referred to as Perceived Ease of Use (PEOU) exerts a significant influence on Attitude Toward Using (ATU).
- Hypothesis 6 posits that the characteristic of Perceived Usefulness (PU) exerts a significant influence on individuals' Attitudes Toward Using (ATU).
- Hypothesis 7: The construct referred to as "Perceived Usefulness" (PU) exerts a substantial influence on "Intention to Use," sometimes denoted as "ITU."
- Hypothesis 8: A noteworthy correlation exists between the variable of Self-Efficacy (SE) and the variable of Intention to Use (ITU).
- Hypothesis 9: The variable of Attitude Toward Using (ATU) is found to be strongly impacted by the strong influence of the Social Influence (SI) variable.

TABLE I. VARIABLE AND INDICATORS IN MODEL BUILDING

Indicator	Label	Ref
Information Quality.		
Information Generated by AI / Chatbot is accurate	IQ1	[4], [9]
AI / Chatbot can help me understand better the content I'm learning	IQ2	[4], [9]
Content generated by AI / Chatbot is consistent with what I want	IQ3	[4], [9]
AI / Chatbot able to give details on the given topic	IQ4	[4], [9]
Social Influences		
My lecturers/teacher will think I should use AI / Chatbot to assist in my education.	SI1	[10]
My colleagues/friends will think I should use AI / Chatbot to assist my education.	SI2	[10]
My school/college has supported using AI / Chatbots to assist my education.	SI3	[10]
Perceived Ease of Use		
I find that AI / Chatbot is easy to use	PEOU1	[11]–[13]
I find that using AI / Chatbot to do what I want to is easy.	PEOU2	[11]–[13]
I find that my interaction with AI / Chatbot does not require much effort.	PEOU3	[11]–[13]
I would find that the AI / Chatbot system is flexible to interact with.	PEOU4	[11]–[13]
Perceived Usefulness		
I find that using AI / Chatbot helps me learn more efficiently	PU1	[10], [14]
I find that using AI / Chatbot improves my academic performance.	PU2	[10], [14]
I find that AI / Chatbot gives me more control over my learning	PU3	[10], [14]
I find that using AI / Chatbot to learn is helpful	PU4	[10], [14]
Facilitating Condition.		
I have the resources necessary to use AI / Chatbot.	FC1	[13]
I have the necessary understanding to effectively utilize artificial intelligence/chatbot technologies.	FC2	[13]
When I encounter difficulties in using AI / Chatbots, a specific person is available to provide assistance.	FC3	[13]
When I encounter difficulties in using AI / Chatbots. I know where to seek assistance.	FC4	[13]
Attitude Toward Using		
Once I started to use AI / Chatbot to help my education, I found it hard to stop.	ATU1	[11], [15]
Using AI / Chatbot to help with my education is a wise choice.	ATU2	[11], [15]
Studying with the help of AI / Chatbot is fun.	ATU3	[11], [15]
I like studying with the help of AI / Chatbot	ATU4	[11], [11]
Internet Experience		
What is the frequency of your internet usage?	IE1	[9], [10]
What is the duration of your internet usage per session?	IE2	[9], [10]
I can use the Internet effectively.	IE3	[9], [10]
Self-Efficacy		
I can operate AI / Chatbot without a problem	SE1	[15]
I am confident in my computer skills.	SE2	[15]
I am confident that I can use AI / Chatbot even if I have no experience using it.	SE3	[15]
Even if no one can teach me how to use AI / Chatbot, I will continue to use it.	SE4	[15]
Intention to Use		
I think AI / Chatbot is worth Using.	ITU1	[15]
I intend to Use AI / Chatbot in the future	ITU2	[10], [15]
I would recommend my friend/family to use AI / Chatbot as studying assistance.	ITU3	[15]
I plan to use AI / Chatbot more frequently to help me study.	ITU4	[15]

IV. DISCUSSION

A. *Measurement Model: Validity and Reliability.*

The use of statistical analysis using SmartPLS 3 has led to the identification of a comprehensive set of thirty-three reliable indicators. It has been demonstrated that there exists an external loading with a value below 0.7 as shown in Fig. 2.

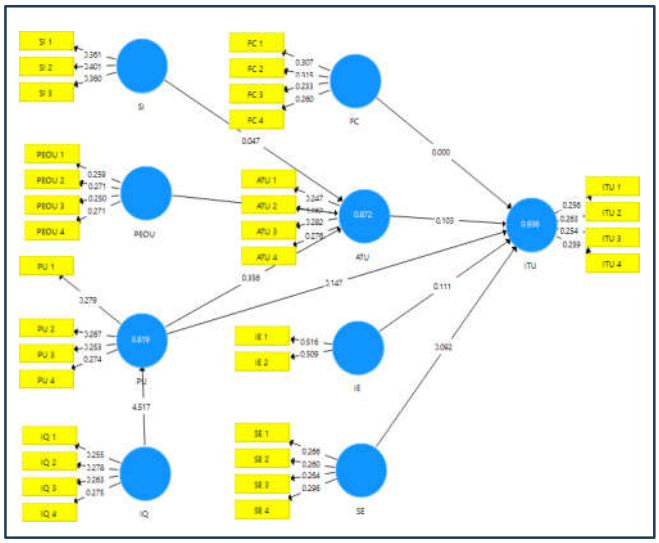

Fig. 2. Model Path Coefficient Output

TABLE II. VARIABLE/INDICATORS VALIDITY AND RELIABILITY

NO	Variables/Indicators	Cross Loading	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
1	**ATU**		0.953	0.966	0.877
2	**ATU 1**	0.906			
3	**ATU 2**	0.929			
4	**ATU 3**	0.950			
5	**ATU 4**	0.960			
6	**FC**		0.916	0.940	0.798
7	**FC 1**	0.919			
8	**FC 2**	0.928			
9	**FC 3**	0.845			
10	**FC 4**	0.878			
11	**IE**		0.948	0.975	0.951
12	**IE 1**	0.975			
13	**IE 2**	0.975			
14	**IQ**		0.951	0.964	0.871
15	**IQ 1**	0.913			
16	**IQ 2**	0.943			
17	**IQ 3**	0.926			
18	**IQ 4**	0.951			
19	**ITU**		0.978	0.984	0.938
20	**ITU 1**	0.958			
21	**ITU 2**	0.979			

NO	Variables/Indicators	Cross Loading	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
22	**ITU 3**	0.964			
23	**ITU 4**	0.973			
24	**PEOU**		0.965	0.974	0.904
25	**PEOU 1**	0.948			
26	**PEOU 2**	0.955			
27	**PEOU 3**	0.942			
28	**PEOU 4**	0.958			
29	**PU**		0.949	0.964	0.869
30	**PU 1**	0.946			
31	**PU 2**	0.932			
32	**PU 3**	0.906			
33	**PU 4**	0.943			
34	**SE**		0.941	0.957	0.849
35	**SE 1**	0.929			
36	**SE 2**	0.910			
37	**SE 3**	0.911			
38	**SE 4**	0.934			
39	**SI**		0.871	0.920	0.794
40	**SI 1**	0.901			
41	**SI 2**	0.882			
42	**SI 3**	0.890			

Table 2 presents the Composite Reliability (CR) values ranging from 0.92 to 0.984. In conclusion, it can be stated that all indicators exhibit a high level of reliability. The Cronbach's Alpha scores exhibit high levels, ranging from 0.871 to 0.978. This further demonstrates the reliability of all the indicators and variables as shown in Fig. 3. The Average Variance Extracted (AVE) values observed in this study range from 0.794 to 0.951, indicating the indicators' validity. The obtained results indicate that the data utilized for the model possess validity and reliability, rendering them suitable for research purposes. Based on the analysis mentioned above, it can be concluded that all variables, indicators, and questions exhibit validity and reliability.

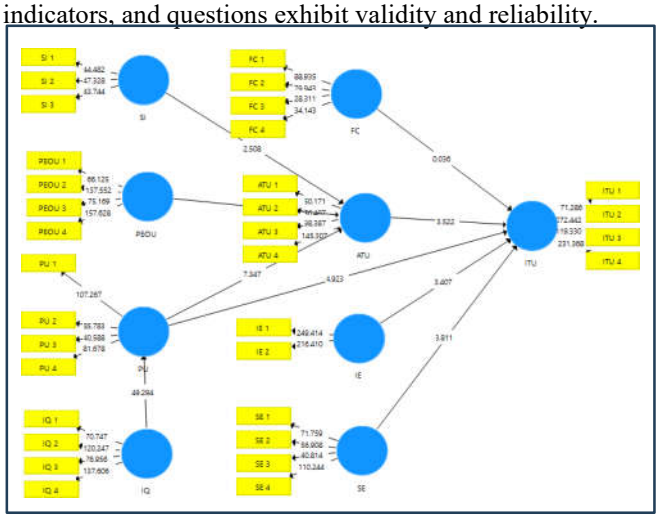

Fig. 3. Model Bootstrapping

TABLE III. PATH COEFFICIENT

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
ATU -> ITU	0.240	0.245	0.068	3.522	0.000
FC -> ITU	0.002	0.007	0.059	0.036	0.972
IE -> ITU	0.231	0.231	0.068	3.407	0.001
IQ -> PU	0.905	0.907	0.018	49.294	0.000
PEOU -> ATU	0.257	0.261	0.069	3.709	0.000
PU -> ATU	0.591	0.584	0.080	7.347	0.000
PU -> ITU	0.321	0.315	0.065	4.923	0.000
SE -> ITU	0.210	0.207	0.055	3.811	0.000
SI -> ATU	0.124	0.129	0.049	2.508	0.012

B. Influence of Variables towards Another

Based on the findings of this investigation, it can be inferred that there is a notable correlation between eight out of nine variables and the subject of interest. Based on the data provided in Table 3, it can be observed that the P-value for most of the hypotheses, precisely eight out of nine, falls below the predetermined threshold of 0.05. This outcome suggests that there is statistical significance associated with these hypotheses. The obtained t-statistic of 5.542 indicates a statistically significant association between the variable assessing attitude towards usage and Intention to use.

The t-statistics value of 3.407 indicates that Internet Experience substantially influences Intention to Use. Based on the findings of reference [10], it can be inferred that students with extensive internet usage experience, prolonged online engagement, and frequent utilization of internet resources are more inclined to embrace e-learning. The findings of the hypothesis testing conducted in research [10] regarding the relationship between Internet Experience and Intention to Use are consistent with the results of the hypothesis testing conducted in this study.

The t-statistic of 49.294 indicates a significant relationship between information quality and perceived utility. Based on the research findings outlined in this paper, individuals must integrate artificial intelligence AI-enabled tools into their educational resources, provided that these tools possess the capability to generate information that is both accessible and pertinent to the given context while maintaining a high level of accuracy. In a scenario where the efficiency of job completion relies on the information generated by a system, the significance of information quality is emphasized, as stated by [4].

The statistical analysis results demonstrate a significant impact on the association between self-efficacy and Intention to use, as evidenced by a t-statistic value of 3.811. The authors listed [15] have undertaken research that establishes the significance of self-efficacy in forming an individual's Intention to utilize a specific entity or system. The probability of users engaging with a system exhibits a positive correlation with their level of motivation, rendering this specific factor essential. The findings derived from the empirical inquiry in this research endeavor, which sought to

investigate the presented hypothesis concerning the correlation between self-efficacy and Intention to use, are consistent with the results documented in a prior study [15].

This discovery offers additional substantiation for the notion that individuals see their colleagues and friends as having the ability to influence their adoption and utilization of mobile learning [13]. The impact of social influence on attitudes about usage demonstrated a statistically significant effect, as evidenced by a t-statistic value of 2.508.

Based on the findings of this study, it can be concluded that there is no significant impact of Facilitating Condition on Intention to Use, as indicated by a t-statistics value of 0.036. However, as indicated by references [10] and [13], a significant causal association exists between the two variables, which contradicts the findings of this particular study.

V. Conclusion.

According to the results of this study, the utilization of AI-enabled solutions in the field of education demonstrates a high level of user-friendliness and confers substantial advantages. An analysis of the questionnaire data reveals that the majority of respondents, specifically 149 individuals (79%), identified themselves as students. In contrast, only a small proportion of respondents, precisely four individuals (2.68%), do not express an intention to employ AI-powered solutions in education. As a result, a significant portion of students exhibit a pronounced interest in utilizing artificial intelligence (AI) as an educational tool. The research findings ascertain the positive impact of AI-powered tools. The education sector is poised to benefit from the implementation of AI-powered technology, specifically tailored to individuals seeking innovative learning experiences. This is attributed to recent technological advancements and enhancements in artificial intelligence, giving rise to a new educational paradigm.

The findings suggest that the implementation of AI-powered platforms in underdeveloped nations is a viable prospect, contingent upon the availability of necessary supporting infrastructures and Internet accessibility among the populace. The adoption of this initiative is expected to contribute to advancements in the nation's education sector, enhancing both the quality of education delivered and the effectiveness of students' learning experiences. Nevertheless, the results also indicate a lack of statistical significance in the association with Facilitating Condition, which may be attributed to respondents' limited familiarity with the concept.

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