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Artificial Intelligence Driven Learning for Sustainable Education: An Empirical Investigation of Learners' Perceived AI Presences in Vocational Higher Education

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Abstract - The integration of Artificial Intelligence (AI) with technology-enhanced learning platforms has the potential to improve education and presents a transformative approach to addressing educational challenges. Despite its beneficial impacts on education, concerns about students' AI literacy have prompted empirical investigations on the perceived AI presences in connection with its usage, benefits, and related risks in classroom instructional practices. This study examined higher vocational students' perceptions and attitudes on artificial intelligence-driven learning based on survey results. The respondents were 372 undergraduate students in one of higher vocational institutions in Indonesia. The data was collected through questionnaire survey distributed through students' class WhatsApp group. The questionnaire consisted of two main sections including demographic information and integrated constructs from the Unified Theory of Acceptance and Use of Technology (UTAUT). The data were analyzed using Statistical Package for the Social Sciences (SPSS). The results show that the means scores for each item in the dataset exceeded 3 indicating positive attitudes towards AI usage and effectiveness in academic settings, they mostly agree that AI tools were beneficial in enhancing their academic performance and engagement in their daily college life. This empirical investigation hopefully offers insights for educators, policymakers, and institutions to make informed decision regarding the integration of AI in the instructional practices.

Keywords: Artificial Intelligence in Education, Learner Perception, Vocational Higher Education

1 Introduction

The proliferation of development in technology has had a tremendous impact on education leading to significant changes in how teachers teach and how students learn. Technology advancement also creates opportunities to alter traditional methods of teaching and learning to become more innovative, interactive, and engaging [1]. In addition, the emergence of digital technologies—such as virtual and augmented reality, artificial intelligence, and mobile applications-- has equipped educators with a diverse array of tools and resources to enrich learning experiences and increase student participation

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[2]. With the help of these modern technologies, students can now receive personalized instruction that is tailored to their individual needs and progress at their own speed.

One of the fastest-developing digital technologies in recent years is Artificial Intelligence (AI). Studies have reported a significant increase in the use of AI in the field of education over the past few years [1], [3], and this AI inception has radically altered the classroom instructional practices [4]. As stated by [5] , the education sector is currently taking proactive steps to explore both the opportunities and challenges presented by technology—especially artificial intelligence—with the aim of enhancing the quality of teaching and learning. This shift aligns with [4] concept of the fourth industrial revolution (IR 4.0) in education. One popular area of AI that is now gaining more and more attention is generative AI, such as ChatGPT. Due to its potential benefits, generative AI is expected to play a pivotal role in shaping the future of sustainable education [4].

As confirmed by [6], AI has the potential to enhance accessible quality education, enrich personalized learning experiences, and support-data driven decision-making. In case for students, AI facilitates personalized learning experiences in accordance with their distinctive learning styles and choices. For teachers, AI can provide information based on large data to recognize students' performance, emotions, and engagement levels in that teachers enable to design their teaching methods and to assist students' learning. By promoting sustainability, AI By promoting sustainability, AI will likely help education in developing the competencies needed by present and future generations for their social and environmental engagement [7].

Research regarding AI for sustainable education has been conducted worldwide. As for example, [6] review some papers related to the role of artificial intelligence in Intelligence Tutoring Systems (ITS) to support sustainable education. This literature review research aims to reveals diverse viewpoints from educational scholars and information technology experts to link up education and AI technology. Acknowledging these different views, the researchers would be able to expose the full potential of AI in managing sustainable education system. Other recent research on the area of AI was conducted by [8]. This study attempts to examine how digital learning might be improved by AI and to investigate problems and opportunities of AI applications in education management systems. Research concerning teachers and students' acceptance and attitude on the use of AI in educational setting has also been prevalent (e.g., [9, 4, 10, 11, 3, 12, 13, 14, 1]. This present study attempts to enrich the literature of AI by providing information on Indonesian vocational higher education students' perceptions on AI in their college learning.

2 Materials and methods

2.1 Literature Review

2.1.1 AI integration in education

The fact that AI has the potential to revolutionize education has been well-acknowledged in recent years. Due to AI, the conventional teaching practices has been transformed into more modern ones to provide students with worth learning experiences, accessible learning resources, and personalized learning opportunities.

The integration of AI in education dates back since the earliest development of AI which includes Intelligent Tutoring Systems (ITS) [15]. This application allows students to have personalized feedback and instruction, as well as to cater their specific learning styles. The following generation of AI is Educational Data Mining (EDM) and Learning Analytics. These applications can analyze large datasets to identify patterns and trends in student performance, which can be instrumental in enhancing the quality of teaching and learning processes.

In recent years, advancements in artificial intelligence have been characterized by the development of machine learning algorithms that play a significant role in the expansion of AI applications in education. An example of an educational platform leveraging machine learning is Smart Sparrow, which allows students to personalize both the content and the difficulty level of their learning activities.

AI in education has continued to advance, with the emergence of chatbots and virtual assistants enabling interactive support and guidance for students through the integration of natural language processing and machine learning. Among these tools, ChatGPT has gained substantial popularity. Initially introduced in 2022, ChatGPT has attracted significant attention from educators and has been increasingly incorporated into teaching practices [11].

The latest advancement of AI technology is natural language processing and speech recognition. These AI technologies have led to the development of conversational agents and virtual tutors enabling students to speak with them and get feedback in natural language and get personalized support in their learning.

2.1.2 The potentials of AI in education

The emergence of AI signifies a paradigm shift in education sector by way of changing approaches of teaching from traditional to AI based online method. AI tools have been pervasively used in higher education institutions around the globe [10]. These AI tools function as academic support including among others for personalized learning and guidance, timely assistance, AI chatbots and virtual advisors.

The availability of AI tools allows students to get instant solutions to their academic queries and enhances their engagement in learning Furthermore, AI is being used in higher education for purposes other than simple automation. Intelligent tutoring systems, for example, work as personalized tutors, offering flexible practice and real-time coaching across a range of courses. With the use of these AI-powered platforms, students may track their progress and improve their study techniques through continuous assessment and instantaneous feedback. This can cultivate students' critical thinking, problem-solving, and metacognition.

ChatGPT has gained prominence in education to be integrated into academic research and writing. This AI tool is potential to help students to accomplish tasks such as for citations and assignments. In addition to ChatGPT, there are other similar AI platforms which can be used for academic research such as Research Rabbit, scite.ai, and ReadCube Papers. These tools have the ability to generate citations and organize research materials. In terms of writing, Grammarly and Quillbot are useful for identifying errors and paraphrasing in language. The error identifications include grammar, sentence structure, capitalization, punctuation, and abbreviation. Grammarly and Quillbot AI are categorized as Natural Language Processing (NLP).

2.2 Research Methodology

2.2.1 Data collection method

This research was undertaken in a public vocational higher education located in Banjarmasin, South Kalimantan. All students ranging from first year to fourth year level were involved. There were 372 students voluntarily participated in this survey study. An online questionnaire was distributed to students through their class WhatsApp groups. The questionnaire employed a 5-point Likert scale (1= strongly disagree, 5=strongly agree) to find out demographic information and AI tool adoption and contained statements intended to explore students' perceptions on the integration of AI in their class learning activities. The research results hopefully could contribute, enrich, and provide insights on the role of AI for achieving sustainable education.

2.2.2 Measurement instrument

The questionnaire used in this study consisted of two sections. The first section was about demographic information including gender, age, education level, field of study, semester, and students' familiarity with AI and usage. The second part consisted of some constructs generated from the Unified Theory of Acceptance and Use of Technology (UTAUT) developed by [10] This model was adopted due to its clear guidance on the constructions of questionnaire items. The constructs include performance expectancy, facilitating conditions, students' engagement, assessment effectiveness, students' interaction, information accuracy, personal innovations, pedagogical fit, behavioral intention, use, students' satisfaction, enhancement of students' academic performance, and risk of AI use. Adopting these constructs will provide comprehensive data to understand students' perceptions on AI.

2.2.3 Data analysis

Tabel 1. Pearson correlation coefficient results.

Variabel	PE1	PE2	PE3	FC1	FC2	FC3	FC4	SE1	SE2	SE3	AE1	AE2	AE3	SI1	SI2	SI3	SI4	IA1	IA2	IA3	IA4
Pearson Correlation	.691**	.700**	.715**	.640**	.706**	.714**	.698**	.728**	.700**	.771**	.769**	.670**	.585**	.709**	.646**	.743**	.643**	.765**	.801**	.790**	.799**
Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Variabel	**PI1**	**PI2**	**PI3**	**PF1**	**PF2**	**PF3**	**ATUB1**	**ATUB 2**	**ATUB 3**	**ATUB 4**	**SS1**	**SS2**	**SS3**	**ISAP 1**	**ISAP 2**	**ISAP 3**	**ISAP 4**	**RP1**	**RP2**	**RP3**	
Pearson Correlation	.695**	.443**	.716**	.828**	.832**	.778**	.766**	.782**	.777**	.731**	.712**	.762**	.803**	.801**	.818**	.800**	.786**	.262**	.244**	.411**	
Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	

The analysis of the collected data was conducted by the Statistical Package for the Social Sciences (SPSS). The analysis was in in the form of descriptive statistics in which each construct was elaborated by the means and the standard deviations scores. The validity and the reliability were also conducted to test the items in the dataset.

3 Results and discussion

3.1 Measuring validity and reliability of research instrument

Prior to data analysis, the questionnaire items for each construct were tested to examine its validity dan reliability. To measure the reliability, the Pearson correlation coefficients was utilized (Table 1). Overall, the results indicate that the Pearson correlation values across most of the variables are significantly high, suggesting that the items in each construct are valid and appropriately measure the intended concepts.

Table 2. Reliability statistics

Cronbach's Alpha	*N* of Items
.973	42

In terms of reliability test results, as shown in the Table 2, indicates that the reliability of the items was in the excellent level as the Cronbach's Alpha value reached 0.973. This value was significantly above the generally accepted threshold of 0.7. The result also shows that the correlations among items

in the dataset were relatively high indicating that respondents' answers to different questions tended to be similar or related, which was an indication of good reliability. Given the high reliability score, the results derived from these 42 items could be considered reliable for further analysis, as they consistently measure the constructs.

3.2 Demographic data analysis

The overall information of demographic data shown in Table 3 presents overview regarding the characteristics of students participated in the research comprising of gender, age, level of education, field of study, semester, and students' familiarity with some AI tools. The total number of respondents was 372 dominated by male students of 54,3%, while females made up 45,7%. In terms of the age group, most participants fell within 16-21 years category, accounting for 98,7%, followed by 22-27 years group at 1,9%. Looking at the educational qualification, the majority of respondents was at diploma level, constituting 85,5%, and at applied bachelor degree with only 14,8%. Regarding the field of study, most participants studied at Electrical Engineering with 38,2%, closely followed by Accounting Department at 23,1%. The other participants were at Civil Engineering, Business Administration, and Mechanical Engineering, accounting for 16,4%, 14,4%, and 8,3% respectively. When it comes to semester, the largest proportion of respondents was in the first semester category making up 81,1%, followed by third semester category with 13%, and by the fifth semester category with 5,7%. There was only small fraction of participants in the second semester with 0,5%, and no participants from the fourth, sixth, seventh, and eighth category. In the case of familiarity with AI, several respondents claimed that they were familiar with ChatGPT, constituting 79,5% and Canva, accounting for 72,7%. Interestingly, most respondents also familiar with Google Gemini at 32,7%, while Mendeley with 10,6%. The other AI tools took up smaller percentage than those mentioned previously with 7,6% for Quillbot, 3,5 % for Tutor AI, 1,6% for Elsa Speak, 1,4% for Otter AI, and 0,6% for Stepwise Math.

Table 3. Demographic information of the respondents

Variable	Characteristics	Frequency	Percent
Gender	Male	202	54,3
	Female	170	45,7
Age	16-21years	366	98,7
	22-27 years	7	1,9
Educational qualification	Diploma	318	85,5
	Applied Bachelor	55	14,8
Field of study	Civil Engineering	61	16,4
	Mechanical Engineering	31	8,3
	Electrical Engineering	142	38,2
	Accounting	86	23,1
	Administration Business	53	14,2
Semester	First	300	81,1
	Second	2	0,5
	Third	48	13
	Fourth	0	0
	Fifth	21	5,7
	Sixth	0	0
	Seventh	0	0
	Eight	0	0
Which artificial intelligent tools are you familiar with?	ChatGPT	294	79,5
	Canva	269	72,7

Variable	Characteristics	Frequency	Percent
	Grammarly	57	15,4
	Quillbot	28	7,6
	Google Gemini	121	32,7
	Otter AI	5	1,4
	Tutor AI	13	3,5
	Elsa Speak	6	1,6
	Stepwise Math	3	0,6
	Mendeley	40	10,8

3.3 Descriptive analysis

Table 4 presents information regarding the construct variables, the construct coding, and the descriptive statistics consisting of mean (M) and standard deviation (SD) value for each item within the dataset of 372 respondents. As can be seen from Table 4, the average means for items in the constructs were above 3 indicating respondents' favorable perceptions toward the use of AI and AI effectiveness in their academic settings. Notably, one of items in the construct regarding risk of AI usage exhibited mean score below 3 on a-5-point scale, suggesting an unfavorable attitude toward the idea of the flaw of AI in preventing them from peer interactions. Each of the construct from the dataset will be further elaborated in the following section. The explanation merely covers the interpretation of mean and standard deviation values for each construct in the dataset.

Table 4. Descriptive statistics of item dataset

Construct	Coding	Items	Mean (M)	Standard Deviation (SD)
Performance Expectancy	PE1	AI tools are useful for my college life	3.9191	0.92060
	PE2	AI tools help me do my college assignments more quickly	3.8679	0.87384
	PE3	AI tools enhance my academic productivity and help me solve my academic problems	3.8676	0.87808
Facilitating Conditions	FC1	It is easy to learn AI tools	3.7886	0.91413
	FC2	Interacting and communicating with AI tools is very clear and easy to understand	3.6199	0.90257
	FC3	It is easy for me become skillful at using AI tools to solve my academic problems	3.6038	0.92525
	FC4	It is easy to get the information that I need using AI tools	3.9160	0.89138
Students' Engagement	SE1	AI tools encourage me to get engaged in learning	3.4205	0.91593
	SE2	AI tools enhance my learning experiences in collaboration with my peers	3.3852	0.94315
	SE3	AI tools improve my participation and interaction in class	3.5366	0.89345
Assessment Effectiveness	AE1	AI tools facilitate the effectiveness of assessment in learning	3.4838	0.95764
	AE2	Using AI tools provides more accurate and reliable assessment results	3.1707	0.97836
	AE3	Using AI tools allows me to get my test results at the same time	3.1784	0.96865
Students' Interaction	SI1	I do not mind to always update myself with AI tools in the future	3.7398	0.91340

Construct	Coding	Items	Mean (M)	Standard Deviation (SD)
	SI2	I do not mind spending my time to learn AI tools to find out the benefits that AI tools have	3.8973	0.86186
	SI3	I feel happy getting information from AI	3.8676	0.86565
	SI4	I feel free to ask questions using AI tools	3.8922	0.90597
Information Accuracy	IA1	AI tools allow me to have accurate and reliable information for my learning purposes	3.4270	0.90845
	IA2	AI tools are powerful to provide an up-to-date and relevant content for my learning	3.5256	0.86447
	IA3	I trust AI tools to provide me with knowledge and information	3.5216	0.92001
	IA4	AI tools AI tools allow me to have accurate and reliable information for my academic purposes	3.3940	0.90392
Personal Information	PI1	I like to explore new information technologies including AI tools	3.7642	0.87614
	P12	Compared with my family/friends, I am more enthusiastic with new information technologies like AI tools	3.3892	1.12854
	P13	AI tools make me think creatively in my learning activities	3.5625	0.91693
Pedagogical Fit	PF1	AI tools fit well with my learning strategies and approaches	3.5121	0.85534
	PF2	The integration of AI tools supports my learning style	3.4797	0.85672
	PF3	AI tools align well with diverse learning contexts and research approaches	3.5514	0.85147
AI Tool Use and Behavior Interaction	ATUB1	I find AI tools beneficial in providing me with learning materials as for example lectures and assignments	3.6522	0.89728
	ATUB2	I find AI tools assist me create content relevant for my learning purposes	3.4715	0.89678
	ATUB3	I will use AI tools to help me solve my problems in my academic query	3.5432	0.90438
	ATUB4	I will use AI tools often, and suggest others to use AI for academic matters	3.2865	0.96782
Student Satisfaction	SS1	Using AI tools give positive impacts on my interactions and engagements in class	3.3703	0.95178
	SS2	I feel satisfied with the outcomes of AI tools for my academic query	3.5162	0.90826
	SS3	I feel satisfied using AI tools for my learning tools	3.6226	0.86863
	ISAP1	Using AI tools improve my academic knowledge	3.6531	0.86540
Improve Students' Academic Performance	ISAP2	Using AI tools improve my academic performance and creativity	3.4528	0.90333
	ISAP3	Using AI tools improve my learning experience	3.6811	0.89317
	ISAP4	Using AI tools have a positive impact on my overall learning effectiveness	3.4959	0.88503

Construct	Coding	Items	Mean (M)	Standard Deviation (SD)
Risk of AI Use	RAU1	I find AI tools limit my interactions and socialization with peers while completing tasks in learning	2.9137	1.16159
	RAU2	I find AI tools hinder my ability to have analytical problem-solving skills and thinking	3.3019	1.12007
	RAU3	I feel I become over-reliant on AI tools in my learning	3.0108	1.11103

3.3.1 Performance expectancy (PE)

Performance Expectancy (PE) is concerned with the effectiveness and potentials of AI tools in assisting students to get better performance and achieve their learning goals. Positive performance expectations occur when students have strong belief that AI tools will improve their academic performance. As shown in Table 4, the mean values for the three items of PE range from 3.8676 to 3.9191. This indicates that students perceived AI tools to be useful and beneficial for improving their performance in learning in terms of completing assignments, improving productivity, and solving academic problems. The mean values are categorized as high reflecting a positive a positive overall perception of AI tools in academic life. In terms of standard deviation, the values range from 0.87384 to 0.92060, showing moderate variability in responses. While most students find AI tools useful, there are slight differences in how strongly they perceive the benefits, especially in terms of speed and productivity.

3.3.2 Facilitating condition (FC)

Facilitating Condition (FC) is related to the availability of resources and support to use AI tools effectively. As can be seen that the mean values for the four items in FC range from 3.6038 to 3.9160, showing that that students generally find AI tools easy to use and effective in providing the information they need. However, there is a slight variation in the ease of learning and interacting with AI tools, with some students finding it more straightforward than others. The standard deviation values range from 0.89138 to 0.92525, reflecting moderate variability in responses. This suggests that while many students find AI tools easy to use, some experience more challenges, especially in becoming skillful at using the tools to solve academic problems.

3.3.3 Students' engagement (SE)

Students Engagement (SE) captures how engaged students feel when using AI in their academic learning process. The mean values for the three items range from 3.3852 to 3.5366, indicating that students perceive AI tools as moderately helpful in increasing engagement, collaboration with peers, and participation in class. The means show that while students feel some positive impact, the effect of AI tools on engagement is not as strong as other constructs. The standard deviation values range from 0.89345 to 0.94315, reflecting moderate variability in responses. This suggests differing levels of engagement, with some students finding AI tools significantly enhancing their learning involvement, while others experience less impact.

3.3.4 Assessment Effectiveness (AE)

The Assessment Effectiveness (AE) is concerned with how AI tools improve the performance of assessment by in which the feedbacks and insights are timely given. The mean values for the three

items in AE construct range from 3.1707 to 3.4838, indicating that students have a moderate perception of the effectiveness of AI tools in enhancing assessment in learning. The highest mean (3.4838) suggests that students believe AI tools can improve assessment effectiveness, while the lower means reflect some skepticism regarding their accuracy, reliability, and timeliness of test results. The standard deviation values range from 0.95764 to 0.97836, showing a higher level of variability in responses. This suggests significant differences in student opinions regarding the effectiveness of AI tools for accurate assessments and timely feedback.

3.3.5 Students' interaction (SI)

The mean values for the four items range from 3.7398 to 3.8973, showing that students generally have a positive attitude toward interacting with AI tools. They are open to updating themselves with AI in the future, learning about its benefits, and feel comfortable engaging with AI for information and questions. The standard deviation values range from 0.86186 to 0.91340, indicating moderate variability in responses. While many students feel positively about interacting with AI, there is some variation, with a few students being less enthusiastic or comfortable.

3.3.6 Information accuracy (IA)

Information Accuracy (IA) evaluates students' perception of the correctness, reliability, and precision of the information provided by AI tools. The mean values for the four items range from 3.3940 to 3.5256, indicating that students generally perceive AI tools as moderately accurate and reliable in providing information for both learning and academic purposes. However, the means are slightly lower compared to other constructs, suggesting that students have some reservations about the accuracy and reliability of AI-generated information. The standard deviation values range from 0.86447 to 0.92001, showing moderate variability in responses. This indicates that while many students trust AI tools for providing up-to-date and relevant content, there are noticeable differences in how strongly they rely on AI for accurate and reliable information.

3.3.7 Personal innovation (PI)

Personal Innovation (PI) reflects the willingness of students to try out new technologies, specifically AI, in their academic routines. The mean values for the three items range from 3.3892 to 3.7642, indicating that students have a generally positive attitude toward exploring new information technologies, including AI tools. However, the enthusiasm compared to family and friends shows a more moderate perception. The standard deviation values range from 0.87614 to 1.12854, reflecting considerable variability in responses. The higher standard deviation for the item about enthusiasm compared to family and friends suggests that students have differing levels of enthusiasm for new technologies, with some being much more enthusiastic than others.

3.3.8 Pedagogical fit (PF)

Pedagogical Fit (PF) refers to how well AI tools align with existing teaching methods and curriculum goals. The mean values for the three items range from 3.4797 to 3.5514, suggesting that students generally perceive AI tools as fitting well with their learning strategies, approaches, and styles. The scores indicate a moderate level of alignment between AI tools and students' educational needs. The standard deviation values range from 0.85147 to 0.85672, indicating low to moderate variability in responses. This suggests a relatively consistent agreement among students regarding the fit of AI tools with their learning contexts and research approaches.

3.3.9 AI tool use and behavioural intention (ATUB)

AI Tool Use (ATUB) captures the extent to which students actually use AI tools in their academic activities and examines students' willingness to use AI tools in the future. The mean values for the four items range from 3.2865 to 3.6522, indicating that students generally find AI tools beneficial for providing learning materials and assisting in content creation. However, the lowest mean of 3.2865 reflects a more cautious approach toward recommending AI tools for academic matters, suggesting that while students see value in AI, their willingness to advocate for its use may vary. The standard deviation values range from 0.89678 to 0.96782, showing moderate variability in responses. This suggests that while many students appreciate the benefits of AI tools, there is a notable diversity in their experiences and attitudes toward using and recommending these tools for academic purposes.

3.3.10 Students' satisfaction (SS)

Students' Satisfaction (SS) measures the overall satisfaction students derive from using AI tools in their learning process. The mean values for the three items range from 3.3703 to 3.6226, indicating that students have a generally positive view of their satisfaction with AI tools. While they feel satisfied using AI tools for learning, the lower mean of 3.3703 suggests some reservations regarding the impact of AI on interactions and engagement in class. The standard deviation values range from 0.86863 to 0.95178, reflecting moderate variability in responses. This suggests that while many students are satisfied with AI tools, there are varying degrees of satisfaction, particularly concerning their impact on class interactions.

3.3.11 Improving students' academic performance (ISAP)

The concept of improving students' academic performance through the use of AI tools focuses on how technological advancements, specifically artificial intelligence, can enhance various aspects of students' learning processes and outcomes. The mean values for the four items range from 3.4528 to 3.6811, indicating that students generally agree that AI tools have a positive impact on improving their academic performance, learning experiences, and creativity. The average perception leans toward positive but not strongly so. The standard deviation values range from 0.86540 to 0.90333, reflecting moderate variability. This suggests that while many students have a positive experience, there is some variation in how strongly they feel about the impact of AI tools on their academic performance and learning.

3.3.12 Risk of AI use (RAU)

The Risk of AI Tools for Students refers to the potential negative consequences or drawbacks associated with the use of artificial intelligence technologies in educational settings. The mean values for the three items range from 2.9137 to 3.3019. The lower mean of 2.9137 suggests that students feel AI tools may somewhat limit their social interactions while working on tasks. The higher mean of 3.3019 indicates a moderate concern that AI tools could hinder analytical problem-solving and critical thinking skills. Overall, these scores reflect a mixed perception regarding the risks associated with AI tool use. The standard deviation values range from 1.11103 to 1.16159, indicating high variability in responses. This suggests that students have diverse opinions on the risks of using AI tools, with some expressing significant concerns about over-reliance and its impact on their learning abilities.

4 Conclusion

This study examined the use of AI tools in one of vocational higher educations in Indonesia. The specific purpose of this research was to observe students' perceptions regarding the integration of AI tools to support and enhance their academic performance. This study sought to offer an overview and valuable insights that would be beneficial for policy makers and educators to take informed-decision regarding the policies and strategies to be applied to improve the quality of higher education in the AI era. This research used descriptive statistics analysis in which the data was analysed by using SPSS to determine the mean and standard deviation values. An online questionnaire was utilized as the research instrument. There were two sections in the questionnaire comprising of students' demographic information and constructs along with items adopted from the Unified Theory of Acceptance and Use of Technology (UTAUT). The results indicated that students generally perceived the use of AI tools positively and expressed their agreement on the benefits of AI tools in their academic settings. Despite presenting insightful information, this study has limitations to be acknowledged. Firstly, the research instrument in this study was not piloted in advance. It is suggested to conduct a pilot test for the research tool to assess the reliability and validity of the questionnaire prior distribution to the targeted respondents. Secondly, a path analysis should be conducted to examine the relationship between variables to make the results of this research robust. The last one, the sample size is small and might not represent the diverse characteristics of students in higher vocational education in Indonesia.

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