Unlocking the Future of Learning: Assessing Students' Awareness and Usage of AI Tools

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***Abstract*—Artificial Intelligence (AI) is a potential solution to some of the biggest challenges in the field of education, but it can be a double-edged sword as it can also pose negative impacts to the learning process of students. This study aimed to determine the students' level of awareness and extent of usage of AI tools. Cochrane's formula was used to determine the sample size and the respondents were selected through random sampling technique. Data was collected from 193 educationstudents studying science and/or math through an online survey via Google Forms. Mixed-methods research design was employed in this study. A researcher-made survey questionnaire that underwent through reliability and validity tests was used to gather the needed quantitative data, followed by qualitative data acquisition through interviews. Results revealed that the students are slightly aware of the AI-powered learning tools and frequently use these technologies in accomplishing their schoolwork. The level of awareness is dependent on the gadgets that the students use. Moreover, the findings also showed that there is a direct relationship between the student's level of awareness and extent of usage. Despite the possible negative impacts of AI on the students' education, formulation of policies or guidelines on how the university can monitor the learners' outputs to maintain quality education is recommended.**

***Keywords*—artificial intelligence, extent of usage, level of awareness**

I. Introduction

Artificial Intelligence (AI) is a branch of computer science that seeks to create intelligent agents capable of learning, reasoning, problem-solving, and decision-making, mimicking human cognitive abilities. Over the past few decades, AI has evolved rapidly, with significant advancements in machine learning, natural language processing, computer vision, and robotics. These developments have paved the way for AI's integration into various domains, including education. In the sphere of education, AI has become a powerful force that catalyzes innovation and transforms conventional teaching and learning approaches [1].

The education sector has long been characterized by its reliance on traditional pedagogical models, limited personalization, and constrained scalability. AI, with its capacity for data-driven decision-making and adaptive learning, offers a compelling solution to these challenges. As a cutting-edge technology, it has shown great potential to enhance the effectiveness and efficiency of educational processes such as monitoring, assessment and evaluation, feedback, and instructional materials generation. Its integration in education is standing as a pivotal development providing opportunities for personalized learning [2], enhanced student engagement [3], and improved educational outcomes [4]. These technological advancements have transformed schooling—from imparting knowledge to collaboration, production of information, mentorship, and evaluation [3]. In essence, Artificial Intelligence in Education (AIEd) is poised to make education more inclusive and equitable.

In addition, the apparent limitless capability of AI has made it one of the foremost technologies in the teaching-learning process. It has made life easier for students by supporting students' growth outside of the classroom [3]. The most frequent inquiries from students can be quickly addressed through support automation and conversational intelligence which helps students identify solutions more quickly to save time. Due to round-the-clock learning opportunities provided by AI-powered devices, students can learn without having to wait for a teacher [5]. Artificial intelligence provides customized learning opportunities that allow students to personalize their educational journeys. Furthermore, AI could adjust to the learners' knowledge, pacing, and goals to maximize learning [6].

The use of AIEd has escalated since the pandemic [7] due to the adoption of distance learning in educational institutions including Quirino State University. The implementation of online and blended learning in the university necessitated learning activities that also required the use of Information and Communications Technology (ICT) materials and tools. This period of learning has made students rely on web-based educational resources and explore newly developed apps that can help them finish their learning tasks easily, thus making AIEd an integral part of their learning. However, the possible overuse and misuse of AIEd in the educational landscape may also pose risks to the quality of education and may hinder learning outcomes. Our students' usage of these technologies may make them reliant and lazy, which may subsequently decrease their thinking power and creativity since the apps can do the task for them. At the same time if students' outputs are AI-generated, we—their teachers, cannot truly gauge their level of understanding, which makes assessment not reflective of their performance. Based on our observation, our college students are undeniably techy as evidenced by the outputs that they submit, and possibly they are also exposed to these apps. Therefore, it is imperative to ascertain the student's level of awareness and utilization of AI-powered applications for us—educators, to strategize and address this issue effectively.

This study aimed to investigate the students' level of awareness and extent of usage of AI tools in education specifically, it aims to:

1) Determine the AI tools that the students are aware of and use;
2) Determine the level of awareness and extent of use of AI tools;
3) Evaluate whether there is a significant difference in the level of awareness and extent of use of AI tools when grouped by profile;
4) Evaluate whether there is a significant relationship between the level of awareness and extent of use of AI tools;
5) Evaluate the significance of the regression model in determining the linear relationship between the level of awareness (independent variable) and extent of use (dependent variable) of AI tools.

II. Literature Review

A. Background of AI

AI is a rapidly advancing technology designed to imitate human cognitive abilities, enabling them to handle complex and ill-defined problems in an intentional, intelligent, and adaptive manner [8]. It aims to develop computational approaches to intelligent behavior, covering various aspects of human cognitive activity [9, 10]. It is the human-like intelligence exhibited by machines, enabling them to mimic human capabilities such as decision-making, problem-solving, and language processing. It collects, processes, and learns from data to perform automated tasks and optimize decision-making [11]. In the past few years, AI has had a significant impact in many areas, enhancing human life and improving performance in manufacturing, service systems, and expert systems [12]. AI is ubiquitous and has applications in various industries, including health, security, education, music, art, and business [13].

B. AI in Education

The introduction of AI has the potential to revolutionize teaching and learning by offering varied tasks, from personalized instruction to evaluation, to improve teaching and learning [14–16]. Teachers and AI are collaborating to enhance education. To improve learning effectiveness and give students a more meaningful learning experience, AI can help teachers create innovative instructional and educational strategies, use immersive technology, and personalize learning experiences for each student [17].

AI technologies can save teachers' time by simplifying teaching activities and automating administrative tasks, thus freeing educators to focus on curriculum development and instruction [18–20]. In addition, the use of AI can be an avenue to automate essential activities, change traditional teaching methodologies [21], predict learners' needs, and generate necessary information for evaluation and improvement [20]. With these possible uses and advantages of AI education, educators are still uncertain about effectively harnessing AI's pedagogical advantages on a larger scale and its potential impact on teaching and learning [22].

According to Sanabria-Navarro *et al*. [23], teachers play a fundamental role in adapting their methodologies to leverage new technologies. In relation, Flogie and Krabonja [24] argue that teachers need knowledge and tools to assess the appropriateness of AI-supported activities in achieving their goals and enabling teaching transformation. In this venture, teachers are challenged with vague and unclear guidelines, a lack of understanding of AI and its limitations, and emotional responses related to preconceptions [25].

C. Challenges and Ethical Implications of AI

AI-supported digital services are increasingly prevalent in schools. However, there are concerns regarding the loss of human decision-making, laziness, privacy issues [26], lack of trust, cost, and potential bias associated with AI in education. The challenges include the need for careful consideration of ethical concerns, integration into current educational systems, and the potential lack of human interaction in classrooms due to automation processes enabled by AI [27]. Ethical implications arise from the potential risks of AI-generated content, such as plagiarism, loss of critical thinking skills, and reduced creativity in academic writing [28]. Additionally, there is a need to promote awareness among students and researchers regarding the ethical implications of using AI in academic writing [29]. The ethical considerations of AI in education include autonomy, privacy, trust, and responsibility [30]. It is important to address these concerns by strengthening plagiarism detection methods, promoting ethical AI usage, incorporating AI into the educational curriculum, and developing guidelines and regulations surrounding the use of AI in academic settings.

The integration of AI in education presents challenges and ethical implications. Biased algorithms used in admission or grading processes can have devastating effects on students [31]. The displacement of human educators by AI systems raises concerns about transparency and accountability [32]. Privacy and security issues arise from the use of big data in education, algorithm recommendation, and the "digital divide" exacerbating educational inequity [33]. Protecting student data privacy is crucial, and ethical risks related to AI technology must be addressed [34]. The launch of ChatGPT has brought attention to legal and ethical implications in education, highlighting the need to understand its capabilities and potential issues [35].

III. Research Methodology

The study employed a mixed-methods research design to investigate students' level of awareness and the extent of usage of AI tools by education students. A correlation research approach was adopted, using descriptive statistics and regression analysis, followed by an interview using an unstructured questionnaire.

A. Respondents and Sampling Procedures

The respondents of this study were students taking up Mathematics and Science courses enrolled in the Bachelor in Elementary Education (BEEd), Bachelor in Secondary Education (BSEd), and Bachelor in Technological and Livelihood Education (BTLEd) programs under the College of Teacher Education of Quirino State University-Diffun during the first semester of school year 2023–2024. This study utilized the stratified random sampling method with a total number of 193.

B. Instrument

The study utilized a researcher-made survey questionnaire which underwent reliability and validity testing. The instrument has four parts: Part I contains the demographic profile of the respondents; Part II contains the different AI applications; Parts III and IV consist of 15 statements on the level of Awareness of AI tools and the extent of usage of AI tools, respectively. Pilot testing was done followed by a test of reliability and internal consistency with Cronbach's alpha value of 0.951.

C. Data Gathering Procedures

To assess awareness and usage of AI tools, researchers conducted an online survey using Google Forms with consent from the respondents and approval from the college dean. The survey was composed of 30 questions that may last for 10–20 min. The interview was done to gather qualitative data from the respondents using an unstructured questionnaire.

D. Statistical Analyses

The gathered data were analyzed using the following statistical tools: frequency count, percentage, mean, standard deviation, *t*-test, Analysis of Variance (ANOVA), Pearson *r* correlation, and simple linear regression analysis.

IV. Results and Discussion

The respondents of this study were freshmen, sophomore, and junior students enrolled in the three programs (Bachelor in Secondary Education, Bachelor of Elementary Education, and Bachelor of Technology and Livelihood Education) under the College of Teacher Education who were studying Mathematics and Science courses/classes as part of their curriculum.

Table 1 shows the profile of the respondents. It can be gleaned from the table that the majority of the respondents are BEEd (87, 45.1%) female (157, 81.3%) students enrolled in Mathematics (91, 47.2%), who have mobile phones (160, 82.9%) and use mobile data (115, 59.6%) for internet connectivity, and live in urban areas (110, 57.0%).

Table 1. Profile of respondents

Profile	Particulars	Frequency	Percent (%)
Program	BEED	87	45.1
	BTLED	21	10.9
	BSED	85	44.0
Sex	Female	157	81.3
	Male	36	18.7
Enrolled courses	Mathematics	91	47.2
	Science	54	28.0
	Both Mathematics and Science	48	24.9
Gadgets	Mobile phone	160	82.9
	Laptop	33	17.1
Internet source	Wi-fi	78	40.4
	Mobile data	115	59.6
Area of residence	Rural	67	34.7
	Urban	110	57.0
	Sub-urban	16	8.3

A. The AI Tools that the Students Are Aware of and Use

Fig. 1 shows the AI tools which the students are aware of. Out of the 21 AI tools listed, 18 of them are known by the students. Cava (127/193, 65.8%), Quillbot (89/193, 46.1%), ChatGPT (74/193, 38.3%), Grammarly (55/193, 28.5%) and Photomath (53/193, 27.5%), respectively, are the top 5 most known AI tools to students. Conversely, students are not aware of DeepL Translator, Perplexity, and Yippity. When asked which additional AI tools they use in addition to those cited above, the students mentioned Google Assistant, Jenni AI, the Lightroom app, Ask AI, AI chat, AI Summarizer, Gauthmath, Bard AI, Midjourney, Remini, Al Gala, School Hack, Koalachat, and Question AI. With those stated apps, it only means that the respondents know various AI support tools. In our society where access to information is just one click away, AI can be introduced to students in a variety of ways. Usually, students discover AI tools via social media, news media, from other students, or work [36]. Every day, many students are engaged for hours in various popular technologies such as Facebook and MySpace [37]. Their exposure to these technologies can channel them towards knowing other applications.

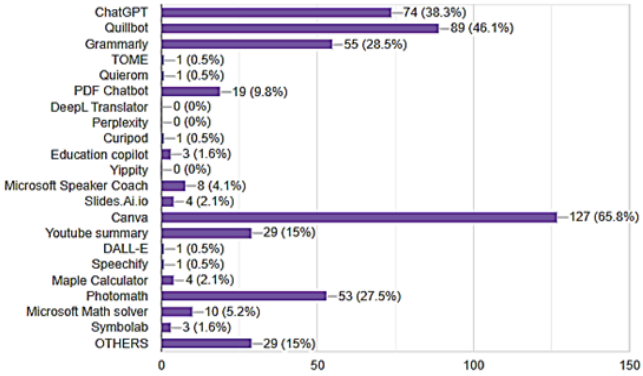

Fig. 1. AI tools that students are aware of.

Grammarly and Quillbot are text editing and proofreading tools that can help students paraphrase and improve their writing. ChatGPT is a chatbot that provides detailed responses to a wide range of topics, making it a valuable resource for research and learning. Canva assists students in preparing more detailed presentations, and Photomath is a tool that helps students solve math problems of any complexity. Students' awareness of these AI tools can be of great help in enhancing the learning experience, improving academic performance, and saving time [2, 38]. With regards to the AI tools that the students use, the students seem to utilize diverse applications.

Fig. 2 shows the AI tools that students use. As shown, all of the listed tools are utilized by the students. Canva (127/193, 65.8%), Quillbot (84/193, 43.5%), ChatGPT (60/193, 31.1%), Grammarly (54/193, 28%) and Photomath (45/193, 23.3%) being the most used AI tools. In contrast, Tome, Quierom, Perplexity, Curipod, Yippity, DALL-E, Speechify, and Mapple calculator are the least used tools. When the respondents were asked about other tools they use for schoolwork, they mentioned AI writer, Question AI, Nova AI, AI Camera, AI chat, Jenni AI, Ask AI, Summarizer, Gauthmath, Bard.ai, Midjourney, Remini, Al Gala, School Hack, Koalachat, Google Assistant. This result means that students operate various AI tools in their education. It is noteworthy that the top 5 most utilized AI tools are the tools that students are most aware of (refer to Fig. 2). This suggests that their understanding of how to use these technologies in their academic work may motivate them to do so as well. This

might be due to their user-friendly interfaces and their ability to address specific needs. These tools have gained traction due to their practical applications.

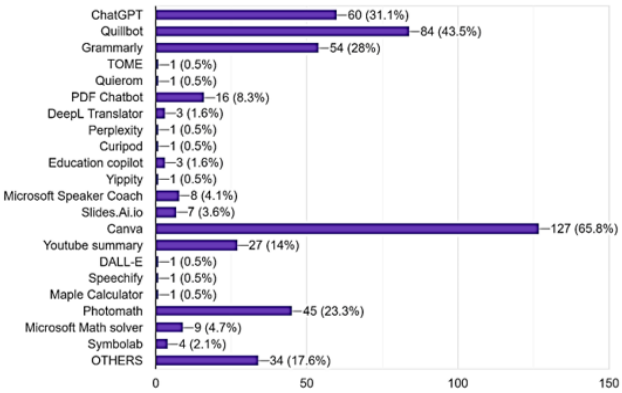

Fig. 2. AI tools that students use.

The Gen Z students have been called generative AI's "super users" since they use the technology frequently and are confident that they are on their way to mastering it [39]. A survey showed that 50% of the undergraduate and graduate students use AI to partially finish their school works. Though they are using technology, these students are amenable that using AI tools to complete assignments and exams is considered as cheating or plagiarism [40].

B. The Level of Awareness and Extent of Use of AI Tools

Table 2 presents the mean level of awareness of the students on the available AI tools. Based on the table, the respondents perceive that they are slightly aware of all of the stated use of the AI tools. Also, their mean level of awareness is reflective of being *slightly aware* of the use of AI tools, which suggests that they are conscious and have knowledge of the utilization of these tools in their learning activities. Moreover, presenting a detailed solution for mathematical problems, solving mathematical problems, anticipating possible questions from the teachers, reviewing my lessons, and analyzing scientific and mathematical problems, are among the most affirmed with a slight awareness of the students. This result means that the respondents are moderately familiar with how they can utilize and later on benefit from these tools, especially in accomplishing their projects, assignments, and other school work. Notably, the respondents of this study belong to Gen Z who was born in a technologically-driven society, and thus often called the "digital natives" who are exposed to and show dependency on the technologies around them.

Table 2. Mean level of awareness of the respondents on the use of AI tools

Statements: I am aware that I can use AI tools to ……	**Mean**	**Description**
1. take down notes	1.92	Slightly aware
2. make presentations	1.87	Slightly aware
3. summarize lessons/notes	1.96	Slightly aware
4. make essays	1.92	Slightly aware
5. rephrase essays	1.96	Slightly aware
6. solve mathematical problems	2.12	Slightly aware
7. write grammatically correct sentences/paragraphs	1.81	Slightly aware
8. analyze scientific and mathematical problems	2.02	Slightly aware
9. create a detailed illustration of something	2.09	Slightly aware
10. present detailed solutions for mathematical problems	2.17	Slightly aware
11. review my lessons	2.04	Slightly aware
12. gain a deeper understanding of the lessons	1.90	Slightly aware
13. anticipate possible questions from the teachers	2.10	Slightly aware
14. improve my presentation skills	1.93	Slightly aware
15. translate from one language to another	1.76	Slightly aware
Grand Mean	**1.97**	**Slightly aware**

Note: 3.25–4.00: Extremely aware; 2.50–3.24: Moderately aware; 1.75–2.49: Slightly aware; 1.00–1.74: Not aware at all.

In similar studies conducted, engineering students in Kazakhstan [41] and pharmacy students in Saudi Arabia [42] showed a good level of awareness of AI. These students acknowledge its importance in their education and have positive perceptions about the concepts, benefits, and implementation of AI. Likewise, the study of Khadse [43] revealed that management students in India have a medium overall awareness of the AI apps that can be used in management subjects.

Presented in Table 3 is the extent of use of the respondents on the AI tools. As shown, the respondents use the AI tools 3–6 times a week, with a mean of 5 times a week, to accomplish their school work. These tools are mostly used by the students to present detailed solutions for mathematical problems, solve mathematical problems, take down notes, create detailed illustrations of something, and anticipate possible questions from the teachers. This result is reflective of the students' frequent usage which may possibly lead to their reliance and dependency on these AI tools. Although AI is known to enhance quality of life, reliance on it may slowly and gradually limit and take over human decision-making. AI may encourage laziness, reduced creativity and critical thinking, and diminished memory [44, 45].

On the other hand, findings revealed that students are positive about the potential benefits of AI in their education including personalized learning, writing, and brainstorming assistance, improved research and analysis capabilities, and enhanced productivity [46, 47]. With these benefits, students have expressed their willingness to incorporate AI in several of their educational activities. On the side of the teachers, despite recognizing the potential benefits of AI, they expressed alarming concerns about overreliance and ethical and pedagogical implications, emphasizing the need for appropriate standards and policies to ensure responsible use of the technology [48, 49].

Table 3. Mean extent of use on the AI tools

Statements: I use AI tools to……	Mean (times per week)
1. take down notes	5.31
2. make presentations	4.53
3. summarize lessons/notes	4.97
4. make essays	5.14
5. rephrase essays	5.13
6. solve mathematical problems	5.34
7. write grammatically correct sentences/paragraphs	4.48
8. analyze problems	5.11
9. create a detailed illustration of something	5.26
10. present detailed solutions for mathematical problems	5.66
11. review lessons	4.90
12. gain a deeper understanding of the lessons	4.44
13. anticipate possible questions from the teachers	5.26
14. improve my presentation skills	4.48
15. translate from one language to another	3.76
Grand Mean	**4.92**

C. The Significant Difference in Level of Awareness and Extent of Use of AI Tools when Grouped by Profile

Presented in Table 4 is the t-test and ANOVA on the level of awareness of AI tools of the students when grouped according to their profile. As shown, H_0 or the null hypothesis which states that there is no significant difference in the level of awareness of students when grouped by their profile, was rejected. This means that there is a significant difference (p = 0.002) in the level of awareness of students when grouped according to the gadget they use. The result suggests that the gadgets owned by the students affect their level of awareness of these tools. Smartphones are prevalent in any home and are a common gadget that students possess because it is handy, accessible, and cheaper as compared to laptops. With smartphones, they can easily browse the net to access information, with ease, anytime and anywhere as long as they have an internet connection. A study showed that 95% of Gen Z students own a smartphone while 83% of them own a laptop [50].

Other socio-demographic factors employed in the study such as program of study, enrolled course, sex, internet source, and area of residence do not affect students' level of awareness as indicated by the $p > 0.05$. The result of our study is similar to the findings that there is no significant difference between the levels of awareness of AI tools used by management students across sexes [43]. Contrastingly, the discipline of study of the students may affect their level of awareness ($p < 0.05$) on AI. Students taking Science courses may know and hear more about AI than students from the Medical and Health, Business and Law, and Arts and Humanities [36].

Table 4. T-test and ANOVA on the level of awareness of the students to ai tools when grouped according to their profile

Profile	Particulars	Mean	SD	t/F	*p*-value	Decision
Program	BEED	1.97	0.58	0.401	0.670	Failed to reject H_0
	BTLED	2.07	0.51			
	BSED	1.95	0.51			
Enrolled courses	Mathematics	1.95	0.50	2.154	0.119	Failed to reject H_0
	Science	1.89	0.53			
	Both Mathematics and Science	2.10	0.63			
Enrolled courses Sex	Female	1.98	0.54	0.642	0.524	Failed to reject H_0
	Male	1.91	0.58			
Gadgets	Mobile phone	2.03	0.54	3.206	0.002	**Reject H_0**
	Laptop	1.70	0.50			
Internet source	Wi-fi	1.92	0.53	–1.062	0.298	Failed to reject H_0
	Mobile data	2.01	0.55			
Area of residence	Rural	1.94	0.51	0.183	0.833	Failed to reject H_0
	Urban	1.99	0.57			
	Sub-urban	1.94	0.48			

Table 5. T-test and ANOVA on the extent of use to ai tools of the students' when grouped according to their profile

Profile	Particulars	Mean	SD	t/F	*p*-value	Decision
Program	BEED	4.64	2.23	1.479	0.230	Failed to reject H_0
	BTLED	5.01	2.25			
	BSED	5.18	1.85			
Enrolled courses	Mathematics	4.73	2.07	1.583	0.208	Failed to reject H_0
	Science	4.84	2.17			
	Both Mathematics and Science	5.37	1.96			
Sex	Female	4.95	2.07	0.457	0.648	Failed to reject H_0
	Male	4.77	2.16			
Gadgets	Mobile phone	4.92	2.06	0.099	0.921	Failed to reject H_0
	Laptop	4.88	2.23			
Internet source	Wi-fi	5.22	1.88	1.745	0.083	Failed to reject H_0
	Mobile data	4.71	2.19			
Area of residence	Rural	4.62	2.19	1.518	0.222	Failed to reject H_0
	Urban	5.01	2.07			
	Sub-urban	5.53	1.53			

Presented in Table 5 are the t-test and ANOVA on the extent of usage of AI tools by the students when grouped according to their profiles. It can be gleaned from the table that there is no significant difference ($p > 0.05$) in the students' extent of usage when grouped according to their profile, which means that program, course, sex, gadgets, internet source, and area of residence do not affect their usage to the AI tools. Conversely, the study of Kelly *et al.* [36] showed that significant differences exist in the use of AI across disciplines. Engineering students' usage of AI is

significantly higher than Nursing, Medical, and Health and Arts students. Students taking up sciences have significantly higher utilization than students from Nursing, Medical and Health, Arts, Business and Law, and Education. Additionally, sciences students have significantly higher confidence in using AI ethically than Nursing, Medical, and Health and Arts students [36].

Nowadays, many students create presentations and projects by employing a variety of software and tools rather than the traditional pen and paper [51]. Adoption of these innovations in educational technology has made their life easier. The students of today are sufficiently digitally literate [52] and as they use and gain experience with GenAI, their confidence in their ability to safely use GenAI also grows [36].

Students' exposure to and utilization of AI technologies can be viewed as significant events in their educational journeys since these advancements can aid in learning. AI has the potential to transform education by giving students personalized, interesting, and effective experiences resulting in better student outcomes [15]. It can analyze data, adapt to individual needs, and offer tailored learning experiences, leading to increased engagement, and enhanced educational experiences where they can learn at their own pace and in a way that suits their learning style [14, 53]. Additionally, AI can save teachers' time by automating tasks such as grading and assessment, providing more accurate and consistent feedback [54]. AI can also help in identifying and delivering the right resources to students, keeping them up to date with new technologies, and providing frequent assessments to gauge their progress [55].

D. The Significant Relationship between the Level of Awareness and Extent of Use of AI Tools

Table 6 shows the test of the relationship between the respondents' level of awareness and the extent of use of the AI tools. With a *p*-value less than 0.010, which leads to the rejection of the null hypothesis, there is a significant relationship between the respondents' level of awareness and the extent of use of the AI tools.

Table 6. Pearson *r* correlation on the test of significant relationship on the level of awareness and extent of use to ai tools

Pearson Correlation	Level of Awareness	*p*-value	Decision
Extent of Use	0.710**	<0.010	Reject H_0

**Correlation is significant at the 0.01 level (2-tailed).

The *r*-value of 0.710 indicates a strong positive correlation between respondents' level of awareness and the extent of use of the AI tools. This implies that when the level of awareness of the respondents increases, they will use the AI tools more frequently.

Haleem *et al.* [51] revealed that when the students are not aware of the online information resources, they tend not to use them. This could be a result of a lack of training for information literacy skills and ineffective user education programs to equip the students with the necessary skills to use the online information resources. Problems such as lack of knowledge and of skills to use the online information resources is a factor militating against the effective use of online information resources [56].

E. The Significance of the Regression Model on Determining the Linear Relationship on Students' Level of Awareness and Extent of Use of AI Tools

Table 7 shows the simple linear regression analysis on the strength of the predictive relationship between the independent variable (level of awareness) and the dependent variable (extent of usage). With R = 0.710, there is a strong positive relationship between the independent variable (level of awareness) and dependent variable (extent of usage) which means that there is a direct relationship. An R Square value of 0.504 means 50.4% of the variance. The extent of use is based on the level of awareness which indicates that the model is a good fit. Adjusted R Square of 0.501 means that the variance on the extent of use based on the level of awareness would change from 50.4% to 50.1%. The *p*-value of 0.000 means that the regression model $y = 2.716x - 0.435$ (constant= –0.435, level of awareness = 2.716) significantly predicts the frequency of usage of AI tools.

Table 7. Simple linear regression analysis on the students' level of awareness and extent of use ai tools

Model Summary			ANOVA		Unstandardized Coefficients (B)	
R	R Square	Adjusted R Square	F	Sig.	Constant	Independent Variable (Level of Awareness)
0.710[a]	**0.504**	0.501	194.012	**0.000[b]**	**–0.435**	**2.716**

Note: a—constant ; b—independent variable

This present study is anchored on Rogers' Diffusion of Innovation Theory. This theory provides a heuristic framework for analyzing the diffusion of innovations, defines innovation as 'an idea, practice or object that is perceived as new by an individual or other unit of adoption', and for understanding how innovations spread through social systems. The concept of this theory focuses on 1) "Awareness" elaborating learner'' knowledge of the existence of a learning tool; 2) "Information" focusing on the learner'' understanding of the features, benefits, and limitations of the tool; 3) "Experience" indicating learner'' practical familiarity with the tool through usage; and 4) "Perception" describing learner'' attitudes, beliefs, and opinions about the tool [57]. In the context of education, this theory can be applied to analyze how learner'' decisions to use AI-powered education tools are influenced by their knowledge and awareness of these tools [58]. Awareness of AI-powered education tools states that learners must be aware of the existence and use of these tools to consider using them because greater awareness and learners' access to comprehensive information positively correlate with the adoption/usage decision.

In a related study, it revealed that the availability of information does not necessarily mean actual use. It also showed that some of the available resources have not been utilized at all. This means that users are not aware of the availability of such resources, they do not know how to access them, or they do not know what the resources offer [59].

In this present-day study, we also observed that some

students who vouched that they are aware of the AI tools have opted not to use them. With this observation, we decided to interview the students why they prefer not to use those technologies, and the following are their responses.

Student 1: "*If you do not read the full text, other or wrong information will be given and may be far from the requested answer. As a standard, I use 2 or more sources in making assignments or schoolwork to be credible. For example, when I search on Google or in a book there are chances that AI's implicit answers are different compared to data from Google or books"*.

Student 2: "*Maybe when I use it once, I will be fond of using it and become reliant on it*".

Student 3: "*I seldom use it to verify answers especially if I do not know much about the concept, example in Mathway I can't see the solution but I can verify my answer if my answer is the same as what the app gives. But if it has a different answer, I find a way to find out the answer. In other apps like tome for presentation, I do not use it because it's easier to discuss and understand the topic if you do the presentation on your own*."

Student 4: "*I don't know the other AI-powered learning tools, just some I know like Quillbot, and it is just recently when I have known these learning tools*"

Student 5: "*I prefer to browse articles or books whenever I need to search that to use AI-powered learning tools*"

Student 6: "*If I can no longer find answer or if I really do''t know the answer, then tha''s the time that I search in ChatGpt*."

Student 7: "*I rarely use AI. I only use it if I can't find the answer in google*"

Student 8: "*I seldom use AI powered tools because I am not very good at using them*"

Our data reveal that students are aware and they use AI tools. Since we found several students telling that they do not or rarely use the app despite of being aware of them, we interviewed them about their reason. Students' responses vary and imply students' awareness of the disadvantages of using AI. The students may not or infrequently use AI in their school assignments because of concerns about the low user trust due legitimacy of the information it provides (Statements Nos. 1, 3, 5, 7), the potential for dependency on AI (Statements No. 2), a lack of knowledge on AI and of expertise on how to effectively utilize AI (Statements Nos. 4, 8), and if they have no other choice (Statements No. 6). These limitations can be the reason why several students may not use AI. It brings us back to the Diffusion of Innovation theory which posits that even if the students are knowledgeable of the innovation, they have the option to use or reject it [57].

Although AI is a powerful tool, it may still have limitations due to its being prone to mistakes, bias, and misinformation. The concerns regarding artificial intelligence call for the implementation of policies and guidelines to effectively address the problems and ethical issues associated with AI.

V. Conclusions and Future Works

The study employed a mixed-methods approach to gather qualitative and quantitative data to investigate the relationship between the level of awareness and extent of usage of AI-powered learning support tools of education students enrolled in Mathematics and Science subjects. For the qualitative data, explanatory design specifically the follow-up explanations model was used to give a richer sense of the quantitative responses from the respondents. The result of the interview enriched the study which further deepened the meaning of the quantitative data gathered.

Based on the objectives, it can be drawn that students are aware of the different AI tools and they use these tools in their education. Their level of awareness is directly related to the extent of their use which means that as the level of awareness increases, their usage also becomes more frequent. However, some students lack trust in the reliability of the data or information provided by AI technologies which may explain their infrequent or non-utilization of such AI tools.

Awareness of AI-powered learning support tools means that learners are aware of the existence and use of these tools which leads the learners to consider using them because greater awareness and learners' access to comprehensive information positively correlate with the adoption/usage decision. Based on the results gathered, students' level of awareness is directly related to the extent of use. As the level of awareness of the students increases, their usage also becomes more frequent. Nevertheless, the reliability of AI tools remains uncertain for certain students.

AI is gradually taking over our activities. And as technology revolutionizes, the greater are the chances of our students' inevitable exposure to these technologies. With this, the researchers plan to institutionalize this study to determine the awareness and usage of the whole Quirino State University student population. Aside from that, there is also a plan to apply this study to the subject instructors. The researchers hope to come up to the formulation and later a recommendation of policies or guidelines on how the university can monitor the learners' outputs to maintain quality education despite the possible negative impacts of AI to the students' education.

Conflict of Interest

The authors declare no conflict of interest.

Author Contributions

AMV did the conceptualization, data gathering, writing, and finalizing the write up of the study. LL did the data gathering. Both authors had approved the final version.

References

[1] K. Zhang and A. Aslan, "AI technologies for education: Recent research & future directions," *Computers & Education: Artificial Intelligence*, vol. 2, 100025, Jan. 2021. doi: 10.1016/j.caeai.2021.100025

[2] K. Seo, J. Tang, I. Roll, S. Fels, and D. Yoon, "The impact of artificial intelligence on learner–instructor interaction in online learning," *International Journal of Educational Technology in Higher Education*, vol. 18, no. 1, Oct. 2021. doi: 10.1186/s41239-021-00292-9

[3] A. Almusaed, A. Almssad, İ. Yitmen, and R. Z. Homod, "Enhancing student engagement: Harnessing 'AIED''s power in hybrid education—a review analysis," *Education Sciences*, vol. 13, no. 7, 632, Jun. 2023. doi: 10.3390/educsci13070632

[4] F. Ouyang, M. Wu, L. Zheng, L. Zhang, and P. Jiao, "Integration of artificial intelligence performance prediction and learning analytics to improve student learning in online engineering course," *International Journal of Educational Technology in Higher Education*, vol. 20, no. 1, Jan. 2023. doi: 10.1186/s41239-022-00372-4

[5] Π. Φωτόπουλος and D. Triantis, "Think twice: First for tech, then for Ed," *SN Computer Science*, vol. 4, no. 2, Dec. 2022. doi: 10.1007/s42979-022-01538-7

[6] H. Munir, B. Vogel, and A. Jacobsson, "Artificial intelligence and machine learning approaches in digital education: A systematic revision," *Information*, vol. 13, no. 4, 203, Apr. 2022. doi: 10.3390/info13040203

[7] F.-V. Pantelimon, R. Bologa, A. Toma, and B.-Ștefan Posedaru, "The Evolution of AI-Driven Educational Systems during the COVID-19 Pandemic," *Sustainability*, vol. 13, no. 23, p. 13501, Dec. 2021, doi: 10.3390/su132313501.

[8] P. Cheeseman and W. B. Gevarter, "Introduction to artificial intelligence," in *Proc. the 24th Aerospace Sciences Meeting*, 2012. https://doi.org/10.2514/6.1986-163

[9] K. K. Jean-Claude, "A comprehensive overview of artificial intelligence," in *Proc. Artificial Intelligence, Soft Computing and Applications*, 2022. https://doi.org/10.5121/csit.2022.122314

[10] W. B. Gevarter, *An Overview of Artificial Intelligence and Robotics, Volume 1—Artificial Intelligence, Part A—The Core Ingredients*, 1984. https://doi.org/10.6028/nbs.ir.83-2799

[11] H. Kennedy and L. Wanless, "Artificial intelligence," in *The Routledge Handbook of Digital Sport Management*, 2022, pp. 333–345. https://doi.org/10.4324/9781003088899-29

[12] M. Vignesh and K. Thanesh. (2020). A review on Artificial Intelligence (AI) is future generation. [Online]. Available: https://typeset.io/papers/a-review-on-artificial-intelligence-ai-is-future-generation-3dwof7r9yc

[13] S. S. Ajankar and A. R. Nimodiya, "Artificial intelligence: The supermind—a review," *International Journal of Advanced Research in Science, Communication and Technology*, pp. 194–203, 2022. https://doi.org/10.48175/ijarsct-2258

[14] A. Harry, "Role of AI in education," *Interdisciplinary Journal and Humanity (INJURITY)*, vol. 2, no. 3, pp. 260–268, 2023. https://doi.org/10.58631/injurity.v2i3.52

[15] N. Ashwini, N. Kumar, M. Nandan, and V. Suman, "Leveraging artificial intelligence in education: Transforming the learning landscape," *International Research Journal of Computer Science*, vol. 10, no. 5, pp. 192–196, 2023. https://doi.org/10.26562/irjcs.2023.v1005.16

[16] S. F. Ahmad, "Impact of artificial intelligence on human loss in decision making, laziness and safety in education," *Humanities and Social Sciences Communications*, vol. 10, no. 1, pp. 1–14, 2023. https://doi.org/10.1057/s41599-023-01787-8

[17] M. Mujiono, "Educational collaboration: Teachers and artificial intelligence," *Jurnal Kependidikan*, vol. 9, no. 2, pp. 618–618, 2023. https://doi.org/10.33394/jk.v9i2.7801

[18] Z. Slimi, "The impact of artificial intelligence on higher education: An empirical study," *European Journal of Educational Sciences*, vol. 10, no. 1, 2023. https://doi.org/10.19044/ejes.v10no1a17

[19] P. Kumar, S. Nithiya, S. Anbazhagan, and K. J. Kavitha, "Implementation of artificial intelligence in education," *International Research Journal of Computer Science*, vol. 10, no. 05, pp. 104–108, 2023. https://doi.org/10.26562/irjcs.2023.v1005.01

[20] R. A. Abdulmunem, *Review of Comparative Research on Diversity in Virtual Learning: Eastern vs. Western Perspectives*, IGI Global, 2023.

[21] M. Solis, C Alejandra, C. Eduardo, J. Luis, and J.-H. Tovalin-Ahumada, "The impact of artificial intelligence on higher education: A sociological perspective," *Journal of Namibian Studies: History Politics Culture*, vol. 33, 2023. https://doi.org/10.59670/jns.v33i.969

[22] S. Sharma and D. Sharma, "Integrating artificial intelligence into education," *International Journal of Advanced Academic Studies*, vol. 5, no. 6, pp. 35–39, 2023. https://doi.org/10.33545/27068919.2023.v5.i6a.1004

[23] J.-R. Sanabria-Navarro, Y. Silveira-Pérez, D.-D. Pérez-Bravo, and M. de-Jesús-Cortina-Núñez, "Incidences of Artificial Intelligence in Contemporary Education," *Comunicar*, vol. 31, no. 77, 2023. https://doi.org/10.3916/c77-2023-08

[24] A. Flogie and M. V. Krabonja, "Artificial intelligence in education: Developing competencies and supporting teachers in implementing AI in school learning environments," in *Proc. 2023 12th Mediterranean Conference on Embedded Computing (MECO)*, Budva, Montenegro 2023. https://doi.org/10.1109/meco58584.2023.10155054

[25] J. Velander, M. A. Taiye, N. Otero, and M. Milrad, "Artificial Intelligence in K-12 Education: Eliciting and reflecting on Swedish teachers' understanding of AI and its implications for teaching & learning," *Educ. Inf. Technol*., vol. 29, pp. 4085–4105, 2024. https://doi.org/10.1007/s10639-023-11990-4

[26] A. Alam, M. Hasan, and M. Raza, "Impact of Artificial Intelligence (AI) on education: Changing paradigms and approaches," *Towards Excellence*, vol. 14, no. 1, 2022. https://hrdc.gujaratuniversity.ac.in/Publication/article?id=4896

[27] M. Rizvi, "Exploring the landscape of artificial intelligence in education: Challenges and opportunities," in *Proc. 2023 5th International Congress on Human-Computer Interaction, Optimization and Robotic Applications (HORA)*, Istanbul, Turkiye, 2023. https://doi.org/10.1109/hora58378.2023.10156773

[28] S. Koos and S. Wachsmann, "Navigating the impact of CHATGPT/GPT4 on legal Academic examinations: Challenges, opportunities and recommendations," *Media Iuris*, vol. 6, no. 2, pp. 255–270, 2023. https://doi.org/10.20473/mi.v6i2.45270

[29] S. Gartner and M. Krašna, "Artificial intelligence in education—Ethical framework," in *Proc. the 2023 12th Mediterranean Conference on Embedded Computing (MECO)*, 2023. https://doi.org/10.1109/meco58584.2023.10155012

[30] T. Adıgüzel, M. H. Kaya, and F. K. Cansu, "Revolutionizing education with AI: Exploring the transformative potential of ChatGPT," *Contemporary Educational Technology*, vol. 15, no. 3, ep429, 2023. https://doi.org/10.30935/cedtech/13152

[31] Z. Slimi and B. Villarejo-Carballido, "Navigating the ethical challenges of artificial intelligence in higher education: An analysis of seven global AI ethics policies," *TEM Journal*, pp. 590–602, 2023. https://doi.org/10.18421/tem122-02

[32] P. Stefan, "The critique of AI as a foundation for judicious use in higher education," *Journal of Applied Learning and Teaching*, vol. 6, no. 2, 2023. https://doi.org/10.37074/jalt.2023.6.2.4

[33] X. Ma and C. Jiang, "On the ethical risks of artificial intelligence applications in education and its avoidance strategies," *Journal of Education, Humanities and Social Sciences*, vol. 14, pp. 354–359, 2023. https://doi.org/10.54097/ehss.v14i.8868

[34] L. Huang, "Ethics of artificial intelligence in education: Student privacy and data protection," *Science Insights Education Frontiers*, vol. 16, no. 2, pp. 2577–2587, 2023. https://doi.org/10.15354/sief.23.re202

[35] F. Panagopoulou-Koutnatzi, C. Parpoula, and K. Karpouzis, "Legal and ethical considerations regarding the use of ChatGPT in education," *Computers and Society*, 2023. https://doi.org/10.31235/osf.io/c5hf3

[36] A. Kelly, M. Sullivan, and K. Strampel, "Generative artificial intelligence: University student awareness, experience, and confidence in use across disciplines," *Journal of University Teaching and Learning Practice*, vol. 20, no. 6, 2023. doi: 10.53761/1.20.6.12

[37] E. Klopfer, J. Haas, and J. Groff. (2009). Using the technology of today, in the classroom today: The instructional power of digital games, simulations, and social networking, and how teachers can leverage it. *The Education Arcade*. [Online]. Available: https://www.academia.edu/707605/Using_the_Technology_of_Today_in_the_Classroom_Today_The_Instructional_Power_of_Digital_Games_Simulations_and_Social_Networking_and_How_Teachers_Can_Leverage_It

[38] I. García-Martínez, J. M. F. Batanero, J. Fernández-Cerero, and S. P. León, "Analysing the Impact of Artificial Intelligence and computational sciences on student performance: Systematic review and meta-analysis," *Journal of New Approaches in Educational Research*, vol. 12, no. 1, 171, Jan. 2023.

[39] S. Ortiz. (2023). Meet generative AI's 'super users': 70% of Gen Z use GenAI. *ZDNET*. [Online]. Available: https://www.zdnet.com/article/meet-generative-ais-super-users-70-of-gen-z-use-genai/

[40] L. Welding. (2023). Half of college students say using AI on schoolwork is cheating or plagiarism. *BestColleges.* [Online]. Available: https://www.bestcolleges.com/research/college-students-ai-tools-survey/

[41] Y. Dergunova, R. Z. Aubakirova, B. Z. Yelmuratova, T. M. Gulmira, P. N. Yuzikovna, and S. Antikeyeva, "Artificial intelligence awareness levels of students," *International Journal of Emerging Technologies in Learning (Ijet)*, vol. 17, no. 18, pp. 26–37, Sep. 2022. doi: 10.3991/ijet.v17i18.32195

[42] Z. Alrabiah and M. B. A. Al-Rawi, "Assessment of awareness, perceptions, and opinions towards artificial intelligence among healthcare students in Riyadh, Saudi Arabia," *Medicina-Lithuania*, vol. 59, no. 5, 828, Apr. 2023. doi: 10.3390/medicina59050828

[43] K. Khadse, "Awareness & applications of artificial intelligence tools for management students," *Psychology and Education Journal*, vol. 57, no. 9, pp. 451–455, Nov. 2020.

[44] S. F. Ahmad *et al.*, "Impact of artificial intelligence on human loss in decision making, laziness and safety in education," *Humanities and*

Social Sciences Communications, vol. 10, no. 1, Jun. 2023. doi: 10.1057/s41599-023-01787-8

[45] S. P. Singh. (2023). Adept or die: Is over-reliance on AI limiting our ability to learn and grow? [Online]. Available: https://www.linkedin.com/pulse/adept-die-over-reliance-ai-limiting-our-ability-learn-singh

[46] C. K. Y. Chan and W. Hu, "Students' voices on generative AI: Perceptions, benefits, and challenges in higher education," *International Journal of Educational Technology in Higher Education*, vol. 20, no. 1, Jul. 2023. doi: 10.1186/s41239-023-00411-8

[47] C. K. Y. Chan and K. K. W. Lee, "The AI generation gap: Are Gen Z students more interested in adopting generative AI such as ChatGPT in teaching and learning than their Gen X and Millennial generation teachers?" arXiv preprint, arxiv.2305.02878, May 2023.

[48] S. Misra, P. A. Assibong, I. A. P. Wogu, and O. D. Udoh, "Artificial intelligence, artificial teachers and the fate of learners in the 21st century education sector: Implications for theory and practice," *International Journal of Pure and Applied Mathematics*, vol. 119, no. 16, pp. 2245–2259, Jul. 2018.

[49] UNESCO. (2023). Artificial intelligence: Examples of ethical dilemmas. [Online]. Available: https://www.unesco.org/en/artificial-intelligence/recommendation-ethics/cases

[50] Outworks Solutions Private Ltd. (2023). Skills for Gen Z: Love or Loathe Digital in 2023. [Online]. Available: https://www.linkedin.com/pulse/skills-gen-z-love-loathe-digital-2023

[51] A. Haleem, M. Javaid, M. A. Qadri, and R. Suman, "Understanding the role of digital technologies in education: A review," *Sustainable Operations and Computers*, vol. 3, pp. 275–285, Jan. 2022. doi: 10.1016/j.susoc.2022.05.004

[52] B. İ. Karagül, M. Şeker, and C. Aykut, "Investigating students' digital literacy levels during online education due to COVID-19 Pandemic," *Sustainability*, vol. 13, no. 21, 11878, Oct. 2021. doi: 10.3390/su132111878

[53] J. Mariappan and C. Krishnan, "Artificial intelligence: Future of advance learning," *Digital Transformation in Education: Emerging Markets and Opportunities*, 2023, pp. 118–135. https://doi.org/10.2174/9789815124750123010011

[54] M. R. Manicka, G. M. A. Kumar, T. Sanchita, and A. Sandhya, "AI-powered mobility educational application for enhancing student learning," in *Proc. the 2023 International Conference on Intelligent Data Communication Technologies and Internet of Things (IDCIoT)*, 2023. https://doi.org/10.1109/idciot56793.2023.10053423

[55] A. Alam, "Harnessing the power of AI to create intelligent tutoring systems for enhanced classroom experience and improved learning outcomes," *Intelligent Communication Technologies and Virtual Mobile Networks*, 2023, pp. 571–591. https://doi.org/10.1007/978-981-99-1767-9_42

[56] E. E. Baro, B. C. Endouware, and J. O. Ubogu, "Awareness and use of online information resources by medical students at Delta State University in Nigeria," *Library Hi Tech News*, vol. 28, no. 10, pp. 11–17, Nov. 2011. doi: 10.1108/07419051111202655

[57] İ. ŞahiN, "Detailed review of Rogers' diffusion of innovations theory and educational technology-related studies based on Rogers' theory," *Turkish Online Journal of Educational Technology*, vol. 5, no. 2, pp. 14–23, Apr. 2006.

[58] C. O. Alordiah *et al.*, "Awareness, knowledge, and utilization of online digital tools for literature review in educational research," *Heliyon*, vol. 9, no. 1, p. e12669, Jan. 2023. doi: 10.1016/j.heliyon.2022.e12669

[59] A. A. Kinengyere, "The effect of information literacy on the utilization of electronic information resources in selected academic and research institutions in Uganda," *The Electronic Library*, vol. 25, no. 3, pp. 328–341, Jun. 2007. doi: 10.1108/02640470710754832

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