

AI Integration in Learning: Awareness and Utilization among Teachers and Students

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artificial intelligence, AI awareness, AI utilization, digital learning, educational technology

Abstract. This study explored the integration of Artificial Intelligence (AI) in learning, focusing on teachers' and students' awareness and utilization within the District of Siquijor. It used a descriptive-correlational research design. Data were collected through a structured survey questionnaire and analyzed using mean, independent samples t-test, and Pearson Product-Moment Correlation Coefficient. The findings revealed a significant difference in the level of AI awareness between teachers' and students. Teachers demonstrated a "very high" level of awareness of AI technologies, while students exhibited only a "high" level of awareness. In terms of utilization, teachers reported a "high" extent of AI utilization, whereas students showed relatively lower utilization, suggesting underutilization. Correlation analysis also revealed a statistically significant and strong positive relationship between teachers' awareness and the extent of their AI utilization. Similarly, students' awareness was found to be significantly and positively related to their utilization of AI technologies, indicating that higher awareness is associated with greater utilization. It was then concluded that awareness is a key factor influencing the effective utilization of AI technologies in educational settings. Moreover, the adoption of innovative strategies and digital resources is vital for sustaining improvements in the quality of public education amid rapid technological advancement.

Introduction

Artificial Intelligence (AI) has become a powerful catalyst for change in the field of education, wherein it creates new and dynamic possibilities for improving both instructional methods and learning experiences. It is even recognized by the United Nations Educational, Scientific, and Cultural Organization as a key driver in realizing Sustainable Development Goal (SDG) 4, which advocates for inclusive, equitable, and quality education. As education systems adapt to rapid technological advancements, integrating AI into teaching practices becomes essential in equipping learners with the required 21st-century skills.

Recent studies emphasize how AI can improve instructional delivery, assessment, and learner engagement. AI tools enable personalized learning experiences, automate content creation, and provide real-time feedback, thereby enhancing both teaching efficiency and student outcomes (Bouguettaya et al., 2025; Lademann et al., 2025; Singh et al., 2025; Srinivasa et al., 2022). In higher education, platforms such as ChatGPT have expanded opportunities for interactive and adaptive learning (Al Mamary et al., 2025). These developments suggest that AI integration can significantly contribute to improving the quality and accessibility of education.

Despite these promising developments, challenges related to awareness, utilization, and ethical use of AI persist, particularly in developing contexts such as the Philippines. While interest in AI is increasing, concerns about overreliance on technology, reduced critical thinking, and issues of data privacy and inequality remain evident (Amadora, 2024; Alibudbud, 2024). These concerns stress the need for educators to be not only technologically competent but also critically aware of the implications of AI integration in instruction.

However, existing studies have largely focused on the behavioral, cognitive, and functional impacts of AI, with limited emphasis on the awareness and actual utilization of AI among both teachers and students in educational settings. This gap

emphasizes the need for empirical investigation into how AI is understood and applied in the teaching-learning process. Engaging in this line of inquiry meaningfully advances the goal of promoting the responsible, principled, and well-informed use of technology in education, as envisioned in SDG 4. In turn, it contributes to refining teaching approaches and fostering more inclusive, equitable, and high-quality learning environments. More specifically, it supports SDG 4.1, which seeks to guarantee quality primary and secondary education; SDG 4.3, which calls for fair access to affordable and high-standard technical, vocational, and tertiary education; SDG 4.4, which focuses on equipping individuals with relevant competencies for employment, including ICT-related skills; SDG 4.5, which aims to remove gender-based inequalities and ensure equal opportunities in education; and SDG 4.c, which emphasizes strengthening the teaching workforce through sustained training and professional development.

Statement of the Problem

This study was designed to determine teachers' and students' level of AI awareness and the extent of their utilization of AI technologies.

Specifically, the study sought to answer the following questions:

1. What is the level of awareness of teachers and students as to using AI technologies in terms of the following:
 - 1.1. personalized learning;
 - 1.2. Intelligent Tutoring Systems;
 - 1.3. communication;
 - 1.4. content creation; and
 - 1.5. Automated Feedback Systems?
2. Is there a significant difference in the level of awareness between teachers and students?
3. To what extent do teachers utilize AI technologies in terms of the following:
 - 3.1. personalized learning;
 - 3.2. Intelligent Tutoring Systems;
 - 3.3. communication;
 - 3.4. content creation; and
 - 3.5. Automated Feedback Systems?
4. To what extent do students utilize AI technologies in terms of the aforementioned usage?
5. Is there a significant relationship between the level of awareness of teachers and the extent of their utilization of AI technologies?
6. Is there a significant relationship between the level of awareness of students and the extent of their utilization of AI technologies?
7. Is there a significant relationship between teachers' AI technology trainings and their:
 - 7.1. level of awareness; and
 - 7.2. extent of AI utilization?
8. Is there a significant relationship between students' level of awareness and extent of utilization, and their profile in terms of:
 - 8.1. sex; and
 - 8.2. performance?

Null Hypotheses

The following null hypotheses were tested at the 0.05 level of significance:

- Ho₁. There is no significant difference in the level of awareness between teachers and students.
- Ho₂. There is no significant relationship between the level of awareness of teachers and the extent of their utilization of AI technologies.
- Ho₃. There is no significant relationship between the level of awareness of students and the extent of their utilization of AI technologies.
- Ho₄: There is no significant relationship between teachers' AI training and their:
 - 4.1 level of awareness; and
 - 4.2. extent of utilization.
- Ho₅: There is no significant relationship between students' level of awareness and the extent of their AI utilization and their profile in terms of:
 - 5.1.sex; and
 - 5.2. performance.

Methodology

Research Design

This study utilized a descriptive-correlational research design. It is descriptive-correlational in nature because it determined the level of awareness and the extent of AI technology utilization. Also, it examined the relationship between the respondents' demographic profiles and their awareness and utilization of AI technologies.

Research Environment

The study was conducted in a municipality within the Division of Siquijor, specifically in public secondary schools offering Senior High School. The participants included Senior High School teachers handling Practical Research 1 and 2 subjects and students enrolled in these courses. Data were collected from six schools across two districts. The schools include: (District I) Cang-alwang National High School (CNHS), Siquijor Provincial Science High School of Siquijor (SPSHS), and Siquijor Integrated School (SIS); (District II) Banban National High School (BNHS), San Antonio National High School (SNHS), and Ponong High School (PHS). All selected schools are public institutions with established Senior High School departments; five of them are equipped with computer laboratories and free internet access.

In terms of instructional quality, the Department of Education–Siquijor Division has demonstrated strong performance, consistently achieving results that exceed the “very satisfactory” level in both regional and national assessments (DepEd–Siquijor, 2022).

Research Respondents

The respondents of the study consist of secondary public Senior High School teachers and students from the District of Siquijor. The total population comprises 244 individuals across participating schools. Using random sampling techniques, 49 teachers and 195 students were selected as study respondents. The teacher-respondents were currently teaching at the Senior High School level during the conduct of the study, while the student-respondents were officially enrolled in the same schools for the academic year covered by the research.

The distribution of respondents was proportionately allocated across participating schools to ensure fair representation. Random sampling was employed to minimize sampling bias and enhance the generalizability of the findings within the district. Participation in the study was voluntary, and the respondents were informed of the study's purpose. Confidentiality and anonymity were strictly observed throughout the data collection process.

Research Instrument

The tool used in the study is a self-made survey questionnaire, having two separate versions—one for teachers and one for students. The questionnaire has four (4) parts. Part I is a disclosure statement. Part II contains the respondents' profiles. Part III is for measuring the level of the respondents' awareness of the usage of AI technologies. Part IV is for assessing the extent of the respondents' utilization of AI technologies.

The questionnaires were presented to three experts for content validity. These tools also underwent a pilot test to ensure coefficient stability. The questionnaires were administered twice to the same respondents with a gap of two weeks from the initial administration. The results revealed a coefficient stability of 0.97 (personalized learning awareness), 0.98 (ITS awareness), 0.96 (communication awareness), 0.98 (content creation awareness), 0.96 (automated feedback system awareness), 0.98 (personalized learning utilization), 0.96 (ITS utilization), 0.96 (communication utilization), 0.97 (content creation utilization), and 0.98 (automated feedback system utilization).

Ethical Considerations

The researcher strictly upheld the principles of research ethics throughout the conduct of the study to minimize potential risks and safeguard the rights of the respondents. The privacy, dignity, and confidentiality of all teachers and students involved were carefully protected. The researcher also adhered to the ethical guidelines prescribed by the Foundation University Ethics Committee and secured the necessary approvals prior to data collection.

Formal letters of permission were first sent to the appropriate school authorities to seek approval for the conduct of the study. Thereafter, informed consent letters were distributed to all teacher-respondents, clearly explaining the purpose of the study, the voluntary nature of participation, the procedures involved, and the assurance of confidentiality and anonymity. For student-respondents, informed consent letters were likewise provided, and parental or guardian consent was secured for minors prior to their participation. The respondents were informed that they could withdraw from the study at any time without penalty.

The researcher ensured that no physical, psychological, or academic harm would arise from participation. A nonjudgmental and professional attitude was maintained throughout the data collection process to create a respectful and comfortable environment for all respondents. The collected data were treated with strict confidentiality and were used solely for academic purposes.

Furthermore, the results were reported honestly and accurately, without fabrication, falsification, or modification of data. All sources cited in the study were properly acknowledged to uphold academic integrity and avoid plagiarism.

Research Procedure

Before the conduct of the study, the researcher sought permission from the Dean of the Graduate School Program to undertake the research in the Division of Siquijor. Upon receiving approval, the researcher formally requested authorization from the Schools Division Superintendent of the Division of Siquijor. Permissions were likewise obtained from the Public Schools District Supervisor and the respective school heads of the schools included in the study.

The final copy of the questionnaire was attached to the letters of request for perusal and approval. The instrument was personally presented by the researcher to the school heads and subsequently distributed to the teacher-respondents. A schedule of visits was then coordinated in advance to ensure minimal disruption and to allow the respondents adequate preparation. The purpose and objectives of the study were also clearly explained to all respondents to secure their understanding, support, and cooperation. They were assured of the confidentiality of their responses, encouraging honest feedback.

Statistical Treatment of the Data

The tools used by the researcher in analyzing the data were the following:

Mean. This was used in identifying the (a) level of awareness of teachers and students of the usage of AI technologies; and (b) extent of utilization of teachers and students of AI technologies.

t-test. This was used in identifying the significant difference in the (a) level of awareness of the teachers and students of the usage of AI technologies; and (b) extent of utilization of the teachers and students of AI technologies.

Pearson Product Moment Correlation Coefficient. This was utilized to determine the relationship between variables considered in the study.

Results and Discussion

The data are presented in tabular format and organized systematically to align with the specific problems addressed. Each relevant data set is analyzed and interpreted in relation to the identified issues, contributing to the main purpose of the study.

AI can...	Teachers (n=49)		Students (n=195)	
	w \bar{x}	VD	w \bar{x}	VD
Personalize lessons based on learning pace and performance through the help of AI-powered learning platforms (e.g., Coursera, Duolingo, Khan Academy)	4.26	SA	3.88	A
Provide AI-driven features like gamification and interactive quizzes, which will enhance learners' motivation and engagement.	4.19	A	3.75	A
Adapt to the learner's learning and challenges.	4.20	A	3.80	A
Emphasize the improvement of ideas while retaining the original context.	4.25	SA	3.82	A
Provide students with various access to scholarly academic literature that can be used as references for further studies.	4.19	A	3.66	A
Composite means:	4.22	SA	3.78	A
Level of Awareness:	Very High		High	

Note: Verbal Descriptions (VD); Explanation (E); 4.21- 5.00 Strongly Agree (SA); Very High (VH); 3.414.20, Agree(A), High (H); 2.61 - 3.40 Neutral (N), Moderate (M); .81- 2.60, Disagree(D), Low(L); 1.00- 1.80, Strongly Disagree (SD)Very Low (VL)

Table 1.1. Level of Awareness of Teachers and Students as to the Usage of AI Technologies in terms of Personalized Learning

Table 1.1 shows a comparative analysis of the level of awareness of teachers and students regarding the use of AI technologies in terms of personalized learning. The results indicate that teachers reported a "Very High" level of awareness, with a composite mean of 4.22, whereas students indicated a "High" level, with a composite mean of 3.78. This connotes that teachers have a higher level of awareness of AI applications in personalized learning compared to their students.

The teachers' weighted means ranged from 4.19 to 4.26, emphasizing specific areas where they demonstrated heightened awareness. The teachers reported being most aware of the role of AI in personalizing lessons based on students' learning pace and performance through AI-powered learning platforms ($w\bar{x} = 4.26$). This finding implies that teachers are prepared to adapt instruction to meet their learners' distinct needs, allowing students to progress at their own pace and receive support appropriate to their performance.

Another area of high awareness was emphasized on improvement of ideas while retaining original context ($w\bar{x} = 4.25$), which suggests that teachers recognize AI as a tool for enhancing students' output without compromising originality, thereby supporting effective feedback and personalized guidance.

Students, on the other hand, reported their awareness of AI in personalized learning as "High," with a composite mean score of 3.78. They claimed having the greatest awareness in using AI-powered platforms to personalize lessons based on their learning pace and performance ($w\bar{x} = 3.88$). This implies that students are engaging in self-directed, personalized learning, taking advantage of AI tools to learn at a pace suited to their individual needs. They also reported being aware that AI can improve their ideas while retaining original context ($w\bar{x} = 3.82$), which demonstrates their understanding of how AI can support the refinement of their work while maintaining conceptual integrity.

The data show that both teachers and students possess strong awareness of AI applications in personalized learning, with teachers demonstrating a higher level of understanding. Teachers' awareness enables them to design lessons that adapt to individual student needs, support self-paced learning, and provide constructive feedback while preserving originality. The students, on the other hand, showed slight awareness, although they are actively engaged with AI tools to personalize their own learning and refine their work. Together, these findings suggest that AI facilitates a collaborative learning environment where teachers guide and scaffold learning while students take ownership of their progress.

Moreover, the higher awareness among teachers is significant, as it equips them to design learning experiences that are responsive to individual students' needs, abilities, and performance levels. In connection to this, Sajja et al. (2023) claimed that personalized learning enhanced by AI uses intelligent systems to create individualized educational experiences, promoting better understanding and retention of concepts. Hashim et al. (2022) further emphasized that AI contributes to flexible, customized, and effective learning environments, enhancing both teaching quality and educational competence.

Ayeni et al. (2024) support these claims, stating that AI-driven personalized learning modifies educational experiences according to each student's unique needs, preferences, and pace. Zhong (2024) also found that AI-driven adaptive learning systems allow teachers to focus more on facilitating learning and addressing individual student needs by automating routine differentiation of assignments and assessments.

AI can...	Teachers (n=49)		Students (n=195)	
	$w\bar{x}$	VD	$w\bar{x}$	VD
Provide immediate feedback to correct mistakes and improve understanding.	4.54	SA	4.26	SA
Provide step-by-step guidance in solving problems or understanding new concepts.	4.40	SA	3.98	A
Suggest additional resources based on learning progress.	4.47	SA	3.96	A
Provide interactive simulations and demonstrations to improve any content I have created.	4.34	SA	4.28	SA
Detect similarities of work from other written works and assist in paraphrasing them.	4.36	SA	3.98	A
Composite means:	4.22	SA	4.09	A
Level of Awareness:	Very High		High	

Note: Verbal Descriptions (VD); Explanation (E); 4.21- 5.00 Strongly Agree (SA); Very High (VH); 3.41-4.20, Agree(A), High (H); 2.61 - 3.40 Neutral (N), Moderate (M); .81- 2.60, Disagree(D), Low(L); 1.00- 1.80, Strongly Disagree (SD)Very Low (VL)

Table 1.2. Level of Awareness of Teachers and Students as to the Usage of AI Technologies in terms of Intelligent Tutoring Systems

Table 1.2 shows a comparative analysis of the level of awareness of teachers and students regarding the use of AI technologies in terms of Intelligent Tutoring Systems (ITS). The results revealed that teachers reported a "Very High" level of awareness with a composite mean of 4.42, while students indicated a "High" level of awareness with a composite mean of 4.09. This indicates that teachers have a more comprehensive understanding of ITS applications in education, whereas students, though aware, may not yet fully grasp the broader functionalities and potential of these systems.

The teachers demonstrated very high awareness across multiple indicators, with varying degrees of emphasis. They reported the highest awareness in providing immediate feedback to correct mistakes and improve understanding ($w\bar{x} = 4.54$), highlighting their recognition of ITS as tools for delivering timely and personalized feedback that supports learning even without continuous teacher intervention, as noted by Zawacki-Richter et al. (2020). The teachers also reported strong awareness that ITS can suggest additional resources based on learning progress ($w\bar{x} = 4.47$), indicating their understanding of AI's potential to address individual learning gaps.

Providing step-by-step guidance in problem-solving or understanding concepts ($w\bar{x} = 4.40$) was another area of high awareness, reflecting the teachers' appreciation of ITS in scaffolding student learning and promoting independent problem-solving. Awareness was also evident in detecting similarities in students' work and assisting in paraphrasing ($w\bar{x} = 4.36$), demonstrating recognition of ITS's role in maintaining academic integrity while guiding improvement. Finally, teachers acknowledged the role of ITS in providing interactive simulations and integrating content into reports ($w\bar{x} = 4.34$), suggesting that they value ITS for enhancing engagement and experiential learning.

These results imply that teachers are well-prepared to leverage ITS to provide personalized, adaptive, and effective learning experiences, supporting student understanding, engagement, and competence. This is consistent with Sajja et al. (2023), Hashim et al. (2022), and Ayeni et al. (2024), who emphasized that AI-enhanced personalized learning promotes flexible, customized, and learner-centered educational environments.

The students, on the other hand, reported a "High" level of awareness, with the strongest agreement on using ITS for interactive simulations and demonstrations ($w\bar{x} = 4.28$), indicating that they recognize the value of AI in making learning more engaging and applied. They also acknowledged that ITS provides immediate feedback to correct mistakes and improve understanding ($w\bar{x} = 4.26$), showing awareness of the practical benefits of AI in supporting their learning. While students are demonstrating readiness to engage in self-directed and interactive learning, the slightly lower scores compared to teachers suggest that further orientation and guidance may be necessary to fully utilize ITS for personalized learning.

According to Guo et al. (2021) and Sajja et al. (2023), integrating ITS and feedback devices in the learning process enhances the learning experience by addressing individual student needs, supporting comprehension, and improving learning outcomes.

The findings further indicate that teachers are highly aware of the role of AI in ITS, enabling them to effectively personalize instruction, provide timely feedback, and facilitate interactive learning, while students are developing awareness and readiness to engage with AI tools. This stresses the importance of teacher facilitation, structured training, and capacity-building programs for both educators and learners, ensuring that ITS are effectively integrated to enhance learning outcomes, promote student engagement, and support personalized education in line with current technological advancements.

AI can...	Teachers (n=49)		Students (n=195)	
	$w\bar{x}$	VD	$w\bar{x}$	VD
Assist in note-taking and in comprehending lessons using AI-based tools, such as speech-to-text transcriptions and automatic captions.	4.33	SA	3.90	A
Analyze communication patterns and suggest better ways to express ideas in writing and speaking.	4.43	SA	3.98	A
Automate announcements, reminders, and updates to keep students informed about my coursework.	4.56	SA	3.90	A
Provide automated feedback on writing and presentations on how to improve communication skills.	4.23	SA	3.75	A
Enhance the ability to collaborate and interact with teachers and classmates effectively through AI-assisted communication skills.	4.20	A	3.78	A
Composite means:	4.35	SA	3.86	A
Level of Awareness:	Very High		High	

Note: Verbal Descriptions (VD); Explanation (E); 4.21- 5.00 Strongly Agree (SA); Very High (VH); 3.41-4.20, Agree(A), High (H); 2.61- 3.40 Neutral (N), Moderate (M); .81- 2.60, Disagree(D), Low(L); 1.00- 1.80, Strongly Disagree (SD) Very Low (VL)

Table 1.3. Level of Awareness of Teachers and Students as to the Usage of AI Technologies in terms of Communication

Table 1.3 provides a comparative analysis of the level of awareness of teachers and students regarding the use of AI technologies in terms of communication. The results revealed that teachers reported a "Very High" level of awareness, with

a composite mean of 4.35, whereas students indicated a “High” level of awareness, with a comparatively lower composite mean of 3.86. This suggests that while teachers are highly aware of the ways AI can facilitate communication, students are still developing their understanding of AI applications in this area.

The teachers demonstrated very high awareness across specific indicators, with varying degrees of emphasis. They reported the highest awareness in automating announcements, reminders, and updates to keep students informed about their work ($w\bar{x}$ = 4.56), indicating that teachers recognize AI as a tool to enhance organizational efficiency and timely communication. The next strongest indicator was analyzing students’ communication patterns and suggesting ways to express ideas in writing and speaking ($w\bar{x}$ = 4.43), highlighting teachers’ understanding of the potential of AI to improve learners’ communication skills through personalized guidance.

The teachers also acknowledged that AI tools can assist in note-taking and comprehension of lessons using transcription and automatic captioning technologies ($w\bar{x}$ = 4.33), showing awareness of AI’s role in supporting accessibility and understanding. Finally, teachers noted that AI could provide automated feedback on how to improve communication skills ($w\bar{x}$ = 4.23), reflecting recognition of AI as a means to enhance learner reflection and skill development. These results imply that teachers are well-positioned to influence AI technologies to strengthen instructional communication, support student engagement, and foster clearer expression of ideas, aligning with the findings of Labadze et al. (2023) and Marzuki et al. (2023), who emphasized that AI facilitates effective teacher-student communication, provides personalized support, and enhances students’ writing and speaking abilities.

The students, on the other hand, reported a “High” level of awareness of using AI technologies in terms of communication. The findings revealed that students generally demonstrated a high level of awareness regarding the use of AI technologies for communication purposes, as reflected in the composite mean of 3.86. This suggests that AI tools are already recognized by students as valuable aids in enhancing communication within the teaching-learning process.

Among the indicators, the highest mean score ($w\bar{x}$ = 3.98) was obtained by “analyze communication patterns and suggest better ways to express ideas in writing and speaking.” This result is highly significant as it signifies that students are particularly aware of AI’s capability to support higher-order communication skills, such as refining expression, improving clarity, and enhancing both written and oral discourse. This implies that learners are not only using AI for basic tasks but are also recognizing its role in developing more advanced communication competencies.

Two indicators, “assist in note-taking and in comprehending lessons using AI-based tools” and “automate announcements, reminders, and updates to keep students informed about coursework,” both obtained a mean score of 3.90, further indicating a strong awareness of AI’s practical and supportive functions. These findings highlight that students perceive AI as an effective tool for improving academic organization, accessibility of information, and comprehension of lessons, particularly through features such as speech-to-text and automated notifications

Meanwhile, “enhance ability to collaborate and interact with teachers and classmates effectively through AI-assisted communication skills” ($w\bar{x}$ = 3.78) and “provide automated feedback on writing and presentations” ($w\bar{x}$ = 3.75) also yielded relatively high mean scores, although slightly lower compared to the other indicators. These results suggest that while students are aware of AI’s collaborative and feedback-related functions, these aspects may not yet be as fully experienced or maximized in actual practice.

Hohenstein et al. (2023) also posited that AI communication tools are becoming increasingly important in learning, as they streamline interactions, promote cooperation, and encourage positive communication strategies.

Furthermore, the findings showed that both teachers and students demonstrated strong awareness of AI technologies in communication, with teachers showing a higher level of familiarity and application. This means that teachers are better positioned to integrate AI tools effectively, while students are still developing their understanding, particularly in collaboration and feedback use. In general, the findings suggest a need for guided implementation of AI in education to bridge this gap and enhance communication skills for both groups.

AI can...	Teachers (n=49)		Students (n=195)	
	$w\bar{x}$	VD	$w\bar{x}$	VD
Help generate summaries, reports, and presentations based on input.	4.48	SA	4.00	A
Enhance writing skills by providing suggestions, grammar corrections, and style improvements.	4.44	SA	4.05	A
Create images, videos, or animations to support projects and assignments.	4.40	SA	3.94	A
Verify AI-generated content for originality before using it in academic work.	4.35	SA	3.89	A
Help students become more efficient and creative in completing schoolwork.	4.43	SA	3.96	A

Composite means:	4.22	SA	3.97	A
Level of Awareness:	Very High		High	

Note: Verbal Descriptions (VD); Explanation (E); 4.21 - 5.00 Strongly Agree (SA); Very High (VH); 3.414.20, Agree(A), High (H); 2.61 - 3.40 Neutral (N), Moderate (M); .81 - 2.60, Disagree(D), Low(L); 1.00 - 1.80, Strongly Disagree (SD) Very Low (VL)

Table 1.4. Level of Awareness of Teachers and Students as to the Usage of AI Technologies in terms of Content Creation

Table 1.4 depicts a comparative analysis of the level of awareness of teachers and students regarding the use of AI technologies in content creation. The findings revealed that teachers reported a “Very High” level of awareness, as indicated by a composite mean of 4.42, while students reported a “High” level of awareness, with a lower composite mean of 3.97. This indicates that teachers have a more comprehensive understanding of AI applications in content creation, whereas students, although aware, have yet to fully grasp the range and potential of AI tools for generating educational content.

The data disclose that the teachers demonstrated very high awareness across all indicators, with weighted means ranging from 4.35 to 4.48. The teachers reported the highest awareness in generating summaries, reports, and presentations based on their input ($w\bar{x} = 4.48$), which reflects recognition of AI’s ability to streamline content production and support instructional efficiency. The next highest indicator was enhancing students’ writing skills through suggestions, grammar corrections, and style improvements ($w\bar{x} = 4.44$), highlighting teachers’ understanding of AI as a tool for improving communication and academic writing proficiency.

The teachers also acknowledged that AI can help students be more efficient and creative in completing schoolwork ($w\bar{x} = 4.43$), demonstrating awareness of AI’s potential to enhance creativity, critical thinking, and independent learning. They further reported awareness of AI tools assisting students in creating images, videos, or animations to support projects and assignments ($w\bar{x} = 4.40$), indicating recognition of the role of AI in enhancing engagement and multimodal learning.

Lastly, the teachers noted that AI can verify AI-generated content in academic work ($w\bar{x} = 4.35$), reflecting an understanding of the importance of ensuring accuracy, credibility, and academic integrity in content creation. These results imply that teachers are well-prepared to integrate AI in content creation, supporting the development of personalized, creative, and effective learning materials, consistent with Morales-Chan et al. (2024), who emphasized that AI tools improve both teacher and student efficiency in educational content creation. Liang (2024) also argued that AI transforms teachers from traditional content deliverers into innovative content creators, opening new opportunities to enhance instructional competence in the age of machine intelligence.

The students, meanwhile, reported a “High” level of awareness, with weighted means ranging from 3.89 to 4.05 across indicators, which is lower than the teachers’ responses. Students showed awareness of AI in supporting writing skills from the provided suggestions, grammar corrections, and style improvement, with a mean score of ($w\bar{x} = 4.05$), and generating summaries, reports, and presentations based on my input ($w\bar{x} = 4.00$). However, their comparatively lower scores suggest that they are still developing familiarity with AI’s full potential in content creation. This implies a need for targeted orientation and training programs to increase students’ competence in leveraging AI tools for educational content production, ensuring that they can effectively use AI to support independent learning and creative output.

These findings signify that teachers possess a highly developed awareness of AI tools for content creation, enabling them to guide students in producing quality, creative, and accurate academic outputs. Meanwhile, students’ awareness, though positive, is still emerging, which stresses the importance of structured guidance, capacity-building initiatives, and practical exposure to maximize AI’s benefits in content creation and enhance overall learning outcomes.

Zawacki-Richter et al. (2019) stated that AI technologies are increasingly utilized in higher education to assist students in writing, content development, and knowledge organization, thereby improving the overall learning process. Kasneci et al. (2023) also emphasized that generative AI technologies can support students in drafting academic content, summarizing information, and producing multimedia outputs. However, the authors also stressed the importance of guiding students toward the responsible and ethical use of AI-generated materials, particularly in maintaining originality and academic honesty.

AI can...	Teachers (n=49)		Students (n=195)	
	$w\bar{x}$	VD	$w\bar{x}$	VD
Provide immediate feedback on answers in quizzes, essays, and assignments.	4.22	SA	4.05	A
Correct grammar, spelling, and writing style while explaining the errors.	4.23	SA	3.96	A
Adapt to learning needs by providing hints or explanations when struggling with a topic.	4.28	SA	3.98	A
Help identify mistakes and suggest improvements for future work.	4.45	SA	4.10	A

Develop creativity, personal expression, or unique perspectives at all times.	4.42	SA	4.12	A
Composite means:	4.32	SA	4.04	A
Level of Awareness:	Very High		High	
<i>Note: Verbal Descriptions (VD); Explanation (E); 4.21- 5.00 Strongly Agree (SA); Very High (VH); 3.41-4.20, Agree(A), High (H); 2.61- 3.40 Neutral (N), Moderate (M); .81- 2.60, Disagree(D), Low(L); 1.00- 1.80, Strongly Disagree (SD)Very Low (VL)</i>				

Table 1.5. Level of Awareness of Teachers and Students as to the Usage of AI Technologies in terms of Automated Feedback Systems

Table 1.5 presents a comparative analysis of the level of awareness of teachers and students on the use of AI technologies in automated feedback systems. Based on the data, the teachers reported a “Very High” level of awareness, with a composite mean of 4.32, while students indicated a “High” level of awareness, with a slightly lower composite mean of 4.04. This suggests that teachers possess a comprehensive understanding of automated feedback systems and their applications, whereas students are aware but still developing their familiarity with these AI tools.

The teachers demonstrated very high awareness across all indicators, with weighted means ranging from 4.22 to 4.45. They reported the highest awareness in identifying mistakes and suggesting improvements for future use ($w\bar{x} = 4.45$), reflecting recognition of AI’s potential to deliver timely, constructive feedback that enhances learning and supports student growth. This was followed by developing creativity, personal expression, and unique perspectives at all times ($w\bar{x} = 4.42$), showing that teachers understand how automated feedback can improve originality and critical thinking.

The teachers also recognized the importance of adapting to students’ learning needs by providing hints or explanations when learners struggle with a topic ($w\bar{x} = 4.28$), and correcting grammar, spelling, and writing style while explaining the errors ($w\bar{x} = 4.23$), indicating awareness of AI’s ability to support both comprehension and writing proficiency. Lastly, they noted the use of automated feedback in assessing and providing feedback on quizzes, essays, and assignments ($w\bar{x} = 4.22$), highlighting its role in enhancing assessment efficiency and instructional effectiveness. These findings indicate that teachers are well-prepared to use AI-driven feedback to support student learning, offer personalized guidance, and enhance academic outcomes. This aligns with Hahn et al. (2021), who emphasized the importance of timely and constructive feedback for skill development and achieving goals.

Furthermore, the results indicate that students generally perceived a high level of awareness regarding the use of AI technologies in learning, as reflected by the composite mean of 4.04, categorized as *High (A)*. This suggests that students recognize AI as a valuable tool that can support various aspects of their academic tasks and learning processes. Among the indicators, students rated “*help identify mistakes and suggest improvements for future work*” highest ($w\bar{x} = 4.10$), which signifies a strong awareness of AI’s capacity to provide guidance and corrective feedback that can enhance learning outcomes. Similarly, “*develop creativity, personal expression, or unique perspectives at all times*” received a mean of 4.12, which indicates that students are aware of AI’s potential to support higher-order cognitive skills such as creativity and individual expression.

Indicators related to more routine academic support, such as “*provide immediate feedback on answers in quizzes, essays, and assignments*” ($w\bar{x} = 4.05$) and “*correct grammar, spelling, and writing style while explaining the errors*” ($w\bar{x} = 3.96$), were also rated highly. These findings reflect that students acknowledge AI’s role in improving accuracy, comprehension, and learning efficiency. Moreover, “*adapt to learning needs by providing hints or explanations when struggling with a topic*” ($w\bar{x} = 3.98$) also received strong agreement, showing that students recognize AI as a responsive and adaptive learning tool. Langove and Khan (2024) noted that the use of automated grading and feedback systems significantly enhances students’ interaction, assignment submission rates, and class engagement, while Han and Sari (2024) found that combining automated feedback with teacher feedback improved analytic writing scores and reduced grammar errors more effectively than teacher feedback alone. Additionally, Albtosh and Suryawati (2025) emphasized that AI-driven feedback supports teacher self-assessment, enabling reflection on instructional practices and professional growth through evidence-based insights.

The findings imply that integrating automated feedback systems in classrooms provides a dual benefit: it enhances student learning by delivering immediate, personalized, and constructive feedback, while also supporting teachers in monitoring performance, refining instruction, and promoting professional growth. This stresses the importance of developing and implementing automated feedback systems in alignment with SDG 4 (Quality Education), as these technologies can enhance the effectiveness, equity, and quality of teaching and learning processes.

As a whole, teachers exhibit a higher level of awareness of AI-powered automated feedback systems compared to students, particularly in delivering personalized, adaptive, and constructive feedback. This suggests the need for effective integration of these systems in education to enhance student learning, improve outcomes, and further develop students’ familiarity with AI tools.

Indicators	Teachers (n=49)		Students (n=195)	
	w \bar{x}	VD	w \bar{x}	VD
1. Personalized Learning	4.22	VH	3.78	H
2. Intelligent Tutoring System	4.42	VH	4.09	H
3. Communication	4.35	VH	3.86	H
4. Content Creation	4.42	VH	3.97	H
5. Automated Feedback System	4.32	VH	4.04	H
Overall Mean:	4.31	VH	3.94	H

Note: Verbal Descriptions (VD); Explanation (E); 4.21 - 5.00 Strongly Agree (SA); Very High (VH); 3.41-4.20, Agree(A), High (H); 2.61 - 3.40 Neutral (N), Moderate (M); .81 - 2.60, Disagree(D), Low(L); 1.00 - 1.80, Strongly Disagree (SD) Very Low (VL)

Table 1.6. Summary Table on the Level of Awareness of Teachers and Students as to the Usage of AI Technologies

Table 1.6 summarizes the level of awareness of teachers and students regarding the use of AI technologies across all areas assessed in the study. The results show that teachers reported a “Very High” level of awareness, with an overall mean score of 4.31. The students, on the other hand, indicated a “High” level of awareness, with an overall mean score of 3.94. The higher level of awareness among teachers is both rational and expected, as they bear the primary responsibility for guiding, facilitating, and implementing AI tools in the teaching-learning process. This highlights the importance of equipping teachers with comprehensive AI knowledge and skills to ensure effective integration of these technologies into instructional practices. On the part of students, the “High” level of awareness indicates a positive starting point in their engagement with AI tools, reflecting growing familiarity and initial competence. However, students’ awareness is comparatively lower, which may be influenced by limited access to technological resources, inconsistent internet connectivity, or insufficient exposure to AI-driven tools. In other words, while students are beginning to learn and utilize AI technologies for personalized and independent learning, additional support and structured opportunities are necessary to enhance their understanding and competence. The findings imply that educational institutions should take a proactive role in providing access to AI tools, digital resources, and training opportunities for students. By doing so, students can develop the skills and confidence to leverage AI technologies effectively in their learning processes. Moreover, enhancing both teacher and student awareness contributes to improved instructional quality, greater learner engagement, and alignment with SDG 4, which emphasizes inclusive, equitable, and effective learning opportunities for all.

Overall, the results reinforce the need for continuous professional development for teachers and targeted exposure for students, ensuring that AI integration in education is both meaningful and impactful. Strengthening institutional support systems and infrastructure will further enable the effective adoption of AI technologies in classrooms. Additionally, promoting collaboration between teachers and students in using AI can maximize its benefits and promote more innovative and engaging learning experiences. Further, regularly evaluating and updating AI programs and resources can guarantee that both teachers and students remain proficient with emerging technologies and pedagogical practices.

Variables	\bar{x}	t	df	p-value	Mean Difference	Decision Rule	Remarks
Personalized Learning							
Teachers	4.22	4.03	49	<.001	0.436	Reject Ho _{1.1}	Significant
Students	3.78						
Intelligent Tutorial							
Teachers	4.42	3.53	49	<.001	0.329	Reject Ho _{1.2}	Significant
Students	4.09						
Communication							
Teachers	4.35	6.58	49	<.001	0.489	Reject Ho _{1.3}	Significant
Students	3.86						
Content Creation							
Teachers	4.42	5.22	49	<.001	0.453	Reject Ho _{1.4}	Significant
Students	3.97						
Automated Feedback							
Teachers	4.32	2.77	49	0.008	0.278	Reject Ho _{1.5}	Significant
Students	4.04						
Overall							
Teachers	4.31	4.51	49	<.001	0.370	Reject Ho ₁	Significant
Students	3.94						

Level of Significance = 0.05; W=0.972; p=0.286; n=49 teachers, n=195 students

Table 2. Test on Significant Difference in the Level of Awareness of Teachers and Students of AI Technologies

Table 2 shows the results of the test for significant differences in the level of awareness between teachers and students regarding the usage of AI technologies. The personalized learning data reveal a significant difference in the level of awareness across all AI domains, as indicated by p-values below 0.05: Personalized Learning ($p < .001$), Intelligent Tutoring Systems ($p < .001$), Communication ($p < .001$), Content Creation ($p < .001$), Automated Feedback ($p = 0.008$), and Overall Awareness ($p < .001$). The null hypothesis, which assumed no difference between teachers' and students' awareness, is therefore rejected.

The teachers consistently reported higher awareness than students across all areas. In personalized learning, teachers ($\bar{x} = 4.22$) surpassed students ($\bar{x} = 3.78$), reflecting stronger familiarity with AI tools that adapt lessons to individual learning pace and performance. In intelligent tutoring systems (ITSs), teachers ($\bar{x} = 4.42$) were more aware than students ($\bar{x} = 4.09$), showing greater understanding of AI-driven feedback and stepwise guidance. This finding aligns with the statement of Zawacki-Richter et al. (2020) on ITS's role in personalized instruction.

The teachers also demonstrated higher awareness in communication ($\bar{x} = 4.35$ vs. 3.86), content creation ($\bar{x} = 4.42$ vs. 3.97), and automated feedback ($\bar{x} = 4.32$ vs. 4.04), indicating stronger skills in leveraging AI for announcements, writing support, multimedia production, and timely constructive feedback.

The overall awareness level of teachers was "Very High" ($\bar{x} = 4.31$) compared to students' "High" level ($\bar{x} = 3.94$). This trend reflects teachers' professional responsibility in guiding the learning process, while students are still developing their familiarity with AI tools. Factors such as limited access to technology, inconsistent internet connectivity, and restricted exposure may contribute to students' lower awareness. These findings imply the need for continuous teacher professional development to maintain advanced AI competencies and for schools to provide greater student access to AI tools and structured learning opportunities.

Additionally, the findings revealed that increased student engagement with AI fosters independent learning, critical thinking, and creativity, preparing learners to thrive in an increasingly digital world. While students show high awareness of the educational benefits of AIs, structured guidance and active engagement are essential to bridge the gap between awareness and actual utilization, promoting 21st-century skills and effective learning.

Indicators	$w\bar{x}$	VD
Make instructional materials fitted for the learning pace of my students.	4.06	A
Adjust content delivery according to students' progress and performance.	4.16	A
Provide personalized feedback and recommendations for student improvement	3.97	A
Modify my teaching strategies for better learning outcomes.	4.15	A
Design unique learning paths for each student.	3.86	A
Evaluate student understanding and adjust instructional approaches accordingly.	3.94	A
Enhance student engagement in personalized learning activities.	4.20	A
Composite Mean:	4.05	A

Extent of Utilization: **High**
 Note: Verbal Description (VD), Extent of Utilization (EoU); 4.21- 5.00, Strongly Agree (SA), Very High Extent (VHE); 3.41- 4.20, Agree(A), High Extent (HE); 2.61- 3.40, Neutral(N), Moderate Extent (ME); 1.81- 2.60 Disagree (D), Low Extent (LE); 1.00- 1.80, Strongly Disagree (SD), Very Low Extent (VLE), n=49

Table 3.1. Teachers' Extent of Utilization of AI Technologies in terms of Personalized Learning

Table 3.1 reflects teachers' extent of utilization of AI technologies in personalized learning. Overall, teachers reported a "High" level of utilization, with a composite mean of 4.05. While the general rating falls within the high category, certain aspects of AI applications received higher scores, indicating areas of stronger practice. Teachers rated themselves highest in enhancing students' engagement in personalized learning activities ($w\bar{x} = 4.20$), followed by adjusting content delivery according to students' progress and performance ($w\bar{x} = 4.16$), and modifying teaching strategies for better learning outcomes ($w\bar{x} = 4.15$).

These findings align with previous studies emphasizing the transformative potential of AI in teaching and learning. Paek et al. (2021) and Huang et al. (2021) highlight that AI-driven tools and machine learning facilitate individualized learning and diversified instructional approaches, which contribute to improved educational quality.

Von der Vorst et al. (2019) also described AI as a "holy grail" for one-to-one learning, allowing teachers to tailor instruction to each student's unique needs. Ng et al. (2023) similarly noted that AI fosters flexible, customized, and effective learning environments while enhancing teachers' educational competencies. Xu and Zhang (2023) further explained that integrating

AI in personalized learning reduces teachers' preparatory workload by automating differentiation in assignments and assessments, enabling educators to focus on meaningful learning facilitation and addressing individual student needs.

Despite the teachers' very high awareness of AI technologies in personalized learning (as indicated in Table 1.1), the results reveal a gap between knowledge and practical application. Teachers underutilized AI-driven tools in certain areas, including the design of individualized learning pathways ($w\bar{x} = 3.86$), evaluation of student understanding and adjusting to instructional approaches accordingly ($w\bar{x} = 3.94$), and the provision of personalized feedback and recommendations ($w\bar{x} = 3.97$). Factors such as increased class sizes, expanded modes of study, and heavier academic workloads likely contribute to this gap. Ekaette et al. (2020) emphasized that high teacher-to-student ratios create significant challenges for managing personalized instruction effectively.

The disparity between awareness and practical use implies that conceptual knowledge alone is insufficient for effective AI integration in personalized learning. These findings underscore the need for targeted professional development programs that go beyond theoretical understanding, emphasizing pedagogical application, instructional design, and data-informed decision-making using AI tools. Furthermore, institutional support, including access to appropriate technologies, ongoing mentoring, and clear policy guidance, is essential to help teachers translate AI awareness into sustained classroom practices that enhance individualized learning outcomes.

I utilized AI technologies to:	$w\bar{x}$	VD
Deliver customized lessons based on students' learning progress.	4.19	A
Create easily accessible and interactive learning materials.	4.18	A
Promote and enhance student interaction and active participation.	4.17	A
Offer remedial lessons or advanced learning activities designed to cater to individual needs.	3.97	A
Provide students with accessible videos and learning materials to support learning.	3.96	A
Offer step-by-step explanations based on students' responses.	3.98	A
Adjust and differentiate the difficulty of questions to match students' varying levels of performance and understanding.	3.95	A
Composite Mean:	4.06	A

Extent of Utilization: **High**

Note: Verbal Description (VD), Extent of Utilization (EoU); 4.21- 5.00, Strongly Agree (SA), Very High Extent (VHE); 3.41- 4.20, Agree(A), High Extent (HE); 2.61- 3.40, Neutral(N), Moderate Extent (ME); 1.81- 2.60 Disagree (D), Low Extent (LE); 1.00- 1.80, Strongly Disagree (SD), Very Low Extent (VLE), n=49

Table 3.2. Teachers' Extent of Utilization of AI Technologies in terms of Intelligent Tutoring System

Table 3.2 shows teachers' extent of utilization of AI technologies in Intelligent Tutoring Systems (ITS). Overall, teachers reported a high level of utilization with a composite mean of 4.06. Within this domain, teachers reported the strongest utilization in delivering customized lessons based on students' learning progress ($w\bar{x} = 4.19$), followed by creating accessible and interactive learning materials ($w\bar{x} = 4.18$) and promoting student interaction and participation ($w\bar{x} = 4.17$). Despite this high utilization, the data reveal a noticeable gap between teachers' awareness and practical application of ITS tools. Lower utilization was observed in differentiating question difficulty to match student levels ($w\bar{x} = 3.95$), providing accessible videos and learning resources ($w\bar{x} = 3.96$), offering remedial or advanced lessons ($w\bar{x} = 3.97$), and providing step-by-step explanations on student responses ($w\bar{x} = 3.98$). This disparity suggests that while teachers recognize the value of ITS, translating this awareness into comprehensive instructional practices remains a challenge.

These findings are consistent with prior research, which claimed that ITS enhances student engagement and improves conceptual understanding as it enables more interactive and conversational learning experiences (Paladines & Ramirez, 2020). Rahim et al. (2020) likewise postulated that the effectiveness of ITS helps educators monitor student progress and allows the system to adjust learning strategies that support better academic outcomes.

Interestingly, this result contrasts with Menekse and Akgun (2022), who found that higher teacher awareness of AI was strongly correlated with greater utilization in instructional settings. Similarly, Ghimire et al. (2024) reported that teachers with higher AI awareness were more likely to adopt AI-based teaching analytics and intelligent tutoring solutions. The difference in this study may reflect contextual factors such as access to resources, institutional support, and teachers' familiarity with the technology.

Overall, the findings accentuate the need for targeted professional development and continuous training on ITS integration. Institutions should provide both access to appropriate technology and structured support systems, enabling teachers to fully implement ITS tools and maximize their potential for personalized and data-driven instruction.

I utilized AI technologies to:	w\bar{x}	VD
Interact with students and provide academic support.	4.15	A
Send automated announcements, deadlines, and important updates to students.	4.12	A
Facilitate communication with students who speak different languages.	3.70	A
Provide instant responses to common student questions regarding coursework and assignments.	4.10	A
Draft, organize, and automate email communication with student improvement.	3.81	A
Generate personalized feedback messages for student improvement.	3.87	A
Modify assessment questions according to the varying levels of my students.	3.86	A
Composite Mean:	3.94	A
Extent of Utilization:	High	

Note: Verbal Description (VD), Extent of Utilization (EoU); 4.21- 5.00, Strongly Agree (SA), Very High Extent (VHE); 3.41- 4.20, Agree(A), High Extent (HE); 2.61- 3.40, Neutral(N), Moderate Extent (ME); 1.81- 2.60 Disagree (D), Low Extent (LE); 1.00- 1.80, Strongly Disagree (SD), Very Low Extent (VLE), n=49

Table 3.3. Teachers' Extent of Utilization of AI Technologies in terms of Communication

Table 3.3 displays teachers' extent of utilization of AI technologies in terms of communication. Overall, teachers reported a high level of utilization with a composite mean of 3.94. It can be observed from the data that teachers rated themselves higher in specific areas, such as interacting with students and providing academic support ($w\bar{x} = 4.15$), sending automated announcements, deadlines, and important updates to students ($w\bar{x} = 4.12$), and providing instant responses to common student questions regarding coursework and assignments ($w\bar{x} = 4.10$). Other indicators, however, were rated lower, ranging from 3.70 to 3.87, which reflects variations in practical application.

The findings reveal a discrepancy between teachers' high level of awareness (as shown in Table 1.3) and the degree to which they apply AI for communication purposes. This indicates that although teachers understand the benefits of AI in supporting effective communication, integrating this awareness consistently into classroom practice has yet to be fully realized. Hohenstein et al. (2023) noted that algorithmic responses, such as AI-generated suggestions, can carry negative social connotations, leading individuals to evaluate AI-mediated communication skeptically. The researchers further stressed that even though AI can enhance communication speed and efficiency, concerns about its perceived anti-social effects may discourage overt use.

Conversely, AI has been shown to amplify the effectiveness of communication when integrated with strong communication methods. Aleq et al. (2024) supposed that AI mediates and strengthens the relationship between communication strategies and outcomes, suggesting that properly designed AI-supported methods can significantly improve interaction and engagement. Similarly, Hohenstein et al. (2023) found that AI-driven "smart replies" can positively influence social interaction by increasing the speed of communication, promoting positive language, and enhancing perceived cooperation among interlocutors.

These findings emphasize the importance of equipping teachers with the skills and confidence to use AI responsibly in communication. Targeted professional development, ongoing support, and exposure to AI-mediated communication tools can help overcome social hesitations, maximize instructional benefits, and ensure that AI effectively enhances both teacher-student and peer-to-peer interactions.

I utilized AI technologies to:	w\bar{x}	VD
Generate structured lesson plans based on learning objectives and students' needs.	4.26	SA
Create instructional materials such as presentations, worksheets, and quizzes.	4.33	SA
Develop engaging educational videos, animations, and interactive media.	3.86	A
Create and customize formative and summative assessments according to my students' different learning levels.	3.74	A
Modify and personalize learning materials for diverse students' needs.	3.78	A
Find, curate, and suggest relevant academic resources (e.g., articles, videos, research papers) for my lessons.	4.13	A
Incorporate AI-driven simulations, virtual labs, or gamified activities in my teaching materials.	4.18	A
Composite Mean:	4.04	A
Extent of Utilization:	High	

Note: Verbal Description (VD), Extent of Utilization (EoU); 4.21- 5.00, Strongly Agree (SA), Very High Extent (VHE); 3.41- 4.20, Agree(A), High Extent (HE); 2.61- 3.40, Neutral(N), Moderate Extent (ME); 1.81- 2.60 Disagree (D), Low Extent (LE); 1.00- 1.80, Strongly Disagree (SD), Very Low Extent (VLE), n=49

Table 3.4. Teachers' Extent of Utilization of AI Technologies in terms of Content Creation

Table 3.4 reflects teachers' extent of utilization of AI technologies in content creation. The data indicate that teachers reported a high level of utilization, as reflected in the composite mean of 4.04. Teachers exhibited a very high level of utilization in key areas, particularly in developing structured lesson plans aligned with learning objectives and students' needs ($w\bar{x} = 4.26$) and producing instructional materials such as presentations, worksheets, and quizzes ($w\bar{x} = 4.33$). Other indicators were rated in the high category, with means ranging from 3.74 to 4.18, reflecting consistent engagement with AI-supported instructional practices.

While teachers exhibit strong knowledge and awareness of AI applications in content creation, this awareness does not consistently translate into daily classroom use. The gap between knowledge and practical application may stem from constraints such as limited access to AI-enabled technologies, insufficient institutional support, and time pressures, which hinder regular integration of AI into instructional tasks.

Supporting these findings, Ahmed et al. (2021) reported that teachers in public-sector institutions were constrained by insufficient technological resources and professional development opportunities, preventing them from fully leveraging AI to improve student learning outcomes. Similarly, Afshan Bibi et al. (2024) proposed a comprehensive AI integration framework encompassing learning with AI, learning about AI, and preparing for AI, emphasizing the cultivation of technical skills, critical thinking, digital citizenship, and awareness of AI's societal, ethical, and human impacts.

These findings imply a need for targeted professional development. Since teachers' awareness is already very high, training programs should move beyond introductory exposure and focus on hands-on, classroom-based applications of AI, demonstrating efficient and ethical integration into daily instructional tasks. Furthermore, educational leaders should prioritize bridging the awareness–utilization gap by providing necessary resources, technical support, ongoing training, and incentives, as suggested by Aleeq (2024), to enable teachers to translate high awareness into effective instructional practices.

For students, these findings highlight the potential of AI-assisted content creation to enhance academic achievement and support personalized learning, aligning with national educational goals and the broader objectives of promoting digital literacy and 21st-century skills.

I utilized AI technologies to:	$w\bar{x}$	VD
Provide individualized feedback on student assignments and assessments.	3.75	A
Evaluate students' responses and provide prompt feedback in the form of scores.	3.86	A
Analyze student work and highlight errors in grammar, logic or conceptual understanding.	3.79	A
Track student progress and generate reports on strengths and areas for improvement.	3.84	A
Provide immediate responses to student queries and submissions.	3.89	A
Assess and provide feedback on students' oral presentations and communication skills.	3.96	A
Generate differentiated feedback based on individual student performance levels.	3.74	A
Composite Mean:	3.83	A

Extent of Utilization: High

Note: Verbal Description (VD), Extent of Utilization (EoU); 4.21 - 5.00, Strongly Agree (SA), Very High Extent (VHE); 3.41 - 4.20, Agree(A), High Extent (HE); 2.61 - 3.40, Neutral(N), Moderate Extent (ME); 1.81 - 2.60 Disagree (D), Low Extent (LE); 1.00 - 1.80, Strongly Disagree (SD), Very Low Extent (VLE), n=49

Table 3.5. Teachers' Extent of Utilization of AI Technologies in terms of Automated Feedback System

Table 3.5 presents the extent of teachers' utilization of AI technologies in automated feedback systems. The results show that, overall, teachers engage with these tools at a high level, with a composite mean of 3.83. While teachers demonstrate strong awareness of AI's potential for providing timely and constructive feedback (as seen in Table 1.5), the data reveal a gap between this awareness and actual classroom implementation. This suggests that recognizing the benefits of automated feedback does not automatically translate into consistent application, stressing the need for targeted strategies and support to bridge the gap between knowledge and practice.

The results indicate that teachers exhibit a high level of utilization of AI technologies in automated feedback systems, as reflected in the composite mean of 3.83, categorized as *High*. Among the indicators, teachers most frequently applied AI to assess and provide feedback on students' oral presentations and communication skills ($w\bar{x} = 3.96$), and to provide immediate responses to student queries and submissions ($w\bar{x} = 3.89$). Other areas of application, such as evaluating students' responses, tracking progress, analyzing work for errors in grammar, logic, or conceptual understanding, and generating individualized or differentiated feedback, also fell within the high utilization category, with means ranging from 3.74 to 3.86.

These findings suggest that teachers are actively integrating AI to enhance the feedback process, particularly in providing timely and targeted responses that support student learning. However, the slightly lower utilization scores in generating differentiated and individualized feedback indicate that while teachers recognize the potential of AI in fitting feedback to students' unique learning needs, there may still be challenges in fully leveraging the system's capabilities. Generally, the data highlight a positive engagement with AI-based feedback tools, while emphasizing the opportunity for further professional development to maximize the effectiveness of automated feedback in promoting individualized learning outcomes.

The findings signify that teachers reported higher utilization in certain areas, yet overall implementation is limited, indicating that the potential of automated feedback is not fully realized in instructional practices. This gap may be attributed to constraints such as insufficient access to AI-enabled tools, time limitations, or the need for additional training on integrating automated feedback into pedagogical strategies. According to Langove and Khan (2024), providing timely, constructive feedback is critical for facilitating learning. Hahn et al. (2021) also asserted that feedback serves as an essential component of scaffolding, which helps students achieve goals and develop skills.

Similarly, Albtosh and Suryawati (2025) posited that automated feedback systems leverage machine learning, natural language processing, and data analytics to provide timely, evidence-based insights to educators, supporting reflection on instructional practices, classroom interaction, and professional growth. The use of AI tools in teaching not only delivers immediate, personalized feedback to students but also reduces teachers' workloads, which allows them to focus on higher-order instructional tasks.

Moreover, empirical evidence demonstrates the effectiveness of combining automated and teacher-generated feedback. Han et al. (2024) found that combined automated-teacher feedback was more effective than teacher-only feedback in reducing students' errors in grammar and mechanics. This highlights the tangible benefits of AI-driven feedback in learning outcomes.

The findings of this study suggest that teachers should recognize automated feedback systems as a vital instructional tool that enhances student learning and engagement. To maximize the benefits of AI in feedback, educational institutions must provide comprehensive support, including access to appropriate technologies, ongoing professional development, and motivation for teachers to integrate these tools consistently. Institutional investment in such resources is critical to ensure that automated feedback systems are effectively and sustainably implemented, contributing to improved learning outcomes in line with SDG 4 on Quality Education.

Indicators	w\bar{x}	VD
Personalized Learning	4.05	High
Intelligent Tutoring System	4.06	High
Communication	3.94	High
Content Creation	4.04	High
Automated Feedback System	3.83	High
Overall Mean:	3.98	High

Note: Verbal Description (VD), Extent of Utilization (EoU); 4.21- 5.00, Strongly Agree (SA), Very High Extent (VHE); 3.41- 4.20, Agree(A), High Extent (HE); 2.61- 3.40, Neutral(N), Moderate Extent (ME); 1.81- 2.60 Disagree (D), Low Extent (LE); 1.00- 1.80, Strongly Disagree (SD), Very Low Extent (VLE), n=49

Table 3.6. Summary Table on Teachers' Extent of Utilization of AI Technologies

Table 3.6 provides a summary of teachers' overall extent of utilization of AI technologies. The result indicates that overall engagement falls within the high category, with a composite mean of 3.98. Among the domains, teachers reported the highest utilization in Intelligent Tutoring Systems ($w\bar{x} = 4.06$) and Personalized Learning ($w\bar{x} = 4.05$). This result suggests a strong inclination to utilize AI tools for adapting instruction to students' learning needs and providing targeted support. Content creation also reflected high utilization ($w\bar{x} = 4.04$), which shows that teachers frequently employ AI technologies to develop instructional materials such as presentations, worksheets, and assessments.

Additionally, the area on Communication ($w\bar{x} = 3.94$) indicates that teachers actively use AI to facilitate interactions with students and peers, though slightly less extensively than for tutoring or content creation. Meanwhile, the Automated Feedback System recorded the lowest, yet still high, mean ($w\bar{x} = 3.83$). This indicates that while teachers utilize AI to provide timely responses, track progress, and deliver individualized feedback, there is room to further optimize its application in the classroom.

Collectively, these findings signify that teachers are integrating AI technologies across multiple facets of instruction, with particular emphasis on personalized learning, tutoring support, and content development. However, the comparatively lower utilization in automated feedback and communication highlights areas where targeted professional development could enhance teachers' capacity to fully harness AI for instructional effectiveness and student-centered learning.

The findings accentuate the critical role of automated feedback systems in supporting student learning. As emphasized by Langove and Khan (2024), assessment is a core function of educators, and providing timely, constructive feedback is essential to facilitate learning and help students achieve their goals.

The discrepancy between awareness and utilization serves as a call to action for teachers to fully embrace their roles as guides and facilitators of learning. The results highlight the need for targeted professional development, continuous mentoring, and institutional support to encourage teachers to translate their knowledge of AI into practical classroom applications. Ultimately, these findings point to an opportunity for the further development, effective implementation, and sustained use of AI technologies in teaching, which can enhance instructional quality and promote better learning outcomes for students.

I utilized AI technologies to:	w\bar{x}	VD
Improve my grammar and writing.	4.00	A
Avoid plagiarism in my writing.	3.74	A
Paraphrase the information gathered.	3.72	A
Receive instant explanations on academic topics utilizing AI chatbots or virtual tutors.	3.80	A
Improve my essays, summaries, and academic writing skills.	3.94	A
Composite Mean:	3.84	A

Extent of Utilization: High

Note: Verbal Description (VD) Extent of Utilization (EoU); 4.21 - 5.00, Strongly Agree (SA), Very High Extent (VHE); 3.41 - 4.20, Agree(A), High Extent (HE); 2.61 - 3.40, Neutral(N), Moderate Extent (ME); 1.81 - 2.60 Disagree (D), Low Extent (LE); 1.00 - 1.80, Strongly Disagree (SD), Very Low Extent (VLE); n=195

Table 4.1. Students' Extent of Utilization of AI Technologies in terms of Personalized Learning

Table 4.1 presents the extent of students' utilization of AI technology in terms of personalized learning. The results indicate that students' utilization is high, as reflected in the composite mean of 3.84. Despite this high rating, it is evident that students are not yet fully utilizing AI technologies for personalized learning. This limited utilization can be partially attributed to their lower level of awareness on AI usage, as shown in Table 1.1.

As highlighted by Caspiz (2023), AI tools and technological gadgets play a pivotal role in supporting personalized learning, allowing instruction to adapt to individual students' needs and learning pace. Similarly, Redena (2022) emphasized that technological tools can connect classroom instruction to real-world contexts, providing a fresh perspective in making learning more relevant and engaging. Suherlan et al. (2022) also noted that students' effective use of digital technologies can improve academic performance and positively influence learning outcomes.

The underutilization of AI tools may be due to limited access to technology, including unreliable internet connectivity or insufficient gadgets, which is often influenced by socio-economic conditions (Redena, 2022). This finding reflects the need for educational institutions to provide students with adequate access to AI-enabled tools and resources, ensuring that all learners can benefit from personalized and technology-driven instruction. By addressing these access gaps, schools can maximize the potential of AI in supporting student-centered learning and improving overall educational outcomes.

I utilized AI technologies to:	w\bar{x}	VD
Provide me step- by -step guidance on complex topics.	4.10	A
Offer immediate feedback on my answer and suggest ways to improve it.	3.88	A
Access the information needed for my research.	3.82	A
Rephrase questions' difficulty based on what I really wanted to be answered.	4.06	A
Receive alternative explanations when I struggle with a concept.	4.05	A
Composite Mean:	3.98	A

Extent of Utilization: High

Note: Verbal Description (VD) Extent of Utilization (EoU); 4.21 - 5.00, Strongly Agree (SA), Very High Extent (VHE); 3.41 - 4.20, Agree(A), High Extent (HE); 2.61 - 3.40, Neutral(N), Moderate Extent (ME); 1.81 - 2.60 Disagree (D), Low Extent (LE); 1.00 - 1.80, Strongly Disagree (SD), Very Low Extent (VLE); n=195

Table 4.2. Students' Extent of Utilization of AI Technologies in terms of Intelligent Tutoring System

Table 4.2 illustrates the extent to which students utilize AI technologies in terms of Intelligent Tutoring Systems (ITSs). The data indicate a high level of utilization, reflected in the composite mean of 3.98. It is noteworthy that students make relatively extensive use of ITS technologies in certain specific areas. These include providing step-by-step guidance on complex topics ($w\bar{x} = 4.10$), rephrasing questions to better reflect their intended meaning ($w\bar{x} = 4.06$), and obtaining alternative explanations when struggling with concepts ($w\bar{x} = 4.05$).

Despite these strong areas, the results also highlight underutilization in other ITS functions, which may stem from limited awareness of the system's full capabilities or insufficient training in leveraging all available features. This indicates that while students recognize ITS as a helpful learning aid, their use remains selective and partially guided by familiarity with its tools.

The findings align with the study of Chein-Hung and Cheng-Yueh (2025), which showed that students with higher knowledge levels used ITS functions such as Hints and User-Defined Questions moderately, achieving better learning outcomes. Conversely, students who relied excessively on ITS tools tended to show diminished independent problem-solving abilities, emphasizing the importance of balanced use to foster both autonomy and mastery.

Similarly, Singh et al. (2025) emphasized the critical role of teachers in guiding students through AI-powered platforms, helping them navigate ITS features, and promoting creativity and critical thinking. Teachers' preparedness and active facilitation are essential in maximizing the benefits of adaptive learning environments.

Akhter (2025) further elaborated on the core components of ITS, including learner modeling, domain knowledge, pedagogical engines, and user interface design. Systems that effectively integrate adaptive personalization, multimodal instructional resources, and culturally responsive frameworks were found to significantly enhance comprehension, retention, engagement, and learner confidence. This stresses the necessity for teachers' and students' readiness, ethical data governance, and proper training to ensure ITS implementation is both effective and responsible.

The study indicates that while students are engaging with ITS tools to a considerable extent, there remains room for improvement in maximizing utilization, particularly through targeted training, increased awareness, and structured teacher support to fully harness the potential of AI-driven personalized learning.

I utilized AI technologies to:	$w\bar{x}$	VD
Convert spoken words into text for easier note-taking and documentation.	3.45	A
Enhance my communication in academic discussions and group work.	3.84	A
Help refine and structure my written or verbal communication.	3.95	A
Rewrite or enhance my writing while maintaining the original meaning.	3.69	A
Condense lengthy academic materials into key points for efficient learning.	3.78	A
Composite Mean:	3.74	A

Extent of Utilization: High

Note: Verbal Description (VD) Extent of Utilization (EoU); 4.21- 5.00, Strongly Agree (SA), Very High Extent (VHE); 3.41- 4.20, Agree(A), High Extent (HE); 2.61- 3.40, Neutral(N), Moderate Extent (ME); 1.81- 2.60 Disagree (D), Low Extent (LE); 1.00- 1.80, Strongly Disagree (SD), Very Low Extent (VLE); n=195

Table 4.3. Students' Extent of Utilization of AI Technologies in terms of Communication

Table 4.3 reveals the extent to which students utilize AI technologies in terms of communication. The data indicate a high overall level of utilization, with a composite mean of 3.74. However, the magnitude of use is comparatively lower than in other AI applications, suggesting partial engagement with communication-focused AI tools.

The results further reveal underutilization in specific communication-related areas, particularly in converting spoken words into text for easier note-taking and documentation ($w\bar{x} = 3.45$) and in rewriting or enhancing written or verbal communication ($w\bar{x} = 3.95$). This underutilization may be attributed to students' limited awareness of AI's full potential in supporting communication, a trend observed by Chien-Hung and Cheng-Yueh (2025), who noted that students with higher AI knowledge tend to use these tools more effectively and achieve better outcomes.

Research highlights the potential of AI in enhancing communication skills. Labadze et al. (2023) emphasized that AI has significantly improved teacher-student communication, providing instant support through AI chatbots and offering personalized assistance tailored to individual learning needs. Similarly, Marzuki et al. (2023) maintained that AI writing tools improve students' writing by providing quick feedback and suggestions to enhance content and structure. Hohenstein et al. (2023) further stressed that AI's role in communication is becoming increasingly crucial in modern learning environments, which supports both clarity and efficiency in information exchange.

Despite these advantages, the findings indicate that students are not fully utilizing AI for communication. This suggests a gap between awareness and practical application and emphasizes the importance of integrating AI tools explicitly into communication-focused learning tasks. Teachers should design activities that require students to use AI tools for drafting, revising, and practicing both oral and written communication, rather than leaving students to explore AI use informally or unguided. Such structured integration will help students develop their communication skills more effectively while maximizing the benefits of AI technology in learning.

I utilized AI technologies to:	w \bar{x}	VD
Compose articles and stories for my assignments.	3.70	A
Find, organize, and summarize relevant information for research and assignments.	3.39	N
Create visuals, infographics, and multimedia presentations for school projects.	3.37	N
Help understand and create multilingual content for academic or personal use.	3.40	N
Convert text into speech or create narrations for presentations and videos.	3.80	A
Composite mean:	3.53	A
Extent of Utilization:		High

Note: Verbal Description (VD) Extent of Utilization (EoU); 4.21 - 5.00, Strongly Agree (SA), Very High Extent (VHE); 3.41 - 4.20, Agree(A), High Extent (HE); 2.61 - 3.40, Neutral(N), Moderate Extent (ME); 1.81 - 2.60 Disagree (D), Low Extent (LE); 1.00 - 1.80, Strongly Disagree (SD), Very Low Extent (VLE); n=195

Table 4.4. Students' Extent of Utilization of AI Technologies in terms of Content Creation

Table 4.4 presents the extent to which students utilize AI technologies in content creation. The data reveal a high overall level of utilization, with a composite mean of 3.53. However, the magnitude of usage is comparatively lower, which means that students are not fully leveraging AI tools for content creation. Further analysis indicates underutilization in specific areas of content creation. These include finding, organizing, and summarizing relevant information for research and assignments ($w\bar{x} = 3.39$), creating visuals, infographics, and multimedia presentations for school projects ($w\bar{x} = 3.37$), and understanding and generating multilingual content for academic or personal use ($w\bar{x} = 3.40$). These findings suggest that while students are generally familiar with AI tools, their practical application in producing and managing educational content remains limited.

Students demonstrate a high level of AI use in content creation, but their actual application remains limited, particularly in tasks such as organizing information, creating multimedia outputs, and generating multilingual content. This suggests the need for stronger guidance and improved AI literacy among both teachers and students to fully maximize the benefits of AI in educational content creation. This result aligns with Romero (2024), who emphasized the importance of AI literacy among educators for the collaborative design of AI-enhanced learning activities. Romero stressed that equipping teachers with the skills to integrate AI effectively into content creation can increase learner engagement and provide more personalized learning experiences. Similarly, Singh and Pathania (2024) found that AI-driven content creation enhances student engagement and improves learning outcomes by fostering deeper comprehension and retention of concepts.

The underutilization observed in this study may be attributed to the limited conceptual and procedural understanding of AI tools among students. Additionally, gaps in teachers' pedagogical and technical competence with AI can indirectly constrain students' exposure and effective use of these technologies. Since teachers serve as the primary mediators of instructional innovations, deficiencies in their AI-related training are likely to cascade to learners. Consequently, while students require structured opportunities and guidance to maximize AI content creation, targeted professional development for educators remains essential to ensure that students' instructional experiences are supported by competent, knowledgeable facilitators.

I utilized AI technologies to:	w \bar{x}	VD
Receive real-time feedback on my writing, including grammar, clarity, and tone.	3.92	A
Ensure originality and avoid unintentional academic dishonesty.	3.86	N
Get instant explanations and suggestions for improvement in different subjects.	3.65	N
Provide personalized quizzes and feedback to track my progress in various subjects.	3.69	N
Clarify academic concepts and receive detailed explanations.	3.73	A
Composite Mean:	3.77	A
Extent of Utilization:		High

Note: Verbal Description (VD) Extent of Utilization (EoU); 4.21 - 5.00, Strongly Agree (SA), Very High Extent (VHE); 3.41 - 4.20, Agree(A), High Extent (HE); 2.61 - 3.40, Neutral(N), Moderate Extent (ME); 1.81 - 2.60 Disagree (D), Low Extent (LE); 1.00 - 1.80, Strongly Disagree (SD), Very Low Extent (VLE); n=195

Table 4.5. Students' Extent of Utilization of AI Technologies in terms of Automated Feedback System

Table 4.5 illustrates the extent to which students utilize AI technologies in automated feedback systems. The data show that the overall level of utilization is high, with a composite mean of 3.77; however, the magnitude of use is comparatively lower than that of other AI applications. This suggests that students are not fully leveraging automated feedback systems to support their learning.

Further analysis indicates underutilization in specific areas, particularly in receiving instant explanations and suggestions for improvement across different subjects ($w\bar{x} = 3.65$), obtaining personalized quizzes and feedback to track progress ($w\bar{x} = 3.69$), and clarifying academic concepts through detailed AI-generated explanations ($w\bar{x} = 3.73$). These findings highlight gaps in students' application of AI for continuous, self-directed learning.

As cited by Hahn et al. (2021), feedback is an essential component of scaffolding for learning, helping students achieve learning goals and develop necessary skills. Ibragimova (2021) emphasized that approximately 65% of studies on automated feedback systems report improved student performance. He further noted that recent technological advancements have enhanced computer tutoring systems, enabling personalized, real-time feedback accessible to learners anywhere and anytime.

Despite these advantages, students are still underutilizing automated feedback systems. A pilot study by Tubino and Adachi (2022) revealed that only a small proportion of students engaged with AI-powered feedback tools, particularly in formative academic writing tasks. The study noted that students who used these tools were typically proactive and high-achieving, suggesting that effective engagement with automated feedback requires evaluative and self-directed learning skills. Students must be willing to interpret and act upon feedback to enhance their learning.

These results signify that students lack sufficient conceptual and procedural understanding of automated feedback systems. Therefore, structured capability-building programs are vital to equip students with the knowledge and skills necessary to fully utilize AI tools, particularly automated feedback systems, for meaningful learning and improved academic performance.

Indicators	$w\bar{x}$	VD
Personalized Learning	3.84	High
Intelligent Tutoring System	3.98	High
Communication	3.74	High
Content Creation	3.53	High
Automated Feedback System	3.77	High
Overall Mean:	3.77	High

Note: Verbal Description (VD) Extent of Utilization (EoU); 4.21- 5.00, Strongly Agree (SA), Very High Extent (VHE); 3.41- 4.20, Agree(A), High Extent (HE); 2.61- 3.40, Neutral(N), Moderate Extent (ME); 1.81- 2.60 Disagree (D), Low Extent (LE); 1.00- 1.80, Strongly Disagree (SD), Very Low Extent (VLE); n=195

Table 4.6. Summary Table on Students' Extent of Utilization of AI Technologies

Table 4.6 presents the summary table on students' extent of utilization of AI Technologies. The data show that students' utilization of AI technologies across the five domains falls within the *high category*, with an overall mean of 3.77. Among the domains, the highest extent of utilization was observed in *Intelligent Tutoring Systems* ($w\bar{x} = 3.98$), which suggests that students frequently engage with AI platforms that provide adaptive support, immediate feedback, and guidance tailored to their learning progress. *Personalized Learning* ($w\bar{x} = 3.84$) and *Communication* ($w\bar{x} = 3.74$) were also rated high, reflecting students' active use of AI tools to address their individual learning needs and to enhance interactions with peers and instructors.

Meanwhile, content creation recorded the lowest mean among the domains, indicating that while students employ AI to generate learning materials and resources, this application is less frequent compared to tutoring or personalized learning activities. Similarly, the Automated Feedback System ($w\bar{x} = 3.77$) demonstrates a substantial, though moderate, engagement, highlighting students' use of AI for receiving timely guidance on assignments, assessments, and skill development.

These findings suggest that students are integrating AI technologies into their learning practices, with particular emphasis on adaptive tutoring and personalized learning experiences. The slightly lower utilization in content creation and automated feedback underscores opportunities for interventions or training programs to encourage more comprehensive use of AI tools, which ensures that students can maximize the benefits of emerging educational technologies.

Similarly, Tubino and Adachi (2022) claimed that only a small portion of students are engaged in AI technologies. Students lack sufficient conceptual and procedural understanding of AI technologies, leading to their underutilization. This result implies a need for students to enhance their knowledge and skills to fully utilize AI technologies.

Variables	r	df	p-value	Decision Rule	Remark
Level of Awareness and Extent of Utilization	0.606	47	<.001	Reject Ho ₂	Significant

Level of Significance = 0.05; Interpretation of r: ±0.01 to ±0.19 - negligible relationship, ±0.20 to ±0.29 - weak relationship, ± 0.30 to ± 0.39 - moderate relationship, ± 0.40 to ± 0.69 - strong relationship, ± 0.70 to ± higher - very strong relationship, n=49

Table 5. Test on Significant Relationship Between the Level of Awareness of Teachers on the Usage of AI technologies and their Extent of Utilization

Table 5 reveals the test of the significant relationship between teachers' level of awareness of AI technologies and their extent of utilization. The results point to a statistically significant relationship between these variables, as indicated by a p-value < 0.001, which is substantially lower than the established significance level of 0.05. Moreover, the correlation coefficient (r = 0.606) denotes a strong positive relationship, suggesting that higher levels of awareness among teachers are associated with greater utilization of AI technologies in their instructional practices. Consequently, the null hypothesis stating that no relationship exists between teachers' awareness and utilization of AI is rejected.

This finding indicates that teachers who are more knowledgeable and aware of AI technologies are more likely to integrate these tools into their teaching, whether for personalized learning, content creation, intelligent tutoring systems, communication, or automated feedback. However, as shown in earlier tables (Tables 3.1–3.6), there remains a gap between awareness and actual instructional application, which implies that awareness alone may not always ensure consistent and comprehensive use of AI technologies.

These results align with prior studies. Menekse and Akgun (2022) reported that increased teacher awareness of AI significantly correlated with a higher tendency to develop and utilize AI applications in classroom settings. Similarly, Ghimire et al. (2024) found that teachers with greater AI awareness were more inclined to adopt AI-based teaching and learning analysis systems.

Additional literature highlights the practical benefits and challenges of AI integration. Okafor and Anyanwu (2025) revealed that AI tools serve as valuable reference materials and enhance instructional delivery in secondary schools, although poor education funding limits widespread implementation. They also claimed that increasing funding and equipping schools with AI tools are key strategies to improve teachers' utilization.

Meanwhile, Ofem et al. (2025) found that teachers' technological readiness, attitudes, and pedagogical beliefs—mediated by perceived usefulness and ease of use—significantly influence their willingness to adopt AI, highlighting the importance of both skills and mindset in effective integration.

Collectively, the findings imply that while teachers' awareness strongly predicts their utilization of AI technologies, other factors such as access to resources, professional development, institutional support, and pedagogical readiness also contribute to the extent of AI integration in teaching. Addressing these factors is essential for translating high awareness into sustained, effective classroom practices that enhance student learning outcomes.

Variables	r	df	p-value	Decision Rule	Remark
Level of Awareness and Extent of Utilization	0.565	193	<.001	Reject Ho ₃	Significant

Level of Significance = 0.05; Interpretation of r: ±0.01 to ±0.19 - negligible relationship, ±0.20 to ±0.29 - weak relationship, ± 0.30 to ± 0.39 - moderate relationship, ± 0.40 to ± 0.69 - strong relationship, ± 0.70 to ± higher - very strong relationship, n=195

Table 6. Test on Significant Relationship Between the Level of Awareness of Students on the Usage of AI technologies and their Extent of Utilization

Table 6 presents the test of the significant relationship between students' level of awareness of AI technologies and their extent of utilization. The results reveal a statistically significant relationship between these variables, as indicated by a p-value < 0.001, which is well below the established level of significance of 0.05. Additionally, the correlation coefficient (r = 0.565) denotes a strong positive relationship, suggesting that students who possess higher levels of awareness of AI

technologies are more likely to utilize these tools in their learning. Consequently, the null hypothesis, which states that no relationship exists between students' awareness and utilization of AI technologies, is rejected.

These findings indicate that greater awareness among students is associated with a higher extent of utilization, reflecting the important role of knowledge and understanding in promoting effective integration of AI into learning practices. This result aligns with the study of Menekse and Akgun (2022), who reported that students with increased awareness of AI concepts and applications tend to integrate these technologies more actively into their learning processes. Similarly, Ghimire et al. (2024) found that students with higher AI awareness were more inclined to adopt AI-based learning analysis systems, thereby improving their study methods.

In addition, Tubino and Adachi (2022) observed that students who actively engaged with AI tools were often identified by their teachers as proactive and high-performing learners. They emphasized that effective use of AI requires evaluative and judgment skills, as students must be willing to extract and apply information to enhance their understanding. Likewise, Chien-Hung and Cheng-Yuch (2025) asserted that students with higher AI knowledge tend to use these technologies more effectively, achieving better learning outcomes.

The findings suggest that students' awareness of AI technologies is a key factor influencing their extent of utilization. Promoting AI literacy and providing structured opportunities for students to explore and apply AI tools in academic settings can further strengthen their engagement and learning outcomes.

Variables	r	Df	p-value	Decision Rule	Remark
AI Technology Trainings and Level of Awareness of AI	0.597	47	<.001	Reject Ho _{4.1}	Significant
AI Technology Trainings and Extent of Utilization	0.640	47	<.001	Reject Ho _{4.2}	Significant

Level of Significance = 0.05; Interpretation of r: ±0.01 to ±0.19 - negligible relationship, ±0.20 to ±0.29 - weak relationship, ± 0.30 to ± 0.39 - moderate relationship, ± 0.40 to ± 0.69 - strong relationship, ± 0.70 to ± higher - very strong relationship, n=49

Table 7. Test on Significant Relationship Between Teachers' AI Technology Trainings and Their Level of Awareness and Extent of Utilization

Table 7 presents the test of the significant relationship between teachers' AI technology training and their level of awareness and extent of utilization of AI technologies. The results reveal a statistically significant relationship between teachers' AI training and both their awareness and utilization of AI tools, as indicated by the p-values of 0.001 for awareness and 0.001 for utilization, which are well below the established significance level of 0.05. Additionally, the correlation coefficients demonstrate a strong positive relationship, with $r = 0.597$ for awareness and $r = 0.64$ for utilization. Consequently, the null hypothesis, which states that no relationship exists between teachers' AI training and their awareness and utilization of AI technologies, is rejected. These findings suggest that AI technology training is a critical determinant of both teachers' knowledge and practical use of AI tools. In other words, teachers who receive more training are likely to have higher awareness and to integrate AI technologies more extensively into their instructional practices. This coincides with Romero (2024), who emphasized the importance of equipping educators with the necessary skills to effectively integrate AI into teaching. Similarly, Uygon et al. (2024) noted that understanding teachers' perceptions and knowledge of AI can inform tailored training initiatives, which help enhance their proficiency in applying AI technologies in educational settings. However, challenges in training remain. Aljemely (2024) posited that many teachers face difficulties in understanding and applying AI due to limited technical knowledge, ethical concerns, and fears about privacy breaches. These barriers can hinder AI integration into the curriculum. As a result, comprehensive and ongoing training programs are essential to equip teachers with both the technical skills and the confidence to use AI effectively in their classrooms. Overall, the results of this study indicate that teachers' awareness and utilization of AI technologies are strongly associated with their training and exposure to AI tools, underscoring the need for structured professional development to maximize the benefits of AI in education. Furthermore, integrating continuous support and hands-on practice within these professional development programs can help ensure that teachers effectively translate their training into meaningful classroom applications. Providing opportunities for collaboration and knowledge-sharing among educators can also foster innovative practices and enhance the overall integration of AI technologies in teaching and learning.

Variables	R	Df	p-value	Decision Rule	Remark
Level of Awareness and Sex	-0.040	193	0.582	Do not reject Ho _{5.1}	Not Significant
Level of Awareness and Performance	0.089	193	0.219	Do not reject Ho _{5.1}	Not Significant
Extent of Utilization and Sex	-0.007	193	0.919	Do not reject Ho _{5.2}	Not Significant
Extent of Utilization and Performance	0.170	193	0.017	Reject Ho _{5.2}	Significant

Level of Significance = 0.05; Interpretation of r: ±0.01 to ±0.19 - negligible relationship, ±0.20 to ±0.29 - weak relationship, ± 0.30 to ± 0.39 - moderate relationship, ± 0.40 to ± 0.69 - strong relationship, ± 0.70 to ± higher - very strong relationship; M=96, F=9, n= 195

Table 8. Test on Significant Relationship Between Students' Level of Awareness and Extent of Utilization of AI Technology and their Profile

Table 8 presents the test of significant relationships between students' level of awareness and extent of utilization of AI technology and their profile variables, specifically sex and academic performance. The findings indicate that neither sex nor academic performance has a statistically significant association with students' level of awareness of AI technology, as evidenced by p-values exceeding the established significance level of 0.05. In contrast, academic performance shows a significant relationship with students' extent of AI technology utilization, as indicated by a p-value of 0.017, which is below the critical threshold of 0.05. The correlation coefficients for sex ($r = -0.04$ for awareness and $r = -0.07$ for utilization) are negligible, suggesting only a marginal tendency for male students to exhibit slightly higher levels of awareness and utilization of AI technology compared to their female counterparts.

Consequently, the null hypothesis, which posits that there is no significant relationship between students' extent of AI technology utilization and their academic performance, is rejected. These results suggest that academic performance serves as a significant determinant of how extensively students utilize AI technologies, with higher-performing students being more likely to actively engage with AI tools to support their learning. These findings are consistent with the results of Ghimire et al. (2024), who reported that students with higher AI awareness were more inclined to adopt AI-based analysis systems in their study practices. Similarly, Tubino and Adachi (2022) found that students who actively utilized AI technology were predominantly proactive and high-performing learners.

These results indicate that students with stronger academic performance are more motivated to leverage AI technologies as tools to enhance understanding, improve learning outcomes, and optimize their academic performance.

Conclusion and Recommendations

The study reflects a clear pattern in the relationship between awareness and utilization of AI technologies among both teachers and students. While teachers demonstrated very high awareness of AI applications across content creation, personalized learning, communication, intelligent tutoring systems, and automated feedback, this awareness does not consistently translate into instructional practice, particularly in areas requiring individualized feedback and differentiated instruction. Students, on the other hand, showed high awareness but underutilized AI tools for personalized learning, communication, content creation, and automated feedback, with utilization being influenced by academic performance rather than demographic factors.

Notably, AI training for teachers emerged as a strong determinant of both awareness and utilization, emphasizing the value of structured professional development. These results imply that while awareness of AI is widespread, practical application remains limited, and both teachers and students require support to bridge this gap. The study accentuates the need for accessible resources, targeted training, and guided opportunities to transform awareness into effective, routine use of AI technologies, ensuring that the potential of AI to enhance learning outcomes is fully realized.

Moreover, the findings that teachers demonstrate a very high level of awareness of AI while exhibiting only a high level of utilization suggest that awareness alone does not necessarily lead to optimal integration of AI in instructional practices. Although teachers appear to possess a strong understanding of AI tools that can be integrated into the teaching and learning process, such awareness may not be fully translated into deliberate, consistent, or advanced classroom use.

This disparity may imply the presence of practical, pedagogical, or institutional gaps that limit the extent to which teachers could have applied AI in their teaching. These gaps may include limited access to appropriate technological resources and insufficient hands-on training on the integration of AI in pedagogy. Further concerns could be ethical use or uncertainty about how to effectively align the AI tool with curriculum goals and learning outcomes. The findings also reflect the void between the desires of developing future-ready skills among learners and the readiness of teachers and the infrastructure and access to these technologies in the schools.

In light of the findings and conclusions drawn, the following are hereby recommended:

For school management, they should provide adequate internet connectivity by allocating a budget for the annual availability of internet connection from a trusted provider, help students develop basic digital skills by organizing trainings, allocate funds for digital infrastructure such as a speech laboratory and an air-conditioned computer room for easy student access, partner with government and private sectors for possible support especially in building digital infrastructures, and provide teachers with continuous workshops in digital pedagogy, inclusive technology, and blended and flexible learning approaches.

For teachers, they should integrate AI tools into lessons by using applications like ChatGPT and Khanmigo for personalized learning, grading assistance, or generating classroom materials such as quizzes and lesson plans, encourage student-centered AI activities by allowing students to use AI tools for research, creativity, or problem-solving projects, incorporate AI awareness and workshops by hosting periodic sessions to introduce students to what AI is, its benefits, and ethical

considerations, collaborate with other teachers for professional development by taking short online courses or certifications on educational technology and AI, and take the lead in training students to integrate technology meaningfully.

For students, they should join AI literacy programs or clubs, work on small practical projects like developing chatbots, simple AI applications, or presentations on AI's role in society, contribute to school AI awareness campaigns, collaborate with peers in using simple AI applications for projects and other school-related outputs, and use AI to understand lessons rather than just to find answers for school assignments.

Finally, an Action Plan and Implementation Roadmap are hereby recommended for implementation.

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Appendices

No appendices are attached to this study.