Artificial Intelligence Technology Utilization and Academic Performance among College of Teacher Education Students in Zamboanga Peninsula Polytechnic State University

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ABSTRACT

The aimed of the study is to determine the AI Utilization and Academic Work of the College of Teacher Education at Zamboanga Peninsula Polytechnic State University. A research-made questionnaire was made subject for validity and reliability of the survey questionnaire. Based on the findings of the study. It shows that Artificial Intelligence both frequency and purpose utilized as a tool for their academic works fall within the descriptive rating of "EXTENT" which mean that Artificial Intelligence (AI) tools are valuable resources in academic tasks, with potential for further integration to enhance productivity and quality. It is also revealed that both writing skills and critical thinking abilities are supported by AI tools that falls within "Extent". These findings indicate that while AI tools are valuable for enhancing both writing and critical thinking, there is room for further integration to fully support students in these areas. The utilization of AI tools plays a significant role in shaping the students' engagement in such a way it improves the academic work of the learners through enhancing ideas, and writing skills that lead to improving skills in grammar, vocabulary, and logical reasoning. It is recommended that artificial Intelligence can integrate into the curriculum to ensure its fair access and exposure to these kinds of technologies with this, AI can be supported and expand to enhance learning experience. However, it needs a proper training and regular workshop to utilize AI in a responsible manner.

Keywords: Generative Artificial Intelligence utilization; College of Teacher Education, students' Academic Performance, AI instruction, influence of AI to academic performance

INTRODUCTION

AI-enabled instruction has also proven to be highly effective in language studies (Fryer, Ainley, Thompson, Gibson, & Sherlock, 2017). Furthermore, a study conducted in Taiwan in 2020 can be considered that found AI-driven educational systems helped reduce learning anxiety among learners by using cognitive performance analysis and deriving a positive feedback loop (Hwang, Xie, Wah, & Gašević, 2020).

Artificial Intelligence (AI) is slowly being introduced and embraced in the education sector in the Philippines, according to a survey done by NYSE-listed education technology company Instructure. The survey showed that 83 percent of students use generative AI, such as ChatGPT, for research and writing, 52 percent said it is for preparing for tests, and 47 percent said it's for learning a foreign language. On the other hand, teachers find generative AI helpful for creating content for their classes, research and writing, and personalized learning. Instructure said that there is still a cautious embrace of the technology in the country, but pointed out that the future of education and AI is inevitable (Espino, 2025).

This study aimed to investigate the perceptions of College of Teacher Education students on the utilization of artificial intelligence (AI) technologies and their relationship with academic performance. It focused on the use of AI applications, including ChatGPT, DALL·E, Bing, Grammarly, and QuillBot, in supporting students' academic activities. Furthermore, the study examined the potential of these technologies to expand access to educational resources while promoting educational quality and equity.. Therefore, with the help of AI-powered educational technology, it is easier to create learning resources that adapt to different learning styles. But these

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benefits come with cons, including the possible loss of human involvement in the learning process, as AI might not be able to completely replace the complex interactions that exist between teachers and students. That could harm students' critical thinking and problem-solving capabilities.

Statement of The Problem

This study sought to provide answers to the following questions:

1. To what extent do students at Zamboanga Peninsula Polytechnic State University use artificial intelligence (AI) tools and resources for their academic work?

1.1 Frequency

1.2 Purpose

2. What is the academic work among students at Zamboanga Peninsula Polytechnic State University who have access and utilize artificial intelligence in terms of:

2.1 Writing skills

2.2 Critical thinking skills

3. Is there a significant relationship between the students' utilization of Artificial Intelligence academic tools and their academic work?

Hypotheses of the Study

H_0: There is no significant relationship between students' utilization of Artificial Intelligence (AI) academic tools and their academic work. Specifically, both the frequency of AI use and the purpose of AI use significantly influence students' writing skills and critical thinking skills as evaluated by the respondents in the College of Teacher Education.

METHODOLOGY

Research Design

This study employed a quantitative descriptive-correlational research design to determine the extent of the utilization of Artificial Intelligence on the Academic works of College of Teacher Education students at Zamboanga Peninsula Polytechnic State University. According to (Creswell & Creswell, 2017), quantitative research involves collecting numerical data to describe trends, attitudes, or opinions and to examine relationships among variables. Thus, the descriptive approach was appropriate because the study gathered numerical responses through a survey questionnaire and summarized the results using frequency, mean, and standard deviation.

Research Environment

The research was conducted at Zamboanga Peninsula Polytechnic State University, located at R.T. Lim Boulevard, Baliwasan, Zamboanga City. Specifically, the study focused on the students of the College of Teacher Education (CTE).

Respondents of the Study

The student-respondents of the study are from the College of Teacher Education (CTE) at Zamboanga Peninsula State Polytechnic State University (ZPPSU). The respondents are enrolled in various degree programs, with 21 coming from the Bachelor of Technology and Livelihood Education (BTLED) program, 30 from the Bachelor of Elementary Education (BEED) program, 40 from the Bachelor of Secondary Education

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(BSED) program, and 9 from the Bachelor of Vocational Teacher Education (BTVED) program. In total, there are 100 respondents participating in the study.

Sampling Method

The sampling method used in this study was the Convenient Sampling Technique, where participants were selected based on their availability, accessibility, and willingness to participate. The sample was drawn from the College of Teacher Education (CTE) at Zamboanga Peninsula State Polytechnic State University (ZPPSU). To ensure representation from each program, respondents were proportionally selected from the four programs within the CTE: Bachelor of Technology and Livelihood Education (BTLED), Bachelor of Elementary Education (BEED), Bachelor of Secondary Education (BSED), and Bachelor of Technical-Vocational Teacher Education (BTVTED). This approach allowed for a fair representation of each program in the study while maintaining the convenience of data collection.

Research Instrument

In conducting this study, the researchers used a survey with a self-made questionnaire for the respondents' evaluation. The survey employed a four-point Likert scale with the following ratings: 4-Highly Extent, 3-Extent, 2-Moderately Extent, and 1-No Extent at all. This scale was used to measure the extent to which the respondents agreed with the statements provided in the study.

The survey questionnaire is self-administered and consists of two parts. Part I collects demographic information, including the respondent's name (optional), age, sex, year level, and program. Part II presents statements related to Artificial Intelligence (AI), focusing on the utilization of AI in areas such as the frequency of use, its purpose, and its relationship to academic work, specifically in writing and critical thinking skills. This division allows for a structured approach to gather relevant insights about the respondents' experiences with AI tools, providing a comprehensive understanding of how these AI tools are integrated into their academic work.

Validity of the Research Instrument

The research instruments for validation, especially the survey questionnaire, were conducted to assess its reliability and validity.

For content validity, experts in the field of education research reviewed the questionnaire. Their feedback was used to refine the questionnaire, ensuring that it accurately measured the students' competencies in Artificial Intelligence (Haynes, Richard, & Kubany, 1995).

To assess reliability, a pilot test was conducted, and the questionnaire was distributed to students enrolled in various programs within the College of Teacher Education (CTE) as part of the main study. The results of the pilot test were analyzed for consistency, and the instruments were revised based on the findings. Once the research instrument was validated and revised accordingly, the collected data from the main group of respondents was used.

Data Gathering Procedures

The researchers sought permission from the Dean of the College of Teacher Education to conduct a survey with the students at the school. After receiving approval, the researchers developed a self-administered survey questionnaire checklist to serve as the instrument for collecting the necessary data to address the research questions.

Before conducting the survey, the researchers provided clear instructions and an orientation to the respondents, ensuring they understood the purpose of the study and how to complete the questionnaire. Following this, the researchers distributed the survey questionnaires and allowed ample time for the respondents to answer. The collected surveys were then tallied, tabulated, and analyzed using appropriate statistical tools to ensure accurate interpretation of the data.

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Statistical Treatment of Data

To effectively analyze and interpret the data, the researchers utilized the following statistical tools:

Weighted Mean was used to determine the average level of engagement with AI tools among students in the College of Teacher Education. By calculating the mean of the responses across different academic purposes. It provides an overall indication of how frequently and effectively AI tools are being used.

Moreover, Pearson product-moment correlation coefficient (Pearson r) was employed to determine the significant relationship between the extent of the utilization of AI technology to their academic performance particularly in writing and critical thinking skills among students of the College of Teacher Education. The Pearson correlation coefficient was developed by (Pearson, 1896) and is widely used to determine the degree of linear association between variables.

RESULTS AND DISCUSSION

This study is to determine the utilization and relationship of Artificial Intelligence (AI) to the Academic work of College of Teacher Education Students in Zamboanga Peninsula Polytechnic State University.

Specifically, it sought to provide answers to the following problems:

Problem 1. To what extent do students at Zamboanga Peninsula Polytechnic State University to artificial intelligence (AI) tools and resources for their academic work in terms of:

1.1 Frequency

1.2 Purpose

Table No. 1 Usage of Artificial intelligence for their Academic Work Frequency

Frequency	**Mean**	**Descriptive Rating**
1. Regular and consistent utilization of AI tools	2.7	Extent
2.Employing AI tools reasonably often, yet not persistently	2.59	Extent
3. Occasional but not consistent use of AI tools	2.69	Extent
4. Infrequent incorporation of AI tools in academic work	2.69	Extent
5. Extremely rare or nearly non-existent utilization of AI tools in academic activities	2.72	Extent
Average Weighted Mean	**2.67**	**Extent**

Legend: **3.26-4.00: Highly Extent, 2.51-3.25: Extent, 1.76-2.50: Moderately Extent, 1.01-1.75: No Extent at all**

The data of table 1 reveals that the usage of AI tools in academic work falls within the "Extent" range across different levels of frequency. The average weighted mean of 2.67 reflects that AI tools are used regularly, but not consistently, in academic works. Specifically, the "Regular and consistent utilization" of AI tools has a mean of 2.7, suggesting that some users incorporate AI tools into their work regularly, though this frequency varies. The "Occasional but not consistent" and "Infrequent incorporation" categories both have means of 2.69, indicating that for a significant portion of individuals, the use of AI tools occurs occasionally, but is not part of their routine. On the other hand, the "Extremely rare or nearly non-existent" category has the highest mean of 2.72, showing that a small portion of individuals rarely or almost never use AI tools in their academic work.

Overall, the data suggests that while AI tools are somewhat integrated into academic work, they are not yet a consistent or regular part of the academic process for most individuals.

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To support this claim of (Hwang, Xie, Wah, & Gašević, 2020), who emphasized that although artificial intelligence has significant potential to transform teaching and learning, its integration into educational settings is still evolving. They noted that the adoption and effective use of AI technologies depend on factors such as learners' readiness, technological competence, institutional support, and the availability of appropriate educational resources. Consequently, while AI tools are becoming increasingly accessible, their consistent utilization in academic work continues to vary among students.

Table No. 2 Usage of Artificial intelligence for their Academic Work Purpose

Purpose	**Mean**	**Descriptive Rating**
1. Improving the quality of work	3.12	Extent
2. Increasing productivity	2.98	Extent
3. Enhancing understanding of concepts	3.17	Extent
4. Writing assistance, proofreading, or generating content	3.09	Extent
5. Helping with difficult task	3.23	Extent
Average Weighted mean	**3.11**	**Extent**

Legend: **3.26-4.00: Highly Extent, 2.51-3.25: Extent, 1.76-2.50: Moderately Extent, 1.01-1.75: No Extent at all**

The table 2 shows that AI tools are frequently used for various purposes in academic work, with an average weighted mean score of 3.11, which falls under the "Extent" rating. The highest usage is for "Helping with difficult tasks," with a mean score of 3.23, showing that AI is most helpful when students face challenging academic work. It is also commonly used for "Enhancing understanding of concepts," with a mean score of 3.17, suggesting AI aids in improving comprehension. Other purposes, such as "Improving the quality of work" with a mean score of 3.12 and "Writing assistance, proofreading, or generating content" with a mean score of 3.09, are also notable but slightly less emphasized. The purpose with the lowest mean score is "Increasing productivity" with a score of 2.98, indicating that while AI can help with productivity, it is not the primary focus. Overall, the data suggests that AI tools are primarily used for overcoming challenges and enhancing understanding, while their role in improving productivity is less significant. These findings are consistent that emphasized that generative AI enhances learning by assisting students with problem-solving, writing, and knowledge acquisition while improving the quality of academic outputs. Similarly, (Hwang, Xie, Wah, & Gašević, 2020) noted that artificial intelligence plays an important role in promoting personalized learning, strengthening conceptual understanding, and supporting students in accomplishing complex academic tasks. Taken together, these findings suggest that AI tools are increasingly recognized as valuable educational resources that facilitate meaningful learning, improve the quality of academic work, and assist students in overcoming learning challenges, rather than serving solely as tools for increasing productivity.

Problem 2. What is the level of academic performance among students at Zamboanga Peninsula Polytechnic State University who have access and utilize artificial intelligence in terms of:

2.1 Writing skills

2.2 Critical thinking skills

Table No. 3 Students' Level of Writing Skills

Writing Skills	**Mean**	**Descriptive Rating**
1. Using of grammar rules and punctuation marks properly	3.08	Extent
2. Expressing ideas accurately and precisely	3.04	Extent

3. Conveying ideas with varied vocabulary	3.09	Extent
4. Structuring content logically with a clear introduction, body, and conclusion	3.1	Extent
5. Maintaining a consistent tone, style, and voice	2.97	Extent
Average Weighted Mean	**3.05**	**Extent**

Legend: **3.26-4.00: Highly Extent, 2.51-3.25: Extent, 1.76-2.50: Moderately Extent, 1.01-1.75: No Extent at all**

Table 3 outlines the extent of AI tool usage in enhancing writing skills, with an overall average weighted mean of 3.05, categorized under "Extent." This indicates a moderate to significant engagement with AI tools in improving various aspects of writing. The highest-rated skills are "Conveying ideas with varied vocabulary" with a mean of 3.09 and "Using grammar rules and punctuation marks properly" with a mean of 3.08, shows notable engagement, reflecting AI's role in expanding students' vocabulary and enhancing writing quality. "Structuring content logically with a clear introduction, body, and conclusion" has a mean of 3.1, demonstrates considerable usage, indicating that AI tools support students in organizing their ideas clearly and cohesively. The skill with the lowest mean is "Maintaining a consistent tone, style, and voice," with a mean of 2.97, but these areas still reflect moderate usage, showing that students rely on AI tools to assist with these basic writing fundamentals.

Table No. 4 Students' Level of Critical Thinking Skills

Critical Thinking Skills	**Mean**	**Interpretation**
1. Identifying the components of an argument or issue	2.91	Extent
2. Evaluating the context and significance of data or statements	2.9	Extent
3. Assessing the credibility and reliability of sources	2.96	Extent
4. Identifying problems and developing effective and creative solutions	2.97	Extent
5. Fostering adaptability by processing and adapting the new information	3.09	Moderately Extend
Average Weighted mean	**2.96**	**Extent**

Legend: **3.26-4.00: Highly Extent, 2.51-3.25: Extent, 1.76-2.50: Moderately Extent, 1.01-1.75: No Extent at all**

Table 4 presents the extent of students' critical thinking skills, with an overall average weighted mean of 2.96, categorized under "Extent," suggesting a moderate to significant level of engagement in critical thinking. The highest-rated skill is "Fostering adaptability by processing and adapting new information" with a mean of 3.09, suggesting that students are moderately utilize AI in this area. Other skills, such as "Identifying problems and developing effective and creative solutions" with a mean of 2.97, "Assessing the credibility and reliability of sources" with a mean of 2.96, "Evaluating the context and significance of data or statements" with a mean of 2.9, and "Identifying the components of an argument or issue" with a mean of 2.91, all show solid performance but are rated slightly lower. Moreover, students could improve their critical thinking by integrating AI in a responsible manner particularly in areas like adaptability.

Problem 3. Is there a significant relationship between the students' utilization of Artificial Intelligence academic tools and their academic work?

Table No. 5 Pearson r Correlation Analysis

Variables	r-value	Interpretation	p-value	Decision
Frequency of AI Use vs Writing Skills	0.62	Moderate Positive Correlation	0.000	Significant
Frequency of AI Use vs Critical Thinking	0.48	Moderate Positive Correlation	0.000	Significant
Purpose of AI Use vs Writing Skills	0.71	Strong Positive Correlation	0.000	Significant
Purpose of AI Use vs Critical Thinking	0.55	Moderate Positive Correlation	0.000	Significant

The results of the Pearson r analysis indicate that students' utilization of Artificial Intelligence (AI) tools is significantly related to their academic work, particularly in writing and critical thinking skills. The **frequency of AI use** shows a **moderate positive correlation** with writing skills (r = 0.62) and critical thinking skills (r = 0.48), suggesting that students who use AI tools more often tend to demonstrate improved academic performance in these areas. Similarly, the **purpose of AI use** exhibits a **strong positive correlation with writing skills (r = 0.71)** and a **moderate positive correlation with critical thinking skills (r = 0.55)**, indicating that students who use AI tools with clear academic intentions—such as drafting, revising, and organizing ideas—are more likely to develop better writing proficiency and analytical abilities. The p-values of 0.000 in all variables confirm that these relationships are statistically significant, leading to the rejection of the null hypothesis. This implies that AI utilization plays a meaningful role in enhancing students' academic work, particularly when used strategically.

These findings are supported by existing literature, which emphasizes that AI-powered tools can enhance writing quality by improving coherence, grammar, and organization, while also assisting in idea development and argument construction (Das & Chen, 2025). Moreover, studies suggest that AI integration in learning environments can contribute to the development of critical thinking skills by enabling students to analyze information, evaluate arguments, and refine their reasoning processes (Ghedir & Gasmi, 2024; Zhang & Liu, 2025). However, it is also important to note that the effectiveness of AI depends on how it is used; when applied appropriately, it supports learning and cognitive development, but overreliance may hinder deeper thinking processes. Overall, the significant correlations observed in the study confirm that AI tools, when used purposefully and frequently, can positively influence students' writing and critical thinking skills, reinforcing their value in modern education.

Table No. 5 T-test for Significance of Correlation

Variables	**Computed t-value**	**t-critical**	**Decision**	**Interpretation**
Frequency vs Writing Skills	7.91	1.984	Reject H_0	Significant Relationship
Frequency vs Critical Thinking	5.41	1.984	Reject H_0	Significant Relationship
Purpose vs Writing Skills	9.85	1.984	Reject H_0	Significant Relationship
Purpose vs Critical Thinking	6.56	1.984	Reject H_0	Significant Relationship

The t-test results reveal that all computed t-values (7.91, 5.41, 9.85, and 6.56) are substantially higher than the critical value of 1.984 at a 0.05 level of significance with 98 degrees of freedom. This leads to the consistent rejection of the null hypothesis (H_0) across all variable pairings, indicating that there is a **statistically significant relationship** between students' utilization of Artificial Intelligence (AI) academic tools and their academic work. Specifically, both the **frequency of AI use** and the **purpose of AI use** significantly influence students' **writing skills** and **critical thinking skills**. The highest computed t-value (9.85) observed in the relationship between purpose and writing skills suggests that intentional and goal-oriented use of AI tools has the strongest impact on improving students' writing performance. These findings imply that AI tools are not merely supplementary but play a meaningful role in shaping academic outcomes when used regularly and with clear objectives.

These results are aligned with recent studies emphasizing the educational benefits of AI integration in academic tasks. Research indicates that AI tools significantly enhance students' writing abilities by supporting idea generation, grammar refinement, and content organization, thereby improving overall writing quality (Kasneci et al., 2023). Furthermore, AI-assisted learning environments promote higher-order thinking skills by encouraging students to analyze, evaluate, and synthesize information, which contributes to the development of critical thinking (Zawacki-Richter et al., 2019; Chan & Hu, 2023). The statistically significant relationships confirmed by the t-test suggest that effective and purposeful engagement with AI tools can lead to measurable improvements in academic performance. However, these benefits are maximized when AI is used as a support tool rather than a substitute for independent thinking, reinforcing the importance of guided and responsible AI integration in education.

CONCLUSION

Based on the findings from the study it signifies that Artificial Intelligence tools significantly influence the students' academic work of the College of Teacher Education at Zamboanga Peninsula Polytechnic State University. Therefore, students' engagement with Artificial Intelligence (AI) shows moderate to significant utilization in terms of frequency, purpose, writing skills, and critical thinking skills with an "EXTENT" rating. Moreover, the use of AI tools has shown a positive impact on their academic work through enhancing grammar, vocabulary, and other related learnings.

RECOMMENDATIONS

Based from the findings and conclusions revealed of the study, the researchers recommend that:

1. The Zamboanga Peninsula Polytechnic State University would address the needs of student and teachers in terms of consistent internet connectivity during online classes so that they can continuously access the AI tools.

2. Further study would be recommended by providing premium AI products to the students and faculty and encourage further research on the role of AI in Educational community and also potential challenges.

3. This emphasizes the need for faculty and administrators to continue supporting and expanding access to AI tools to foster equitable and enhanced learning experiences for all students.

4. Integration into the curriculum through incorporating the AI tools across all programs ensuring its fair access and exposure to these kinds of technologies.

5. Provide regular workshops and training to students and faculty to improve proficiency in AI utilizations

6. Establish a monitoring system and evaluation regarding the impacts of AI tools on their academic performance for areas for possible improvements.

Disclosure on the Use of Generative AI

This article utilized generative AI solely to enhance language clarity and coherence, without altering the original research findings or interpretations.

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