INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY: APPLIED BUSINESS AND EDUCATION RESEARCH
2026, Vol. 7, No. 7, 2908 – 2941
http://dx.doi.org/10.11594/ijmaber.07.07.08

Research Article

Dependency on AI Tools and its Impact on the Knowledge Acquisition of Maritime Students in Classroom Settings: Implementing AI-Assisted Learning Enhancement Program

John Oliver F. Panes*, Carol A. Abucay, Myla Christine DC. San Miguel, Zclyn V. Arpon, Lance J. Campos, Richmond A. Falmarin, MC Ruyanz E. Fisco

Central Luzon College of Science and Technology, Philippines

Article history:
Submission 30 June 2026
Revised 14 July 2026
Accepted 23 July 2026

**Corresponding author:*
E-mail:
jpanes334@gmail.com/
johnoliver.panes@deped.gov.ph

ABSTRACT

The integration of Artificial Intelligence (AI) tools in education has significantly transformed how students access information, complete academic tasks, and develop learning strategies. However, the increasing reliance on AI technologies raises concerns regarding its potential impact on students' knowledge acquisition and independent learning. This study assessed the dependency on AI tools and its impact on the knowledge acquisition of maritime students in classroom settings at the Central Luzon College of Science and Technology (CELTECH), Olongapo City. The general objective of the research was to determine the level of maritime students' dependency on AI tools and examine its relationship with their knowledge acquisition, particularly in terms of critical thinking, decision-making abilities, and study habits. Additionally, the study aimed to identify whether significant differences existed in AI dependency and knowledge acquisition when respondents were grouped according to demographic profile variables. This study employed a quantitative descriptive–correlational research design. A total of 276 maritime students from the Bachelor of Science in Marine Transportation (BSMT) and Bachelor of Science in Marine Engineering (BSMarE) programs participated in the study using stratified random sampling. Data were collected through a validated structured survey questionnaire and analyzed using statistical tools such as frequency, percentage distribution, weighted mean, Analysis of Variance, and Pearson product–moment correlation coefficient. The findings revealed that maritime students demonstrated a moderate level of dependency on AI tools and a moderate level of knowledge acquisition in classroom settings. Results also indicated that there were significant relationships between AI tool dependency and knowledge acquisition, suggesting that while AI tools support learning efficiency, excessive reliance may influence students' independent thinking and problem-solving skills. The study concluded that AI tools can serve as beneficial educational support systems when used responsibly. However, balanced and guided integration of AI technologies is necessary to ensure that students

How to cite:
Panes, J. O. F., Abucay, C. A., Miguel, M. C. D. C. S., Arpon, Z. V., Campos, L. J., Falmarin, R. A., & Fisco, M. C. R. E. (2026) Dependency on AI Tools and its Impact on the Knowledge Acquisition of Maritime Students in Classroom Settings: Implementing AI-Assisted Learning Enhancement Program. *International Journal of Multidisciplinary: Applied Business and Education Research* 7(7), 2908 – 2941. doi: 10.11594/ijmaber.07.07.08

continue to develop essential cognitive and practical competencies. Therefore, the study proposed the implementation of an AI- Assisted Learning Enhancement Program to promote responsible AI use while strengthening students' critical thinking and independent learning abilities.

Keywords: *AI dependency, Artificial Intelligence tools, Classroom Learning, Knowledge Acquisition, Maritime students*

The Problem and Its Background

Backround of the Study

Over the past several years, technology has been greatly developed with the introduction of artificial intelligence (AI). The different innovations resulted in a huge advancement of technology. Nowadays, the implementation of technology towards education has paved the way to a new system of learning. These AI helped students learn independently, where they got personalized feedback, better explanations and instant information.

While many current studies acknowledge the potential of AI to improve learning by individualizing student experiences or decreasing teacher workload, they tend not to investigate its practical use in classrooms with limited funds (Yan et al., 2023). Moreover, while worldwide initiatives have been undertaken to illustrate how AI can enhance classroom learning, few studies have looked at the potential implications of students using AI too much. In the Philippines, it lacks research about the AI dependency impacts on maritime students. The research gaps would be the absence of local studies on how dependent the maritime education is on the use of AI tools. In this research, the researchers will research how dependent maritime students are with AI and will study if it has a significant impact with knowledge acquisition.

The increasing use of AI tools in classrooms by students offers both opportunities and obstacles. This is especially important for maritime students, as their field demands both academic knowledge and strong practical skills for realworld work in maritime related fields. The enthusiasm for using AI in education is overshadowed by the significant concerns regarding its sustained and responsible application in higher education. The evidence indicated that AI can predict future use through factors such as usefulness, ease of use, satisfaction levels and the correlation of technology to task demands, there is still a significant gap in understanding why certain learners or institutions are unwilling or uninterested in using AI, even when it has shown desirable effects contrary (Saifi et al., 2025). The barriers that exist in certain localities are still not fully explored, but they include ethical concerns related to data protection, unfair access, excessive reliance on automation and reduced critical thinking abilities.

Maritime education has seen a rapid adoption of Artificial Intelligence (AI) features in the learning environment, bringing both challenges and opportunities. While they offer students quick access to knowledge, may speed up the completion of assignments, and can help them understand complicated ideas, they also may lead to greater reliance. Based on this, the study proposes to create and implement an AI-based learning enhancement initiative to address the problem. While ensuring that students are involved in practical training, independent analysis and classroom activities to develop their professional competence, this program also seeks to make the most of AI as an additional learning resource. An educational software can be customized for the students' requirements. In addition to that, AIdriven programs can provide beneficial feedback to students and teachers. Certain colleges, particularly those offering classes online, are employing artificial intelligence systems to keep track of students' progress and to warn the professors if they think there is a problem with the students' performance.

The guidelines for conducting this study are based on both national and international legal frameworks that promote high standards in maritime training and education. IMO is required by the STCW Convention to provide

education that emphasizes competition and values, with a focus on decision-making, situational awareness, and preparedness skills (International Maritime Organization, 2024). CHED in the Philippines enforces policies at national level to ensure that maritime programs meet international requirements by incorporating cutting-edge teaching techniques and adhering to strict academic and practical standards (Commission on Higher Education, 2021). The research is supported by institutional demands, as well as the legal sources which highlight the need for balance between skill development and technology usage. As AI (artificial intelligence) tools become more important and influential in classrooms, the researchers were inspired to undertake this study. The researchers want to take the dependence on AI and make it an educational tool that will enhance education but also give future maritime workers the skills needed to solve problems with critical thinking. They have a deep knowledge of the pros and cons of relying on AI.

This study was driven by the ongoing exposure of students to AI tools, as the researchers have been also students for years. The researchers have seen the students using AI irresponsibly to finish work and allowing time to complete self-directed work. As AI will never replace seafarers, cadets need to develop their independent decision-making and problem-solving skills. Lastly, the researchers found that while AI tools offer easier learning, it may also encourage students to be fully reliant on AI tools which could affect their knowledge acquisition and practical skills.

Research Locale

The research was conducted at the Central Luzon College of Science and Technology (CELTECH) College, Olongapo City, Zambales, Philippines. Known for its excellence in providing education and professional development in information technology, business, tourism, criminology, hospitality management, and maritime education. It has modern facilities, including simulation laboratories and computer rooms which support theoretical and practical learning. The Maritime department's program is focused on developing skilled and highly competitive seafarers by offering both classroom and fieldwork opportunities in the maritime industry. This philosophy is evident throughout the department.

Central Luzon College of Science and Technology (CELTECH) – Olongapo City was chosen as the research locale because of the students' progressive adoption of artificial intelligence (AI) tools and digital learning systems in classroom settings. The institution's efforts to incorporate AI-driven learning maritime simulation technologies, and interactive digital systems make it an ideal site for studying the dependency on AI tools and their impact on students' knowledge acquisition. As a maritime college that emphasizes both academic and experiential learning, (CELTECH) provided a relevant environment to explore how technology influenced educational outcome.

Students that were enrolled in other maritime programs and students that were enrolled in other colleges or universities were not included in this study. It doesn't address faculty opinion, outside factors like access to the internet at home, nor the ethics of AI use. Similarly, the study will not explore how relying on AI may affect employment in the future or onboard performance, as this research only focused on the present context of a classroom. This will be quantitative data only - no qualitative interviews or observation would be collected. The boundaries are set to keep the study relevant and focused, and to allow the potential use of AI in Central Luzon College of Science and Technology (CELTECH).

Statement of the Problem

The study aims to assess the dependency on AI tools and its impact on the knowledge acquisition of maritime students in classroom settings in Central Luzon College of Science and Technology (CELTECH) – Olongapo City. The research seeks to analyze if maritime students depend on AI tools, particularly in study habits and decision-making abilities, balancing the knowledge acquisition; Identifying AI tools effectiveness in enhancing knowledge acquisition by implementing an AI-assisted learning enhancement program.

Specifically, it sought to answer the following questions:

1. What is the demographic profile of the respondents in terms of:

1.1 age;
1.2 gender;
1.3 year level;
1.4 program; and
1.5 section?

2. How may the dependency of maritime students on AI tools be described in terms of;
   2.1 familiarity with using AI tools;
   2.2 impact on knowledge acquisition; and
   2.3 effects on classroom settings and study habits?
3. How may the maritime students assess their knowledge acquisition and in terms of;
   3.1 critical thinking and problem-solving skills;
   3.2 decision-making abilities; and
   3.3 study habits and classroom engagement?
4. Is there a significant difference in the level of Al tools dependency when grouped according to demographic profile variables?
5. Is there a significant difference in maritime students' knowledge acquisition when grouped according to profile variables?
6. Is there a significant relationship between maritime students' Al tool dependency and their knowledge acquisition?
7. What intervention program can be developed to improve the dependency of AI tools and knowledge acquisition of maritime students?

Significance of the Study

Listed below were individuals and groups who would directly and indirectly benefit from the research on assessing the dependency on AI tools and its impact on the knowledge acquisition of maritime students in classroom at Central Luzon College of Science and Technology (CELTECH) – Olongapo City in Academic Year 2025–2026. The study was expected to provide valuable insights and advantages to the following beneficiaries.

Maritime Students. They would benefit from this study as it provides objective data on their level of dependency on AI tools in relation to knowledge acquisition and classroom performance. The quantitative results may help them reflect on their academic strategies on measurable findings. Data gathered from them may also be the basis for implementing an AI-assisted learning enhancement program.

CELTECH College. Beyond the BSMT and BSMarE program, the institution will benefit from the statistical results of this study. The data can guide school administrators and academic departments in making evidence-based decisions regarding curriculum design, teaching strategies, and the responsible integration of AI technology across different programs, not just in maritime education. The gathered data from maritime students may also be the basis for the school to implement an AI-assisted learning enhancement program.

Maritime Educators and Administrators. The results of the study can guide maritime schools and educational authorities in updating new policies and programs that effectively integrate AI while maintaining high standards of maritime training and safety. It may give them the idea that will equip their teachers with such a new strategy in teaching-learning with AI tools assistance. AI-assisted learning enhancement programs might help teachers to assist in teaching students.

Society. This study would serve as an eye-opener for society. It is to recognize the growing dependency of students on AI tools and its potential implications on education as artificial intelligence becomes more integrated into everyday life. The results of this study could serve as their basis for further refinement of the AI-assisted learning enhancement program for the benefit of Filipino students.

Future Researchers. This study will serve as a reference for future research on Artificial Intelligence (AI) adoption in education, particularly in maritime programs, providing a foundation for further studies on AI and learning innovations. They can extend the scope of the present investigation to formulate a more generalized conclusion. The result of this research may be a basis for further studies and can be used as related literature.

Scope and Deliminate

This study aimed to evaluate the level of dependency on Artificial Intelligence (AI) tools of Bachelor of Science in Marine Transportation (BSMT) and Bachelor of Science in Marine Engineering (BSMarE) students at Central Luzon College of Science and Technology (CELTECH)

- Olongapo City in their academic work for Academic Year 2025– 2026. It specifically sought to see how it affects theoretical knowledge, being in the classroom, and their approaches to learning. The scope was limited to BSMT and BSMarE students and does not expand to other programs or departments in the institution. The design for this research is descriptive-correlation, utilizing predetermined structured survey questionnaires for data gathering. The analysis focused primarily on the role of academic performance in the use of AI tools by the students and their competency in the hands-on or practical applications required in their program.

Delimitation of this study included the exclusion of students from other maritime programs and those enrolled in other colleges or universities. It does not cover faculty perspectives, external factors such as internet accessibility at home, or the ethical implications of AI usage. Likewise, the study will not examine the long-term impact of AI dependency on employment opportunities or actual shipboard performance, as it was limited to current classroom settings. Only quantitative data will be collected, excluding qualitative interviews or observational methods. These boundaries were established to maintain a focused scope and to ensure the study's relevance to improving teaching strategies and the possible integration of AI within Central Luzon College of Science and Technology (CELTECH).

Framework of the Study

This chapter presents the theoretical framework, related literature and studies, conceptual framework, hypothesis and definition of various relevant terms used in the study.

Theoritical Framework

The theoretical framework of this study was anchored on assessing and its impact on the knowledge acquisition of the maritime students in CELTECH College, Olongapo City to the dependency on AI tools, a long-term reliance on artificial intelligence for loss of cognitive autonomy. The major concepts in this research included learning enhancement, defined as the strategies, practices and support individuals to improve how effectively and efficiently individuals learn. AI tools dependency in this context, is the reliance on AI technologies, often leading to a psychological and behavioral dependence (Huang et al.,2024).

To guide the study, the Technology Acceptance Model (TAM) by Venkatesh and Davis (2000) was employed. TAM is perceived as useful usage intentions in terms of cognitive instrumental processes. The theory explains why the students depended on AI tools and how it impacted their knowledge acquisition- because they find it convenient to easily complete tasks. It helped measure the reliance or extent of dependency among the maritime students' assessment of AI as a learning support tool.

It is assumed that AI tools dependence will motivate maritime students to be more active and research-oriented in their knowledge learning process. Awareness of attitudes and social norms in classroom environment and students' perceived ability to effectively use AI tools are thought to affect their engagement and performance.

The Technology Acceptance Model (TAM) is well suited to this research as it offered guidelines for developing an AI assisted learning framework for a guide, when investigating students' learning patterns and potential strategies for improving responsible and productive use of AI technologies in maritime education. TAM assisted the maritime students in understanding and clarifying their perception/awareness and how it resulted in their behavioral responses (acceptance, compliance, resistance) in the context of the AI assisted learning enhancement program. The theory is also flexible and usable; variables specific to the context can be added to the theory. In other similar research, TAM has been used to describe technological adaptive learning in classroom implementations like the use of digital tools, AI systems, adaptive learning technologies that automatically adapt the learning experience to students' needs, pace and performance. The result showed the researcher that an individual's decision making is determined by the analysis expected to be received from the behavior (Marikyan & Papagiannidis, 2022).

Review of Related Literature

Students' Dependency on AI Tools

Artificial intelligence (AI) is becoming more pervasive in schools and classrooms, especially since 2021 when technology became more prominent in schools because of the COVID-19 pandemic. In the article, The Effectiveness of Artificial Intelligence in Classroom Teaching, it discusses how AI can assist teachers through providing students with more tailored learning, simplifying grading, and assisting teachers in improving their support for their students. However, there are issues as well, such as ensuring that student information remains confidential, treating every student equally, and ensuring that teachers become comfortable with using these new technologies (Seema, 2024). AI should not replace teachers but rather, teachers should be adequately trained to utilize AI systems effectively (Seema, 2024).

This AI technology allows students to gain insights into artificial intelligence (AI) (Sriwichai et al., 2025). In this research, 32 students who are in grade 12 at one school in Thailand were participants in one class "Computer for Career. They took a look at three aspects: what was the current level of student learning to acquire AI skills, what was the level of knowledge about the influence of AI in the world, and how much fun it was to learn this way. Students rated highly after class on their AI competence (81.25%) and their understanding of the impact of AI was very high. Additionally, they enjoyed the course. The study also found that issues of data privacy and responsible and ethical use of AI in schools need to be taken into account.

The study revealed that in addition to being influenced by technology, students' reliance on AI tools was also psychological and emotional. The study on University Students and ChatGPT revealed that academic stress and expectations for performance are major factors in determining the risk of AI dependence. They found that lower academic SE was a risk factor for over-dependence on AI, but this link was mediated by stress and perceived performance benefits. The study also states that over-reliance can cause a loss of creativity, critical thinking and susceptibility to misinformation. The results reveal that relying on AI tools is not a straightforward convenience, but rather a reflection of other academic and emotional stressors that are affecting students' learning experiences (Zhang et al., 2024).

Research also highlighted the rapid expansion of AI use among young learners. Generative AI tools are increasingly embedded in students' everyday academic routines, but several risks have been identified, including weakened interpersonal communication, declines in academic integrity, heightened stress, reduced motivation, and disruption of traditional learning practices (Al-Kumaim et al., 2025). These findings emphasized that dependency extends beyond individual behavior and affected broader educational systems. Other studies explored how university students' technological readiness, perceived usefulness, and attitudes shape their use of AI tools. Findings show that students with strong technological self-efficacy are more inclined to see AI tools as easy to use and beneficial. However, technological readiness alone does not guarantee responsible use; the critical predictor of actual use is students' attitudes toward AI (Falebita & Kok, 2025). Another study examined the role of digital literacy and peer-supported collaborative learning in shaping students' use of AI tools. Results showed that digital literacy and AI tool use are positively associated with students' perceptions of AI-assisted learning. Importantly, peer collaboration partially mediates this relationship, helping students use AI tools more meaningfully rather than dependently (Joseph et al., 2024). Research on AI-supported writing shows both benefits and risks. Studies found that AI-assisted blended learning improved students' writing accuracy, confidence, and resilience. AI tools were shown to reduce cognitive load and support vocabulary development. However, students may become overly reliant on AI-generated feedback, which can weaken creativity and independent problem-solving (Lai, 2025). Other related studies caution that excessive dependency on AI may undermine students' creativity and agency (Mustofa, et al., 2025). Additional research found that heavy reliance on AI can restrict the development of independent knowledge and decision-making skills (Sheliemina et al., 2025).

Recently, artificial intelligence (AI) has also become prevalent in classrooms, not only

among older children, but even among younger children. Even children could begin studying and applying AI if they have assistance from parents and teachers. Having AI tools and courses designed for their age is crucial. With proper support, young children can begin studying AI at an early age, which might be beneficial for them in the future as AI is increasingly becoming a part of our lives (Uaidullakyzy et al., 2024).

Impact on Knowledge Acquisition

The high school students, when taught AI in a STEAM way (science, technology, engineering, arts and math), showed that they gained better in computational thinking, increased their interest in learning and increased their confidence levels. Students who experienced this STEAM-AI program demonstrated much better thinking skills, were more engaged, and were more confident than those who did not. This suggested that using STEAM and AI instructions can be a feasible way to teach AI along with other subjects in elementary and high school, as well as perhaps in college students (Huang & Qiao, 2024).

Individualized learning needs have been attempted by designing AI technologies like adaptive learning environments and intelligent tutoring systems. These systems scanned student performance records to offer personalized learning paths, thus making the learning of knowledge more efficient. AI tools, for instance, can identify the ways and places where students are falling behind, and offer them targeted resources to help catch up (World Bank, 2025). The use of AI in education has led to the customization of learning materials to meet the needs of individual students. AI systems with data analytics modified the teaching, so students are given the most suitable resources and support. This technique not only helps to improve engagement, it also helps to enhance understanding and recall of the content. Students who do not have formal AI learning in university were identified as having the AI literacy comprising of six key concepts: recognition of AI, knowledge of AI, AI ethics, AI empowerment, AI self-competence, and using AI. Their research demonstrated that the learning of AI positively impacts students' use of AI, and AI ethics, empowerment and self-competence were identified as mediators between knowledge and usage of AI (Lu & Lin 2025).

As AI tools become more prevalent in the education sector, studies have been conducted on the impact of relying on AI on educational outcomes and knowledge acquisition. Research showed that students' excessive dependence on AI can negatively impact their critical thinking and problem-solving skills because they might rely on AI for solutions instead of establishing their own (Wan, 2025). Furthermore, there is some evidence that using AI in different ways in different contexts may affect students' learning in different ways: while AI can be used for scaffolding more routinized and technical learning, it can also limit more comprehensive learning and skill acquisition (Bordalejo et al., 2025). Additionally, the practical utility of AI support tools for students could impact the learning of transferable skills like making decisions, being creative, and solving problems hands-on, a role that is also suggested by research (Kulesa et al., 2025). Likewise, teachers' views emphasized the double-edged sword of AI education, noting the advantages of improved learning efficiency but also the potential risks of overreliance that could stifle students' autonomous learning abilities (Mwakapesa, 2025).

AI support can lead to loss of skills among professionals and even deter skill acquisition students. They opined that excessive dependency upon AI tools might deprive one of the abilities to notice the deterioration in their cognitive abilities and hence the importance of awareness and judicious use (Macnamara et al., 2024). It referred to the epistemological consequences about the support of the AI, that AI tools can help one carry out tasks, but can also decrease the necessity of thinking intensively over the tasks. The lack of involvement in deep-level thought causes problemsolving, critical thinking skills to be one of the most important components of practical knowledge to be underdeveloped.

Certain education sectors are incorporating artificial intelligence tools like ChatGPT to aid students in developing hands-on skills such as writing. The ChatGPT feedback system is designed for undergraduate English students studying ESL. ChatGPT has helped improve the academic writing skills of the students. Several

students also reported positive sentiments towards employing ChatGPT as a trusted writing improvement tool. Under proper training, ChatGPT can be an efficient feedback mechanism, particularly in big classes where instructor feedback is hard to deliver individually (Mahapatra, 2024).

Academic performance and interpersonal skills development are two key factors that impacted the educational quality of Jordan's schools, and artificial intelligence (AI) plays a significant role in this area (Almajdoub et al, 2025). It turned out that teachers in general feel like AI makes for a very good learning experience and this has an average score of 3.50 (on their scale) for the students. It showed the impact of AI, though, on social skills (communication, teamwork, empathy, etc.) was rated lower, averaging 2.58, which suggested that teachers view it having only a secondary role there.

Recent scholarship underscored a complex tension in AI's integration into education: while AI-powered systems promised to adaptively scaffold learning and personalize instruction, excessive reliance on them may impair the development of core practical competencies and ethical awareness (Karimi et al., 2024). In specialized training fields such as maritime education, AI-based adaptive instructional systems leverage machine learning to tailor simulations based on individual learner performance, but their deployment also raises concerns around data scarcity and model interpretability (Kizilay & Çelik, 2025). At the same time, students' overdependence on AI tools is increasingly linked to psychosocial and cognitive drawbacks: low academic self-efficacy paired with high academic stress increased performance expectations, which in turn fosters problematic AI use, reducing creativity, independent thinking, and problem-solving abilities (Tovmasyan, 2025). Furthermore, virtual learning environments integrated with AI have shown promise in improving practical skill acquisition, though careful design is necessary to prevent students from becoming overly reliant on automated guidance (CyberLeninka, 2024). Government and institutional initiatives are increasingly promoting AI integration in schools to enhance learning outcomes, highlighting the need for balanced strategies that cultivate both AI literacy and independent skills (GMA News, 2023).

Conceptual Framework

The study aimed to assess the dependency on AI tools and its impact on the knowledge acquisition of maritime students in classroom settings. The key variables included the level of maritime students' dependency on AI tools and its impact on their knowledge acquisition such as measuring the maritime students' reliance on AI tools, which can influence performance in classroom settings and improving decision-making and enhancing an individual's problem-solving skills, wherein students could develop an understanding of a subject matter.

The conceptual framework was anchored in the Technology Acceptance Model (TAM), which posits that perceived usefulness and perceived ease of use shape individuals' acceptance of technology. These frameworks help explain the behavioral and technological factors driving students' dependency on AI tools and how such dependency may impact their knowledge acquisition in classroom settings.

This framework was selected because it aligned with the study's goal of examining both the cognitive outcomes and behavioral patterns associated with students' dependency on AI tools. The Input-Process-Output (IPO) model guided the structure of the research, helped in identifying the influence of AI dependency on academic performance, and provided a basis for designing a targeted AI assisted learning enhancement program.

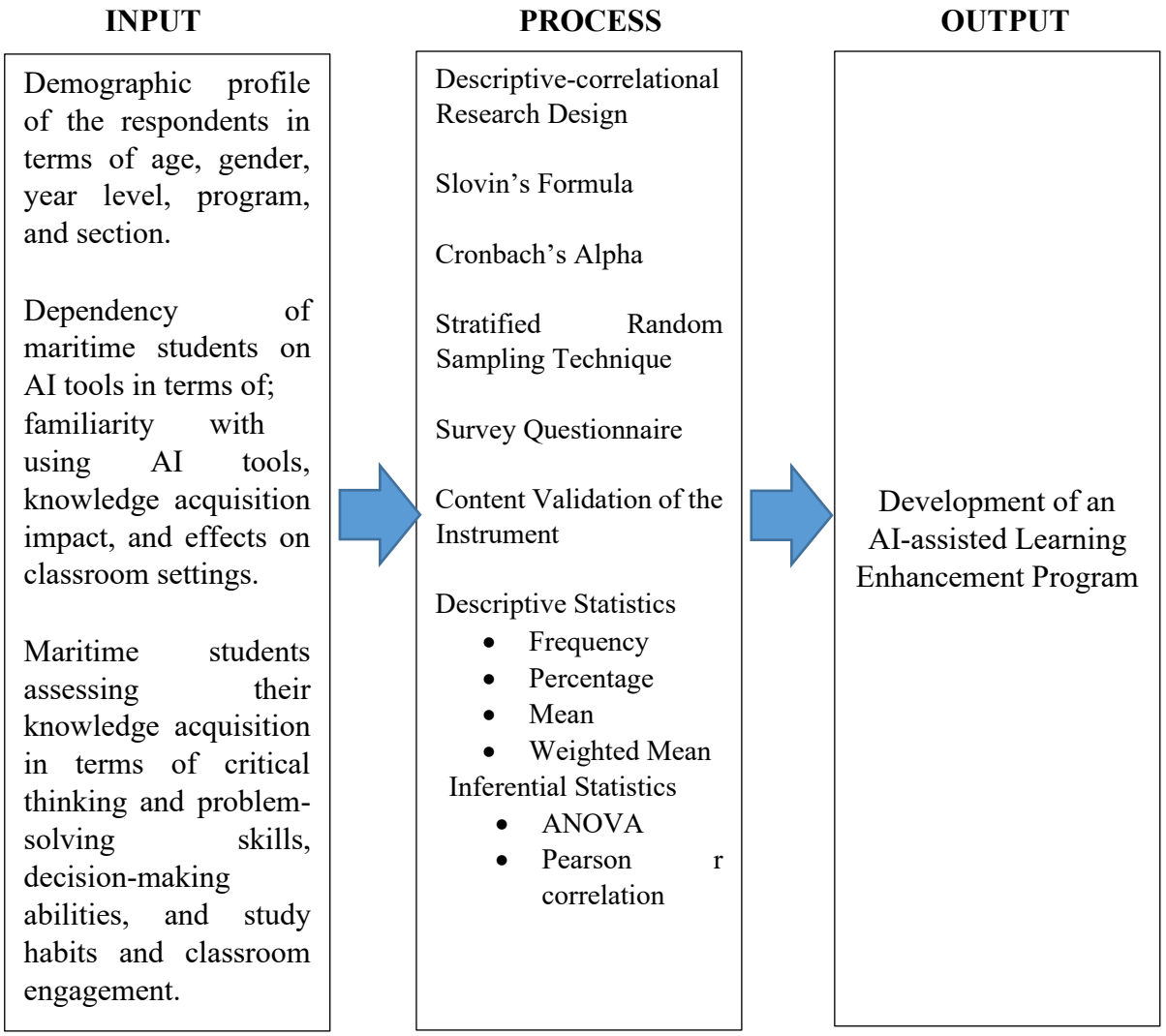

Figure 1. The Paradigm of the Study

The collected data served as the basis for the research. It included demographic profiles about the maritime students at CELTECH College, such as their age, gender, year level, and program. The study also looked at how dependent maritime students are on AI tools and how this affects their knowledge acquisition in classroom settings, specifically their familiarity with using AI tools and its impact on knowledge acquisition, and effects on classroom settings. The researchers also assessed the maritime students' knowledge acquisition, such as critical thinking and problem-solving skills, decision-making abilities, and study habits and classroom engagement. The researchers checked if there were significant differences in the level of Al tools dependency and maritime students' knowledge acquisition when grouped according to demographic profile variables. Lastly, the study explored the relationship between maritime students' Al tool dependency and their knowledge acquisition, aiming to understand how maritime students' dependency on AI tools impacts their knowledge acquisition in classroom settings.

To answer the research objectives, the study used a descriptive-correlational design. The number of participants was calculated using Slovin's formula, and the researchers used stratified sampling to make sure different types of students were selected. Data was collected through a survey questionnaire, which was checked through content validation. The researchers used descriptive statistics like frequency, percentage, and average scores to help explain the results. For a deeper look at the results, the researchers used inferential statistics like the ANOVA and Pearson r correlation, to

identify significant differences and relationships among the variables.

The study produced a detailed description of the dependency on AI tools and its impact on the knowledge acquisition of maritime students in classroom settings. It identified significant differences in dependency on AI tools and knowledge acquisition of maritime students based on demographic profiles and revealed a statistically significant relationship between the maritime students' level of dependency on AI tools and knowledge acquisition. Based on the findings, the researchers proposed an AI-assisted learning enhancement program to help maritime students improve their knowledge. This program aims to make learning better and more effective.

Hypothesis

Based on the study, the following hypotheses were formulated:

1. There is no significant difference in the level of Al tools dependency when grouped according to demographic profile variables.
2. There is no significant difference in maritime students' knowledge acquisition when grouped according to profile variables.
3. There is a significant relationship between maritime students' Al tool dependency and their knowledge acquisition.

Definition of Terms

To understand the specific given words clearly. Words are defined using operational and conceptual methods. These definitions will help the readers understand the relation to the topics and ideas of this research.

AI-Assisted Learning Enhancement Program. This refers to empowering schools and improving learning outcomes by providing quality and personalized assessments and analysis for every student. It also enhances students' skills by developing their dependency on AI tools.

AI Tools. This refers to artificial intelligence (AI) applications created using software technologies that emerged in the 21st century. It also includes using ChatGPT, Duolingo, Grammarly, and others, which are designed to assist users, especially students, in tasks like writing and schoolwork.

Classroom Settings. This refers to the academic environment within the school where learning takes place. It also pertains to the location where students study and where students and teachers interact.

Dependency. This refers to the act of relying on someone or on something. It is also how an individual relies on AI tools in everyday life, which can possibly affect performance in classroom settings.

Knowledge Acquisition. This refers to improving decision-making and enhancing an individual's problem-solving skills. It also refers to the process by which students develop an understanding of a subject matter.

Maritime Students. This refers to students taking the Bachelor of Science in Marine Transportation (BSMT) and Bachelor of Science in Marine Engineering (BSMarE) enrolled at Central Luzon College of Science and Technology. It also pertains to college students who use AI tools and the respondents of this research study.

Research Methodology

This chapter presents the research design, sample and sampling techniques, research instrument, instrument validation, data-gathering procedure, statistical treatment of data employed, and ethical considerations in the study.

Research Design

This research aimed to assess the dependency on AI tools and its impact on the knowledge acquisition of maritime students in classroom settings. This research addresses how reliance on artificial intelligence tools may influence the learnings of maritime students. The study serves as a basis for developing an AIassisted learning enhancement program that could help in teaching and learning approaches in maritime education. The present study followed the quantitative approach, the descriptive-correlational methodology to achieve these objectives. Descriptive-correlational research included studies that give pertinent information about the elements that were prevailing in the present times. It described and interpreted what existing conditions are, ongoing processes, perceived effects, developing trends and relationship among the identified variables, specifically, the dependency on AI

tools (independent variable) and its impact on knowledge acquisition (dependent variable).

Moreover, descriptive-correlational research emphasized the interpretation of gathered data or the significance of what is described. It includes studies and literature that provide information about the present state of the involved variables (Yazon et al., 2019). The researchers collected the data using a survey questionnaire. It will be distributed to maritime students of Central Luzon College of Science and Technology (CELTECH) – Olongapo City. The gathered data were analyzed statistically using Slovin's formula, stratified random sampling technique, survey questionnaire, content validation of the instrument, descriptive statistics (frequency, percentage, mean, weighted mean, overall weighted mean), and inferential statistics through excel tabulation to determine possible significant relationships between the variables.

Descriptive-correlational design was selected because it provides an objective and systematic way of assessing educational practices and to understand how AI integration influences the learning outcomes of maritime students. It aligns with the study's goal, to possibly help in teaching and enhance learning approaches in maritime education that might be the idea of implementing an AI-assisted learning enhancement program in Central Luzon College of Science and Technology (CELTECH) – Olongapo.

Sample and Sampling Technique

The study focused on maritime students in Central Luzon College of Science and Technology (CELTECH) as the target population, aiming to assess their dependency on AI tools and its impact on their knowledge acquisition. To ensure reliable and representative results, from a total population of 888 maritime students, consisting of 338 BSMarE and 550 BSMT students, a sample size of 276 respondents was determined using Slovin's formula. This approach enhanced the accuracy of the findings by capturing dependency level on AI tools and its impact on the level of knowledge acquisition, while the calculated sample size ensured statistical validity and minimized sampling error. Stratified random sampling is effective in studies where the population is heterogeneous and subgroup representation is essential (Calderon & Gonzales, 2019). Using Slovin's formula is a practical method for determining sample size when the population is known and a specific margin of error is desired (Glen, 2023). Stratified random sampling was used in the research since the researchers considered the population divided into subgroups, and samples taken from each that every member has an equal chance of selection.

Instrumentation

To gather the necessary data for assessing the dependency on AI tool and its impact on the knowledge acquisition of maritime students in classroom settings in Central Luzon College of Science and Technology (CELTECH), the researcher developed a structured survey questionnaire as the primary research instrument. The questionnaire was designed to capture three key dimensions: (1) the demographic profile of the respondents including their age, gender, year level, course and section, (2) level of maritime student dependency on AI tools, and (3) the level of maritime students knowledge acquisition. Each item was carefully crafted to be clear, concise, and directly aligned with the study's objectives, ensuring relevance to the research questions. To ensure the instrument's validity, a content validation process was conducted with an expert review panel composed of three subject matter specialists. These experts evaluated each item for relevance, clarity, and representativeness, and their feedback led to minor revisions in wording and item structure. This process followed the recommendations of DeVellis (2021), who emphasized the importance of expert judgment in establishing content validity. Following validation, the instrument underwent pilot testing with a sample of 20 maritime students from (10) BS Marine Transportation and (10) BS Marine Engineering. This trial run helped identify ambiguities and improve the overall flow and comprehension of the questionnaire, consistent with the guidelines of Creswell and Creswell (2020) on refining instruments through pretesting.

To assess the instrument's reliability, the researcher analyzed its internal consistency using Cronbach's alpha, computed through statistical software. The resulting Cronbach's

alpha value indicates that the set of indicators measuring dependency on AI tools and knowledge acquisition demonstrate reliable internal consistency, with most values falling within the good range (o.9> Alpha >0.8) and several in the acceptable range (0.8> Alpha >0.7). The rigorous process of validation, pilot testing, and reliability assessment ensured that the instrument was both scientifically sound and contextually appropriate for the target population.

Ethical Considerations

All participants can withdraw from, or leave, the study at any point without feeling an obligation to continue. Participants don't need to provide a reason for leaving the study. It's important to make it clear to participants that there are no negative consequences or repercussions to their refusal to participate.

Furthermore, participants are taking the time to help the researchers in the research process. The researchers respected the participants' decisions without trying to change their minds. All potential participants received and understood all the information needed to decide whether they wanted to participate. This includes information about the study's benefits, risks, and institutional approval (Bhandari, 2021).

The researchers guarantee the anonymity by not gathering personal identifying data. All participants have the privacy rights, the researchers protected their personal data. Confidentiality should be achieved when possible, even if it is not possible to get data anonymously (Bhandari 2021). Ethical researchers have the responsibility of doing as little harm as possible and as much good as possible (Babbie, 2021).

The researcher will report the findings in a clear and accurate manner and not fabricate, falsify or misrepresent the data. This mirrors the research integrity principles and ethical research is honest in its handling and reporting of data (Neuman, 2021). The ethical guidelines followed in the study helped to safeguard the participants and the validity of the results.

Data-Gathering Procedure

The study followed a systematic and ethically sound process to ensure the accuracy, reliability, and integrity of the data collected. The first step involved the preparation of a structured survey questionnaire, which had undergone content validation by three subject matter experts and pilot testing with 20 maritime students. The instrument was finalized after revisions based on expert feedback and pilot results, and its internal consistency was confirmed with a Cronbach's alpha value of good (o.9> Alpha >0.8) and in the acceptable range.

Once the instrument was finalized, the researcher sought and obtained the necessary permissions and consents from maritime students in Central Luzon College of Science and Technology (CELTECH). These approvals ensured institutional support and granted access to the target population of maritime students. The researcher also secured a letter for the participants to affirm that the study complied with ethical standards, including informed consent, confidentiality, and voluntary participation.

Stratified random sampling was used to select participants, as the researchers considered the population divided into subgroups and drew samples from each, ensuring that every member had an equal chance of selection. The researchers coordinated with the school's registrar to identify potential participants, and they provided a letter to the research coordinator that explained the study's objectives, procedures, and ethical safeguards. Participants have the right to refuse or withdraw from the study at any time without penalty and they were informed of their rights. Informed consent letters were distributed prior to participation

The survey was done face-to-face, as participants were available. The researchers took a class schedule for each section of BS Marine Transportation and BS Marine Engineering and the printed questionnaires were given out, where the participant is allowed to complete the survey in a quiet and comfortable environment. The researchers assisted and clarified where necessary and left them alone so as not to influence their responses. Questionnaires were completed and checked for completeness and then coded into a secure database. Data were arranged by year level, course and section using spreadsheet software in order to

support and assist in the prevention of data loss. All responses were treated as confidential and anonymous to preserve the anonymity of the participants and all information was kept in a password protected data file and only accessed by the researcher. The methodology adopted in the data collection ensured that data gathered were reliable and comprehensive, providing a strong basis for subsequent analysis and interpretation of findings.

Data Analysis Technique

These statistical tools were carefully selected to ensure that the data were analysed accurately, the research questions were addressed effectively, and the findings were both valid and meaningful for informing environmental intervention programs.

1. **Frequency and Percentage Distribution.** This technique summarized categorical data by showing how often each response or category occurs, expressed in counts and percentages. It was used to describe the demographic profile of respondents and the dependency level on AI tools, providing a clear overview of data patterns.
2. **Mean (Arithmetic Average, including weighted mean and overall weighted mean).** The mean was used to compute the sum of all numerical values divided by the number of observations, representing the central tendency of a data set. It was employed to determine the dependency level on AI tools and the impact level of knowledge acquisition, offering a general measure of their dependency and impact on knowledge acquisition.
3. **Pearson Product-Moment Correlation Coefficient (Pearson r).** Pearson's r quantifies the strength and direction of the linear relationship between two continuous variables. It was used to examine the relationship between the maritime students' level of dependency on AI tools and knowledge acquisition, which was central to the study's correlational objective.
4. **Analysis of variance (ANOVA).** This was used to determine whether there are significant differences in the level of AI tools dependency and maritime students' knowledge acquisition across three or more demographic groups.
5. **Cronbach's Alpha.** Assesses the internal consistency or reliability of a set of survey items measuring the same construct. With a computed value of good (o.9> Alpha >0.8) and several in the acceptable range (0.8> Alpha >0.7), it confirmed that the questionnaire items had reliable internal consistency that measured dependency on AI tools and their impact on the knowledge acquisition.The table shows the frequency and distribution of students' profile.

Presentation, Analysis and Interpretation of Data

This chapter presents the gathered and processed data in a tabular form, along with the analysis and interpretation, to provide a clearer and deeper understanding of the problems stated in Chapter 1.

1. Profile of the Respondents

Table 1. Frequency and Percentage Distribution of Students' Profile

Profile Variable	Category	Frequency (f)	Percentage (%)
Age	18 years and below	71	26
	19 years old	62	22
	20 years old	80	29
	21 years old	35	13
	22 years old	28	10
	Total	276	100
Gender	Male	252	91
	Female	17	6
	LGBTQIA+	7	3
	Total	276	100

Profile Variable	Category	Frequency (f)	Percentage (%)
Year Level	1st Year	92	33.33
	2nd Year	92	33.33
	3rd Year	92	33.33
	Total	276	100
Program	Marine Transportation	105	38
	Marine Engineering	171	62
	Total	276	100
Section	Alpha	74	27
	Bravo	73	26
	Charlie	73	26
	Delta	34	12
	Echo	12	4
	Foxtrot	5	2
	Golf	5	2
	Total	276	100

The table shows the frequency and distribution of students' profile.

Age. The largest group of student-respondents were from of 20 years old with 29% (n=80), followed by the bracket of 18 years old and below (n=71) with 26%, 19 years old with 22% (n=62), 21 years old (n=35) with 13% and the least is 22 years old with 10% (n=28).

Gender. Majority of the student-respondents were male with 91% (n=252), while female and LGBTQIA+ student-respondents has 6% (n=17) and 3% (n=7) respectively.

Year level. Data shows a perfectly uniform distribution across the three academic levels surveyed. Specifically, there were 92 student-respondents for 1st year (33%), 92 for 2nd year (33%), and 92 for 3rd year (33%).

Program. The data reveals that majority of the student-respondents are enrolled in marine engineering representing 62% (n=171) of the total sample. While 38% (n=105) are enrolled in marine transportation. Section. Student-respondents are primarily concentrated on the first three sections: Alpha 27% (n=74), Bravo 26% (n=73), and Charlie 26% (73). Meanwhile, there is a noticeable decline of student-respondents from the remaining section with Delta contributing 12% (n=34), and Echo, Foxtrot, and Golf contributing 4% (n=12), 2% (n=5), and 2% (n=5) respectively.

In terms of age, the results of the study revealed that most respondents were between 18 and 21 years old, with the largest proportion being 20 years old. This finding is consistent with the traditional college-age population. Individuals within this age group are also more likely to engage with digital technologies and artificial intelligence tools as part of their academic activities (NCES, 2023). This supports the idea that students within the traditional college age group are more likely to utilize AI tools such as intelligent tutoring systems, automated writing assistants, and AI-based research platforms. With regard to gender, the findings indicated that the majority of respondents were male. This distribution is common in technical and maritime related programs. Research in engineering and maritime education suggests that male students historically dominate these disciplines due to occupational traditions and career pathways associated with maritime and engineering industries. According to UNESCO, women remain underrepresented in science, technology, engineering, and mathematics (STEM) fields worldwide, which contributes to higher male enrollment in technical programs such as engineering and maritime studies (UNESCO, 2023). In terms of year level, the respondents were evenly distributed among firstyear, second-year, and third-year students. Including students from multiple academic levels provides a broader understanding of how learners interact with educational technologies throughout their academic journey. According to research on technology integration in higher education, students at different academic levels may demonstrate varying levels of digital literacy,

critical thinking, and learning independence when using AI-assisted tools in classroom settings (Bond et al., 2024).

In terms of academic program, most of the respondents were enrolled in Marine Engineering and the others were taking Marine Transportation. Maritime education focuses on technical skills, operational skills and decision making skills necessary in the functioning of ships. Maritime education institutions are important training ground for the future generation of seafarers, as IMO recognizes these institutions for embedding modern technologies and digital systems in training programs, thus improving learning and professional competency (IMO, 2019). Moreover, the increasing application of artificial intelligence in the field of education has greatly affected the ways in which student's access information and build knowledge. Research on AI in education shows that AI tools can aid personalization, provide timely feedback, and aid in information retrieval, potentially enhancing students' grasp of difficult content when used effectively. Research of AI in learning suggests that AI tools can help customize learning, deliver real-time feedback, and facilitate information retrieval, ultimately helping students better understand complex subjects properly. High levels of using AI tools can also impact critical thinking and independent knowledge building if not appropriately directed by teachers (Zawacki-Richter, 2019).

2. Maritime Students' Dependency on AI Tools

Table 2. Maritime Students' Dependency on AI Tools in terms of Familiarity with its Usage

Statements	Mean	Verbal Description	Rank
1. I often use AI tools (ChatGPT, Grammarly, etc.) to finish school task.	2.95	Moderately Dependent	1
2. I use AI as my primary source when learning new lessons.	2.78	Moderately Dependent	3
3. I rely on AI instead of reviewing my class materials (PowerPoint presentations, PDF files, etc.).	2.45	Slightly Dependent	10
4. I ask AI for help before trying to solve tasks on my own.	2.68	Moderately Dependent	8
5. I use AI to check if my assignments are correct.	2.72	Moderately Dependent	6
6. I am comfortable using different AI platforms.	2.75	Moderately Dependent	5
7. I use AI to translate or reword academic materials.	2.77	Moderately Dependent	4
8. I explore AI tools to help my learning.	2.90	Moderately Dependent	2
9. I use AI regularly when I study.	2.67	Moderately Dependent	9
10. I am confident in integrating AI tools into my studies.	2.69	Moderately Dependent	7
Total	2.74	Moderately Dependent	

Table 2 shows the maritime student's dependency on AI tools in terms of familiarity with its usage.

The use of AI tools to finish school task ranks the highest with a mean of 2.95 (moderately dependent) followed by exploring AI tools to assist learning with a mean of 2.90 (moderately dependent) and use of AI as primary source when learning new lessons with a mean of 2.78 (moderately dependent). While relying on AI instead of reviewing class materials ranks the lowest with a mean of 2.45 (slightly dependent).

Overall, the computed mean of 2.74 (moderately dependent) indicates that student-respondents have integrated Artificial Intelligence tools in their regular academic routine. They recognize the help and use of AI tools but not to an excessive or absolute degree.

A systematic review of the uses of AI in higher education uncovered that students widely use AI tools to support their studies, including to assist with assignments, to receive feedback, and to help access information (Richter et al., 2019). The scientists, though, noted that AI technologies would be most effective

when used as complementary learning tools and not as stand-ins for traditional learning tools.

Researchers also included Bettayeb et al. (2023) who explored the educational opportunities of generative AI tools like ChatGPT, a product of OpenAI. The study revealed that a significant portion of students are utilizing AI tools to help them with their assignments, brainstorming ideas, and understanding complex concepts. The authors explained that while AI can improve productivity and learning efficiency, its overuse can have a negative impact on students' critical thinking and independent knowledge acquisition if used in an irresponsible manner.

Table 3. Maritime Students' Dependency on AI Tools in terms of Impact of Knowledge Acquisition

Statements	Mean	Verbal Description	Rank
1. I use AI to summarize lessons I don't understand.	2.95	Moderately Dependent	1
2. I find writing tasks hard without AI.	2.54	Moderately Dependent	10
3. I use AI to get ideas for projects and assignments.	2.91	Moderately Dependent	3
4. I remember less when I depend on AI.	2.60	Moderately Dependent	9
5. AI helps me understand difficult lessons.	2.92	Moderately Dependent	2
6. AI explanations help me understand real - life examples.	2.78	Moderately Dependent	6
7. I practice solving problems using AI tools.	2.66	Moderately Dependent	7
8. AI have improved my writing and research skills.	2.80	Moderately Dependent	5
9. I use AI to summarize and organize lessons.	2.84	Moderately Dependent	4
10. AI tools support my overall academic development.	2.65	Moderately Dependent	8
Total	2.77	ModeratelyDependent	

The table 3 shows maritime students' dependency on AI tools in terms of impact knowledge acquisition. The use of AI to summarize difficult and unfamiliar lesson ranks the highest with a mean of 2.95 (moderately dependent), followed by the use of AI tools to breakdown difficulty lesson with a mean of 2.92 (moderately dependent) and the use of AI to generate ideas for projects and assignments with a mean of 2.91 (moderately dependent). While finding writing task without the use of AI ranks the lowest with a mean of 2.54 (moderately dependent).

Overall, the computed mean of 2.77 (moderately dependent) indicates that maritime students consistently use of Artificial Intelligence tools serves as a cognitive support for their learning process.

These findings are supported by the study of Wayne Holmes et al. (2023), who emphasized that artificial intelligence technologies in education can support students' knowledge acquisition by providing automated explanations, summaries, and structured learning assistance. The researchers explained that AI-powered learning tools help students process complex information more efficiently and improve their conceptual understanding.

Likewise, the study conducted by Sharples (2023) found that generative AI tools like ChatGPT can help students with new ideas, beginning writing tasks, and finding alternative viewpoints for academic assignments. It is suggested that these tools can be used to invoke students' creativity and their thinking process, especially when it comes to assignments and research.

Moreover, intelligent learning technologies can improve learning by assisting students in information analysis, providing adaptive support, and highlighting the main points from complex academic content, as reported by Baker and Siemens (2021). Their research in the field of learning analytics and AI in education underscores how technology will help to enhance students' learning content understanding and engagement.

Table 4. Maritime Students' Dependency on AI Tools in terms of Effects on Classroom Settings and Study Habits

Statements	Mean	Verbal Description	Rank
1. I join class discussion more easily after using AI.	2.60	Moderately Dependent	8
2. I rely on AI-generated summaries writing notes on lectures.	2.62	Moderately Dependent	6.5
3. I stopped traditional study (like flashcards or re-writing notes) because AI helps more for exams.	2.71	Moderately Dependent	1
4. I feel less motivated to study because AI gives quick answers.	2.53	Moderately Dependent	10
5. I verify classroom lessons with AI materials.	2.59	Moderately Dependent	9
6. I use AI to clarify lessons I did not fully understand.	2.68	Moderately Dependent	3
7. I rely on AI to create my study notes.	2.62	Moderately Dependent	6.5
8. AI helps me manage my study time effectively.	2.70	Moderately Dependent	2
9. I use AI while attending classes.	2.65	Moderately Dependent	5
10. AI enhances my overall learning experience.	2.67	Moderately Dependent	4
Total	2.64	Moderately Dependent	

Table 4 shows the maritime students' dependency on AI tools in terms of effects on classroom settings and study habits.

The stoppage of traditional studying method because of the help of AI tools before the exam ranks the highest with a mean of 2.71 (moderately dependent) followed by AI helps manage study time effectively with a mean of 2.70 and the use of AI to clarify lessons that are not fully understand by maritime students with a mean of 2.68. While feeling less motivated to study because of AI gives quick answer ranks the lowest with a mean of 2.53 (moderately dependent).

Overall, the computed mean of 2.64 (moderately dependent) signifies that maritime students have integrated AI as a central component of their study strategy, effectively substituting some traditional review methods with digital alternatives to maximize efficiency.

Based on the result for Table 4, it can be concluded that students have a moderate dependence on AI tools in studying, managing their time, and participating in the classroom. This is consistent with Luckin (2024), who highlighted the potential of AI to create personalized learning experiences and streamline academic work for students. Hence, it can be inferred that AI tools serve as aids for learning and help students handle their studies and engage with learning.

3. Maritime Students' Knowledge Acquisition

Table 5. Maritime Students' Knowledge Acquisition Towards Critical Thinking and Problem-Solving Skills

Statements	Mean	Verbal Description	Rank
1. I can analyze tasks without fully depending on AI.	3.01	Moderate Knowledge	1
2. AI guidance helps me improve my problem-solving skills.	2.89	Moderate Knowledge	3.5
3. AI helps me understand difficult academic tasks.	2.94	Moderate Knowledge	2
4. I use AI to explore different solutions to problems.	2.87	Moderate Knowledge	6.5
5. I use AI to compare different viewpoints on a topic.	2.86	Moderate Knowledge	8.5
6. AI helps me identify errors in my work.	2.89	Moderate Knowledge	3.5
7. I can evaluate if AI answers are correct and logical.	2.88	Moderate Knowledge	5
8. I use AI examples to solve similar problems.	2.87	Moderate Knowledge	6.5
9. AI helps me think creatively and critically.	2.82	Moderate Knowledge	10
10. AI helps me simplify complex problems.	2.86	Moderate Knowledge	8.5
Total	2.89	Moderate Knowledge	

Table 5 shows the maritime students' knowledge acquisition towards critical thinking and problem-solving skills. Analyzing the tasks without fully depending on AI ranks the highest with a mean of 3.01, followed by AI helping the understand difficult academic tasks with a mean of 2.94. While AI guiding improves problem solving skills and AI helping identify errors on the task have tied in ranking with a mean of 2.89. However, even though the respondents are moderately knowledgeable about AI helping think creatively and critically, it ranks the lowest with a mean of 2.82.

Overall, the computed mean of 2.89 (moderate knowledge) signifies that the respondents possess a functional but developing competence in using AI.

The findings in Table 5 indicate that maritime students demonstrate moderate levels of critical thinking and problem-solving abilities when using AI tools. The study by Holmes (2023) echoes this, as it indicated that AI in the field of education can aid learning by offering students interactive tools for information analysis, exploring perspectives, and accessing knowledge. The report on the use of AI in education also reports that AI technologies can help learners to understand information, consider their own responses and think more deeply when using AI as a part of the learning process. Hence, this aligns with the current study finding that AI can enhance students' cognitive abilities as an aid rather than a replacement for their own thought processes.

Table 6. Maritime Students' Knowledge Acquisition Towards Decision Making Skills

Statements	Mean	Verbal Description	Rank
1. I know how to check and apply AI suggestions when deciding.	2.92	Moderate Knowledge	1
2. I feel more confident making decisions with AI support.	2.78	Moderate Knowledge	8
3. AI helps me see different choices before deciding.	2.88	Moderate Knowledge	2.5
4. AI improves the quality of my decisions.	2.88	Moderate Knowledge	2.5
5. I confirm AI suggestions using reliable sources.	2.84	Moderate Knowledge	4
6. I use AI to weigh my pros and cons before deciding.	2.76	Moderate Knowledge	9
7. AI helps me evaluate risks and possible outcomes.	2.79	Moderate Knowledge	7
8. I'm more confident in my decisions when AI supports them.	2.82	Moderate Knowledge	5.5
9. I use AI to see possible results of different decisions.	2.82	Moderate Knowledge	5.5
10. I feel comfortable deciding after consulting AI.	2.74	Moderate Knowledge	10
Total	2.82	Moderate Knowledge	

Table 6 shows the maritime students' knowledge acquisition towards decision making skills. The data reveals that knowing how to check and apply AI suggestions when deciding ranks, the highest with a mean of 2.92 followed by AI revealing different choices before deciding and AI improves the quality of decision which ties in ranking with a mean of 2.88. Conversely, though respondents are moderately knowledgeable, feeling comfortable deciding after consulting AI ranks the lowest with a mean of 2.74. Overall, the computed mean of 2.82 (moderate knowledge) implies that maritime students have functional but guarded engagement with AI in decision-making.

It reveals that students moderately use AI tools to evaluate options, analyze information, and support decision-making processes. This result was supported by the study of Dwivedi (2023), which explains that AI systems can function as decision-support technologies by helping users access multiple alternatives and potential outcomes. The study also notes that AI technologies can improve analytical reasoning when users critically review AI-generated suggestions. This corroborates the finding that students use AI tools to assist in making academic decisions while still maintaining independent judgment.

Table 7. Maritime Students' Knowledge Acquisition Towards Study Habits and Classroom Management

Statements	Mean	Verbal Description	Rank
1. I use AI to study better during class hours.	2.60	Moderate Knowledge	10
2. I feel more ready for class discussions after using AI.	2.65	Moderate Knowledge	7.5
3. I use AI to make reviewers and study plans.	2.79	Moderate Knowledge	2
4. I participate more in class because AI boosts my confidence.	2.62	Moderate Knowledge	9
5. I use AI to test myself on the lessons.	2.80	Moderate Knowledge	1
6. AI help me plan and schedule my study sessions.	2.70	Moderate Knowledge	4
7. I use AI to help classmates understand the lessons.	2.71	Moderate Knowledge	3
8. I feel more engaged in discussions because of AI	2.65	Moderate Knowledge	7.5
9. I use AI to review lessons before tests.	2.69	Moderate Knowledge	5.5
10. I stay motivated in my studies because AI supports me.	2.69	Moderate Knowledge	5.5
Total	2.69	Moderate Knowledge	

The table shows the Maritime Students' Knowledge Acquisition Towards Study Habits and Classroom Management. Data reveals that the use of AI to test the respondents' self on lesson ranks the highest with a mean of 2.80 followed by the use of AI to make reviewers and study plans with a mean of 2.79 and use of AI to help classmate understand the lesson with a 2.71 mean. However, though moderate knowledge, the use of AI to study during class hours ranks the lowest with a mean of 2.60. The overall computed mean of 2.69 indicates that maritime students have a mid-level understanding and utilization of AI regarding their study habits and classroom management.

The findings of the study are supported by research from Vieriu and Petrea (2025), which shows that AI tools significantly help students improve their study habits and classroom engagement. Their study revealed that students who use AI for tasks such as self-testing, making study plans, and reviewing lessons reported better understanding of lessons and higher motivation in learning activities. This supports the results in Table 7, where maritime students use AI tools to test themselves, create reviewers, and plan their study sessions, indicating that AI positively influences their knowledge acquisition and classroom participation.

4. Significant Difference in the level of Al tools Dependency when grouped according to Demographic Profile Variables

Table 8. Significant Difference in the level of Al tools Dependency in terms of Familiarity when grouped according to Demographic Profile Variables

Profile Variable	Source of Variation	Sum of Squares (SS)	df	Mean Square (MS)	F	Sig. (p)	Decision
Age	Between Groups	1.746	4	0.437	1.126	.346	Accept H_0 (Not Significant)
	Within Groups	100.577	271	0.388			
	Total	102.324	275				
Gender	Between Groups	0.290	2	0.145	0.371	.691	Accept H_0 (Not Significant)
	Within Groups	102.034	273	0.391			
	Total	102.324	275				
Year Level	Between Groups	3.668	2	1.834	4.852	.009	Reject H_0 (Significant)
	Within Groups	98.656	273	0.378			
	Total	102.324	275				
Program	Between Groups	.171	1	.171	.440	.508	Accept H_0 (Not Significant)
	Within Groups	102.152	274	.390			
	Total	102.324	275				

Profile Variable	Source of Variation	Sum of Squares (SS)	df	Mean Square (MS)	F	Sig. (p)	Decision
Section	Between Groups	4.405	6	0.734	1.927	.077	Accept H_0 (Not Significant)
	Within Groups	97.919	269	0.381			
	Total	102.324	275				

The table shows Significant Difference in the level of Al tools Dependency in terms of Familiarity when grouped according to Demographic Profile Variables. The data reveals that there is no significant difference in the level of AI dependency when respondents are group according to profile variables evident in age (0.345), gender (.691), program (.508), and section (.077). However, the results show a significant difference in the level of AI dependence when group according to profile variable present in year level (.009). This finding suggests that the respondents' academic year level plays a significant role in the familiarity with and dependency on AI tools.

The results of Table 8 are supported by research conducted by Patel (2025), which found that students' familiarity with AI tools increases as they progress in their academic levels. The study highlighted that students in higher years are more confident and frequent users of AI tools, while students in lower years are less familiar with these technologies. This supports the findings of Table 8, which show a significant difference in AI tool familiarity according to year level, but no significant difference based on age, gender, course, or section. This indicates that academic progression plays a key role in AI dependency and familiarity.

Table 9. Significant Difference in the level of Al tools Dependency in terms of Impact of Knowledge Acquisition when grouped according to Demographic Profile Variables

Profile Variable	Source of Variation	Sum of Squares (SS)	df	Mean Square (MS)	F	Sig. (p)	Decision
Age	Between Groups	2.256	4	0.564	1.502	.202	Accept H_0 (Not Significant)
	Within Groups	97.276	271	0.376			
	Total	99.532	275				
Gender	Between Groups	1.088	2	0.544	1.442	.238	Accept H_0 (Not Significant)
	Within Groups	98.445	273	0.377			
	Total	99.533	275				
Year Level	Between Groups	3.746	2	1.873	5.103	.007	Reject H_0 (Significant)
	Within Groups	95.787	273	0.367			
	Total	99.533	275				
Program	Between Groups	0.012	1	0.012	0.032	.858	Accept H_0 (Not Significant)
	Within Groups	99.520	274	0.380			
	Total	99.532	275				
Section	Between Groups	4.255	6	0.709	1.913	.079	Accept H_0 (Not Significant)
	Within Groups	95.278	269	0.371			
	Total	99.533	275				

The table shows the Significant Difference in the level of Al tools Dependency in terms of Impact of Knowledge Acquisition when grouped according to Demographic Profile Variables. The data reveals that there is no significant difference in the perceived impact of AI on knowledge acquisition when respondents are grouped by age (.202), gender (.238), program (.858), and section (.079). However, the results indicate a significant difference when the respondents are grouped according to year level (.007). This finding implies that year level is a significant factor in how students perceive the impact of AI on their knowledge acquisition.

The findings in Table 9 are supported by research from Frontiers in Education (2025), which reports that students' perceptions of

AI's impact on learning vary according to their academic experience and exposure. Students with higher familiarity and more frequent use of AI tools reported greater improvement in knowledge acquisition and learning efficiency, while those with less experience perceived lower impact. This aligns with Table 9, which shows a significant difference in perceived AI impact on knowledge acquisition according to year level, but no significant difference for age, gender, course, or section. This suggests that year level influences how students perceive AI's contribution to learning outcomes.

Table 10. Significant Difference in the level of Al tools Dependency in terms of Effects on Classroom Settings and Study Habits when grouped according to Demographic Profile Variables

Profile Variable	Source of Variation	Sum of Squares	df	Mean Square	F	Sig.	Decision
Age	Between Groups	3.454	4	0.863	1.887	0.113	Accept H_0 (Not Significant)
	Within Groups	118.535	271	0.458			
	Total	121.989	275				
Gender	Between Groups	0.790	2	0.395	0.851	0.428	Accept H_0 (Not Significant)
	Within Groups	121.199	273	0.464			
	Total	121.989	275				
Year Level	Between Groups	4.109	2	2.054	4.541	0.011	Reject H_0 (Significant)
	Within Groups	117.880	273	0.452			
	Total	121.989	275				
Program	Between Groups	0.011	1	0.011	0.024	0.876	Accept H_0 (Not Significant)
	Within Groups	121.978	274	0.466			
	Total	121.989	275				
Section	Between Groups	6.164	6	1.027	2.279	0.037	Accept H_0 (Not Significant)
	Within Groups	115.825	269	0.451			
	Total	121.989	275				

The table shows the Significant Difference in the level of Al tools Dependency in terms of Effects on Classroom Settings and Study Habits when grouped according to Demographic Profile Variables. The study reveals that there is no significant difference n the effects of AI on study habits and classroom settings when respondents are grouped by age (.113), gender (.428), and program (.876). However, the data reveals a significant difference in the effects of tools when respondents are grouped by year level (.011) and section (.037). This suggests that the practical application of AI in the classroom and its effect on study habits are shaped more by a student's current academic stage and their immediate classroom environment.

The findings supported by De Leon et al. (2025) show a significant difference when respondents are grouped by year level and section, indicating that students' academic stage and classroom environment may influence how AI tools affect their study habits and learning experiences. This supports the idea that as students' progress academically, their use and reliance on AI tools may change due to varying academic demands and exposure to technology.

5. Significant Difference in Maritime Students' Knowledge Acquisition when grouped according to Profile Variables

Table 11. Significant Difference in Maritime Students' Knowledge Acquisition in terms of Critical Thinking and Problem-Solving Skills when grouped according to Profile Variables

Profile Variable	Source of Variation	Sum of Squares	df	Mean Square	F	Sig.	Decision
Age	Between Groups	1.356	4	0.339	0.991	.413	Accept H_0 (Not Significant)
	Within Groups	88.550	271	0.327			

Profile Variable	Source of Variation	Sum of Squares	df	Mean Square	F	Sig.	Decision
	Total	89.906	275				
Gender	Between Groups	.808	2	.404	1.183	.308	Reject H_0 (Significant)
	Within Groups	89.098	273	.341			
	Total	89.905	275				
Year Level	Between Groups	3.023	2	1.512	4.541	.012	Accept H_0 (Not Significant)
	Within Groups	86.882	273	0.318			
	Total	89.905	275				
Program	Between Groups	0.180	1	0.180	0.524	.470	Accept H_0 (Not Significant))
	Within Groups	89.726	274	0.327			
	Total	89.906	275				
Section	Between Groups	3.065	6	.511	1.512	.175	Accept H_0 (Not Significant)
	Within Groups	86.841	269	.338			
	Total	89.905	275				

The table shows the significant difference in the level of AI tools dependency in terms of knowledge acquisition towards study habits and classroom management when grouped according to profile variables.

The study reveals that there is no significant difference in the level of knowledge acquisition related to AI usage when students are grouped according to age (.413), gender (.308), program (.470), and section (.175). Conversely, the data reveals a significant difference when the respondents are grouped according to year level (.012). This indicates that as maritime students move from 1st year to their final year, their understanding and application of AI tools to manage their classroom responsibilities and study habits significantly evolve.

This finding was supported by Paredes and Victoriano (2025), who found that students' knowledge and utilization of artificial intelligence significantly vary according to year level because higher-level students have more opportunities to use digital technologies in academic tasks and research activities. Similarly, a study from the International Journal of Research and Innovation in Social Science (2024) reported that students in higher year levels tend to demonstrate greater familiarity and competence in using AI tools due to increased academic demands and exposure to technology-enhanced learning environments.

Table 12. Significant Difference in Maritime Students' Knowledge Acquisition in terms of Decision Making Abilities when grouped according to Profile Variables

Variable	Source of Variation	Sum of Squares	df	Mean Square	F	Sig.	Decision
Age	Between Groups	1.592	4	0.398	0.984	0.417	Accept H_0 (Not Significant)
	Within Groups	104.685	271	0.404			
	Total	106.276	275				
Gender	Between Groups	0.678	2	0.339	0.838	0.434	Accept H_0 (Not Significant)
	Within Groups	105.598	273	0.405			
	Total	106.276	275				
Year Level	Between Groups	3.768	2	1.884	4.797	0.009	Reject H_0 (Significant)
	Within Groups	102.508	273	0.393			
	Total	106.276	275				
Program	Between Groups	0.000	1	0.000	0.000	0.995	Accept H_0 (Not Significant)
	Within Groups	102.240	274	0.398			
	Total	106.276	275				

Variable	Source of Variation	Sum of Squares	df	Mean Square	F	Sig.	Decision
Section	Between Groups	4.037	6	0.673	1.690	0.123	Accept H_0 (Not Significant)
	Within Groups	102.239	269	0.398			
	Total	106.276	275				

The table shows the Significant Difference in Maritime Students' Knowledge Acquisition in terms of Decision-Making Abilities when grouped according to Profile Variables. The study reveals that there is no significant difference in decision-making abilities when respondents are grouped by age (.417), gender (.434), program (.995), and section (.123). In contrast, there is a significant difference when respondents are grouped according to year level (.009). This finding suggests that the level of seniority or academic stage significantly impacts how students use AI tools to aid their decision-making process.

This finding was supported by the study of Delcker et al. (2024), which reported that students' knowledge, attitudes, and competencies in using AI tools influence how they apply AI in learning processes and academic tasks. Their study emphasized that as students gain more experience in higher education, they develop stronger abilities to integrate AI tools effectively to support learning and decision-making activities.

Table 13. Significant Difference in Maritime Students' Knowledge Acquisition in terms of Study Habits and Classroom Management when grouped according to Profile Variables

Variable	Source of Variation	Sum of Squares	df	Mean Square	F	Sig.	Decision
Age	Between Groups	5.255	4	1.314	10.536	.000	Reject H_0 (Significant)
	Within Groups	32.295	271	.125			
	Total	37.550	275				
Gender	Between Groups	.560	2	.280	1.977	.141	Accept H_0 (Not Significant)
	Within Groups	36.990	273	.142			
	Total	37.550	275				
Year Level	Between Groups	8.374	2	4.187	37.453	.000	Reject H_0 (Significant)
	Within Groups	29.177	273	.112			
	Total	37.550	275				
Program	Between Groups	.063	1	.063	.441	.507	Accept H_0 (Not Significant)
	Within Groups	37.487	274	.143			
	Total	37.550	275				
Section	Between Groups	2.739	6	.456	3.370	.003	Reject H_0 (Significant)
	Within Groups	34.811	269	.135			
	Total	37.550	275				

The table shows the significant difference in maritime students' knowledge acquisition in terms of study habits and classroom management when grouped according to profile variables. The results show that there is no significant difference in knowledge acquisition in terms of study habits and classroom management when grouped according to gender (.141) and program (.507). However, the study also reveals that there is a significant difference evidently shown in age (.000), year level (.000) and section (.003). The study implies that age and section play a vital role when specifically looking at the practical application of AI in study habits and classroom management.

These results were supported by Ward et al. (2025), who found that AI tools can significantly influence students' study behaviors, including time management, personalized learning, and classroom task efficiency. The study emphasized that while AI adoption benefits all students, the effectiveness of AI tools is moderated by factors such as age, academic stage, and prior experience, which aligns with the present

study's findings. Therefore, the practical application of AI in study habits and classroom management appears to improve as students gain experience and advance in their academic programs.

6. Significant Relationship between Maritime Students' Al Tool Dependency and their Knowledge Acquisition

Table. 14. Significant Relationship between Maritime Students' Al Tool Dependency and their Knowledge Acquisition

Students' Knowledge Acquisition	Student Dependency on AI Tools		
	Familiarity	Impact on Knowledge Acquisition	Effects on Classroom Setting and Habits
Critical Thinking and Problem Solving	.580**	.655**	.592**
Decision-making Abilities	.604**	.614*	.633*
Study Habits and Classroom Engagement	.726**	.752**	.734**

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

The positive correlation suggests that AI tools are not merely "shortcuts" for students but are functioning as cognitive assistants that enhance their academic performance. The strong link between AI impact and study habits ($r = .752$) implies that the more effective a student finds an AI tool to be, the more motivated and organized they become in their study habits.

The results in Table 14 indicate that students moderately utilize AI tools to support academic decision-making, evaluate information, and enhance learning processes. This finding is supported by Mashagbeh et al. (2025), who reported that AI platforms such as ChatGPT enable students to engage with academic tasks, assess multiple alternatives, and make informed decisions. This corroborates the table's results by showing that AI tools can enhance students' critical thinking and independent judgment, so that learners can benefit from AI assistance while maintaining control over their academic decisions.

7. Implementing AI-Assisted Learning Enhancement Program

Program Components	Objectives	Activities/ Strategies	AI Tools/Resources	Persons Involved	Time Frame	Budget Allocation (₱)	Expected Outcomes
1. Needs Assessment and Baseline Evaluation	To determine students' current academic performance and learning gaps in maritime subjects.	• Conduct diagnostic tests in navigation, marine engineering, and safety. • Survey students' familiarity with AI tools. • Analyze previous academic records.	AI-based assessment platforms, survey tools	Program Coordinator, Instructors, IT Staff	Week 1–2	₱15,000	Identified learning gaps and baseline data for targeted intervention.
2. Orientation and Training on AI Tools	To familiarize students and instructors with AI-	• Conduct workshops on AI tools (e.g.,	AI chatbots, virtual simulators, LMS platforms	IT Experts,	Week 3–4	₱30,000	Increased awareness and competency in

Program Components	Objectives	Activities/ Strategies	AI Tools/Resources	Persons Involved	Time Frame	Budget Allocation (₱)	Expected Outcomes
	assisted learning platforms.	chatbots, simulation software). • Demonstrate ethical use of AI. • Provide hands-on training sessions.		Instructors, Students			using AI tools effectively.
3. AI-Assisted Instruction Integration	To enhance teaching and learning through AI-supported instruction.	• Integrate AI tools into lessons (e.g., maritime simulators). • Use adaptive learning systems for instruction.	Adaptive learning systems, maritime simulation software	Instructors, Students	Month 2–4	₱50,000	Improved understanding of complex maritime concepts.
4. Personalized Learning Support	To address individual student learning needs.	• Provide AI-driven tutoring sessions. • Assign personalized learning modules. • Monitor progress using analytics dashboards.	AI tutoring systems, performance tracking tools	Instructors, Students, Academic Advisors	Month 2–5	₱40,000	Increased student engagement and improved academic performance.
5. Continuous Monitoring and Feedback	To track student progress and provide timely feedback.	• Use AI analytics to monitor performance .• Provide real-time feedback. • Conduct regular formative assessments.	Learning analytics tools, AI feedback systems	Instructors, Program Coordinator	Throughout the Program	₱25,000	Timely intervention and improved learning outcomes.
6. Evaluation and Program Assessment	To evaluate the effectiveness of the intervention program.	• Conduct post-tests and compare with baseline data. • Gather student and instructor feedback. • Analyze performance improvements.	Data analytics tools, survey instruments	Program Coordinator, Researchers	Month 6	₱20,000	Measurable improvement in academic performance and skills.

Program Components	Objectives	Activities/ Strategies	AI Tools/Resources	Persons Involved	Time Frame	Budget Allocation (₱)	Expected Outcomes
7. Sustainability and Improvement Plan	To ensure the long-term implementation and enhancement of the program.	• Revise the program based on evaluation results. • Provide continuous training. • Integrate AI tools into the curriculum permanently.	Institutional LMS, AI platforms	School Administrator, Faculty	Ongoing	₱30,000	Sustainable AI integration and continuous improvement in maritime education.

The AI-Assisted Learning Enhancement Program was created to assist students with their learning while remaining responsible and effective when using AI tools. The program begins with an assessment and survey to determine the students' learning needs, followed by training on how to use AI technologies correctly and ethically. It also uses artificial intelligence in the classroom, provides real-time student support, monitors student performance, and assesses program effectiveness. Last but not least, a sustainability plan ensures that effective AI-driven teaching methods are still effective with future students.

This program was important in the current research because it addressed the relationship between AI reliance and knowledge learning. Although AI tools can improve learning and academic achievement, over-reliance on them can impair students' critical thinking, problem-solving, and autonomous learning skills. The program encourages students to use AI as a learning tool rather than a replacement for their own thinking, through guided and responsible use. As a result, it facilitates relevant knowledge learning, improves academic capabilities, and encourages responsible and active knowledge consumption by AI in student learning.

Summary, Conclusion, and Recommendations

This section presents a summary of the major findings, conclusions and recommendations of the study based on the data gathered and analyzed in Chapter IV.

Summary of Findings

The purpose of this study was to assess the dependency on AI tools and its impact on the knowledge acquisition of maritime students in classroom settings in Central Luzon College of Science and Technology (CELTECH) – Olongapo City, examined whether there is significant differences existed between the respondents were grouped according to age, sex, year level, section, course and gathered respondent's feedback for the basis of the AI - assisted learning enhancement program. The key findings of the study were summarized as follows:

1. Many respondents were 20 years old with a significant proportion of 29%, totaling about 80 students. Where the average college students age range is represented, while low in representation of respondents were 22 years old, with only 28 respondents (10%). Male respondents (with 252 maritime students or =91%) followed by females (17 respondents, 6%) and LGBTQIA+ student - respondents (7, 3%). This gender were adequately represented in the study. The year level where properly distributed across three academic levels from 1st year to 3rd year. The Bachelor of Science in Marine Engineering program had the highest number of respondents with a total sample of 171 respondents or 62%, followed by Bachelor of Science in Marine Transportation with 105 respondents (38%). Student-respondents are primarily concentrated on the first three sections: Alpha 27% (n=74), Bravo 26% (n=73), and Charlie 26% (73).

2. Maritime Students' Dependency on AI Tools

2.1 Familiarity with AI Usage. The findings revealed that students are familiar with using AI tools, particularly for completing school tasks and assisting their learning. However, they are less likely to rely on AI instead of reviewing their class materials. Overall, the results indicate that students have incorporated AI into their academic activities while maintaining balanced use.

2.2 Impact on Knowledge Acquisition. The findings showed that students mainly use AI tools to summarize difficult lessons, explain complex topics, and generate ideas for projects and assignments. They are less likely to complete academic tasks without AI assistance. Overall, the results suggest that AI supports students in understanding lessons and improving knowledge acquisition.

2.3 Effects on Classroom Settings and Study Habits. The findings indicated that students commonly use AI as part of their study strategies, especially when preparing for examinations, managing study time, and clarifying lessons they do not fully understand. Although some students reported that AI's quick answers may reduce their motivation to study, the overall findings suggest that AI complements traditional learning methods and helps improve study efficiency.

3. Maritime Students' Knowledge Acquisition

3.1 Critical Thinking and Problem-Solving Skills. The findings revealed that maritime students most commonly analyze tasks without fully depending on AI while also using AI to understand difficult academic tasks. They also use AI to improve problem-solving skills and identify errors in their work. However, they are less likely to rely on AI to enhance creative and critical thinking. Overall, the results indicate that students have a moderate level of knowledge acquisition, using AI as a support tool while still applying independent thinking.

3.2 Decision-Making Skills. The findings showed that maritime students are most knowledgeable in evaluating and applying AI-generated suggestions when making decisions. They also use AI to explore different options and improve the quality of their decisions. However, they are less comfortable making decisions solely after consulting AI. Overall, the findings indicate a moderate level of knowledge acquisition, suggesting that students use AI cautiously and still exercise personal judgment in decision-making.

3.3 Study Habits and Classroom Management. The findings indicated that maritime students commonly use AI to test their understanding of lessons, create reviewers and study plans, and help classmates understand course topics. However, they are less likely to use AI during class hours. Overall, the results reveal a moderate level of knowledge acquisition, showing that students use AI primarily to support their study habits and classroom learning while maintaining appropriate classroom practices.

4. Significant Difference in the level of Al tools Dependency when grouped according to Demographic Profile Variables

4.1 In terms of familiarity with AI tools, the results revealed that there was no significant difference when respondents were grouped according to age ($p = .345$), gender ($p = .691$), program ($p = .508$), and section ($p = .077$) since the computed significance values were greater than the 0.05 level of significance. However, a significant difference was found when respondents were grouped according to year level ($p = .009$), indicating that students' familiarity with and dependency on AI tools vary depending on their academic level.

4.2 With regard to the impact of AI tools on knowledge acquisition, the findings showed no significant difference when

respondents were grouped according to age (p = .202), gender (p = .238), program (p = .858), and section (p = .079) as the significance values were greater than 0.05. However, a significant difference was observed when respondents were grouped according to year level (p = .007), suggesting that students from different academic levels perceive the influence of AI tools on their learning differently.

4.3 In terms of the effects of AI tools on classroom settings and study habits, the results revealed no significant difference when respondents were grouped according to age (p = .113), gender (p = .428), and program (p = .876). However, significant differences were found when respondents were grouped according to year level (p = .011) and section (p = .037), indicating that students' academic stage and classroom environment influence how AI tools affect their study habits and classroom learning experiences.

5. Significant Difference in Maritime Students' Knowledge Acquisition when grouped according to Profile Variables

5.1 In terms of critical thinking and problem-solving skills (Table 11), the findings revealed that there was no significant difference when respondents were grouped according to age (p = .413), gender (p = .308), program (p = .470), and section (p = .175) since the computed significance values were greater than the 0.05 level of significance. However, a significant difference was found when respondents were grouped according to year level (p = .012), indicating that students' academic level influences their ability to utilize AI tools in developing critical thinking and problem-solving skills.

5.2 In terms of decision-making abilities (Table 12), the results showed no significant difference when respondents were grouped according to age (p = .417), gender (p = .434), program (p = .995), and section (p = .123). However, a significant difference was observed when respondents were grouped according to year level (p = .009), suggesting that students' academic progression influences how they utilize AI tools to support their decision-making abilities.

5.3 Regarding study habits and classroom management (Table 13), the findings indicated no significant difference when respondents were grouped according to gender (p = .141) and program (p = .507). However, significant differences were found when grouped according to age (p = .000), year level (p = .000), and section (p = .003). This implies that students' age, academic level, and classroom grouping influence how AI tools affect their study habits and classroom management practices.

6. The results revealed a strong positive correlation between the impact of AI tools and students' study habits, with a computed correlation coefficient o (r = .752). This positive relationship indicates that as students' dependency on AI tools increases, their knowledge acquisition and study habits also tend to improve. The strong correlation suggests that AI tools function not merely as shortcuts for students but as cognitive assistants that support learning, organization, and academic performance. Furthermore, the findings imply that students who perceive AI tools as helpful are more likely to become motivated, organized, and efficient in managing their academic tasks and study routines.

7. The findings suggest that AI tools can significantly improve maritime students' knowledge acquisition when used strategically and responsibly. Students' academic year level plays a crucial role in their ability to leverage AI effectively, as more advanced students tend to demonstrate greater familiarity and more appropriate use of AI in their learning. Furthermore, the strong positive relationship between AI tool dependency and knowledge acquisition indicates that AI can serve as an effective learning support tool, helping students understand complex concepts, strengthen critical thinking and decision-making skills, and

develop better study habits without replacing independent learning.

Conclusions

Based on the findings of the study, the following conclusions were drawn:

1. The respondents were predominantly 20-year-old male maritime students, with most enrolled in the Bachelor of Science in Marine Engineering program, indicating that the study adequately represented the target population of maritime students.
2. Maritime students demonstrate a balanced level of AI tool dependency, using AI mainly to assist with academic tasks, understand lessons, and improve study habits while still relying on traditional learning methods.
3. Maritime students exhibit a moderate level of knowledge acquisition, showing that AI serves as a learning support tool that enhances critical thinking, decision-making, and study habits without replacing independent thinking.
4. Students' year level significantly influences their level of AI tool dependency, whereas age, gender, program, and section generally do not affect how they use AI in their academic activities.
5. Students' knowledge acquisition through AI differs significantly according to year level and, in some areas, age and section, indicating that academic progression influences how students benefit from AI tools.
6. There is a strong positive relationship between AI tool dependency and knowledge acquisition, suggesting that the responsible and appropriate use of AI tools contributes to better learning, improved study habits, and enhanced academic performance among maritime students.
7. Implementing an AI-Assisted Learning Enhancement Program is necessary to help students maximize the benefits of AI, strengthen study habits, and develop critical thinking and decision-making skills, ensuring AI supports learning rather than replacing traditional methods.

Recommendations

Based on the findings of the study on maritime students' dependency on AI tools and its impact on knowledge acquisition, the following recommendations are proposed to enhance learning through an AI-Assisted Learning Enhancement Program:

1. Conduct AI Skills Workshops Organize training sessions to improve students' familiarity and effective use of AI tools for learning, critical thinking, and decision-making.
2. Integrate AI Tools into the Curriculum Incorporate AI-assisted exercises and assignments in courses to support classroom learning and knowledge acquisition.
3. Promote Strategic AI Usage Encourage students to combine AI tools with traditional study methods rather than relying solely on AI, ensuring deeper understanding of lessons.
4. Implement Personalized Feedback Systems Monitor students' AI usage and provide feedback on how to optimize AI tools for improved academic performance and study habits.
5. Focus on Year-Level-Specific Training. Since year level significantly affects AI usage and knowledge acquisition, design interventions tailored to different academic stages to maximize learning benefits.
6. Encourage AI for Critical Thinking and Problem-Solving. Design activities where AI tools support analysis, idea generation, and problem-solving, enhancing students' higher-order cognitive skills.

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