An Assessment of Nursing Students' Utilization and Intent to Adopt Artificial Intelligence in a Selected Higher Education Institution: Basis for Proposed Guidelines on Proper Utilization of Artificial Intelligence

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ABSTRACT

The integration of AI in healthcare education is accelerating, offering innovative learning tools such as virtual simulations, adaptive learning platforms, and AI-assisted writing. Despite the benefits, gaps remain in nursing students' awareness, readiness, and responsible use of AI. Ethical concerns, data privacy, and over-reliance on AI further underscore the need for structured integration in nursing curricula. This study aimed to assess the level of utilization and intent to adopt Artificial Intelligence (AI) among nursing students in a selected higher education institution. It also sought to propose guidelines for the proper use of AI in nursing education based on the findings. The study employed descriptive correlational quantitative design. Data was gathered from 482 nursing students at Mary Chiles College using a validated survey instrument. Stratified random sampling was applied. The instrument covered demographic profiles, AI usage levels, intent to adopt AI, and ethical assessments. Data were analyzed using statistical methods to determine correlations and significant differences among variables. The overall level of AI utilization was rated as "Moderate", with AI-assisted research and AI-enhanced writing being the most frequently used applications. The intent to adopt AI was also moderate, with readiness and awareness showing relatively higher means. Ethical awareness in AI use was likewise moderate, especially on human oversight and critical thinking. Pearson correlation revealed significant relationships between AI utilization and extent of academic use, intent to adopt AI, and responsible AI usage. An independent t-test showed a significant difference in AI utilization levels across student groups based on their intent to adopt AI. It was found that nursing students moderately engage with AI, showing potential for broader adoption, especially in academic applications. The study supports the development of institutional guidelines to enhance AI literacy, address ethical concerns, and promote responsible use in nursing education.

Keywords: Artificial Intelligence, Nursing Students, AI Utilization, Intent to Adopt, AI Literacy, Ethical Use of AI.

INTRODUCTION

Artificial intelligence (AI) is a simulation of human intelligence. This technology allows computers and machines to simulate human learning, comprehension, problem-solving, decision-making, creativity, and autonomy.

Nursing students play a critical role in shaping the future healthcare workforce, and their ability to adapt to technological advancements will directly influence the quality of patient care and safety. Understanding students' behaviors and attitudes towards AI can help educators and curriculum developers determine how to effectively incorporate this kind of technological advancement into the nursing curriculum.

Recent studies highlight the growing importance of artificial intelligence (AI) in nursing education and practice. Nursing students generally have positive attitudes towards AI and high intentions to adopt it, with perceptions of AI utilization influencing these attitudes (Labrague et al., 2023).

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Also, the study of De Gagne (2023), highlights the growing use of AI tools among nursing students and their tendency to rely heavily on AI for assignments without thoroughly assessing the information's reliability. It emphasizes the need for AI literacy to prevent over-reliance and promote critical thinking. Similarly, the study by White et al. (2024), investigated how nursing students incorporate AI into their academic routines, and the study found that students primarily use AI tools for convenience, such as automated literature searches and drafting assignments, but pro. Still, proper guidelines are needed to leverage these tools for deeper learning outcomes. It recommends integrating Artificial intelligence literacy modules to improve utilization.

A scoping review predicts that AI will transform nursing across all domains, emphasizing the urgent need for curricular reform in nursing education programs to prepare students for the AI era. This includes adopting new pedagogies incorporating AI and equipping students with skills to assess and integrate AIHTs in practice (Buchanan et al., 2021). While AI holds vast potential for nursing education, significant gaps remain in its current utilization.

This research aims to bridge the gap between the current nursing education practices and advances in AI. AI literacy should not be viewed solely as an academic enhancement but as a strategic health systems strengthening mechanism. Preparing nursing students to responsibly utilize AI contributes to workforce readiness, supports clinical decision-making accuracy, and promotes patient safety within increasingly digital healthcare environments.

Background Of The Study

This study is fundamentally inspired by the University of the Philippines' implementation of its Principles for Responsible and Trustworthy Artificial Intelligence. The institution's proactive approach emphasizes the responsible use of AI, which serves to mitigate potential negative consequences associated with the misuse or over-reliance on such technology (Anna, 2024).

Nursing programs are progressively incorporating AI tools such as virtual simulations, adaptive learning platforms, and clinical decision support systems to enhance student learning (Katsamakas et al., 2024). AI-driven educational tools have been found to improve critical thinking, diagnostic accuracy, and overall student engagement. However, despite these advancements, research indicates that many nursing students lack sufficient exposure and training in AI applications, limiting their ability to integrate these technologies effectively into practice.

This study aligns global and national priorities, such as the Sustainable Development Goals (SDGs) 2030. The integration of AI in nursing education supports SDG No. 4 (Quality Education) by promoting equitable and high-quality learning opportunities through AI-enabled education (United Nations, 2015). Furthermore, it contributes to SDG No. 8 (Decent Work and Economic Growth) by enhancing the employability and readiness of nursing graduates for AI-driven healthcare systems. Additionally, it supports SDG No. 9 (Industry, Innovation, and Infrastructure) by fostering innovation in nursing education.

Additionally, as Dorin and Atkinson (2024) point out, it's essential to address ethical issues like data privacy and algorithmic bias as AI becomes more common in education. This study will explore how nursing students use AI tools while also considering the ethical implications, helping to create more informed policies and guidelines in this fast-changing field.

In the identification of barriers to AI adoption and understanding students' readiness to embrace these tools, this research seeks to inform educators and institutions on how to best support nursing students in developing AI competencies.

Statement of the problem

This study aims to assess the utilization and intent to adopt Artificial Intelligence (AI) among nursing students in a selected higher education institution.

Specifically, this study seeks to answer the following questions:

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1. What is the profile of the nursing student respondents in the selected higher education in terms of:
   1.1. Age;
   1.2. Sex; &
   1.3. Year Level
2. What is the level of utilization of artificial intelligence tools among nursing student respondents?
3. To what extent do the nursing student respondents utilize AI tools in academics in terms of:
   3.1. AI-Assisted Research;
   3.2. Personalized Learning;
   3.3. Simulation and Virtual Learning;
   3.4. AI in Communication; &
   3.5. AI-Enhanced Writing?
4. What is the respondents' level of intent to adopt artificial intelligence in nursing education in terms of:
   4.1. Awareness of the different AI tools that can be utilized for learning;
   4.2. Readiness to engage with AI technologies; &
   4.3. Barriers to adopting AI tools?
5. What is the respondents' assessment on responsible AI tool utilization in terms of:
   5.1. Ethical Considerations;
   5.2. Accuracy and Reliability;
   5.3. Data Privacy and Security; &
   5.4. Human Oversight and Critical Thinking
6. Is there a significant relationship between the following:
   6.1. The level of utilization AI tools and extent of utilization in academics;
   6.2. The level of utilization and the intent to adopt artificial intelligence; &
   6.3. The level of utilization and the assessment on responsible AI tool utilization?
7. Is there a significant difference in the level of utilization of artificial intelligence tools among nursing students and the intent to adopt artificial intelligence when grouped according to profile?
8. Based on the findings, what guidelines may be developed for proper AI utilization?

Statement Of Hypotheses

Ho1: There is no significant relationship between the level and extent of utilization of artificial intelligence tools.

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Ha1: There is a significant relationship between the level and extent of utilization of artificial intelligence tools.

Ho2: There is no significant relationship between the level of utilization and the level of intent to adopt artificial intelligence.

Ha2: There is a significant relationship between the level of utilization and the level of intent to adopt artificial intelligence.

Ho3: There is no significant relationship between the level of utilization and the assessment of responsible AI tool utilization.

Ha3: There is a significant relationship between the level of utilization and the assessment of responsible AI tool utilization.

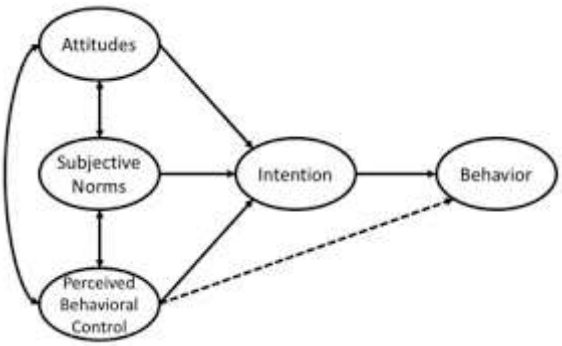
Ho4: There is no significant difference in the level of utilization of artificial intelligence tools and the level of intent to adopt artificial intelligence when grouped according to profile.

Ha4: There is a significant difference in the level of utilization of artificial intelligence tools and the intent to adopt artificial intelligence when grouped according to profile.

Theoretical Framework

This study is grounded on the Theory of Planned Behavior, Multiple Intelligences Theory, Diffusion of Innovation Theory, Technology Acceptance Model, and Unified Theory of Acceptance and Use of Technology.

Theory of Planned Behavior



Source: Sansom, R. (2021).

Figure 1. Theory of Planned Behavior

Developed by Icek Ajzen in 1991, the Theory of Planned Behavior (TPB) is a psychological framework that seeks to explain the processes involved in the decision-making and behavioral intentions of individuals.

According to the Theory of Planned Behavior (TPB), three key factors influence an individual's intention to perform a behavior: attitudes toward the behavior, subjective norms, and perceived behavioral control. Attitudes refer to the individual's positive or negative evaluation of the behavior; if nursing students believe that using AI will enhance their learning and improve patient care, they are more likely to adopt it.

Subjective norms involve the perceived social pressure to engage or not engage in behavior, meaning that if nursing students perceive approval from mentors, peers, and institutions, their intention to adopt AI increases. Perceived behavioral control refers to the perceived ease or difficulty of performing the behavior, influenced by past experiences, resources, and self-efficacy; if nursing students feel confident and well-supported, their intention to use AI is strengthened.

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Multiple Intelligences Theory

Source: The University of Tennessee Health Science Center. (2021).

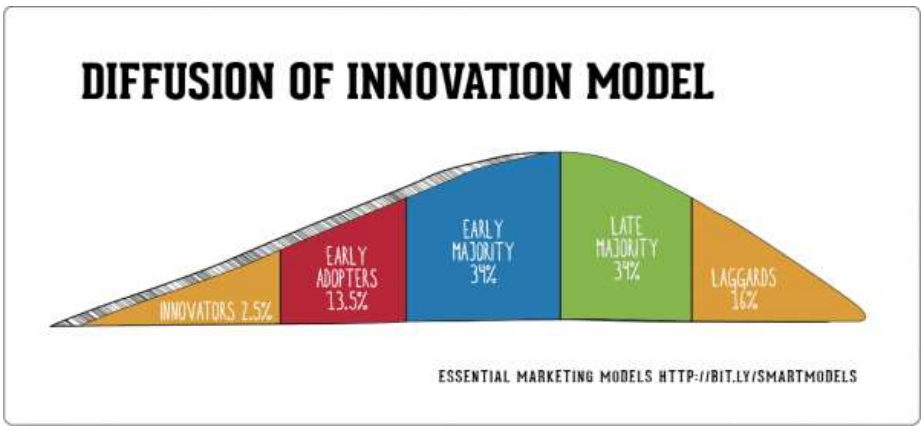
Figure 2. Multiple Intelligences Theory

Developed by Howard Gardner in 1983, the Multiple intelligences Theory asserts that intelligence is not a single, uniform attribute that can be measured simply by IQ tests. Instead, Gardner identified multiple distinct types of intelligence that individuals possess in varying degrees.

Gardner's Multiple Intelligences Theory identifies various types of intelligence beyond traditional cognitive abilities. Linguistic intelligence involves the effective use of language for communication and comprehension. Logical-mathematical intelligence encompasses reasoning and numerical abilities. Spatial intelligence relates to thinking in three dimensions and visualizing mental images. Bodily-kinesthetic intelligence involves skillful control of body movements and handling objects. Musical intelligence includes perception, creation, and appreciation of rhythm and melody. Interpersonal intelligence is about understanding and interacting with others effectively. Intrapersonal intelligence refers to self-awareness and self-reflection. Lastly, naturalistic intelligence involves recognizing and categorizing elements of the natural world. Each type of intelligence highlights unique strengths that can be nurtured and leveraged in educational and professional contexts.

Gardner's theory suggests that students learn in different ways based on their unique combination of these intelligences. Traditional educational approaches may not cater to all these intelligences, but recognizing and leveraging them can enhance learning outcomes (Cherry, 2023).

Diffusion of Innovation Theory



Source: Hanlon, A. (2020)

Figure 3. Diffusion of Innovation Theory

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The Diffusion of Innovation Theory, developed by Everett Rogers in 1962, provides a comprehensive framework for understanding how new ideas, products, or technologies spread within a social system. According to this theory, the adoption of innovation is influenced by several key factors. The characteristics of the innovation itself, such as its relative advantage, compatibility, complexity, trialability, and observability, play a crucial role in its acceptance.

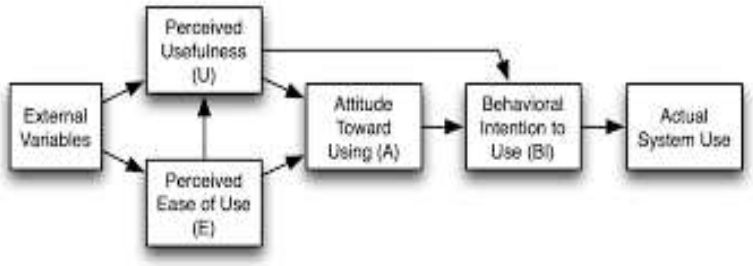
Effective communication channels, including mass media, interpersonal networks, and social media, significantly impact how the innovation is spread and received by potential adopters. Adopter perceptions, shaped by attitudes, beliefs, and experiences, also influence the willingness to adopt, hinging on factors like perceived usefulness, ease of use, and trust in technology. The social and cultural context, comprising social norms, values, and peer influences, affects the rate and extent of adoption, often guided by opinion leaders, social networks, and institutional support.

Lastly, the adoption process occurs over time, following an S-shaped curve with distinct groups: innovators, early adopters, early majority, late majority, and laggards, each exhibiting unique characteristics and behaviors towards the innovation.

Through the application of Diffusion of Innovation Theory, educators can identify key factors influencing nursing students' adoption of AI, such as their perceptions of its benefits and challenges, and the communication channels used to introduce AI concepts.

Effective communication strategies tailored to address students' perceptions can promote positive attitudes towards AI adoption. Understanding the social and cultural context helps design interventions aligned with nursing students' values, leveraging peer networks to champion AI use. Practical experiences with AI tools can enhance students' willingness to adopt technology. Insights from the theory guide curriculum development to incorporate AI in accessible ways and predict adoption trends, supporting early adopters and encouraging broader acceptance of AI technologies (Halton, 2023).

Technology Acceptance Model



Source: Wikipedia. (2018)

Figure 4. Technology Acceptance Model

The technology Acceptance Model was developed by Fred Davis in 1986 and is based on the idea that people's attitudes towards technology are shaped by two key factors: perceived usefulness and perceived ease of use. Perceived usefulness is the extent to which people believe that using technology will improve their performance or help them achieve our goals, whereas perceived ease of use is the degree to which people believe that using technology will be simple and easy.

According to TAM, these two criteria are the key predictors of our intention to utilize technology, which then predicts people's actual usage behavior. In other words, if they believe technology is valuable and simple to use, they are more inclined to adopt and implement it. This theory is well suited for this study as it specifically explains individual attitudes and intentions towards technology adoption (James, 2023).

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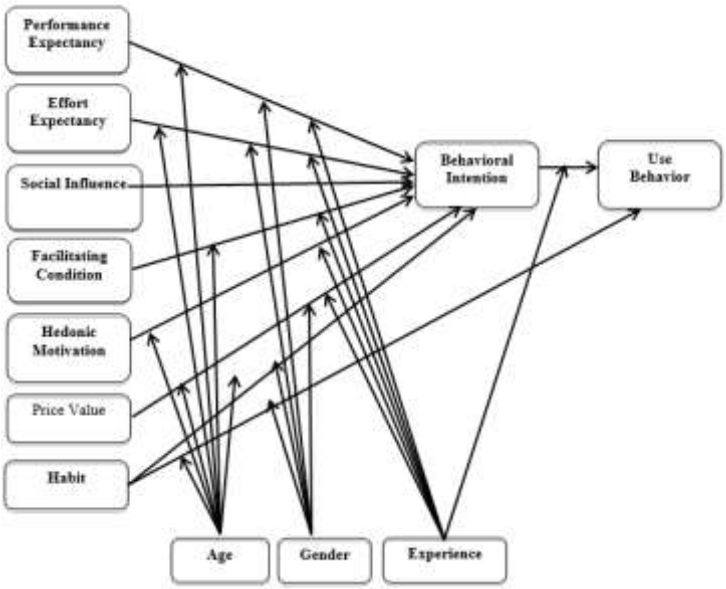
Unified Theory of Acceptance and Use of Technology



Source: Marikyan & Papagiannidis. (2021)

Figure 5. Unified Theory of Acceptance and Use of Technology

According to the Unified Theory of Acceptance and Use of Technology (UTAUT), users' behavioral objectives influence how they use technology. Four key elements influence people's intentions to use technology: performance expectancy, effort expectancy, social influence, and facilitating conditions. Performance expectation is the idea that using a system would improve job performance, based on concepts from multiple models such as the Technology Acceptance Model (TAM) and others.

The perceived effort needed for technology adoption can be greatly decreased by streamlining technology interfaces and offering easily navigable training materials. People might promote broader adoption and utilization by making sure that tools and applications are simple and intuitive. Giving detailed video instructions on how to use agricultural software, for example, can assist remove initial obstacles and increase confidence.

Social influence can be developed by promoting knowledge-sharing websites and establishing user communities of practice. These platforms can promote conversations, exchange success stories, and share best practices around the implementation of technology. Positive reinforcement and peer support are important factors in influencing people's choices.

Enhancing Facilitating conditions entails making certain that the required tools and support networks are available. To obtain the necessary financing, infrastructure, and technical support, this may entail forming alliances with funding organizations, government departments, and technology suppliers. Furthermore, providing opportunities for continuous training and professional growth can enable users to successfully adjust to and embrace changing technology.

Ultimately, the UTAUT model provides a complete framework for analyzing the factors that influence technology adoption and utilization. For people as change agents, the UTAUT model provides useful insights into improving the efficacy and efficiency of our efforts. By considering the four primary factors of performance expectancy, effort expectancy, social influence, and facilitating conditions, people may build an environment receptive to technology adoption. People can harness the power of technology to create good change and accomplish sustainable farming practices by taking user-centric methods, constantly analyzing and upgrading technology solutions, encouraging cooperation, and tackling the digital divide (James, 2023).

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In summary, the variables examined in this study align with established technology adoption theories. Awareness and perceived usefulness reflect core constructs of the Technology Acceptance Model, readiness corresponds with perceived ease of use and behavioral control, while perceived barriers parallel facilitating conditions identified in the Unified Theory of Acceptance and Use of Technology. This alignment strengthens the theoretical grounding of the statistical relationships examined in the study.

Conceptual Framework

Paradigm of the Study

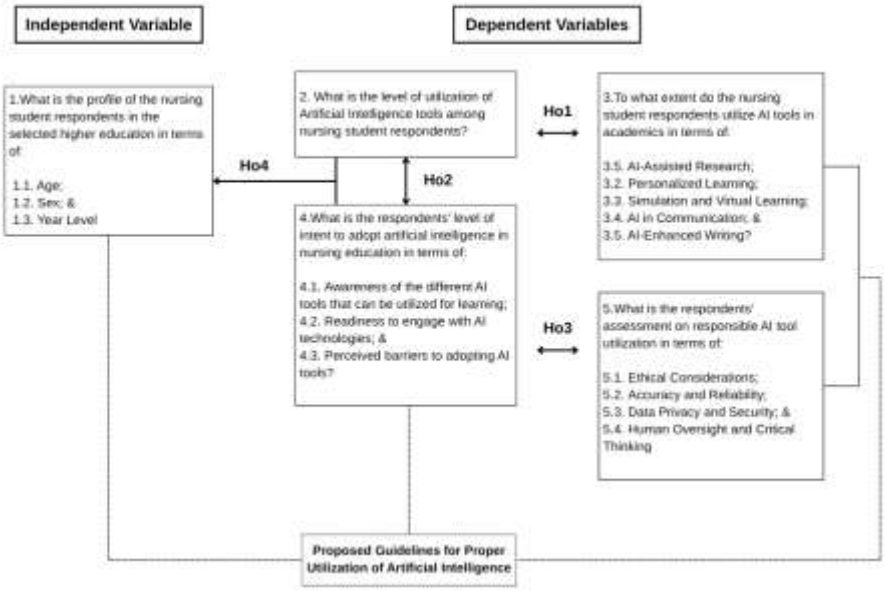

Figure 6. An Assessment of Nursing Students' Utilization and Intent to Adopt Artificial Intelligence in a Selected Higher Education Institution: Basis for Proposed Guidelines on Proper Utilization of Artificial Intelligence

The paradigm of the study shows the interrelatedness of the variables to examine the concept of the study. The first of the variables are the independent variables which include the profile of the nursing student respondents in the selected higher education in terms of: Age; Sex; and Year Level.

The dependent variables comprise four sets of variables. The first set contains the level of the utilization of artificial intelligence tools among nursing student respondents.

The second set contains the extent of utilization of artificial intelligence tools in academics. This includes AI-Assisted Research; Personalized Learning; Simulation and Virtual Learning; AI in Communication; and AI-Enhanced Writing.

The third set refers to the respondents' level of intent to adopt Artificial Intelligence in their nursing education, which includes Awareness of the different AI tools that can be utilized for learning; Readiness to engage with AI technologies; and barriers to adopting AI tools.

The fourth set refers to the nursing students' assessment of responsible use of Artificial Intelligence tools. This includes Ethical Considerations; Accuracy and Reliability; Data Privacy and Security; and Human oversight and Critical thinking.

The first two-tailed arrow shows the relationship between the level and extent of utilization of artificial intelligence tools among nursing students.

The second two-tailed arrow shows the relationship between the level of utilization and the level of intent to adopt artificial intelligence.

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The third two-tailed arrow shows the relationship between the level of utilization of AI tools and the assessment on responsible utilization of AI tools.

The one-tailed arrow shows the significant difference in the level of utilization of artificial intelligence tools among nursing students and the intent to adopt artificial intelligence in their nursing education when grouped according to profile.

The broken line shows the basis for proposed guidelines on the proper utilization of Artificial Intelligence, which will be based on the findings.

Assumptions

This study focuses on the assessment of nursing students` utilization and intent to adopt artificial intelligence in a selected higher education. The following assumptions were made:

1. The researchers assumed that Nursing students have widely used AI tools in their academic activities, including research, personalized learning, simulation, and communication.

2. The researchers assumed that the integration of AI in nursing education is already occurring but varies to an extent due to differences in accessibility, digital literacy, and institutional policies.

3. The researchers assumed that the students' intent to adopt AI in their education is influenced by their perceived usefulness of AI, ethical concerns, and institutional support. These variables may be interpreted as multilevel determinants of technology adoption, encompassing individual readiness, educational exposure, and institutional support structures.

4. The researchers assumed that the AI utilization in nursing education presents both opportunities and challenges, requiring structured guidelines to maximize its benefits while addressing issues such as accuracy, data privacy, and ethical considerations.

5. The researchers assumed that the development of proper AI utilization guidelines will help nursing students navigate AI tools effectively, ensuring responsible and ethical use in their academic and professional training.

Scope and Limitations

This study aims to assess the utilization and intent of nursing students to adopt artificial intelligence (AI) in their nursing education for future innovation. The respondents included are local and foreign nursing students from Levels 1 to 4 enrolled at Mary Chiles College. The primary variables to be explored include: (1) the level of utilization of AI tools among nursing students, which includes ChatGPT, Microsoft Copilot, Google Gemini, Deep AI, HyperWrite, Grammarly, Quillbot, and Meta AI; (2) the extent to which AI tools are utilized in academics; (3) the level of intent to adopt artificial intelligence, evaluated through their awareness of different AI tools available for learning, their readiness to engage with AI technologies, and their barriers to adopting these tools; and (4) the nursing students' assessment on responsible use of Artificial Intelligence tools. The study was conducted during the second semester of the School Year 2024-2025, thus providing relevant insights into the current and immediate future landscape of AI integration in nursing education at the selected higher education institution.

The limitations of this study involve the exclusion of students from other departments, such as Senior High, Technical Vocational Education and Training (TVET) Department, Midwifery, and Respiratory Therapy. Additionally, the study excludes students who are 17 years old and below, as this involves getting parental consent, which can further constrain the limited timeframe allotted for data gathering. Second-courser students, who first took courses related to technology development, such as Computer Science, Information Technology, Computer Engineering, Information Science, Data Science, and Software programming, are also excluded. The focus on nursing students may limit the generalizability of the findings to other departments that may also benefit from AI integration. Furthermore, factors such as the availability of AI tools, differing levels of

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technological access, and varying background knowledge among students may affect data gathering, which are beyond the researchers' control. Of the 219 target respondents, only 202 provided their responses due to time constraints. While the study identified statistically significant associations between variables, the use of nonparametric correlation techniques limits the ability to establish predictive relationships.

The potential for response bias, as participants may provide socially desirable answers about their awareness and utilization of AI tools, could further influence the quality of the data collected. Furthermore, there is limited research about utilization and intent to adopt Artificial Intelligence in Nursing Education. Lastly, the study will be constrained by its timeframe, which may not capture longer-term trends or developments in AI adaptation within nursing education.

Significance Of The Study

The result of this study can foster insights and relevance to the following:

Allied Health Institutions- this study will assist educational institutions in incorporating Artificial Intelligence literacy into their curricula.

Future Researchers - this study can help future researchers explore barriers to AI adoption, refine proposed guidelines for its use, and conduct longitudinal or comparative studies to understand changing perceptions over time.

Health Educators/Faculty- this study will assist educators in adapting their teaching approaches and assignments based on nursing students' preferences and need for AI tools. Teachers can improve students' engagement, foster critical thinking abilities and personalize learning experiences by adding AI technologies to their teaching practice.

Nursing Students - this study will help students to be more prepared for the demands of the digital age if they are given the ability to properly explore and use Artificial intelligence tools.

Policymakers - this study can help policymakers create regulations and policies that support the ethical and responsible usage of AI in education. Policymakers can equip students to succeed in this technologically advanced society by guaranteeing fair access to AI technologies and encouraging digital literacy.

Research Community - this study will contribute to the growing body of literature on AI adoption and utilization in education, particularly in the context of nursing students. It will also help to explore factors influencing nursing students' acceptance and usage of AI. By using this study's insight stakeholders can work to harness AI potentials to improve learning outcomes and foster digital literacy of nursing students.

Technology Developers - this study will assist developers of AI tools for academic writing in tailoring their products to better fit the demands and preferences of the students.

Definition Of Terms

The following terms are defined operationally for a better understanding of the content of the study:

Artificial Intelligence (AI) refers to the simulation of human intelligence processes by machines, especially computer systems. These processes include learning, reasoning, problem-solving, perception, and language understanding, which can be used in various applications such as research, communication, and educational tools.

Extent of Utilization in academics refers to the main aspects of nursing education where AI tools are utilized by students, such as:

AI-Enhanced Research refers to the process of using AI tools to assist in conducting research and drafting written reports.

AI-Enhanced Writing refers to support services that help students and researchers improve their writing skills and produce high-quality academic work.

AI in Communication refers to the use of AI tools to communicate with peers, instructors, and collaborate on group projects or assignments.

Personalized Learning refers to the educational approach that tailors the learning experience to the individual needs, strengths, skills, and interests of each student.

Simulation and Virtual Learning refer to learning that involves creating realistic scenarios and challenges in a controlled environment to help students apply their knowledge and skills. Virtualized learning, also known as online learning or virtual learning, involves using digital technologies to deliver educational content and facilitate learning interactions.

Intent to Adopt AI refers to the willingness and readiness of nursing students to integrate AI tools into their educational practices. This includes their awareness of available AI tools, readiness to engage with them, and the barriers to using AI effectively.

Awareness of the different AI Tools that can be utilized for learning refers to the degree to which nursing students are knowledgeable about the different AI tools available and how they can be utilized for learning, research, and other educational activities.

Barriers to Adopting AI Tools the challenges or obstacles nursing students perceive in using AI tools, including factors like lack of access, technical skills, awareness, and concerns about the effectiveness of AI in nursing education.

Readiness to Engage with AI Technologies refers to the preparedness and willingness of nursing students to incorporate AI tools into their studies and adapt to the evolving technology in nursing education.

Nursing Students pertain to the respondents or population of the study who will participate in answering the survey questionnaires to assess the utilization and intent to adopt AI. They are students who are under the Bachelor of Science in Nursing program from Level I to IV and are enrolled in the second semester of the academic year 2024- 2025 in the selected higher education institution.

Profile of Nursing Students refers to the demographic characteristics of the nursing students in the study, including their age, sex, year level, and if nursing is their first course or second course.

Utilization of AI Tools the use of artificial intelligence technologies and applications by nursing students in their educational activities, such as study, research, communication, and exam preparation.

REVIEW OF RELATED LITERATURE AND STUDIES

This chapter presents the related literature and studies from both local and international sources, which significantly support the objective and significance of the study. This part contains the gathered data from the relevant sources consisting of online sources, published articles, books and journals.

An article made by Stryker & Kavlakoglu (2024) described Artificial Intelligence (AI) as the ability of machines and computer systems to imitate human intelligence processes such as reasoning, learning, decision-making, and problem-solving. Rather than relying solely on pre-programmed instructions, AI systems are designed to adapt and improve based on the data they process. This makes them capable of performing tasks that usually require human cognitive effort.

Stryker & Kavlakoglu. (2024) emphasized that AI is not a single technology, but rather a field made up of multiple branches, including machine learning, deep learning, and natural language processing. These components work together to allow AI systems to analyze information, recognize patterns, and generate appropriate responses or actions. One major advancement in this field is generative AI, which allows systems

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to create original content like text, images, and even sound, demonstrating a more creative and intuitive application of machine intelligence.

The evolution of AI has also led to a focus on ethical and responsible development. IBM highlights the importance of building AI systems that are trustworthy, fair, and aligned with human values, especially as they become more embedded in daily life, education, and healthcare. In this context, the integration of AI into fields like nursing education aligns with the broader vision of enhancing human capabilities rather than replacing them.

Related Literature

Artificial Intelligence can be utilized, for example, in nursing education to create virtual patient simulators that allow students to practice identifying and treating medical illnesses. This improves critical thinking and decision-making abilities by providing practical experience with intricate clinical problems (Pascual, 2023). Additionally, by adjusting to each student's progress, AI-based solutions provide individualized learning experiences that guarantee that instructional materials are suited to their requirements, which has been demonstrated to increase engagement and information retention (University of the Philippines Open University, 2024).

In addition to nursing education, an article discussed how artificial intelligence (AI) can improve healthcare by enhancing diagnostics, therapeutics, and decision-making processes (University of the Philippines - Manila, 2024). It highlighted its potential to address challenges like medical staff shortages and accessibility in remote areas. Experts emphasized integrating AI into medical education and stress the importance of understanding its limitations, such as reliance on high-quality data. The piece encouraged embracing AI as a tool to augment, not replace, human healthcare providers.

Moreover, another article highlighted that the University of the Philippines Open University has published its official Guidelines for the Use of Artificial Intelligence (AI) in Teaching and Learning. These guidelines have been developed to recognize the impact that the integration of AI and education will have on transforming teaching and learning in the digital era. They emphasize UPOU's acknowledgment of AI's role in areas such as content creation, adaptive learning, language assistance, assessment, and feedback. UPOU is convinced that AI will significantly contribute to fostering lifelong learning skills in students (University of the Philippines Open University, 2024).

Furthermore, the Higher Education Leaders Forum (HELF) 2024, organized by MSU-Iligan Institute of Technology (MSU-IIT) in collaboration with ATUNet and CHED, focused on the integration of Artificial Intelligence (AI) in higher education. The forum aimed to explore the transformative potential of AI while emphasizing the ethical considerations necessary for its implementation. Key discussions centered on transforming curricula to include digital tools, addressing the digital divide to ensure equitable access, and overcoming cultural and institutional barriers to enhance staff and student mobility across Asia. The forum concluded with the consensus that AI's integration must be approached cautiously, with a strong ethical framework to guide its application in education (MSU-IIT, 2024).

In a related context, an article discussed Mapúa University's leadership in integrating AI into education in the Philippines. The university emphasized AI's transformative role in enhancing learning and developing future-ready professionals. Through AI-driven curricula and research, Mapúa aims to equip students with skills crucial for modern industries, fostering a deeper understanding of AI's potential across various sectors. This focus on AI aligns with the university's commitment to innovation and its mission to shape students who can contribute meaningfully to technological advancements. (Mapúa University, 2024).

Finally, according to an article by IDP Philippines (2025), AI significantly influences education by providing personalized learning experiences through adaptive algorithms that cater to individual students' needs, including those of Filipino learners, regardless of their study environment or level. This tailored approach can enhance understanding and engagement, as AI offers assessments and feedback that help students improve in specific subjects. However, the reliance on AI also presents challenges, particularly the potential lack of human

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connection and emotional support that only traditional educators can provide. Filipinos, who highly value community and interpersonal relationships, may find this aspect of education lacking in AI-driven environments. Additionally, there are serious concerns regarding data privacy and security, as the collection and analysis of student information could lead to unauthorized access or breaches, compromising students' personal information.

AI technologies, such as chatbots and virtual tutors, offer personalized learning experiences by adapting content to meet individual student needs. This customization enhances student engagement and improves learning outcomes by focusing on areas that require further development (Western Governors University, 2023). This highlights important aspects of how AI technologies, particularly chatbots and virtual tutors, contribute to personalized learning experiences. One key insight is the adaptability of content that these technologies provide, which is crucial in addressing the diverse needs of students. By focusing on individual learning gaps, AI can tailor educational experiences, making them more relevant and effective. Additionally, it emphasizes the correlation between personalization and student engagement. When students feel that their unique learning needs are acknowledged and addressed, they are more likely to take an active role in their education. This engagement is not just about participation; it translates into improved learning outcomes, as students are more likely to master content that they are actively working on in line with their needs.

In contrast, the use of AI in healthcare education raises ethical concerns, particularly regarding data bias and fairness. Ensuring that AI systems do not perpetuate healthcare disparities is essential to maintaining equity in education and practice (HITRUST, 2023). The integration of artificial intelligence (AI) into healthcare education brings forth important ethical considerations that must be addressed to ensure equitable outcomes for all students and future practitioners. One significant concern is data bias; AI systems are only as good as the data they are trained on. If the training data reflects existing biases—whether related to race, gender, socio-economic status, or other factors—then AI tools could perpetuate these inequities in both educational settings and patient care.

Moreover, AI can potentially embed existing human biases into electronic systems and can exacerbate a push towards market-driven goals of efficiency, such as increasing nurses' tasks or the volume of patients (Columbia School of Nursing, 2023). The integration of AI in healthcare raises significant concerns regarding the embedding of human biases and the prioritization of market-driven efficiency. AI systems often rely on historical data that can reflect and perpetuate societal biases, leading to unequal treatment outcomes for different demographic groups. This highlights the importance of diverse data representation in AI training to mitigate these biases. Additionally, the push for efficiency can result in increased workloads for healthcare professionals, such as nurses, without adequate support or compensation, potentially compromising the quality of patient care.

On another note, the growing use of AI tools is addressing the shortcomings of conventional nursing teaching techniques. For example, trainees can practice diagnostic and therapeutic abilities in a secure setting with the aid of AI-powered virtual patients. Studies have shown that students who utilize AI technologies report higher levels of interest and a better understanding of challenging subjects (Educational Trends and Innovations, 2023). However, the degree of AI integration in nursing curricula is greatly influenced by elements like institutional support and technology accessibility.

Related Studies

A recent study conducted by Fabro et al. (2024), reveals that Filipino students are generally neutral in their attitudes and beliefs about using artificial intelligence (AI) in academic writing. However, a notable finding is the strong positive correlation between students' attitudes towards AI and their actual usage of these tools. This indicates that fostering a positive attitude is essential to boosting student engagement with AI technologies. In contrast, the beliefs students hold about AI have only a negligible impact on the practical use of these tools, highlighting that their feelings about AI are far more influential than their perceptions of its effectiveness. Furthermore, socio-demographic factors—such as age, educational level, and type of schools significantly correlate with attitudes towards AI. This emphasizes the critical need for customized interventions and supportive systems tailored to students' diverse backgrounds. By developing targeted strategies, educators can

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effectively integrate AI technologies into academic writing contexts, thereby enhancing students' skills and confidence in utilizing these powerful tools.

Furthermore, in the systematic review conducted by Labrague et al. (2023), the findings reveal a significant gap between healthcare students' optimism regarding artificial intelligence (AI) and their actual knowledge of technology. The data showing that 65% of healthcare students, including those in nursing programs, expressed hopefulness about AI suggests they recognize its potential to transform the healthcare sector. This enthusiasm is encouraging as it indicates a willingness among future professionals to embrace innovative technologies that could improve patient care and system efficiency. Additionally, the study provided insights on student nurses' readiness to adopt artificial intelligence (AI) and highlighted factors influencing their attitudes towards AI, including technological proficiency, understanding of AI, and its perceived role in nursing practice. The study found moderate readiness and perceived barriers such as lack of computer skills, AI knowledge, and time constraints. To improve AI integration, it suggested enhancing students' technological abilities, increasing AI awareness, and offering practical experiences. This research emphasizes the importance of preparing nursing students.

The study by Asirit & Hua (2023) examined various themes related to the ethical implications and social consequences of artificial intelligence (AI) technologies. One significant theme is the ethical concerns surrounding data privacy and AI bias. Participants expressed apprehensions regarding the risks associated with data privacy, stressing the need for responsible data usage and the potential biases embedded in AI algorithms. They emphasized the importance of transparency, accountability, and ethical practices in AI development to ensure fairness and mitigate harmful outcomes arising from biased decision-making processes. Another theme addressed the over-reliance on technology, which participants identify as a growing concern. This theme highlights the drawbacks of excessive dependence on AI and technology, including reduced human interaction and the erosion of social skills. Participants worry that such dependency could negatively affect mental health. The core message emphasizes the necessity to recognize the risks associated with digital reliance and to foster meaningful human relationships, counteracting the social implications tied to technology-mediated communication. Furthermore, the preservation of human decision-making in critical scenarios emerges as another vital theme. Participants underscore the significance of human accountability and ethical considerations, arguing that AI may lack the contextual adaptability required for informed decision-making in critical situations. They advocate for a human-centered approach in AI applications, stressing the value of emotional intelligence, safety, and security when human judgment is essential.

A 2024 Global AI Student Survey conducted by the Digital Education Council reveals that a significant number of students are incorporating artificial intelligence into their academic work, with 86% of respondents from 16 countries reporting AI usage in their studies. The survey gathered data from over 3,800 students across bachelor's, master's, and doctoral levels, indicating a rapid adoption of AI tools among diverse learners. The report highlights that 24% of students use AI daily and 54% weekly, suggesting that nearly 80% engage with AI tools at least once a week. On average, students utilize 2.1 different AI tools, reflecting their exploration of multiple platforms to meet varying academic needs. ChatGPT is the most used tool, with around two-thirds of students dependent on it, followed by Grammarly and Microsoft Copilot, each used by approximately 25% of students. AI is leveraged for tasks such as information searches, text summarization, grammar checking, and assignment drafting. The study emphasizes the need for educational institutions to view AI as essential rather than auxiliary. It urges them to integrate AI into curricula and instructional design, ensuring that students learn to use this technology responsibly. The survey also calls for enhanced AI literacy for both students and faculty, highlighting its importance in preparing students for future workplaces where AI is standard. In summary, education systems must evolve alongside technological advancements to remain relevant (Kelly, R., 2024).

A study by Kamalov et al. (2023) conducted a comprehensive analysis of the evolving role of artificial intelligence in education, emphasizing its potential to revolutionize teaching and learning practices. Their study reviewed existing literature and identified several major areas where AI technologies are making a significant impact, including personalized learning, automated assessments, intelligent tutoring systems, and enhanced teacher-student collaboration. The author pointed out that AI tools, such as those driven by deep learning and natural language processing, are increasingly used to deliver tailored feedback, support adaptive learning paths, and manage repetitive administrative tasks. However, they also stressed the importance of

addressing challenges related to equity, accessibility, data privacy, and ethical use, arguing that for AI to support sustainable educational development, these concerns must be proactively managed. This literature thus reinforces the idea that while AI presents valuable opportunities for enhancing learning, its successful and ethical implementation depends on informed users and structured institutional support.

In a separate study by Ahmad et al. (2022), explored the integration of artificial intelligence within educational institutions and emphasized its role in enhancing both academic and administrative functions. Their study identified multiple applications of AI, such as automated admissions processing, intelligent library systems, grading software, learning analytics, and virtual learning environments. These tools were designed to improve operational efficiency while also supporting individualized learning experiences for students. By reducing routine administrative workloads, AI enables educators to focus more on student engagement and instruction. This is closely related to the findings of the current research, which showed that nursing students frequently used AI for tasks like academic writing and content improvement, especially through tools like Grammarly and ChatGPT. These tools align with the study's description of AI systems that support productivity and learning outcomes. Moreover, the institutional benefits outlined by Ahmad et al. (2022), support the recommendation in the present study for increased institutional investment in AI infrastructure. Providing accessible, structured, and varied AI tools could help nursing students go beyond writing assistance and engage more deeply with AI in clinical, collaborative, and personalized learning contexts.

The study of Ouyang and Jiao (2021), presented a comprehensive analysis of the evolution of Artificial Intelligence in Education (AIEd), describing its development across three distinct paradigms. The first paradigm, AI-directed, positions learners as recipients of AI-driven instruction, where systems deliver content directly. The second, AI-supported, encourages collaborative interaction between learners and AI tools, facilitating feedback and co-creation. The third, AI-empowered, empowers learners to take charge of their learning journey, leveraging AI as a personalized partner to guide self-directed exploration. The authors argued that the field is progressing toward the third paradigm, characterized by greater learner autonomy, system adaptability, and data-driven personalization.

This framework directly resonates with the findings of the present study. Nursing students demonstrated the highest engagement with tools that align with the AI-directed paradigm, such as ChatGPT and Grammarly, which provide immediate writing assistance. Use of AI-supported tools, such as simulation platforms offering interactive feedback, was moderate and underutilized, suggesting limited institutional emphasis or training. Meanwhile, evidence for AI-empowered usage, for self-directed learning or content customization, remains minimal, indicating the nascent stage of advanced AI adoption. Ouyang and Jiao's study underscore the importance of moving beyond passive use toward interactive and learner-centered AI applications, aligning with our recommendation that nursing education should invest in training and infrastructure to support higher-order AI integration (Ouyang & Jiao, 2021).

Nguyen et al. (2022) delved into ethical principles for AI in education and offered a clear look at how AI should be governed and managed in learning settings. It emphasized setting up structures and rules to guide how AI is used, ensuring that it meets its goals, respects data privacy, and serves everyone fairly. It refers to UNESCO and OECD frameworks that call for AI to promote inclusivity, human-centered values, transparency, security, and accountability. These principles line up closely with what emerged in your study: nursing students showed strong concern for data privacy, proper citation, responsible tool use, and oversight. This underlines the study's recommendations that institutions need not only rules but also ongoing training, monitoring, and ethical guidance to support trustworthy and responsible AI use among students.

A study by Zhang & Lu, (2021), presented a broad overview of how artificial intelligence (AI) was developed and where it is headed in various fields, including education and healthcare. It characterized AI as a computer science discipline aimed at replicating human cognitive functions such as learning, reasoning, and decision-making. The study described AI not merely as a tool but as a system capable of gathering, analyzing, and applying knowledge, positioning it as a central component of the emerging technological revolution alongside innovations like the Internet of Things (IoT) and blockchain technologies.

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According to Zhang & Lu, (2021), AI systems are increasingly being used to carry out complex tasks that require intelligence, such as recognizing patterns, predicting outcomes, and making informed decisions. These capabilities have significant implications for nursing education, where such tools can support student learning through simulation, data analysis, and personalized content delivery. Although the study is not specific to nursing, its framework highlights the broader relevance of AI across disciplines that rely on knowledge processing and human-like decision support.

Furthermore, the article brought attention to ongoing concerns about ethical practices, privacy issues, and the potential biases embedded in AI technologies. These considerations echoed the findings of the present study, where respondents demonstrated a high level of ethical awareness, emphasizing the importance of citing AI-generated content, protecting sensitive data, and recognizing the limitations of AI. This underscores the need for institutions and educators to establish clear guidelines on responsible AI usage.

In summary, this foundational review on AI provides essential context for understanding the growing role of intelligent systems in education. When compared with findings from this research, it becomes clear that nursing students are beginning to interact with AI in ways that mirror the broader technological shift described in the article. As such, this study contributes to the conversation by providing localized, discipline-specific data that supports the integration of AI into nursing education, while advocating for ethical, informed, and critically guided implementation.

A study by Buchanan et al. (2021) emphasized the urgent need for curriculum reform in nursing education programs within academic institutions and clinical practice environments. This change is essential for preparing nurses and nursing students to deliver safe and effective care in the age of artificial intelligence. To better support students across all educational levels, nursing educators should adopt innovative and evolving teaching methods that incorporate AI.

In addition, a recent study explored Indonesian nursing students' perspectives on integrating AI chatbots, specifically ChatGPT, into their learning processes. The findings revealed that students generally view AI chatbots as beneficial tools for enhancing their education, particularly in areas like information retrieval and understanding complex medical concepts. However, concerns were raised regarding the accuracy of information provided by AI and the potential for diminished human interaction in the learning environment. The study emphasizes the importance of balancing AI integration with traditional teaching methods to maintain the essential human elements of nursing education (Gunawan et al., 2024). This research underscores the need for nursing educators to thoughtfully incorporate AI tools into curricula, ensuring that technological advancements complement rather than replace the humanistic aspects of nursing education. By doing so, educators can leverage AI to enhance learning outcomes while preserving the core values of empathy and patient-centered care that are fundamental to the nursing profession.

Moreover, nursing education has been profoundly changed by artificial intelligence (AI), which offers cutting-edge resources for improving critical thinking and problem-solving abilities. Nursing students can participate in realistic clinical scenarios in a safe, flexible setting thanks to artificial intelligence (AI) technology, including virtual simulations, decision assistance systems, and tailored learning platforms. According to recent research, incorporating AI into nursing education promotes experiential learning and increases students' confidence and clinical practice preparation (Joshi, 2023).

Additionally, AI applications help streamline administrative tasks in nursing programs, such as grading and feedback, allowing educators more time to focus on interactive learning and mentorship. This creates an opportunity to integrate more AI-driven innovations into nursing education, such as virtual reality (VR) training environments, which offer immersive experiences for students to practice complex procedures and nursing interventions in a safe, controlled setting (Glass, 2024).

Some of the impacts of AI include expanding access to high-quality medical care and improving care delivery, the electronic health record (EHR), and improving collaboration, communication, and coordination between healthcare disciplines (Pailaha, 2023). Generative AI tools, such as ChatGPT and BardAI, summarize data into text for expedited information-gathering and content creation are gaining use in clinical and operations settings

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to “help nursing staff improve productivity and decrease waste by eliminating menial tasks and enabling more informed and efficient clinical decisions” (Carroll, 2023). In automating certain processes, AI has the potential to give clinicians more time for patient interaction, thereby improving outcomes (Molyneux, 2023).

Furthermore, AI is being extensively used to simulate clinical environments, allowing nursing students to develop critical thinking and decision-making skills. These simulations can mimic real-life scenarios, providing students with hands-on experience without the risks associated with actual patient care. AI-driven platforms introduce varying complexities in training scenarios, enhancing the learning process (Jordan, 2023). The ability to replicate varying levels of complexity in clinical situations is particularly valuable. It enables students to progress through their training as they build confidence and competence, starting from basic scenarios to more intricate, high-stakes situations. This graduated exposure can help cultivate essential skills such as rapid assessment, prioritization, and effective communication. Moreover, the feedback mechanisms often embedded in these AI platforms can facilitate reflective learning. Students can receive immediate, personalized feedback on their performance, which is crucial for identifying areas for improvement and reinforcing correct practices.

A recent research study titled "Nursing Students' Perception and Attitudes toward the Utilization of Artificial Intelligence in Healthcare" explored how nursing students view the incorporation of AI in the healthcare field. The results indicated that students generally have a favorable attitude toward AI, acknowledging its potential to enhance healthcare services and improve patient care. However, they expressed concerns regarding the ethical aspects of AI, including matters related to patient privacy, data security, and the risk of diminishing human interaction in patient care. The study underscores the necessity of integrating AI education into nursing programs to prepare students for future healthcare settings where AI will be integral. Additionally, it stresses the importance of continuous discussions surrounding the ethical implications of AI in nursing practice to ensure that technological progress aligns with the profession's fundamental values (Benfatah et al., 2024).

One example of AI-enhanced simulation is the use of AI-powered computers that can interact with nursing students in a more realistic manner than current high-fidelity mannequins. This innovation has the potential to supercharge simulation by providing scenarios that are both realistic and tailored to each student’s individual learning needs (Glauberman et al., 2023). The introduction of AI-enhanced computers into nursing education represents a significant advancement in how we approach simulation-based learning. Unlike high-fidelity mannequins, which can only respond to a set program of scenarios, AI systems can adapt in real time to a student’s actions and decisions. This interactivity creates a more immersive learning experience that mirrors the unpredictability of real-life patient interactions.

According to Omari et al. (2024), the willingness of nursing students to utilize AI in their practice is an effective indicator of how well it will be integrated, as it reflects their readiness and eagerness to incorporate AI tools into their future clinical responsibilities. Several elements affect the intention to use AI, such as their understanding of the technology, their attitudes towards it, their perceptions, and their experiences with AI in educational environments. Their understanding of AI plays a significant role—students who grasp the potential benefits and functionalities of AI are more likely to embrace it. Additionally, attitudes toward AI, shaped by their educational experiences and exposure to technology, can greatly affect their willingness to utilize AI tools. Positive interactions with AI in academic settings can foster a sense of confidence and competence, encouraging students to apply these technologies in practice.

Moreover, AI literacy among nursing students varies significantly, with higher levels of literacy strongly correlating with more positive attitudes toward the adoption of artificial intelligence in their practice. Students who actively engage with AI tools tend to score higher on AI literacy scales, indicating that practical experience with these technologies enhances their understanding. This relationship suggests that as nursing students increase their knowledge of AI, their intention to incorporate it into their future practice also grows, underscoring the importance of fostering AI literacy in nursing education (Acka et al., 2024).

Additionally, a research study revealed that students’ perceptions often reflect their level of AI literacy, which is crucial for the responsible usage of GenAI technologies. Identifying gaps in students' understanding allows educators to develop targeted interventions aimed at improving AI literacy, ultimately preparing them for

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future work environments that increasingly incorporate AI technology. Moreover, research findings suggested that while students recognize the potential benefits of GenAI, they also expressed concerns regarding its risks. By acknowledging these apprehensions, educators can establish guidelines and safeguards that promote ethical and responsible use of GenAI technologies. This proactive approach not only addresses student concerns but also fosters an educational environment that prioritizes ethical considerations in technology usage. Incorporating these insights into the nursing curriculum can significantly influence how future healthcare professionals perceive and utilize AI tools in their practice, ultimately shaping the quality of patient care they provide (Chan & Hu, 2023).

A study found many similarities in the ways Generation Z students and Generation X and Y educators intended to use GenAI technologies in higher education. Both groups aimed to utilize these technologies for various tasks, such as gathering, organizing, and synthesizing information. Their plans included brainstorming and finding inspiration, simplifying and summarizing complex ideas, as well as using GenAI to help write literature reviews for research papers and assist with data analysis (Cecilia & Katherine, 2023).

Geographically, significant differences also exist in the use of AI. For instance, research indicates that students in wealthier nations possess greater knowledge of AI compared to their counterparts in developing countries (Nashwan et al., 2023). To close the digital divide and establish fair chances for AI education worldwide, focused capacity-building initiatives are required. This digital divide is fueled by various socio-economic factors, including access to technology, educational resources, and governmental support for STEM initiatives, which can hinder the ability of students in less affluent regions to compete in a technology-driven world. To address these issues, it is essential to explore existing successful capacity-building initiatives that could serve as models for future programs. Integrating perspectives from policymakers, educators, and students will provide a comprehensive understanding of the AI education landscape, while examining cultural attitudes toward technology can further enrich the analysis.

A study on student nurses' readiness to adopt artificial intelligence (AI) highlighted factors influencing their attitudes towards AI, including technological proficiency, understanding of AI, and its perceived role in nursing practice. The study found moderate readiness and barriers such as a lack of computer skills, AI knowledge, and time constraints. To improve AI integration, it is suggested to enhance students' technological abilities, increase AI awareness, and offer practical experiences. This research emphasizes the importance of preparing nursing students for an AI-driven healthcare environment to enhance patient care outcomes (Labrague et al., 2023).

Furthermore, a research study indicates that nursing students' intention to use AI is influenced by their attitudes towards technology and perceived ease of use. The Unified Theory of Acceptance and Use of Technology (UTAUT) model has been applied to study these factors, highlighting the importance of positive attitudes in the adoption of AI tools (Kwak et al., 2022). Nursing students' likelihood of adopting AI is closely tied to their attitudes towards technology and their perception of how easy it is to use. By utilizing the Unified Theory of Acceptance and Use of Technology (UTAUT) model, the study underscores that fostering a positive attitude towards AI tools is crucial for their successful integration into nursing practice.

Despite the potential benefits, several barriers hinder the widespread adoption of AI in nursing education. These include limited access to technology, lack of faculty training, and concerns about over-reliance on AI tools. Addressing these challenges is crucial for successful integration (Labrague et al., 2023). Also, the study's statistics revealed that only 44% of healthcare students have adequate knowledge of AI, which raises significant concerns about a knowledge gap that could impede the effective implementation of AI in nursing education and, potentially, clinical practice. This lack of understanding may lead to misuse or overreliance on technology, underscoring the need to reevaluate educational curricula.

There is a notable gap in integrating AI into nursing curricula effectively. Many programs lack comprehensive AI-focused content, which hinders students from gaining the necessary skills to utilize AI effectively in clinical settings. There's a strong recommendation for training nursing faculty to understand and utilize AI-NLP platforms. Educators need to be equipped with the knowledge to integrate AI effectively into their teaching methods. The study suggests that nursing curricula need to be updated to include AI-focused content that prepares students for the technological advancements in healthcare. As AI becomes more integrated into

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education, ethical guidelines must be established to address issues like data privacy and algorithmic bias. (Dorin & Atkinson, 2024).

AI chatbots like ChatGPT can be used in nursing education. They can help draft course materials, assist with administrative tasks, and provide personalized learning for students. However, there are concerns about over-reliance on AI, such as plagiarism and reduced critical thinking. Educators need to set clear guidelines and emphasize critical thinking and proper citation (Ahmad et al., 2022). The utilization of AI chatbots, such as ChatGPT, in nursing education presents both innovative opportunities and notable challenges. While these tools can significantly enhance the learning experience by assisting in the creation of course materials, streamlining administrative tasks, and offering personalized support to students, there is a pressing concern regarding the potential for over-reliance on AI. This dependency may lead to issues like plagiarism and a decline in critical thinking skills among students, as they may lean heavily on AI-generated content without fully engaging with the material.

A study showed that over 60% of Chinese design college students are using AI mainly for gathering data and ideas. Students believed that AI helped them to become more efficient and improve their skills. Some students, especially those who are new to AI, felt anxious about its development. The study tried to integrate the use of AI in education by teaching them to understand more deeply about AI and how to use it correctly (Song & Wang, 2024).

Synthesis

AI tools can significantly enhance nursing curricula, yet a systematic review by Labrague et al. (2023) revealed that, despite 65% of healthcare students expressing optimism about AI, only 44% possessed adequate knowledge of these technologies. This gap underscores the urgent need for nursing programs to incorporate foundational principles of AI, including machine learning and diagnostic imaging, into their curricula.

AI technologies are already revolutionizing nursing education by providing innovative resources that facilitate critical thinking and problem-solving skills. Practical applications such as virtual simulations, decision support systems, and personalized learning platforms promote experiential learning and bolster students' confidence and readiness for clinical practice (Joshi, 2023). Virtual patient simulators, for instance, allow students to hone their diagnostic and treatment abilities in a safe environment, enhancing their critical thinking through exposure to complex clinical scenarios (Pascual, 2023). Furthermore, AI applications streamline administrative tasks, allowing educators more time to focus on interactive learning and enhancing educational experiences through immersive technologies like virtual reality (Glass, 2024).

While the benefits of AI in nursing education are substantial, there remain notable disparities in awareness and access to these technologies across different geographic regions. According to Nashwan et al. (2023), students in wealthier nations exhibit a better understanding of AI. Therefore, targeted initiatives are necessary to bridge the digital divide and ensure equitable AI educational opportunities worldwide. Additionally, healthcare professionals must comprehend both the potential and limitations of AI, as suggested in discussions by the University of the Philippines - Manila (2024), which emphasize the role of AI in addressing challenges such as medical staff shortages.

Student readiness to engage with AI technologies is crucial, as highlighted in various studies. Factors influencing students' attitudes towards AI include their technological proficiency and understanding of its applications in nursing practice. Research indicates that while there is moderate readiness among student nurses, barriers such as limited computer skills, lack of AI knowledge, and time constraints persist (Labrague et al., 2023). Models such as the Unified Theory of Acceptance and Use of Technology (UTAUT) illustrate that positive attitudes toward technology play a pivotal role in the adoption of AI tools (Kwak et al., 2022).

However, significant challenges hinder the wide adoption of AI in nursing education. Barriers include limited access to technology, insufficient faculty training, and ethical considerations surrounding data bias and fairness (HITRUST, 2023). Moreover, many nursing programs currently lack comprehensive AI-focused curricula, limiting students' preparedness to utilize AI effectively in clinical settings. Recommendations include training

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nursing faculty in AI applications and updating curricula to include AI content that addresses technological advancements in healthcare (Dorin & Atkinson, 2024).

In summary, while the incorporation of AI in nursing education offers transformative potential, achieving its full impact requires addressing challenges in integration, access, and educational equity. Increased awareness and training for both students and educators, as well as the establishment of ethical guidelines, are critical for facilitating a successful transition into an AI-enhanced educational framework.

RESEARCH METHODOLOGY

This chapter discusses the research design chosen for the study. This also provides information about the respondents as described in the criteria for inclusion in the study. The research instrument for data collection and the procedures that will be followed to carry out this study are also included.

Research Design

The study utilized a descriptive correlational quantitative design to assess the utilization and intent to adopt Artificial Intelligence among nursing students at a selected higher education institution.

This research falls under the fields of behavioral and educational epidemiology, focusing on the patterns, factors, and connections that affect the use and acceptance of artificial intelligence among nursing students within a specific academic group. By pinpointing behavioral predictors and examining the learning environments of institutions, the study enhances our understanding of technology adoption trends among future healthcare professionals.

A correlational design was applied to this study because it allowed the researchers to examine the relationships between variables without controlling or manipulating any of the variables. Correlational research is a type of non-experimental research method that studies the relationships between variables with the help of statistical analysis.

In a correlational design, researchers investigate the impact of a potential cause that they are unable to control. They utilize methods that analyze the relationships among different variables. Many variables relevant to nursing research cannot be manipulated. Concepts such as attitudes, beliefs, and behaviors are often considered causal factors in health, illness, responses to treatment, and other outcomes (Devi et al., 2022).

Furthermore, the correlational design enabled the researchers to explore the relationships between the level of utilization and various dependent variables, including the extent to which AI tools are utilized in academics, the intent to adopt, and the assessment of responsible use of AI tools.

Research Locale

The study was conducted at Mary Chiles College in Manila. This selected higher education institution specializes in allied healthcare courses, recognized by the Commission on Higher Education (CHED), the Technical Education and Skills Development Authority (TESDA) and the Department of Education (DepEd). It is one of the private educational institutions known for its programs in allied health sciences, particularly nursing.

The selected higher education institution, in its 111 years of service, was founded and established in 1913. It is one of the oldest Nursing schools in the Philippines. The school offers the following courses: Bachelor of Science in Nursing, Bachelor of Science in Respiratory Therapy, Bachelor of Science in Midwifery, and Caregiving, and also caters to a Senior High school program.

The researcher selected this higher education institution because it has reputable academic programs and accessible participants relevant to the research focus.

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Sources of Data

The primary data for this study were collected through questionnaire responses from nursing students at the selected higher education institution. The questionnaire was designed to assess students' attitudes, behaviors, and intentions regarding the utilization and adoption of artificial intelligence in their nursing education. In distributing the questionnaire at the onset of the study, the researchers aimed to gather firsthand insights directly from the participants, which provided a foundation for understanding current perceptions and usage patterns of AI among nursing students. The secondary data was obtained from the higher education institution's records, which provided the total Number of Enrolled Students in the Nursing Program in the 2nd semester of A.Y. 2024-2025.

The Population and Sampling Procedure

The population of the study consisted of 482 nursing students. They are currently enrolled in the Bachelor of Science in Nursing program at Mary Chiles College, Manila. They are from Level 1 to Level 4 and are currently enrolled in the second semester of the academic year 2024 to 2025. The participants were selected by stratified random sampling and according to their availability.

In utilizing Slovin's formula, from the total population of 482 nursing students using a 5 per cent error margin, it was determined that the sample size of participants was 219 nursing students. Additionally, 30 nursing students were selected as the total number of respondents for the pilot study. To ensure equal distribution of respondents from different year levels, the researchers computed the percentage of the total sample size of 219 from the total population of nursing students, which was 482, equivalent to 45.44%. From Level 1, which has a total of 155 students, 45.44% amounted to 71 respondents, meaning 71 respondents were selected. In Level II, there were 65 respondents selected from their total number of 144; 56 respondents were selected out of 124 from Level III, and lastly, 27 respondents were selected from Level IV out of 59. This is where the total sample size of 219 will come from.

Table 1. Sample Size

No.	Strata	Nursing Students Population	Sample Size
1	Level I	155	71
2	Level II	144	65
3	Level III	124	56
4	Level IV	59	27
Total		482	219

The researchers used proportionate stratified random sampling due to the unequal distribution of students across year levels. This approach prevented bias and ensured an equal distribution of respondents from each year level. Stratified random sampling, a form of probability sampling, was more cost-effective and time effective. It was also simple, as it did not involve a complicated process, required intricate expertise, or a lengthy time. For the actual data gathering, respondents were chosen randomly with the help of their respective class presidents. From Level I, 18 students from each four sections were randomly chosen to answer the questionnaire. In Level II, 16 nursing students from each four sections, 14 from each four sections from Level III, and lastly 13 fourth-year students from each two sections were randomly chosen to answer the questionnaires. After the study, only 202 respondents were able to answer the survey out of the 219-target sample size population.

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Research Instrument

A researcher-made questionnaire was utilized. It was formulated by the researchers based on the review of related literature and was aligned with current frameworks and best practices on the utilization of artificial intelligence (AI) in higher education, particularly in nursing education.

Part One (1) of the questionnaire consisted of the demographic profile of the 202 respondents. For demographic data such as the nursing students' age, sex, nationality, year level, and whether they are a first courser or second courser. Part One (1) aimed to profile the students. Researchers were able to identify patterns among various student cohorts and how age affected the usage of technology in the classroom by, for instance, understanding the age distribution.

Part Two (2) centered on the level of utilization of artificial intelligence tools. This section presents the various AI tools that nursing students use to support their studies, namely: ChatGPT, Microsoft Copilot, Google Gemini, Meta AI, Deep AI, Quillbot, Grammarly, and HyperWrite. The responses were categorized as Highly Utilized, Utilized, Moderately Utilized, Least Utilized, and Not Utilized.

Part Three (3) focused on the extent of application of the AI tools in academics. These were categorized into: AI-Assisted Research, Personalized Learning, Simulation and Virtual Learning, AI in Communication, and AI-Enhanced Writing. The responses could be recorded by selecting all that applied. Research and Report Writing focused on how AI assisted in gathering information and organizing findings. Personalized Learning represents the use of AI to tailor educational experiences to individual student needs, enhancing engagement and understanding. Additionally, Simulation and Virtual Learning illustrated how AI created immersive environments for practical learning experiences. AI in Communication showcased the ways in which AI facilitated teamwork and interaction among students and educators. Lastly, AI-Enhanced Writing emphasized the support AI offered in crafting, editing, and improving written work.

Part Four (4) focused on the intent to adopt AI in nursing education and was organized into three (3) categories: Awareness of the different AI tools that could be utilized for learning, Readiness to engage with AI technologies, and Barriers to Adopting AI tools. This section was crucial for understanding not only students' past interactions with AI but also their willingness and readiness to incorporate these technologies into their learning experiences. By dividing this section into key aspects, researchers gained a comprehensive understanding of the factors that influenced students' attitudes toward the adaptation of AI.

The first category, Awareness of AI tools, included five (5) items designed to assess nursing students' knowledge of the various AI technologies available to them. This factor was essential as awareness often laid the groundwork for adaptation; students who were well-informed about AI tools were more inclined to consider their use in their studies. The statements in this category covered a range of areas, including general knowledge of AI, familiarity with specific applications pertinent to nursing, and an understanding of the functionalities provided by AI.

For instance, the statements evaluated whether students recognized AI applications that supported clinical decision-making, diagnostic tools, or educational resources such as intelligent tutoring systems. By analyzing responses in this domain, the researchers gained valuable insights into the level of AI literacy among nursing students, revealing gaps that could have been addressed via educational programs or workshops.

The second category, readiness to engage with AI technologies, consisted of five (5) items designed to evaluate students' preparedness and willingness to utilize AI tools in their academic pursuits. This focused on various aspects of engagement with AI technologies, specifically in the context of enhancing productivity and educational advancement. Each point addressed a different dimension of how individuals interacted with AI tools, such as their perceived benefits, the effort they invested in becoming proficient, and the practical applications of these tools in nursing education and research. This category not only assessed personal beliefs and attitudes toward AI but also highlighted specific functions where AI could be beneficial, such as research efficiency, literature reviews, and collaboration. This ultimately helped identify areas for further training or support needed in the integration of AI into educational frameworks.

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The third and final category, which focused on barriers to adopting AI tools, consisted of five (5) items that aimed to identify challenges preventing nursing students from integrating artificial intelligence into their academic settings. These obstacles could be systemic—such as limited access to technology or inadequate institutional support—or individual, including fears related to technology, doubts about reliability and accuracy, and concerns regarding the ethical implications of AI usage.

In pinpointing these barriers, this category sought to offer valuable insights into the challenges nursing education encountered in incorporating emerging technologies and underscored the necessity for targeted interventions or policy changes that could create a more supportive environment for AI adoption.

Part Five (5) focused on the nursing student respondents' assessment of responsible AI utilization. It had four (4) categories consisting of Ethical Considerations, Accuracy and Reliability, Data Privacy and Security, and Human Oversight and Critical Thinking. The first (1) category focused on Ethical Considerations, which had nine (5) items. The second (5) category focused on Accuracy and Reliability, which also had five (5) items. The third (3) category focused on Data Privacy and Security, which had five (5) items. The fourth (4) category focused on Human Oversight and Critical Thinking, which also had 5 (5) items.

The questionnaire contained a 4-point rating scale to measure responses in Part Four (4) and Part Five (5). The scale descriptions are as follows:

Table 2. 4-point Likert scale for Part Four (4) and Five (5) of the Questionnaire

Point	**Interpretation**			**Range**
4	SA	Strongly Agree	I completely agree with the statement	3.26 - 4.00
3	A	Agree	I mostly agree with the statement	2.51 - 3.25
2	D	Disagree	I mostly agree with the statement	1.76 - 2.50
1	SD	Strongly Disagree	I completely disagree with the statement	1.00 - 1.75

Additionally, the questionnaire contained another 4-point rating scale to measure responses in Part Two (2) and Part Three (3). The scale descriptions were as follows:

Table 3. 4-point Likert scale for Part Two (2) of the Questionnaire

Point	**Interpretation**			**Range**
4	U	Utilized	I often use AI tools	3.26 - 4.00
3	MU	Moderately Utilized	I sometimes use AI tools	2.51 - 3.25
2	LU	Least Utilized	I rarely use AI tools	1.76 - 2.50
1	NU	Not Utilized	I never use AI tools	1.00 - 1.75

Table 4. 4-point Likert scale for Part Three (3) of the Questionnaire

Point	**Interpretation**			**Range**
4	O	Often	I often utilize	3.26 - 4.00
3	S	Sometimes	I sometimes utilize	2.51 - 3.25

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2	R	Rarely	I rarely utilize	1.76 - 2.50
1	N	Never	I never utilize	1.00 - 1.75

Construction and Validation of the instrument/s

A self-made questionnaire was constructed by the researchers, aligned with the study's objectives. The development process of the instrument started with a comprehensive review of related literature to identify key ideas that the questionnaires should explore. The related studies served as the foundation in structuring the questionnaire. Buchanan et al. (2021) inspired the inclusion of items under barriers to adopting AI tools, focusing on perceived difficulty and limited exposure. Asirit & Hua (2023) guided the development of statements under responsible AI utilization, particularly on ethical concerns, data privacy, and AI bias. Meanwhile, Glauberman et al. (2023) influenced the items in simulation and virtual learning, emphasizing the role of AI-powered simulations tailored to nursing students' learning needs. From there, the researchers carefully drafted statements that are clear, relevant, and aligned with the study's goals. After the completion of the initial draft, the instrument underwent content validation by a panel of experts who assessed each item for appropriateness, clarity, and coverage of the intended constructs. It was reviewed by three expert validators, each with extensive experience in their fields. The process followed the Content Validity Index, where each validator rated the relevance of each item. The Content Validity Index (CVI) results show that the instrument has high overall validity across its many components. In Part I, which covered the demographic profile, all items received a score of 1, resulting in a perfect average CVI of 1.0, showing the items were relevant. For Part II, which assessed the usage of artificial intelligence (AI) tools, also achieved a CVI of 1.0. Part III, while most items were rated valid, one (Q3.3) had a lower I-CVI of 0.67, resulting in an average CVI of 0.93. For Part IV, which evaluated nursing students' intentions to adopt AI, received a CVI of 1.0. Part V, focused on responsible AI usage, nearly all items were rated 1, except for one (Q5.3.1) with an I-CVI of 0.67, with a total average of 0.98. The detailed result of the Content Validity Index can be found in the appendices.

The first validator is a seasoned Computer Engineer professional and a faculty member at a reputable university in the Philippines. He holds a master's degree in computer engineering, specializing in Machine Learning, Artificial Intelligence, and software development, and has over five years of teaching experience in higher education. The second validator is a licensed professional teacher with a Doctorate in Education, a former professor, and also a school principal. She is currently working as a research consultant and is also an active peer reviewer for academic journals. And lastly, the third validator is a nursing professor with a Master of Arts in Nursing and a Doctorate in Education with more than 10 years of teaching experience in nursing education. After validation and revisions of the questionnaires, a pilot study was conducted with 30 nursing students as respondents. The results were sent to a statistician for statistical analysis and to test reliability using Cronbach's Alpha. Then the final version of the questionnaire is administered for the final data gathering.

Utilizing a validated survey tool enhances the reliability of measurements and reduces systematic errors. The content validity indices demonstrated strong consensus among expert reviewers, indicating that the questionnaire effectively covered constructions associated with AI usage, readiness, obstacles, and responsible application. As a result, this instrument is deemed suitable for exploring behavioral technology adoption in nursing education.

Table 5. Reliability test using Cronbach's Alpha (Pilot Study Result)

Scale Reliability Statistics	
	Cronbach's alpha
Level of Utilization of Artificial Intelligence	0.647
Extent Of AI Utilization in Academics	0.764

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Respondents' Intent to Adopt Artificial Intelligence	
Awareness	0.868
Readiness	0.917
Barriers	0.936
Assessment Of Responsible AI Tool Utilization	0.942

Interpretation:

An alpha score of 0.942, 0.936, and 0.917 is an excellent reliability score, and 0.868 is good; 0.764 and 0.647 are considered acceptable reliability scores. Cronbach's alpha measures internal consistency, or how closely related a set of items is as a group. Moreover, the value indicates very high internal consistency among the items in your scale. Values between 0.6 and 0.7 are considered moderate, which indicates that the items at the level and extent are moderately related to each other.

The questionnaire consisted of five (5) parts, which included Part One (1), documenting the profiles of nursing students, such as age, year level, sex, nationality, and whether they were first courser or second courser. Part Two (2) of the questionnaire assessed the students' level of utilization of artificial intelligence tools in their studies. It included eight (8) AI tools, such as ChatGPT, Microsoft Copilot, Google Gemini, Meta AI, Deep AI, Quillbot, Grammarly, and HyperWrite. Part Three (3) covered the extent of application of artificial intelligence tools in academics, categorized into four (4) areas: AI-assisted research, personalized learning, simulation and virtual learning, AI in communication, and AI-enhanced writing. Part Four (4) assessed the students' intention to adopt artificial intelligence, categorized into key aspects such as awareness of AI tools, which contained thirteen (13) items; readiness to engage with AI technologies, which included eleven (11) items; and barriers to adopting AI tools, which had six (6) items. Part Five (5) addressed the assessment of responsible utilization of AI, categorized into ethical considerations (which had nine (9) items), accuracy and reliability (also with nine (9) items), data privacy and security (which contained ten (10) items), and human oversight and critical thinking (with eleven (11) items). Part Six (6) focused on three (3) additional questions that assisted in creating guidelines for the proper utilization of artificial intelligence.

The questionnaire aimed at assessing nursing students' utilization of and intent to adopt artificial intelligence as a tool for learning and innovation in nursing education. It was validated by three experts in nursing education and information technologies and underwent a pilot study to ensure its validity and reliability, ensuring its appropriateness and effectiveness in gathering the required data. A cover letter was included with the questionnaire, serving as an invitation to participate and providing comprehensive information about the study to ensure transparency and adherence to ethical research standards.

A letter was addressed to the Dean of the selected higher education institution seeking permission to conduct the pilot study. This letter was approved and endorsed by the researcher's adviser and academic committee.

Data Gathering Procedures

The data-gathering process began with a thorough review of the online questionnaire to ensure clarity and relevance. This included an initial pilot test using a small group of nursing students to obtain feedback on the content and usability of the online format. Adjustments were made based on this feedback to enhance the questionnaire's effectiveness.

A digital consent letter was developed to inform potential participants about the study. This letter detailed the purpose of the research, the voluntary nature of participation, the procedures involved, and the measures in place to ensure confidentiality and anonymity of responses. Participants were required to digitally sign a consent form before accessing the questionnaire to confirm their understanding and agreement to partake in the research.

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Formal permission was sought from the appropriate authorities at the selected higher education institution to conduct the study online. This involved submitting a request to the college's research ethics board or institutional review board, which included a comprehensive overview of the study's purpose, methodology, data management protocols, and ethical considerations. Securing this approval ensured adherence to ethical standards when conducting research involving human participants.

Furthermore, the study employed the survey method. Survey research involved the collection of primary data from all or a portion of a population to determine the prevalence, distribution, and interrelationships of specific variables within that group. It included the collection of data via an online Google form.

Ethical Considerations

Informed consent was prioritized, with all participants required to provide consent before their involvement in the study, ensuring they were fully aware of its purpose, procedures, potential risks, and benefits. This process confirmed that participants understood their involvement was voluntary and that they could withdraw at any time without penalty. Privacy and confidentiality were paramount, necessitating that personal information and responses remained confidential, with measures put in place to anonymize data and securely store information to prevent unauthorized access. Participants were informed about how their data would be used, stored, and shared.

Researchers also needed to be mindful of potential biases that could influence the study's findings, particularly in relation to perceptions and utilization of AI. This included biases in survey design, data interpretation, and reporting results, which were mitigated through a peer review process. The study took into account the impact of AI on academic integrity, emphasizing the importance of critical thinking and responsible AI use to prevent over-reliance and potential academic misconduct. Additionally, the ethical implications of AI utilization in nursing education were examined, including its effects on the significance of human decision-making and AI literacy among students. Data was to be stored for at least five years after the study was completed, and it would be stored through Google Cloud.

To mitigate potential risks associated with the study, researchers took proactive steps. The researchers conducted a pilot study to identify and refine the research design and sought regular ethics reviews from an institutional review board (IRB). Establishing support systems for participants helped those who may have felt pressured to use AI unethically or struggled with its application. Finally, the autonomy and right to refuse participation were upheld, with researchers clearly communicating participants' rights to decline involvement without any negative consequences. This transparency fostered trust and respect, reinforcing that participation was entirely voluntary. By addressing these ethical considerations and implementing appropriate measures, the study proceeded with integrity while safeguarding the rights and well-being of nursing students.

Statistical Treatment

The researchers utilized the following statistical treatments:

Descriptive and inferential statistics are used to describe significant properties or qualities of data, such as the shape of the distribution, the location of the center, and how the data varies around it. (Green et al., 2023)

The researchers applied the descriptive statistics in the form of:

Frequency/Percentage Distribution

The number of times a given value appears in the data is its frequency (f). The pattern of frequencies, or the collection of all potential values and the frequencies corresponding to them, is the distribution of a variable. Frequency tables or charts are used to illustrate frequency distributions. Frequency distributions can display the percentage of observations or the exact number of observations that fall into each range. The distribution in the latter case is referred to as a relative frequency distribution.

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The profile of nursing students was summarized and analyzed quantitatively in terms of Age, Sex, Year level, Nationality, and whether they were First courser or Second courser. The frequency of each variable was divided by the total number of respondents, which was then multiplied by 100.

This study also included various AI tools, including Generative AI (ChatGPT, Google Gemini, Microsoft Copilot, Meta AI, Deep AI) and Writing Assistant AI (Quillbot, Grammarly, HyperWrite). Respondents indicated their extent of application of AI tools in academics by selecting all that applied; the choices included Research and Report Writing, Personalized Learning, Simulation and Virtual Learning, Communication and Collaboration, and Academic Writing Assistance. After collecting responses, the Percentage Statistical Treatment was used to interpret the data and highlight trends in AI tool usage.

Formula:

$$\% = \frac{F \times 100}{N}$$

Where:

% = Percentage

F = Frequency

N = Number of respondents

Weighted Mean

A weighted mean is an average that is determined by giving values in a data set additional weight based on a particular data attribute. Each quantity that needs to be averaged is given a weight, and these weightings establish how important each quantity is in relation to the average. The equivalent of having a large number of similar things with the same value included in the average is a weighting. To ascertain the respondents' total average response, the researcher will employ the weighted mean.

The weighted mean was utilized to assess three key aspects that influenced the intention to adopt AI technologies: awareness of AI tools, readiness to engage with AI technologies, and barriers to adopting AI. In assigning weights to these components based on their relevance, the weighted mean allowed the researcher to have a more accurate reflection of their influence on the overall intent to adopt AI.

Formula:

$$\bar{x} = \frac{\Sigma wx}{\Sigma w}$$

Where:

x = is the repeating value

w = is the number of occurrences of x (weight)

$\bar{x}$ = is the weighted mean

Kruskal-Wallis H Test

The Kruskal-Wallis H test is a non-parametric alternative to one-way ANOVA. It is used when the assumptions of ANOVA (such as normal distribution or homogeneity of variances) are not met. This test compares the medians of three or more independent groups.

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The Kruskal-Wallis H test was utilized to assess statistically significant differences in AI utilization and intent to adopt when grouped according to profile.

Hypotheses:

Null (H_0): The distributions of all groups are equal

Alternative (H_1): At least one group differs in distribution

Formula:

$$H = \frac{12}{N(N+1)} \sum_{i=1}^{k} \frac{R_i^2}{n_i} - 3(N+1)$$

Where:

N = total number of observations

k = number of groups

R_i = sum of ranks for group i

n_i = number of observations in group i

If the H statistics are significant, post-hoc tests (e.g., Dunn's test) may be used to determine which groups differ.

Spearman Rank-Order Correlation (Spearman's Rho)

Spearman's Rank-Order Correlation (ρ) was used to determine the relationship between two ranked or non-normally distributed variables. It is suitable for ordinal data, such as Likert-scale responses. This test assessed correlations between awareness and usage of AI tools, readiness and intent to adopt AI, and barriers and actual AI use. Values close to +1 or -1 indicate strong relationships, while values near 0 suggest little to no correlation.

Formula:

$$\rho = 1 - \frac{6 \sum d_i^2}{n(n^2 - 1)}$$

Where:

d_i is the difference between the ranks of paired scores

n is the number of observations

Presentation, Analysis And Interpretation Of Data

This chapter offers an analysis and interpretation of the results according to the study's particular objectives. It covers the key components in Chapters 1 to 3, such as the problem's background, theoretical and conceptual frameworks, literature review, and methodology. The conversation combines literature and information to

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frame the use and intention to embrace artificial intelligence among nursing students at a specific higher education institution.

Employing a descriptive-quantitative method to collect information from 202 nursing students at Mary Chiles College in the Philippines. Stratified random sampling guaranteed proportional representation across all year levels (Levels I–IV), enhancing the data's rigor. The research employed a validated and pre-tested survey instrument, covering various aspects such as AI application, academic incorporation, and perceived challenges. Data were analyzed using descriptive and inferential statistics, including Spearman's rho and Kruskal-Wallis tests, to identify relationships and differences between variables. Ethical approval and data confidentiality were maintained, ensuring the research adhered to established standards. This robust approach enhances the reliability of the results and the recommendations that come from them. The research setting, Mary Chiles College, offers a significant context for the study, as it embodies a small-scale representation of nursing education in the Philippines.

The chosen participants showcased varying academic achievements, guaranteeing that the data reflected a spectrum of experiences with AI. The survey tool was structured around factors like AI-supported research, simulation, communication, and obstacles to implementation. This guaranteed thorough data gathering and aided in addressing each individual objective (SOP). The research setting, characterized by academic focus and technological evolution, offered a rich context to evaluate the preparedness and application of AI tools. These contextual understandings assist in creating applicable, regionally pertinent AI standards for nursing students. This study thoroughly establishes the groundwork for examining AI applications among nursing students.

The research is conceptually solid, backed by evidence, and pertinent to the context, with both local and international literature supporting the necessity for changes in the curriculum. Using a methodologically sound design, the researchers thoroughly examined demographic factors, degrees of AI tool usage, and students' willingness to embrace AI. The conversation highlights the essential importance of AI literacy and responsible usage, which will guide the creation of actionable guidelines. This research enhances nursing education in the AI era by offering well-informed, ethical, and student-focused suggestions. These findings will be elaborated upon in the upcoming discussion of particular outcomes (SOP 1–8) and the development of suggested guidelines.

Problem 1: Profile of the nursing student respondents in the selected higher education, in terms of:

Table 6.1 Age Range

Age Range	**Frequency(f)**	**Percentage(%)**
18 - 20	114	56.4%
20 - 25	82	40.6%
26 - 30	1	0.5%
31 and above	5	2.5%
Total	**202**	**100%**

The data reveals that a majority of nursing student respondents (56.4%) are aged between 18 to 20 years old. This is expected as this age bracket typically represents first- and second-year college students who have recently transitioned from high school into higher education. The next highest group, aged 21 to 25 years old, accounts for 40.6% of respondents and likely consists of upper-year students.

This age distribution reflects the traditional age structure of undergraduate nursing programs in the Philippines. The smaller proportions of respondents aged 26 to 30 (0.5%) and 31 and above (2.5%) suggest that older students returning to or continuing nursing education are uncommon in this particular institution. This limited

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representation from non-traditional age groups may affect overall perceptions and adoption of technology such as AI tools.

The youthful demographic of the sample implies a potentially higher adaptability and openness to using digital tools and innovations. Younger learners are often more exposed to technology through both academic and personal use, which may influence their willingness to engage with artificial intelligence tools in their nursing education.

This lack of older students may have an impact on how technology, particularly AI tools, is perceived and adopted within the course. With the predominance of younger students, there is a greater likelihood of adaptability and comfort with digital tools and innovations. Younger individuals generally possess a higher exposure to technology, both in their academic pursuits and everyday life, which can enhance their willingness to incorporate AI into their learning. This group's familiarity with technology may lead to increased engagement with AI-driven educational resources, fostering an environment where these tools can be more readily accepted and utilized.

However, the absence of older perspectives may limit the diversity of views on technology's role in nursing education. Older students may bring valuable insights and experiences that could enrich discussions about the use of AI and its integration into nursing practice. Therefore, while the prevalent age group may drive a more technology-friendly environment, it is crucial for nursing programs to encourage inclusivity and seek ways to support learners of all ages, ensuring a well-rounded approach to technology education. By recognizing and addressing these dynamics, nursing programs can better prepare their students for a rapidly evolving healthcare landscape.

Table 6.2. Sex

Sex	**Frequency (f)**	**Percentage (%)**
Female	169	83.7%
Male	33	16.3%

The table shows that the majority of the respondents are female, accounting for 83.7% of the total respondents, while males covers the 16.3%. The sample was predominantly female (83.7%), which aligns with the global trend of female dominance in the nursing profession (Gunawan et al., 2024). This gender distribution is significant because previous studies suggest that gender may influence comfort and familiarity with technology tools, although evidence remains mixed (Chan & Hu, 2023). However, the findings suggest no significant difference in AI utilization based on sex, implying a uniform attitude toward technology use across genders. This finding supports the idea that proper AI training and integration should be inclusive, not tailored to gender. The study helps affirm the need for gender-neutral AI policy guidelines in nursing education.

Given this finding, it is essential that any training or support regarding AI in nursing is inclusive and not designed specifically for one gender. This is particularly relevant as AI continues to grow in the healthcare field. It highlights the need for guidelines that apply to all, ensuring that education and resources are available to everyone, regardless of gender. By doing so, we can help all nurses, male and female, become skilled in using AI, which can ultimately improve patient care and the efficiency of healthcare services.

Table 6.3. Year Level

Year Level	**Frequency (f)**	**Percentage (%)**
Level I	67	33.2%
Level II	54	26.7%

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Level III	56	27.7%
Level IV	25	12.4%

The data shows that a significant portion of the respondents are in Level I (33.2%), followed by Level III (27.7%) and Level II (26.7%). Only 12.4% are in Level IV, the final year of the nursing program. This indicates that most respondents are in the early or middle stages of their academic journey.

Year level can be a major factor in exposure and engagement with artificial intelligence tools. Students in earlier levels may have limited experience applying such tools in clinical or research settings, while upper year students may have encountered them through more specialized or practicum-related tasks. However, with Level I comprising the largest group, it becomes crucial to implement AI-related interventions early in the curriculum.

This distribution suggests that institutional policies and AI-related training programs should consider varying levels of preparedness across year levels. Tailoring content and support based on academic progression may improve effectiveness and ensure equitable access to technological learning resources throughout the nursing education pipeline.

Data by year shows that the majority of respondents were from Level I (33.2%) and Level III (27.7%), while a smaller proportion were from Level IV (12.4%). This distribution illustrates the changing exposure of students to AI at various academic levels. Labrague et al. (2023) stated that students in higher education are anticipated to face more intricate academic challenges, possibly requiring the use of advanced AI. Notably, statistical analysis showed that year level greatly affects AI tool usage, indicating the necessity for structured AI literacy programs tailored to students' educational advancement.

In conclusion, the demographic characteristics of nursing student respondents provide context for their engagement with AI tools in education. The majority of AI users in this study are younger, mainly female Filipino students from lower academic levels. These results suggest that any suggested AI usage policy should take into account the demographic characteristics of the users to guarantee relevance and accessibility. The information additionally backs the idea that early and comprehensive incorporation of AI education can enhance digital skills among nursing students. Demographics not only indicate existing usage trends but also influence preparedness and possible obstacles to AI adoption.

Problem 2: The level of utilization of artificial intelligence tools among nursing student respondents

Table 7. Level of Utilization of Artificial Intelligence tools

AI Tools	**Median**	**Verbal Interpretation**
ChatGPT	3.00	Moderately Utilized
Google Gemini	1.00	Not Utilized
Microsoft Copilot	1.00	Not Utilized
Meta AI	2.00	Least Utilized
Deep AI	1.00	Not Utilized
Quillbot	3.00	Moderately Utilized
Grammarly	3.00	Moderately Utilized
HyperWrite	1.00	Not Utilized

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Scale: 1.00 - 1.75 (Not Utilized), 1.76 - 2.51 (Least Utilized), 2.52 - 3.27 (Moderately Utilized), 3.28 - 4.00 (Highly Utilized)

The results indicate that ChatGPT, Quillbot, and Grammarly are the most commonly used AI tools among nursing student respondents, all falling under the “Moderately Utilized” category based on a median score of 3.00. These tools are likely favored due to their accessibility, relevance to academic writing, and user-friendly interfaces. They offer functions such as paraphrasing, grammar correction, and content generation, which are highly beneficial in academic tasks like assignments, essays, and project papers.

In contrast, Google Gemini, Microsoft Copilot, Deep AI, and HyperWrite are classified as “Not Utilized” by most students. This may be attributed to a lack of awareness, limited institutional promotion, or difficulty in accessing these tools. Their lower recognition might also reflect their complexity, perceived irrelevance, or lack of alignment with student needs in nursing education.

Meta AI, although slightly better utilized, only reached the level of “Least Utilized”, suggesting a minor presence in the academic routines of nursing students. This disparity in usage levels highlights an important consideration: while students are open to certain well-known tools, others remain underutilized, revealing a gap in awareness, training, or perceived usefulness. This calls for institutional support introducing diverse and ethically appropriate AI resources in nursing education.

The table shows that ChatGPT, Grammarly, and Quillbot were the most moderately used AI tools by nursing students, each receiving median ratings of 3.00. These resources are well-regarded for functions such as composing, grammar correction, and brainstorming. This indicates that nursing students are attracted to AI tools that improve efficiency in tasks and documentation, aligning with their fundamental academic needs. The dependence on these particular tools underscores the significance of AI understanding in students' educational experiences. The trend indicates that students rely on AI for assistance instead of engaging in profound academic interaction or simulation.

In contrast, platforms such as Microsoft Copilot, Google Gemini, and Deep AI received minimal use, showing median ratings of 1.00, indicating restricted familiarity or availability. This limited use might indicate deficiencies in students' understanding of the wider AI ecosystem or the lack of institutional backing in promoting these platforms. Katsamakas et al. (2024) emphasized that readiness of institutions and accessibility of tools are vital factors for successful AI adoption. If nursing programs do not incorporate and educate students on new AI platforms, there is a danger that students will miss out on valuable tools that could improve both clinical and theoretical skills. This under-use highlights a need for immediate curriculum reform to incorporate various AI applications into nursing education.

Meta AI received the designation of "least utilized," while HyperWrite saw no usage at all, suggesting that students are not widely exploring AI platforms beyond the most readily available options. Buchanan et al. (2021) highlighted that the uptake of AI tools by students is frequently restricted by perceived difficulty and insufficient exposure. This discovery backs the Diffusion of Innovation Theory, which states that complexity and limited observability hinder adoption. Nursing instructors should close this exposure gap by providing structured AI tool orientation programs and guided simulations.

Through a theoretical perspective, the Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT)frameworks clarify this particular use of AI. Instruments viewed as user friendly and beneficial (such as ChatGPT and Grammarly) are embraced more quickly, whereas those considered complicated or unfamiliar are disregarded. According to Davis (1986) in TAM, attitudes toward adoption of technology are directly influenced by perceived ease of use and perceived usefulness. This emphasizes the necessity for customized teaching and assistance to enhance adoption rates for additional AI tools. In summary, the results indicate that although nursing students are somewhat using a limited range of known AI tools, a considerable gap persists in their awareness and application of other beneficial AI technologies. This trend could restrict the range of technological proficiency that students are able to acquire throughout their nursing education. Tackling this problem will necessitate intentional modifications to the curriculum, training for faculty, and awareness initiatives led by the institution. These actions will enable

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students to enhance their AI skills, improving their preparedness for tech-integrated healthcare settings. The results provide a fundamental justification for developing systematic guidelines to encourage wider and more accountable AI applications in nursing education.

Problem 3: To what extent do the nursing student respondents utilize AI tools in academics in terms of:

Table 8. Extent of AI Utilization in Academics

Extent of AI Utilization in Academics	Mean	Standard Deviation/Verbal Interpretation
3.1. AI-Assisted Research	2.85	0.821 / Sometimes
3.2. Personalized Learning	2.91	0.907 / Sometimes
3.3. Simulation and Virtual Learning	2.55	0.941 / Sometimes
3.4. AI in Communication	2.37	0.955 / Rarely
3.5. AI-Enhanced Writing	3.10	0.829 / Sometimes

Scale: 1.00 - 1.75 (Never), 1.76 - 2.51 (Rarely), 2.52 - 3.27 (Sometimes), 3.28 - 4.00 (Often)

According to the data presented in the table, the first sub-variable relates to AI-assisted research tools, which aim to facilitate and assist with the research process for nursing students. These tools are designed to help users locate credible sources and synthesize information efficiently. The findings reveal a mean score of 2.85, indicating that nursing students engage with these tools occasionally. While this suggests a recognition of the potential benefits afforded by AI, it also highlights a reliance on traditional research methods. This reliance is likely due to lingering concerns regarding the accuracy and credibility of AI-generated information, which necessitates thorough factchecking to ensure reliability.

The second sub-variable focuses on personalized learning AI, which encompasses adaptive learning platforms that allow students to customize their study materials to cater to their unique learning needs. The results show a mean score of 2.91, suggesting that students engage with these platforms intermittently. This points to an appreciation for AI-driven personalized learning experiences; however, it seems that nursing students have not fully integrated these tools into their daily academic routines. Although AI can offer tailored educational experiences, students may still favor traditional, structured lessons delivered by their instructors, who provide guidance and support.

The third sub variable pertains to simulation and learning AI tools, which are designed to offer nursing students the opportunity to practice clinical scenarios in a controlled and safe environment. The analysis indicates that these tools are utilized sometimes, with a mean score of 2.55. This lower engagement may stem from either limited access to such tools or a preference among nursing students for hands-on patient care experiences. Research indicates that while simulations can significantly enhance critical thinking and clinical skills, students often feel that there is no substitute for real-world patient interactions.

The fourth sub-variable examines the role of AI in communication, including tools that facilitate language translation, chatbot interactions, and professional messaging. The findings indicate that this aspect, with a mean score of 2.37, is the least utilized category among the AI functions assessed, falling into the "rarely" category. This trend may reflect a preference for face-to-face communication among nursing students, who often seek clarity and empathetic interactions that AI tools struggle to replicate effectively.

Lastly, the fifth sub-variable, AI-enhanced writing tools highlight their ability to assist with grammar checking, paraphrasing, and content improvement. With a mean score of 3.10, these tools rank among the most frequently used resources, demonstrating that nursing students actively leverage AI to refine their academic

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writing. While AI can indeed provide enhanced structure and coherence, it remains essential for students to engage critically with their work to ensure originality and depth.

Overall, the findings present a nuanced picture of how nursing students are engaging with AI in their academic pursuits. It is evident that the most significant interactions occur in the realms of research and writing, where AI tools offer considerable support in gathering information, organizing ideas, and refining written work. Students find these functionalities familiar and beneficial, akin to having an extra set of helping hands during the learning process. In contrast, AI tools for communication and simulated clinical practice receive considerably less attention. The intrinsically human nature of nursing communication, which is characterized by empathy, understanding, and real-time responsiveness, poses challenges for AI technologies, which have not yet achieved the same level of effectiveness. As a result, students may prefer direct interactions with peers and mentors, reinforcing the importance of personal connection over reliance on AI for professional communication.

Problem 4: The respondents' level of intent to adopt artificial intelligence in nursing education in terms of:

Table 9.1. Awareness of the different AI tools that can be utilized for learning

Awareness of the different AI tools that can be utilized for learning	**Mean**	**Standard Deviation**	**Verbal Interpretation**
4.1.1. I am aware of the different AI tools available for learning in nursing education.	3.22	0.665	Agree
4.1.2. I am aware that AI-based tools are helpful in improving my understanding of difficult nursing concepts.	3.35	0.623	Strongly Agree
4.1.3. I am aware that AI tools help me generate learning resources, such as flashcards and practice questions.	3.40	0.600	Strongly Agree
4.1.4. I am aware that AI tools are essential for modern nursing education because they provide personalized learning experiences.	3.23	0.684	Agree
4.1.5. I am aware that AI tools offer diverse learning resources.	3.28	0.619	Strongly Agree
	3.30		**Strongly Agree**

Scale: 1.00 - 1.75 (Strongly Disagree), 1.76 - 2.51 (Disagree), 2.52 - 3.27 (Agree), 3.28 - 4.00 (Strongly Agree)

This table's result shows a compelling glimpse into nursing students' growing relationship with artificial intelligence (AI) in their academic journey. With an overall mean of 3.30, the data reflects a strong level of agreement across all five awareness indicators suggesting that students are not only open to using AI but are increasingly recognizing its place in modern learning.

The highest level of agreement was observed in students' awareness that AI tools help generate personalized study aids, such as flashcards and practice questions (M = 3.40). This aligns with the emerging preference for self-paced, interactive learning environments, where students are able to reinforce content on their terms. Han et al. (2023) echoed this trend, observing that students favored AI for creating practice materials tailored to their weak points, enhancing not just memory retention but also learning confidence.

Students also strongly agreed that AI tools help them understand difficult nursing concepts (M = 3.35). This is especially important given the complexity and volume of information in nursing curricula. The ability to break down clinical topics, drug classifications, or pathophysiological mechanisms using generative AI allows learners to engage with the material in a more digestible, personalized way. This type of scaffolding

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complements traditional instruction and supports diverse learning styles, particularly for students who might struggle with high-stakes material when delivered via lecture alone (Han et al., 2023).

That said, the lowest score emerged in students' awareness of the *variety* of AI tools available (M = 3.22). This nuance is crucial. While students clearly value AI's functionality, many seem unaware of the breadth of tools that extend beyond common generative platforms. This limited familiarity may be a consequence of the informal, exploratory way in which many students adopt AI—often through peer influence or trial-and-error—without structured orientation or guidelines. Han et al. (2023) emphasized that without clear direction on the range of available tools and their pedagogical strengths, students may default to what's popular rather than what's most effective.

Other items revealed strong, but slightly lesser, agreement on AI's value in providing personalized learning (M = 3.23) and offering diverse educational resources (M = 3.28). These results signal that while students conceptually understand AI's capabilities, more consistent exposure to its adaptive and multimodal potential may be needed. AI-powered platforms that adjust content difficulty, simulate clinical cases, or deliver visual summaries are still underused not because students doubt their utility, but because they may not know they exist.

The data reveals that nursing students are increasingly aware of how AI can support their learning, especially when it comes to simplifying complex concepts and generating practical study aids. Their high level of agreement on these functions highlights a growing sense of trust in AI's role as a valuable educational partner. However, the lower awareness of specific tools and the full spectrum of AI capabilities remind us that interest alone isn't enough. Students need structured guidance, exposure, and digital literacy training to truly thrive in an AI-augmented academic environment. As nursing education continues to evolve, integrating technology shouldn't feel like an optional upgrade; it's becoming a foundational skill. With thoughtful curriculum planning, workshops, and ethical guidance, we can empower students not just to *use* AI, but to *use it wisely*, confidently, and with the compassion that nursing demands.

Table 9.2. Readiness to engage with AI technologies

Readiness to engage with AI technologies	**Mean**	**Standard Deviation**	**Verbal Interpretation**
4.2.1. I am ready to invest time and effort to be proficient in AI tools	2.99	0.619	Agree
4.2.2 I am ready to incorporate AI tools into my daily academic routines	3.10	0.559	Agree
4.2.3. I am adequately prepared to handle the challenges associated with AI integration in nursing education.	3.01	0.590	Agree
4.2.4. I am ready to use writing assistant AI tools to edit and refine my academic papers and assignments.	3.08	0.585	Agree
4.2.5. I am ready to utilize AI tools to enhance collaboration on group projects by providing shared platforms for improved organization and communication.	3.08	0.610	Agree
	3.05	**Agree**	

Scale: 1.00 - 1.75 (Strongly Disagree), 1.76 - 2.51 (Disagree), 2.52 - 3.27 (Agree), 3.28 - 4.00 (Strongly Agree)

The first item presents the statement*, "I am ready to invest time and effort to be proficient in AI tools."* Mean = 2.99, SD = 0.619 This score suggests that students are cautiously open to learning AI tools but may feel uncertain about the time and effort required. Their willingness is present, but perhaps not yet fully confident.

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Kwak et al. (2022) found that students' motivation to engage with AI is closely tied to their self-efficacy, those who feel more capable are more likely to invest time in developing AI proficiency.

For the second statement, *"I am ready to incorporate AI tools into my daily academic routines."* Mean = 3.10, SD = 0.559 This was the highest-rated item, indicating that students are most comfortable with the idea of using AI in their everyday academic tasks. It reflects a growing normalization of AI in study habits, such as using writing assistants or scheduling tools. According to Kwak et al. (2022), students with positive attitudes toward AI are more likely to integrate it into their routines, especially when they perceive it as helpful and easy to use.

The third statement*, "I am adequately prepared to handle the challenges associated with AI integration in nursing education."* Mean = 3.01, SD = 0.590 Students generally agree they're prepared, but the modest score suggests some lingering uncertainty, perhaps around ethical use, data privacy, or technical limitations. Kwak et al. (2022) emphasized that students' preparedness improves when they receive structured education on AI ethics and practical applications.

The fourth statement, *"I am ready to use writing assistant AI tools to edit and refine my academic papers and assignments."* Mean = 3.08, SD = 0.585 This score reflects strong readiness to use AI for academic writing. Students likely see these tools as helpful for improving grammar, clarity, and structure. Kwak et al. (2022) noted that writing support tools are among the most widely accepted forms of AI in nursing education, especially when students feel confident in their ability to use them responsibly.

For the fifth statement, *"I am ready to utilize AI tools to enhance collaboration on group projects by providing shared platforms for improved organization and communication."* Mean = 3.08, SD = 0.610 Students appear equally ready to use AI for teamwork, which is encouraging. It shows they recognize AI's potential not just for individual tasks, but also for improving group dynamics through shared documents, scheduling apps, or collaborative brainstorming tools. Kwak et al. (2022) found that students with higher self-efficacy and lower anxiety were more likely to embrace AI in collaborative settings.

The results show a student body that is open, curious, and cautiously optimistic about engaging with AI technologies. Nursing students are ready to incorporate AI into their everyday academic life especially in tasks like writing and collaboration, but they may need more structured support when it comes to building deeper confidence and technical proficiency. Their willingness is clear; what's needed now is guidance. By investing in AI literacy, ethical awareness, and hands-on experience, nursing programs can help students move from *ready* to *be empowered* not just as learners, but as future healthcare professionals equipped to thrive in an AI-integrated world.

Table 9.3. Barriers to adopting AI tools

Perceived barriers to adopting AI tools	**Mean**	**Standard Deviation**	**Verbal Interpretation**
4.3.1. I find it difficult to understand how AI tools can be applied effectively in my nursing studies.	2.35	0.683	Disagree
4.3.2. I lack the necessary technical skills to use AI tools effectively for academic purposes.	2.37	0.694	Disagree
4.3.3. The time required to learn how to use AI tools is a barrier to using them in my education.	2.39	0.713	Disagree
4.3.4. I feel that AI tools are too complex or difficult to integrate into my current study routine.	2.26	0.695	Disagree
4.3.5. I face access-related barriers, such as internet connectivity or	2.55	0.760	Agree

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device availability, which limit my use of AI tools in my studies.			
	2.38	**Disagree**	

Scale: 1.00 - 1.75 (Strongly Disagree), 1.76 - 2.51 (Disagree), 2.52 - 3.27 (Agree), 3.28 - 4.00 (Strongly Agree)

Despite the growing presence of artificial intelligence (AI) in education, the majority of nursing students in this study do not perceive significant barriers to utilizing AI. With an average mean score of 2.38, it appears that many students believe that the primary requirement for using AI effectively is simply the right encouragement. For example, when asked whether AI tools are too complicated or difficult to integrate into their daily study routines, students generally disagreed, reporting a mean score of 2.26. This indicates that, while AI may initially seem unfamiliar or daunting, most students do not find it intimidating once they have had the opportunity to work with it. This finding is encouraging, suggesting that increasing familiarity with AI may rely more on exposure and experience than on inherent complexity.

However, some respondents did express minor concerns regarding their understanding of how AI fits into their nursing education, reflected in a mean score of 2.35. They also reported slightly lower confidence in their technical skills related to AI, with a mean score of 2.37. While these concerns do not represent substantial obstacles, they serve as reminders that students are still in the process of navigating these new technologies. As noted by Ramadan et al. (2024), even when students exhibit a willingness to use AI, they often benefit from mentorship or training that helps them connect AI tools to their specific academic needs and contexts.

The most prominent concern identified among the respondents relates to access issues, such as the reliability of internet connections or the availability of devices, which has a mean score of 2.55. Although access was not perceived as a strong barrier overall, it remains an important issue for educators and institutions to address. When students do not have equal access to the necessary tools, it creates an uneven playing field that can hinder their ability to fully engage with AI technologies. This finding underscores the importance of addressing digital equity within nursing education. Although students demonstrate readiness to engage with AI technologies, disparities in access to devices, stable internet connectivity, and institutional infrastructure may widen competency gaps. Higher education institutions therefore carry a critical responsibility to ensure equitable technological access so that all future healthcare professionals are prepared for digitally enabled practice environments.

In summary, the findings suggest that these nursing students are more prepared to embrace AI than to resist its integration into their studies. The barriers they encounter are challenging but not insurmountable. With clearer guidance, concrete real-world examples of AI applications, and equitable access to technology, these obstacles can be navigated rather than merely observed.

Problem 5: The respondents' assessment on responsible AI tool utilization in terms of:

Table 10.1. Ethical Considerations

Ethical Considerations	**Mean**	**Standard Deviation**	**Verbal Interpretation**
5.1.1. I use AI responsibly to avoid plagiarism and academic dishonesty.	3.40	0.685	Strongly Agree
5.1.2. I believe it is important to acknowledge when AI tools contribute to academic work	3.33	0.584	Strongly Agree
5.1.3. I understand the importance of citing AI-generated content.	3.30	0.593	Strongly Agree
5.1.4. I recognize the need for AI ethics training.	3.31	0.665	Strongly Agree

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5.1.5. I am aware that AI-generated content may reflect bias present in its training data.	3.33	0.617	Strongly Agree
	3.33	**Strongly Agree**	

Scale: 1.00 - 1.75 (Strongly Disagree), 1.76 - 2.51 (Disagree), 2.52 - 3.27 (Agree), 3.28 - 4.00 (Strongly Agree)

As presented in Table 5.1, nursing student respondents exhibit a strong sense of ethical responsibility in their use of AI tools. The statement with the highest mean— "I use AI responsibly to avoid plagiarism and academic dishonesty" (mean = 3.40)—reflects a significant commitment to academic integrity. This demonstrates that students are not merely using AI for convenience but are aware of the academic boundaries and ethical implications involved.

Other high-scoring items include the importance of acknowledging AI contributions (mean = 3.33), understanding the need to cite AI-generated content (mean = 3.30), and being aware of potential biases in AI outputs (mean = 3.33). These responses indicate that the majority of nursing students are not only ethically conscious but also understand the nuanced implications of AI-assisted work, such as the risk of bias embedded in training data.

Interestingly, the statement "I recognize the need for AI ethics training" (mean = 3.31) suggests that while students are currently practicing responsible AI use, they still see value in receiving formal education on the subject. This implies a proactive attitude towards further strengthening their ethical foundation.

The composite mean of 3.33 across all items supports the conclusion that students strongly agree with the need for ethical conduct when integrating AI tools in their academic work. This is consistent with the findings of Smith & Johnson (2023), who emphasized the importance of ethical transparency, acknowledgment of AI's role in academic work, and the mitigation of bias. The responses highlight a readiness among students to responsibly use provided they are guided with proper institutional support.

The table presents important insights into the ethical considerations surrounding artificial intelligence (AI) utilization among nursing students, measured through mean scores and standard deviations for five key statements. The first statement, "I use AI responsibly to avoid plagiarism and academic dishonesty," received a mean score of 3.40, the highest among the group. This indicates that students generally believe they are using AI responsibly in this context, with a relatively low standard deviation of 0.685, suggesting a consensus on their ethical practices regarding plagiarism and academic integrity.

The second statement, emphasizing the importance of acknowledging AI's contributions to academic work, garnered a mean of 3.33. This score reflects students' recognition of the necessity for transparency when utilizing AI tools, and the low standard deviation of 0.584 further indicates broad agreement on this ethical obligation. For the statement concerning the understanding of the need to cite AI-generated content, the mean dropped slightly to 3.30, marking it as the lowest of the five. This result suggests that while students acknowledge the importance of citation, there may be gaps in their understanding of how to properly implement this practice in their academic work.

Regarding the recognition of the need for AI ethics training, the mean score was 3.31, indicating moderate awareness among students about the necessity for education in this area. The higher standard deviation of 0.665 suggests that opinions on the importance of formal training may vary among respondents, reflecting differing levels of certainty or perspectives on this topic. Lastly, the statement about awareness of bias in AI-generated content also scored a mean of 3.33, indicating a moderate awareness of this significant ethical concern, although, like the previous statement, it exhibited some variation in responses, with a standard deviation of 0.617.

In summary, the overall mean of 3.33 signifies a generally strong agreement among students concerning ethical considerations in AI usage. While there is a positive acknowledgment of ethical practices, there remain areas for improvement, particularly in understanding proper citation and the need for formal training in AI ethics.

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These results underscore the importance of developing comprehensive educational initiatives within the nursing curriculum that focus on the ethical implications of AI. By enhancing these areas, nursing education can equip students to navigate the complexities of AI's role in their future practice effectively.

Table 10.2. Accuracy and Reliability

Accuracy and Reliability	**Mean**	**Standard Deviation**	**Verbal Interpretation**
5.2.1. I understand the potential risks of misinformation when using AI-generated content.	3.56	0.497	Strongly Agree
5.2.2. I thoroughly evaluate AI-generated content before trusting it	3.52	0.557	Strongly Agree
5.2.3. I should develop a more extensive approach to verifying data for accuracy	3.50	0.549	Strongly Agree
5.2.4. I often cross-verify information provided by AI tools with reliable sources.	3.46	0.607	Strongly Agree
5.2.5. I am responsible enough to search data coming from reliable sources.	3.51	0.530	Strongly Agree
	3.51	**Strongly Agree**	

Scale: 1.00 - 1.75 (Strongly Disagree), 1.76 - 2.51 (Disagree), 2.52 - 3.27 (Agree), 3.28 - 4.00 (Strongly Agree)

In Table 5.2, the dimension of Accuracy and Reliability also received high ratings, indicating that nursing students are critically aware of the need to assess the correctness and trustworthiness of AI-generated information. The highest-rated statement— "I understand the potential risks of misinformation when using AI-generated content" (mean = 3.56)—underscores a high level of vigilance regarding the accuracy of digital outputs.

The mean scores for other items, such as evaluating AI content before trusting it (3.52), cross-verifying with reliable sources (3.46), and being responsible in using credible information (3.51), reflect a culture of critical thinking. These findings imply that students do not passively accept AI outputs; instead, they are actively engaged in validating information.

Notably, the statement "I should develop a more extensive approach to verifying data for accuracy" (mean = 3.50) suggests that students are aware of the limitations in their current practices and express a willingness to improve. This aligns with the research of Smith and Kumar (2023), who emphasized the growing need for digital literacy and critical evaluation skills in the context of AI-driven education.

The consistently strong agreement scores suggest a mature and responsible attitude toward ensuring the reliability of AI-generated academic content. Students are mindful of the risks of misinformation and demonstrate the capacity to uphold academic standards through verification and evaluation of AI outputs.

Table 10.3. Data Privacy and Security

Data Privacy and Security	**Mean**	**Standard Deviation**	**Verbal Interpretation**
5.3.1. I avoid uploading sensitive data to AI tools.	3.57	0.515	Strongly Agree

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5.3.2. I understand the privacy implications of using AI.	3.55	0.518	Strongly Agree
5.3.3. I believe the institution should require consent agreements before using AI-based tools that collect data.	3.49	0.575	Strongly Agree
5.3.4. I believe the use of AI tools in my nursing education should prioritize maintaining confidentiality and data protection measures.	3.49	0.539	Strongly Agree
5.3.5. I understand the importance of knowing how my data is stored and used by AI applications to ensure it is handled responsibly.	3.50	0.539	Strongly Agree
	3.52	**Strongly Agree**	

Scale: 1.00 - 1.75 (Strongly Disagree), 1.76 - 2.51 (Disagree), 2.52 - 3.27 (Agree), 3.28 - 4.00 (Strongly Agree)

The results in Table 5.3 reveal that nursing students are highly conscious of data privacy and information security when using AI tools. The highest mean score— "I avoid uploading sensitive data to AI tools" (mean = 3.57)—demonstrates a strong understanding of the potential risks associated with data exposure. This is a vital aspect in healthcare education, where privacy and confidentiality are paramount.

Students also expressed strong agreement with understanding privacy implications (mean = 3.55) and showed support for institutional policies such as requiring consent agreements (mean = 3.49). These findings suggest that students are not only protecting their personal data but also acknowledge the broader ethical obligations of data protection in educational and clinical settings.

The item "I understand how my data is stored and used by AI tools" (mean = 3.50), while rated highly, may also hint at an area for further education, given the complex nature of data handling by AI platforms. Nursing students exhibit a strong commitment to data privacy, showing an informed and cautious approach to AI interaction. Their responses indicate not just personal vigilance, but also a desire for structured institutional mechanisms that support ethical AI usage.

Table 10.4. Human Oversight and Critical Thinking

Human Oversight and Critical Thinking	**Mean**	**Standard Deviation**	**Verbal Interpretation**
5.4.1. I ensure that AI-generated content supports, rather than replaces, my critical thinking and academic work.	3.36	0.616	Strongly Agree
5.4.2. I rely on human judgment over AI-generated answers when they conflict.	3.35	0.638	Strongly Agree
5.4.3. I carefully evaluate the recommendations provided by AI tools to avoid producing misleading information in my academic work.	3.48	0.539	Strongly Agree
5.4.4. I am prepared to challenge AI conclusions when they conflict with my professional knowledge or experiences.	3.49	0.602	Strongly Agree
5.4.5. I enhance my learning outcomes and improve my ability to make informed decisions in my nursing education by combining critical	3.42	0.569	Strongly Agree

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thinking with AI utilization.			
	3.39	**Strongly Agree**	

Scale: 1.00 - 1.75 (Strongly Disagree), 1.76 - 2.51 (Disagree), 2.52 - 3.27 (Agree), 3.28 - 4.00 (Strongly Agree)

Table 8.4 indicates that students highly value human oversight and critical thinking when engaging with AI tools. The highest scoring item— "I evaluate AI recommendations to avoid misleading conclusions" (mean = 3.48)—illustrates that students actively engage in judgment and scrutiny rather than uncritical acceptance of AI output.

Students also agreed that AI should support, not replace, academic thinking (mean = 3.36), and that human judgment should prevail when AI outputs conflict (mean = 3.35). These items highlight the balance students are trying to maintain between embracing technological assistance and preserving intellectual independence.

Additionally, the statement "I combine critical thinking with AI to improve decisions" (mean = 3.42) reflects an integrated approach, where AI tools are used as enhancements rather than substitutes for cognitive processes. This reinforces the idea that human oversight remains essential, especially in nursing education where clinical reasoning and ethical judgment are indispensable. The findings affirm that students recognize the value of maintaining human control and thoughtfulness when working with AI tools.

Problem 6: Significant relationship between:

Table 11. Spearman Rho Correlation

Spearman	**Correlation**
0.70	Very Strong Relationship
0.40-0.69	Strong Relationship
0.30-0.39	Moderate Relationship
0.20-0.29	Weak Relationship
0.01-0.19	No or negligible relationship

(Adapted From Dancey & Reidy, 2004) In this study, hypothesis testing was conducted at an alpha level (level of significance) of 0.05, which means that any p-value less than 0.05 was considered statistically significant. This threshold indicates that the probability of observing the results by chance is less than 5%, justifying the rejection of the null hypothesis.

For correlation analyses using Spearman's rho, the degrees of freedom (df) were computed as df = n – 2, where *n* represents the sample size. For instance, with a total of 202 respondents, the degrees of freedom equaled 200. This df is used to interpret the significance of the correlation coefficient.

In cases where chi-square tests were applied, degrees of freedom were calculated using the formula df = (r – 1) × (c – 1), where *r* is the number of rows and *c* is the number of columns in the contingency table. The chi-square statistic obtained from the data was then compared to the critical value from chi-square distribution tables based on the corresponding degrees of freedom and the alpha level. If the computed chi-square value was greater than the critical value, the null hypothesis was rejected, indicating a statistically significant association between the variables tested.

These procedures ensured that the study's findings on the relationships between AI tool utilization, extent of use, intent to adopt, and responsible use were rigorously evaluated for statistical significance. The

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interpretations of correlation coefficients and p-values followed the guidelines adapted from Dancey & Reidy (2004), which categorize the strength of correlation and significance levels for non-parametric data analysis.

Table 11.1. Level of Utilization of AI tools and Extent of Utilization in academics

Variables	Spearman's rho	df	p-value	Decision	Remarks
Level of Utilization of AI tools and Extent of Utilization in Academics	0.365	200	<0.001	Accept Ha1	Significant Relationship

Note: *A Spearman's rho value of 0.365 indicates a moderate positive relationship, which suggests that if one variable increases, the other variable also increases. A p-value of <0.001 is lower than the alpha level of 0.05, which means that the null hypothesis is rejected. Therefore, there is a significant correlation between the respondents' level of utilization of AI tools and the extent of utilization of AI tools.*

The Spearman's rho value of 0.365 reveals a moderate positive correlation between nursing students' level of AI tool utilization and the extent to which they incorporate these tools into their academic activities. This correlation coefficient provides insight into the strength and direction of the monotonic relationship between two ranked variables. Specifically, it suggests that an increase in the frequency of AI tool usage correlates with a greater degree of application across various academic tasks, such as literature reviews, personalized learning, and AI-assisted writing.

To derive this value, data from a sample of 202 respondents were analyzed by ranking their responses concerning both how frequently they utilize AI tools and the extent of their integration into academic work. The Spearman's rho was employed as a nonparametric measure, which is particularly suitable for ordinal data or datasets that do not follow a normal distribution. With degrees of freedom set at 200 (total sample size minus 2), the analysis determines the critical value necessary for evaluating the significance of the correlation coefficient. The significance of this correlation is further emphasized by the p-value associated with it, which was found to be less than 0.001. This indicates a less than 0.1% probability that the observed correlation is due to random sampling variability. Given that this p-value is significantly lower than the conventional alpha threshold of 0.05, the researchers confidently reject the null hypothesis, which posits that there is no relationship between AI utilization and the extent of its use. This statistic suggests that the moderate positive correlation observed is unlikely to have arisen by chance.

According to Dancey and Reidy (2004), a correlation coefficient ranging from 0.10 to 0.39 is categorized as weak to moderate, positioning our findings at 0.365 squarely within the moderate association range. This implies that nursing students who report higher levels of AI tool usage are also more inclined to utilize these tools extensively across various academic tasks. This trend reflects an increasing integration of AI technologies into educational frameworks, signifying a growing comfort and reliance on AI to support diverse learning activities.

In conclusion, the analysis not only highlights the relationship between AI utilization and its academic integration but also reinforces the importance of promoting responsible and effective AI tool use. Encouraging nursing students to harness AI tools thoughtfully can potentially enhance their learning outcomes and better prepare them for the evolving landscape of healthcare education. As educational institutions continue to adapt to technological advancements, fostering a culture that values responsible AI usage will be crucial in shaping future nursing professionals.

Table 11.2. Intent to Adopt

Variables	Spearman's rho	df	p-value	Decision	Remarks
Awareness	0.103	200	0.146	Accept Ho2	Not Significant

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Readiness	0.089	200	0.210	Accept Ho2	Not Significant
Barriers	0.148	200	0.036	Accept Ha2	Significant Relationship

Note: *Spearman's rho was used to determine the relationship between awareness, readiness, and perceived barriers and the level of utilization of AI tools. The level of significance was set at α = 0.05. A p value less than 0.05 indicates a significant relationship and acceptance of the alternative hypothesis, while a p value greater than 0.05 indicates acceptance of the null hypothesis.*

The table presents the results of a Spearman's rho correlation analysis, which is commonly used to assess the strength and direction of relationships between ranked variables. In this context, three factors were evaluated: Awareness, Readiness, and Barriers, each accompanied by their respective Spearman's rho coefficients (0.103, 0.089, and 0.148), degrees of freedom (df = 200), and p-values.

Spearman's rho values indicate the strength of the correlation between these factors; a value closer to 1 suggests a strong positive correlation, while a value closer to -1 implies a strong negative correlation. The values observed here are relatively low, suggesting weak correlations overall. For instance, Awareness has a rho of 0.103, indicating a slight positive relationship, but the p-value of 0.146 suggests that this correlation is not statistically significant at the typical alpha level of 0.05. Similarly, Readiness shows a rho of 0.089 with a p-value of 0.210, further emphasizing a lack of significance and a weak correlation with the variables studied.

However, the most interesting finding emerges with the Barriers factor, which exhibits a rho of 0.148 and a p-value of 0.036. This result is significant because the p-value is below the 0.05 threshold, suggesting that there is a statistically meaningful correlation between Barriers and the other variables considered. The positive rho indicates that as the perceived barriers increase, there may be a tendency for the other factors (Awareness and Readiness) to increase as well, albeit the relationship remains weak.

In summary, while Awareness and Readiness do not show significant correlations with the context of the study, the Barriers variable presents a noteworthy and statistically significant correlation, which could prompt further investigation into how barriers influence other factors in this dataset. The implications of these findings are important in understanding the dynamics at play and can guide future research or practical applications in addressing barriers effectively.

Table 11.3. Level of Utilization of AI tools and Intent to Adopt AI

Variables	**Spearman's rho**	**df**	**p-value**	**Decision**	**Remarks**
Level of Utilization of AI tools and Intent to Adopt AI	0.143	200	0.043	Accept Ha3	Significant Relationship

Note: *Spearman's rho was used to determine the relationship between variables. The level of significance was set at α = 0.05. A p value less than 0.05 indicates a statistically significant relationship and warrants rejection of the null hypothesis. Correlation coefficients were interpreted as follows, negligible to weak correlations indicate limited strength of association despite statistical significance.*

A Spearman's rho value of 0.143 indicates a weak positive relationship, which suggests that if one variable increases, the other variable slightly increases. A p-value of 0.043 is a bit lower than the alpha level of 0.05, which means that the null hypothesis is rejected. Therefore, there is a significant correlation between the respondents' level of utilization of AI tools and the intent to adopt AI tools.

The findings from the study indicate a weak positive relationship between the respondents' level of utilization of AI tools and their intent to adopt these tools, as evidenced by a Spearman's rho value of 0.143. This suggests that while there is a correlation, it is not particularly strong; as one variable increases, the other variable tends to increase slightly. Nonetheless, the significance of this relationship is underscored by a p-value of 0.043,

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which falls below the conventional alpha level of 0.05. This allows us to reject the null hypothesis, confirming that there is a statistically significant correlation present.

In practical terms, this finding highlights the importance of fostering greater utilization of AI tools among respondents, as even a slight increase in usage could potentially enhance their intent to adopt these technologies more broadly. This insight is crucial for institutions looking to encourage AI adoption, as it suggests that initiatives aimed at increasing familiarity and usage could be beneficial. Furthermore, understanding this correlation can inform targeted strategies to improve engagement with AI tools, ultimately leading to higher adoption rates. While the weak positive relationship indicates room for improvement, the statistical significance emphasizes that efforts in this area are likely to yield meaningful results.

Table 11.4. Assessment of responsible AI tool utilization

Variables	**Spearman's rho**	**df**	**p-value**	**Decision**	**Remarks**
Ethical Considerations	-0.038	200	0.591	Accept Ho3	Not significant
Accuracy and Reliability	-0.083	200	0.242	Accept Ho3	Not significant
Data Privacy and Security	-0.114	200	0.107	Accept Ho3	Not significant
Human Oversight and Critical Thinking	-0.133	200	0.059	Accept Ho3	Not significant

***Note**: Spearman's rho was used to assess the relationship between responsible AI utilization factors and the level of utilization of AI tools. Statistical significance was evaluated at $\alpha = 0.05$. All p values exceeded the significance level, indicating acceptance of the null hypothesis and absence of significant relationships.*

The table provides a statistical analysis of various dimensions of responsible AI tool utilization, utilizing Spearman's rho to determine the correlation between levels of utilization and specific ethical considerations. Spearman's rho is a measure of rank correlation, indicating how well the relationship between two variables can be described with a monotonic function. The provided data points focus on four critical aspects of AI utilization: ethical considerations, accuracy and reliability, data privacy and security, and human oversight and critical thinking.

Starting with ethical considerations, the Spearman's rho value is -0.038, suggesting a very weak negative correlation, which essentially implies no significant relationship between the level of AI tool utilization and ethical considerations. The corresponding p-value of 0.591 is quite high, indicating that the result is not statistically significant. This suggests that increased utilization of AI tools does not necessarily correlate with an improvement or decline in ethical considerations, hinting at a potential oversight in integrating ethical frameworks into AI deployment practices.

Next, accuracy and reliability revealed a Spearman's rho of -0.083, again indicating a very weak negative correlation. The p-value of 0.242 remains above the common threshold of 0.05 for statistical significance, reinforcing the notion that there is no robust relationship between the level of AI tool utilization and the perceived accuracy and reliability of AI outputs. This could point to concerns that as the utilization of AI tools increases, there might not be proportional enhancements in their accuracy, possibly due to inadequate oversight or maintenance of standards during deployment.

The third aspect, data privacy and security, displays a Spearman's rho of -0.114, coupled with a p-value of 0.107. While this suggests a slightly more pronounced negative correlation compared to the previous variables, it remains statistically insignificant. This raises alarms about whether higher levels of AI tool utilization have been implemented with respect to data protection norms. The implications could be troubling, suggesting that organizations may prioritize deployment over safeguarding user data, potentially compromising user privacy and security.

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Lastly, human oversight and critical thinking reveal a Spearman's rho of -0.133, with a p-value of 0.059. This correlation is somewhat stronger than the previous metrics and borders on statistical significance. It suggests that as the utilization of AI tools increases, there is a potential decrease in human oversight and critical thinking involvement. This trend could be particularly concerning, as it implies that organizations may be relying excessively on AI without adequate human intervention, which could have detrimental effects on decision-making processes that require human judgment and ethical considerations.

In summary, the correlations analyzed reveal an underlying concern regarding the responsible use of AI tools. The consistently high p-values indicate that, while there are some negative correlations, they lack statistical significance, underscoring the need for further research. Organizations may need to bridge the gap between AI tool utilization and ethical frameworks to ensure responsible implementation, particularly in the realms of accountability, accuracy, data security, and human oversight. Without addressing these issues, the long-term ramifications could pose significant risks in technological practices.

Table 11.5. Level of utilization and the assessment of responsible AI tool utilization

Variables	Spearman's rho	df	p-value	Decision	Remarks
Responsible AI tool Utilization & Level of Utilization of AI tools	-0.098	200	0.166	Accept Ho3	Not significant

Note: *Spearman's rho was used to examine the relationship between responsible AI tool utilization and the level of utilization of AI tools. The level of significance was set at α = 0.05. The p value indicates acceptance of the null hypothesis, showing no statistically significant relationship between the variables.*

A Spearman's rho value of -0.098 indicates a negligible relationship, which suggests that there's no association between the variables. A p-value of 0.166 is higher than the alpha level of 0.05, which means that the null hypothesis is retained (i.e., failed to reject the null hypothesis). Therefore, there is no significant correlation between the respondents' level of utilization of AI tools and the assessment of responsible AI tool utilization.

The analysis of AI tool utilization, with particular emphasis on responsible AI tool utilization, yields noteworthy statistical insights as indicated by a Spearman's rho of -0.098, a degree of freedom (df) of 200, and a p-value of 0.166. Spearman's rho serves as a measure of the strength and direction of association between two ranked variables, suggesting a very weak negative correlation in this context. A rho value approaching zero signifies that, within the parameters of this study, the relationship between responsible AI tool utilization and the variable in question is minimal.

The negative correlation observed may suggest that as one variable increases, there is a slight tendency for the other to decrease. However, the magnitude of -0.098 indicates that this association is insufficient to be deemed both statistically significant and practically meaningful. Additionally, the p-value of 0.166 surpasses the conventional significance threshold of 0.05, thereby indicating that the results do not achieve statistical significance. Consequently, we cannot reject the null hypothesis, implying that any observed correlation may be attributable to random chance rather than an authentic underlying relationship.

Problem 7: Significant difference in the level of utilization of artificial intelligence tools among nursing students and the intent to adopt artificial intelligence in their nursing education in the selected higher education institution

Table 12.1. Significant difference in Level of AI utilization and Intent to Adopt

Variables	x3	df	p-value	Decision	Remarks
Awareness	2.70	3	0.440	Accept Ho4	Not Significant

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Readiness	6.98	3	0.073	Accept Ho4	Not Significant
Barriers	9.76	3	0.021	Accept Ha4	Significant Difference
Overall Intent to Adopt	8.38	3	0.039	Accept Ha4	Significant Difference

Note: *x^3 values were used to examine the relationship between the variables and intent to adopt AI. Statistical significance was set at $\alpha = 0.05$. P values below 0.05 indicate significant differences, while p values above 0.05 indicate no significant differences.*

Based on the table, the awareness and readiness under intent to adopt AI has a lower Kruskal-Wallis value than the critical value (df = 3, critical value = 7.815). This means that there's no significant difference between the respondents' level of utilization of AI tools and their readiness and awareness in adopting AI tools.

Additionally, each has a higher p-value than the alpha level of 0.05. This suggests that the level of utilization of AI tools did not significantly vary in respondents' awareness and readiness in adopting AI tools.

On the other hand, the barriers in adopting AI tools have a higher Kruskal-Wallis value than the critical value (df = 3, critical value = 7.815). This means that there's a significant difference between the respondents' level of utilization of AI tools and the barriers to adopting AI tools. Moreover, it has a lower p-value than the alpha level of 0.05. This suggests that the level of utilization of AI tools significantly varies in respondents' barriers to adopting AI tools.

The overall intent to adopt AI tools has a higher Kruskal-Wallis value than the critical value (df = 3, critical value = 7.815). This means that there's a significant difference between the respondents' level of utilization of AI tools and their intent to adopt AI tools. Moreover, it has a lower p-value than the alpha level of 0.05. This suggests that the level of utilization of AI tools significantly varies in respondents' intent to adopt AI tools.

The Kruskal-Wallis test results indicate that awareness and readiness under the intent to adopt AI have a lower Kruskal-Wallis value than the critical value of 7.815 (with 3 degrees of freedom). This finding implies that there is no significant difference in the respondents' levels of utilization of AI tools relative to their awareness and readiness to adopt such tools. Essentially, this suggests that differences in how well respondents recognize and prepare for AI adoption do not translate into noticeable variations in their actual usage of AI technologies. The higher p-values associated with this analysis, which exceed the standard alpha level of 0.05, further reinforce this conclusion, indicating a lack of statistical significance. Therefore, it can be inferred that simply being aware of AI tools or feeling ready to use them does not correlate strongly with their utilization among respondents.

Conversely, when examining the barriers to adopting AI tools, the data tell a different story. Here, the Kruskal-Wallis value exceeds the critical value of 7.815, suggesting a significant difference in the level of AI tool utilization in relation to the barriers faced by respondents. In this context, the barriers seem to substantially impact whether individuals engage with AI technologies. Additionally, the lower p-value in this section, which falls below the alpha level of 0.05, indicates that these barriers do indeed lead to statistically significant variations in AI tool usage. This suggests that the challenges or obstacles that respondents encounter when considering adopting AI, such as lack of resources, training, or familiarity with technology, play a crucial role in determining whether or not they utilize AI tools.

Moreover, when evaluating the overall intent to adopt AI tools, the results reveal a similarly significant pattern. The Kruskal-Wallis value again surpasses the critical threshold of 7.815, emphasizing a notable difference in utilization levels stemming from respondents' intent to adopt AI tools. The corresponding low p-value, which is also below the alpha level of 0.05, strongly indicates that individual intent significantly influences how actively respondents engage with AI technologies. Here, motivation and willingness to integrate AI into existing workflows are pivotal factors that appear to drive utilization, distinguishing it from the awareness and readiness factors that previously showed no significant correlation.

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Table 12.2. Significant difference in Age Range

Variables	x3	df	p-value	Decision	Remarks
Level of Utilization of AI Tools	3.77187	3	0.287	Accept Ho4	Not Significant
Intent to Adopt AI Tools	0.00897	3	1.000	Accept Ho4	Not Significant

Note: *Kruskal-Wallis (x^3) tests were used to examine differences in the level of utilization and intent to adopt AI tools across groups. Statistical significance was set at $\alpha = 0.05$. P values above 0.05 indicate no significant differences, supporting acceptance of the null hypothesis.*

Based on the table, the level of utilization and intent to adopt AI tools has a lower Kruskal-Wallis value than the critical value (df = 3, critical value = 7.815). This means that there's no significant difference between respondents' age range and their level of utilization and intent to adopt AI tools.

Additionally, it has a higher p-value than the alpha level of 0.05. This suggests that the age range did not vary in the respondents' level of utilization and intent to adopt AI tools.

The Kruskal-Wallis test, employed to assess the relationship between respondents' age ranges and their levels of utilization and intention to adopt AI tools, indicates no significant differences among the groups. The Kruskal-Wallis value fell below the critical value of 7.815, with degrees of freedom set at 3, confirming that age does not play a pivotal role in influencing how respondents engage with or plan to adopt AI technologies.

Furthermore, the observed p-value exceeded the significance threshold of 0.05, reinforcing the conclusion that variations in age do not significantly impact the respondents' attitudes or behaviors regarding AI tool utilization. This finding suggests a homogeneity of intent and capability across different age groups, indicating that factors other than age may be more influential in shaping individuals' engagement with AI tools.

The analysis indicates that there is no significant difference in the levels of utilization and intent to adopt AI tools across different age ranges, according to the Kruskal-Wallis test results. With a value falling below the critical threshold of 7.815 and a p-value exceeding the significance level of 0.05, it becomes evident that age is not a determining factor in how individuals engage with or plan to utilize AI technologies. This outcome suggests a level of homogeneity among respondents, implying that regardless of age, individuals may share similar intentions and abilities regarding AI tool adoption.

Moreover, the absence of significant age-related differences facilitates a broader conversation about the contemporary landscape of technological interaction. The proliferation of digital technologies may have contributed to a growing comfort and willingness among all age groups to engage with AI tools. This evolution can be attributed to the increasing integration of technology in everyday life and education, creating an environment where even older or non-traditional students feel empowered to adopt these tools.

Table 12.3. Significant difference in Sex

Variables	x3	df	p-value	Decision	Remarks
Level of Utilization of AI Tools	0.0495	1	0.824	Accept Ho4	Not Significant
Intent to Adopt AI Tools	1.5206	1	0.218	Accept Ho4	Not Significant

Note: *Kruskal-Wallis (x^3) tests were used to examine differences in the level of utilization and intent to adopt AI tools between two groups. Statistical significance was set at $\alpha = 0.05$. P values above 0.05 indicate no significant differences, supporting acceptance of the null hypothesis.*

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Based on the table, the level of utilization and intent to adopt AI tools has a lower Kruskal-Wallis value than the critical value (df = 1, critical value = 3.841). This means that there's no significant difference between respondents' sex and their level of utilization and intent to adopt AI tools.

Additionally, it has a higher p-value than the alpha level of 0.05. This suggests that sex did not vary in the respondents' level of utilization and intent to adopt AI tools.

The data indicates that the level of utilization and intent to adopt AI tools does not significantly differ between sexes, as evidenced by a lower Kruskal-Wallis value than the critical threshold (df = 1, critical value = 3.841). The corresponding p-value surpasses the commonly accepted alpha level of 0.05, reinforcing the conclusion that sex does not play a pivotal role in influencing the respondents' engagement with AI tools. This finding is significant, especially in contexts where gender-based perceptions and behaviors toward technology may vary.

The findings from the current study, which indicate no significant difference between sexes in the level of utilization and intent to adopt AI tools, provide a contrasting perspective to the research conducted by Ofosu-Ampong (2023). While the former suggests that sex does not influence engagement with AI tools among respondents, Ofosu-Ampong's study highlights the persistent gender disparities in the context of higher education in Ghana. Specifically, it claims that girls' participation in STEM subjects and subsequent use of AI tools lags that of boys due to various sociocultural factors, including the belief that STEM fields are predominantly male domains.

The contrasting results between these studies may indicate that contextual factors greatly influence gender dynamics related to technology adoption. In the study of Ofosu-Ampong (2023), the emphasis is on educational environments where gendered perceptions may significantly impact students' confidence and willingness to engage with AI-based tools. Conversely, the lack of significant gender differences found in the current study could suggest that in more diverse or advanced contexts, the barriers associated with gender norms may be diminishing, leading to an equal intent to adopt AI technologies.

Furthermore, Ofosu-Ampong advocates for institutional interventions to encourage greater engagement among women with AI technologies, which highlights the importance of proactive measures in addressing gender biases and fostering an inclusive environment for technology adoption. This positions the findings of the two studies in a broader conversation about how gender impacts technology utilization, suggesting that while some contexts may show parity in engagement, others, particularly in educational settings, continue to face challenges rooted in societal beliefs and educational practices. Thus, it underscores the necessity for targeted programs that can bridge these gaps in various contexts, ultimately contributing to a more equitable landscape for technology integration across genders.

Table 12.4. Significant Difference in Year Level

Variables	**x3**	**df**	**p-value**	**Decision**	**Remarks**
Level of Utilization of AI Tools	9.48	3	0.024	Accept Ha4	Significant Difference
Intent to Adopt AI Tools	2.09	3	0.553	Accept Ho4	Not Significant

Note: *Kruskal-Wallis (x^3) tests were used to examine differences in the level of utilization and intent to adopt AI tools across groups. Statistical significance was set at $\alpha = 0.05$. P values below 0.05 indicate significant differences, while p values above 0.05 indicate no significant differences.*

Based on the table, the intent to adopt AI tools has a lower Kruskal-Wallis value than the critical value (df = 3, critical value = 7.815). This means that there's no significant difference between respondents' year level and their intent to adopt AI tools.

Additionally, it has a higher p-value than the alpha level of 0.05. This suggests that the year level did not vary in the respondents' intent to adopt AI tools.

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On the other hand, the level of utilization of AI tools has a higher Kruskal-Wallis value than the critical value (df = 3, critical value = 7.815). This means that there's a significant difference between the respondents' year level and their level of utilization of AI tools. Moreover, it has a lower p-value than the alpha level of 0.05. This suggests that the year level significantly varies in respondents' level of utilization of AI tools.

The analysis reveals a nuanced relationship between the year level of students and their engagement with AI tools. The findings indicate that while there is no significant difference in respondents' intent to adopt AI tools across different year levels—grounded in a Kruskal-Wallis value that falls below the critical threshold, there is, conversely, a significant difference in the actual utilization of AI tools, as indicated by a higher Kruskal-Wallis value. This pattern suggests that although students from various year levels may express a similar interest in adopting AI technologies, their actual engagement levels diverge, hinting at potential external factors that influence the transition from intent to action.

Moreover, the data indicates that most students perceive little disconnect between the technology used in high school and that of university may suggest that a foundational level of digital literacy exists across year levels. However, it is the sustained engagement and familiarity cultivated over time that seemingly drives the actual utilization of AI tools. Overall, this relationship emphasizes the importance of establishing strong digital literacy programs and supportive measures to enhance both the intent and use of AI tools among all students, particularly those in their first year, helping to equalize the experience across different academic years.

The indicators examined in this study may be interpreted as health-related determinants influencing artificial intelligence utilization and adoption within a higher education setting. Awareness and readiness reflect individual-level determinants, perceived barriers represent contextual and institutional determinants, while responsible use captures ethical and professional determinants relevant to nursing practice. The statistically significant associations identified between these determinants and both AI utilization and intent to adopt provide quantified evidence of their influence. These linkages form an empirical basis for the development of institutional guidelines aimed at promoting the proper, ethical, and equitable utilization of artificial intelligence in nursing education.

Problem 8: Based on the findings, what guidelines may be developed for proper AI utilization?

Title: Proposed Guidelines for the Responsible Utilization of Artificial Intelligence by Nursing Students at Mary Chiles College

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I. Rationale

- AI tools like ChatGPT, Grammarly, and Quillbot are increasingly used by nursing students, especially for academic writing and research. The study revealed moderate usage, readiness to adopt, and a growing ethical awareness. However, students still face barriers like limited AI literacy, lack of training, and concerns about data privacy and over-reliance. The findings therefore underscore the need for structured guidelines to ensure responsible utilization and proper support as students navigate this technological advancement with their nursing education.

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II. Objectives:

General Objective

- To propose guidelines for the responsible, ethical, and effective integration of artificial intelligence (AI) into nursing education at Mary Chiles College, based on the findings on students' actual utilization, intent to adopt, ethical awareness, and perceived barriers, guided by the University of the Philippines' Responsible AI principles.

Specific Objectives

- To describe the moderate level of AI utilization among nursing students in academic work.
- To present students' moderate intent to adopt AI and readiness.
- To identify barriers such as lack of access, training, and ethical uncertainties.
- To highlight students' ethical awareness, particularly in human oversight and data privacy.
- To propose contextualized guidelines grounded in study results and the UP's Responsible AI Guidelines**.**

III. Target Beneficiaries: Nursing Students at Mary Chiles College

IV. Proposed Guiding Principles (as part of the Proposed Guidelines)

1. **AI as a Learning Aid, not a Substitute**

AI should support academic tasks, but students must still think critically and produce their own work.

2. **Academic Integrity and Disclosure**

All AI use must be properly declared. Submitting AI-generated content without acknowledgment is dishonest.

3. **Human Oversight and Critical Evaluation**

AI output must be verified. When in doubt, follow evidence-based nursing practices.

4. **Respect for Data Privacy**

Never input real patient or personal data into AI tools. Use only hypothetical or anonymized information.

5. **Equity and Access**

The school should help provide basic access to AI tools and internet so all students can benefit.

6. **AI Literacy for Students and Faculty**

Students and teachers must receive orientation or training on how to use AI responsibly.

7. **Continuous Policy Review**

These guidelines should be reviewed regularly to keep up with changes in AI and student needs.

V. Roles and Responsibilities

1. **Students**

- Use AI for learning tasks (e.g., writing, summarizing) while ensuring output reflects personal understanding.
- Always declare AI use in written assignments (see declaration template).
- Verify AI outputs with trusted references.
- Never enter personal, clinical, or patient-identifying data into AI systems.

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2. Faculty

- Clearly communicate course-specific AI policies.
- Integrate brief discussions or modules on ethical and practical AI use.
- Emphasize the importance of critically appraising AI-generated information.

3. Administration

- Provide access to campus Wi-Fi and cost-free AI tools (e.g., Grammarly, ChatGPT free tier).
- Organize annual AI ethics orientation and literacy briefings.
- Periodically review AI policies and update based on student needs and tech changes.

4. Citation and Acknowledgment of AI Use

- All submissions involving AI use must include a declaration.

Sample Declaration:

"AI tools (e.g., ChatGPT, Grammarly) were used for grammar checking and idea generation. All content and analysis are my own."

- Improper use (e.g., full AI-generated essays, no disclosure) is considered academic dishonesty.

V. Monitoring and Continuous Improvement

- The guidelines shall be reviewed annually or as needed.
- Feedback from students and faculty will be gathered to assess the relevance and effectiveness of AI-related practices.
- AI literacy and responsible use will be evaluated through formative assessments and feedback surveys

Figure 7. Infographics "Shaping Tomorrow's Nurses: Ethical and Responsible Use of Generative AI for Nursing Students"

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SUMMARY, CONCLUSIONS, RECOMMENDATIONS

This chapter represents the summary of findings, conclusions, and recommendations.

Summary of Findings

1. The survey indicated that a significant portion of nursing students (56.4%) falls within the 18 to 20 age range, which aligns with the expectation that many are first- or second-year students transitioning from high school. The second largest group, those aged 21 to 25, represented 40.6% of respondents and likely consisted of upper-year students.

This age distribution was characterized by the undergraduate nursing programs in the Philippines, where older students (aged 26 to 30 at 0.5% and over 31 at 2.5%) were notably underrepresented. This lack of older students may influence how technology, specifically AI tools, is perceived and adopted within the institution.

The findings revealed that the majority of respondents are female, with 169 individuals accounting for 83.7% of the sample. In contrast, male respondents total 33, making up 16.3% of the participants. This data highlights a significant gender disparity within the sample, indicating that female students are overwhelmingly more represented than their male counterparts.

The findings showed the distribution of respondents by year level in the nursing program. Level I students comprised the largest group, with 67 participants representing 33.2% of the sample. Level II students accounted for 54 respondents, or 26.7%, while Level III students make up 56 individuals, representing 27.7%. Finally, Level IV students are the smallest group, with 25 respondents, which is 12.4% of the total. This distribution reflects varying levels of participation across the different year levels in the nursing program.

2. The findings on the utilization of various AI tools indicated differing levels of engagement among respondents. ChatGPT, Quillbot, and Grammarly were identified as moderately utilized tools, each received a median score of 3.00. In contrast, Google Gemini, Microsoft Copilot, Deep AI, and HyperWrite have all been categorized as not utilized, with a median score of 1.00. Meta AI is noted as the least utilized tool, scoring a median of 2.00. Overall, the data reveals a varied landscape of AI tool usage, with a clear preference for ChatGPT, Quillbot, and Grammarly, while several other tools are largely unused.

The results indicated that ChatGPT, Quillbot, and Grammarly were the top AI tools used by nursing students, all categorized as "Moderately Utilized" with a median score of 3.00. These tools are favored for their accessibility and practicality in academic writing, providing functions like paraphrasing and grammar correction that assist students in completing assignments and projects.

In contrast, Google Gemini, Microsoft Copilot, Deep AI, and HyperWrite were categorized as “Not Utilized,” which may result from factors such as lack of awareness, minimal institutional promotion, or accessibility challenges. Their lower usage might also reflect complexity or a perceived lack of relevance to students' needs in nursing education.

Meta AI, while slightly better utilized, is still considered "Least Utilized," indicating limited integration into nursing students' academic routines. This variation in usage levels suggests that while students are open to familiar tools, there is a gap in awareness and training regarding other AI resources, emphasizing the need for institutional support in diversifying educational tools.

The findings further revealed that the most utilized AI tools, ChatGPT, Grammarly, and Quillbot, are effective for composing, correcting grammar, and brainstorming, which aligns with the academic requirements of nursing students. This reliance on specific AI tools highlights the significance of understanding AI in students' educational experiences. However, it also suggests a tendency to rely on AI for assistance rather than engaging in deep academic interaction.

Conversely, tools like Microsoft Copilot, Google Gemini, and Deep AI show minimal usage, indicating students' limited familiarity with a broader range of AI applications. This might point to institutional inadequacies in promoting these platforms, with the potential risk of students missing out on valuable tools

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that could enhance their clinical and theoretical skills. There is a pressing need for curriculum reforms to incorporate a wider array of AI applications in nursing education.

Meta AI's category as "least utilized" and the absence of usage for HyperWrite suggested that students were not exploring AI platforms beyond the most accessible options. Barriers like complexity and insufficient exposure to various tools limit student adoption, as supported by theories suggesting that perceived difficulty hinders usage. Nursing educators should bridge the exposure gap by implementing structured orientation programs and guided simulations for AI tools.

Theoretical frameworks like the Technology Acceptance Model (TAM) highlight that user-friendly tools are adopted more readily, while those perceived as complex are overlooked. This underscores the importance of tailored education to improve acceptance rates for less familiar AI tools. Overall, the findings indicate a limited range of AI tool usage among nursing students, revealing significant gaps in awareness and application of other useful technologies.

3. The findings regarding AI-assisted research tools indicated a mean score of 2.85, showing that nursing students occasionally engaged with these resources to locate credible information and synthesize it effectively. This suggests an acknowledgment of the benefits of AI; however, students still rely on traditional research methods due to concerns about the accuracy and credibility of AI-generated content.

For personalized learning AI, the mean score is 2.91, indicating intermittent use of adaptive learning platforms tailored to individual study needs. While there is an appreciation for these personalized experiences, students have not fully integrated them into their academic routines, favoring structured lessons from instructors instead.

Simulation and learning AI tools received a mean score of 2.55, indicating they are utilized occasionally. This lower engagement may stem from limited access to the tools or a preference for hands-on patient care, as students believe real-world interactions are irreplaceable for developing critical skills.

In communication, AI tools scored the lowest at 2.37, marking it as the least utilized category. This suggests nursing students prefer face-to-face communication, seeking the clarity and empathy that AI tools cannot replicate effectively.

AI-enhanced writing tools received a mean score of 3.10, indicating they are among the most frequently used resources by nursing students for grammar checking and content improvement. This engagement highlights the importance of these tools in refining academic writing, though students must still ensure originality in their work.

Overall, the findings revealed that nursing students primarily engage with AI in research and writing, valuing the support these tools provide in gathering and organizing information. Conversely, communication and simulation tools are less frequently used, reflecting the preference for personal interaction in nursing. The challenges AI faces in replicating the empathy and responsiveness inherent in nursing communication suggest that students prioritize direct connections with peers and mentors over reliance on AI.

4. The findings regarding awareness of AI tools available for nursing education indicated that respondents generally agree with the statement about their awareness of different AI tools, receiving a mean score of 3.22 with a standard deviation of 0.665. This suggests that while respondents have some understanding of the AI tools at their disposal, there may still be room for increased familiarity and education about the full range of tools available for enhancing their learning experiences.

Respondents demonstrated strong agreement (mean score of 3.35, standard deviation of 0.623) regarding the helpfulness of AI-based tools in improving their understanding of difficult nursing concepts. This high score reflects confidence in using AI technologies to facilitate comprehension of complex materials, indicating that respondents recognize these tools as valuable resources in their academic journey.

The awareness of AI tools' capability to generate learning resources, such as flashcards and practice questions, received a mean score of 3.40 with a standard deviation of 0.600, also indicating strong agreement. This

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suggests respondents appreciate the practical functions of AI tools that aid in their revision and study efforts, reinforcing the perceived utility of AI in their educational processes.

When considering the essential role of AI tools in providing personalized learning experiences, the mean score was 3.23, with a standard deviation of 0.684, reflecting overall agreement. This indicates that respondents acknowledge the importance of AI in tailoring educational content to meet their individual learning needs, further emphasizing the role of AI in modern nursing education.

Finally, respondents strongly agreed with the statement that AI tools offer diverse learning resources, achieving a mean score of 3.28 and a standard deviation of 0.619. This high level of awareness highlights the recognition among nursing students of the varied educational materials and supports that AI technologies can provide, indicating a robust understanding of AI's potential to enrich their learning experiences.

The findings regarding respondents' readiness to engage with AI technologies revealed a varied level of preparedness and willingness to invest effort in mastering these tools. The mean score for the statement about readiness to invest time and effort in becoming proficient in AI tools was 2.99, with a standard deviation of 0.619. This score indicates that respondents are generally in agreement but also suggests a hesitance, highlighting the need for additional encouragement or support to boost confidence in their capabilities with AI.

Respondents expressed a slightly higher readiness, with a mean score of 3.10 and a standard deviation of 0.559, regarding their willingness to incorporate AI tools into their daily academic routines. This finding suggests that while they recognize the potential benefits of AI, there may still be barriers to consistent usage, reflecting a transitional phase in their adaptation to this technology.

When assessing their preparedness to handle challenges associated with AI integration in nursing education, respondents reported a mean score of 3.01 and a standard deviation of 0.590, indicating general agreement. This suggests that while they feel somewhat equipped to navigate the complexities of incorporating AI, there are still uncertainties that could be addressed through further guidance and training.

Regarding the specific use of writing assistant AI tools to edit and refine academic papers and assignments, respondents rated their readiness at a mean score of 3.08 with a standard deviation of 0.585. This score demonstrates a willingness to engage with AI in the context of academic writing, indicating that respondents see value in using technology to enhance the quality of their work.

Lastly, respondents also indicated a mean score of 3.08 (standard deviation of 0.610) in their readiness to utilize AI tools for enhancing collaboration on group projects through improved organization and communication. This finding reflects an understanding of AI's potential to facilitate teamwork and streamline project management, reinforcing the idea that respondents are open to integrating AI as a collaborative tool in their academic endeavors. Overall, the average readiness score across these measures is 3.05, indicating a general agreement among respondents regarding their preparedness to engage with AI technologies in their studies.

A survey conducted among respondents explored barriers to adopting AI tools in academic settings. The results indicated that most respondents do not find it difficult to understand how to apply AI tools effectively in their nursing studies, with a mean score of 2.35, reflecting disagreement with the notion that comprehension presents a barrier.

Similarly, respondents disagreed with the statement regarding a lack of necessary technical skills for using AI tools effectively for academic purposes, as indicated by a mean score of 2.37. Additionally, the time required to learn these tools was generally not viewed as a significant barrier, with a mean of 2.39, suggesting that the learning curve is manageable for most.

Furthermore, the complexity of integrating AI tools into their current study routines was also met with disagreement, evidenced by a mean score of 2.26. This suggests that many respondents do not perceive AI tools as overly complex or difficult to use.

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However, access-related barriers were recognized as a more pressing concern, with a mean score of 2.55 indicating agreement that issues such as internet connectivity and device availability limit their use of AI tools in studies. This highlights an important area where respondents feel challenges persist, distinguishing it from the other barriers identified. Overall, while many respondents expressed confidence in their ability to engage with AI tools, access issues emerged as a significant hurdle.

5. The respondents demonstrated a strong commitment to using AI responsibly to prevent plagiarism and uphold academic integrity, reflected in a mean score of 3.40. This indicates a widespread agreement on the importance of ethical practices in leveraging AI technologies within educational contexts.

In terms of acknowledgment, respondents emphasized the significance of recognizing when AI tools contribute to their academic work. This belief earned a mean score of 3.33, showcasing a consensus on the necessity of attributing AI contributions appropriately.

The importance of citing AI-generated content was also highlighted, with a mean score of 3.30. This indicates that respondents understand the ethical obligation to properly credit sources, including those generated by AI, further reinforcing their commitment to academic integrity.

Moreover, the need for AI ethics training was recognized by the respondents, yielding a mean score of 3.31. This score reflects an awareness of the complexities surrounding AI use and the importance of equipping individuals with the necessary knowledge to navigate ethical considerations effectively.

Finally, respondents expressed awareness of potential biases in AI-generated content, as indicated by a mean score of 3.33. This understanding highlights their recognition that AI technologies can carry inherent biases from their training data, emphasizing the importance of critical evaluation when utilizing AI tools in academic settings.

Respondents exhibit a strong awareness of the potential risks associated with misinformation from AI-generated content, reflected in a mean score of 3.56. This indicates a clear understanding of the need for caution when utilizing such tools and a recognition of the challenges they may pose.

Additionally, respondents show a commitment to thorough evaluation of AI-generated content before placing trust in it, with a mean score of 3.52. This suggests a proactive approach in assessing the credibility of the information they encounter.

Furthermore, there is an acknowledgment among respondents that they need to enhance their strategies for verifying the accuracy of data, as indicated by a mean score of 3.50. This implies a desire for improvement in their verification processes.

Respondents also frequently cross-verify AI-provided information against reliable sources, achieving a mean score of 3.46. This champions a diligent practice of ensuring the reliability of the information they accept.

Lastly, a score of 3.51 suggests that respondents feel a sense of responsibility to research and gather data from trustworthy sources, reinforcing their commitment to accuracy and reliability in their information-seeking behaviors.

Regarding data privacy and security, respondents demonstrated a strong awareness and commitment to safeguarding sensitive information when using AI tools. The mean score for avoiding the upload of sensitive data to AI tools was 3.57, indicating a robust agreement among respondents about this practice, supported by a standard deviation of 0.515.

Respondents also expressed a strong understanding of the privacy implications associated with the use of AI, as reflected in a mean score of 3.55 (standard deviation of 0.518). This indicates a solid recognition of the potential risks and concerns related to privacy in AI applications.

Moreover, a mean score of 3.49 (standard deviation of 0.575) showed that respondents believe their institution should implement consent agreements prior to the utilization of AI-based tools that gather data. This highlights their advocacy for transparency and ethical practices in data collection.

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In relation to maintaining confidentiality and data protection in nursing education, respondents again rated their agreement at 3.49 (standard deviation of 0.539), emphasizing the importance they place on safeguarding personal and sensitive information while leveraging AI tools.

Lastly, respondents recognized the significance of understanding how their data is stored and utilized by AI applications, scoring an average of 3.50 (standard deviation of 0.539). This suggests a collective awareness of the responsibilities surrounding the responsible handling of personal data, culminating in an overall average agreement score of 3.52.

In the context of Human Oversight and Critical Thinking, respondents indicated a strong belief in the importance of maintaining control over their academic work when using AI-generated content. They reported an average score of 3.36, suggesting that they see AI as a tool that should support, rather than replace, their critical thinking skills. This idea is reinforced by a score of 3.35, which shows that when AI responses conflict with their own insights, they prioritize human judgment.

Additionally, the respondents showcased a diligent approach to scrutinizing AI recommendations, as seen in their average score of 3.48. This reflects their commitment to ensuring that the information they use in their academic work is reliable and not misleading. They also scored 3.49 on the readiness to question AI conclusions that clash with their professional experience, underscoring the value they place on human expertise.

Moreover, the respondents believe that combining critical thinking with the use of AI tools positively impacts their learning and decision-making in nursing education, with an average score of 3.42. Overall, these responses highlight a strong consensus, with an average score of 3.39, emphasizing the critical role of human oversight in effectively utilizing AI technology.

6. The Spearman's rho value of 0.365 reflects a moderate positive relationship between two variables. This means that as one variable increases, the other tends to increase as well, highlighting a connection between the two factors being measured.

Furthermore, the study presents a p-value of <0.001, which is significantly lower than the alpha level of 0.05. This result leads to the rejection of the null hypothesis, indicating that there is a statistically significant correlation between the respondents' level of utilization of AI tools and the extent to which these tools are utilized.

A Spearman's rho value of 0.143 reflects a weak positive relationship between the two variables, implying that an increase in one variable is associated with a slight increase in the other. This suggests a minimal correlation, indicating that while there is some connection, it is not strong.

Additionally, the p-value of 0.043 is below the alpha level of 0.05, leading to the rejection of the null hypothesis. This indicates that the findings are statistically significant, confirming a notable correlation between respondents' utilization of AI tools and their intent to adopt such tools in the future.

In the statistical analysis conducted, Spearman's rank correlation coefficient (rho) was calculated to be -0.098. This value suggests a very weak negative correlation between the level of utilization of AI tools and responsible AI tool utilization, indicating that there is little to no meaningful relationship between these two variables.

The analysis included a sample size represented by 200 degrees of freedom (df), which contributes to the robustness of the findings. Additionally, the p-value associated with the correlational analysis was found to be 0.166. This value exceeds the typical alpha level of 0.05, suggesting that the observed correlation is not statistically significant and that there is insufficient evidence to conclude that a discernible relationship exists between AI tool utilization and responsible practices in their use.

The analysis presented in the table indicates that the Kruskal-Wallis value associated with awareness and readiness in relation to the intent to adopt AI is lower than the established critical value of 7.815, with a degree of freedom of 3. This statistical finding suggests that there is no significant difference in how respondents

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utilize AI tools compared to their levels of awareness and readiness for adopting these tools. Thus, the data implies a consistent relationship across these variables, indicating that utilization, awareness, and readiness are closely aligned among the respondents.

The analysis of the data indicates that the Kruskal-Wallis value pertaining to the level of utilization and intent to adopt AI tools is lower than the critical value of 7.815 (with df = 3). This finding implies that there is no significant difference in the utilization and intent to adopt AI tools across different age ranges of the respondents. Furthermore, the p-value obtained from the analysis is greater than the alpha level of 0.05. This reinforces the conclusion that the age range of respondents does not significantly influence their level of utilization and intent to adopt AI tools.

The analysis presented in the table indicates that the level of utilization and intent to adopt AI tools is characterized by a Kruskal-Wallis value that is lower than the critical value of 3.841 (df = 1). This outcome signifies that there is no significant difference between the sexes of the respondents regarding their utilization and intent to adopt these AI tools. Furthermore, the findings reveal a higher p-value than the established alpha level of 0.05. This reinforces the conclusion that there is no variation in the respondents' level of utilization and intent to adopt AI tools based on their sex.

Based on the table, the intent to adopt AI tools has a lower Kruskal-Wallis value than the critical value (df = 3, critical value = 7.815). This means that there's no significant difference between respondents' year level and their intent to adopt AI tools.

Additionally, it has a higher p-value than the alpha level of 0.05. This suggests that the year level did not vary in the respondents' intent to adopt AI tools.

On the other hand, the level of utilization of AI tools has a higher Kruskal-Wallis value than the critical value (df = 3, critical value = 7.815). This means that there's a significant difference between the respondents' year level and their level of utilization of AI tools. Moreover, it has a lower p-value than the alpha level of 0.05. This suggests that the year level significantly varies in respondents' level of utilization of AI tools.

Conclusion

The findings revealed that the majority of nursing student respondents are within the 18 to 20 years old age bracket, accounting for 56.4% of the sample. This reflects the typical entry-level age for undergraduate nursing students, likely representing those in their first or second year.

A significant portion, 40.6%, falls within the 21 to 25 age range, representing upper-year students. Older age groups, such as those aged 26 to 30 (0.5 %) and above 31 (2.5 %), are notably underrepresented. This concentration of younger students suggests a population that is still adjusting to academic life and potentially less experienced in the application of digital tools like AI.

Furthermore, the sample was overwhelmingly female, comprising 83.7% of respondents, which aligns with the common gender distribution in nursing education in the Philippines.

All respondents identified as Filipino, indicating a homogeneous population in terms of nationality. In terms of academic standing, most respondents were from Level I (33.2%), followed by Level III (27.7%), Level II (26.7%), and Level IV (12.4%). This distribution shows that a large proportion of participants were in the earlier stages of the program, which may influence their familiarity and comfort with advanced AI tools.

The study concluded that nursing students show a varied pattern of AI tool utilization. ChatGPT, Quillbot, and Grammarly emerged as the most frequently used tools, each receiving a median rating of 3.00, classifying them as "moderately utilized." These tools were preferred primarily for their writing support features such as grammar correction, paraphrasing, and idea generation, which directly assist students in their academic tasks.

On the other hand, AI platforms like Google Gemini, Microsoft Copilot, Deep AI, and HyperWrite were rated with a median of 1.00, indicating that they were "not utilized" by most students. Meta AI, while slightly better utilized, still received a low median score of 2.00, classifying it as "least utilized." These results suggest a clear

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familiarity bias, where students tend to use AI tools that are more widely known or user-friendly.

Limited usage of other platforms could be attributed to the lack of exposure, minimal institutional promotion, or perceived complexity of the tools. This underscores a gap in AI education and indicates that students rely heavily on tools they are already comfortable with, missing out on the potential benefits of a broader range of AI applications in nursing education.

The study also examined how AI tools are applied in various academic tasks and concluded that their use is most prominent in writing and research, with a mean score of 3.10 for writing assistance tools. This high usage suggests that nursing students find AI helpful in improving grammar, structuring content, and enhancing overall academic writing quality.

Research-related AI tools were also used occasionally, with a mean score of 2.85, indicating students' interest in using AI to gather and synthesize credible information, albeit with caution due to concerns about accuracy. Personalized learning tools received a moderate mean score of 2.91, indicating occasional use but a preference for traditional instruction. Simulation and learning tools, as well as AI for communication, scored lower means of 2.55 and 2.37 respectively, reflecting limited use. These results suggest that while AI is gradually being integrated into academic life, its use is still concentrated in areas that require less direct human interaction.

Tools involving clinical simulation or communication are underutilized, possibly due to students' preference for real-world experiences and the belief that AI cannot replicate human empathy or nuanced judgment, which are essential in the nursing profession.

In terms of awareness, the findings revealed that respondents generally agreed that they were aware of the different AI tools available for nursing education, with a mean score of 3.22. This indicates a moderate level of awareness that could still be improved.

Students strongly agreed that AI tools are useful in enhancing their understanding of complex nursing concepts, with a mean score of 3.35, and acknowledged their capability in generating effective study aids such as flashcards and practice questions (mean score of 3.40). These findings reflect a positive attitude toward the usefulness of AI in reinforcing theoretical learning.

Furthermore, students agreed on the importance of personalized learning through AI (mean score of 3.23) and recognized the diversity of learning resources these tools can offer (mean score of 3.28). Overall, while awareness exists, there is still room to improve student familiarity with less popular or emerging AI tools, which can be addressed through targeted training and integration into classroom instruction.

The study found that students generally expressed readiness to engage with AI tools, though with varying levels of confidence. The average readiness score across the different dimensions was 3.05, indicating general agreement. Specifically, the mean score for willingness to invest time and effort in mastering AI tools was 2.99, showing moderate enthusiasm tempered by uncertainty or lack of experience.

Students were slightly more inclined to incorporate AI tools into their academic routines (mean score of 3.10) and felt prepared to face the challenges associated with AI integration (mean score of 3.01). Readiness to use AI for academic writing and group collaboration was also evident, with both dimensions receiving mean scores of 3.08. These findings suggest that while nursing students are open to using AI in their education, many are still transitioning from basic familiarity to confident and consistent usage. They may benefit from more structured support systems and orientation programs to fully harness the potential of AI in their studies.

When it comes to barriers, the study revealed that most students did not perceive difficulty in learning or applying AI tools. The lowest scores were seen in items regarding complexity (2.26), time investment (2.39), and lack of technical skills (2.37), all indicating disagreement with the idea that these are major obstacles. However, access-related concerns emerged as a significant barrier, with a mean score of 2.55. This points to issues such as poor internet connectivity, limited access to suitable devices, or inadequate school infrastructure as key hindrances. These findings emphasize that while students are capable and willing to use AI, their ability to do so consistently may be restricted by material limitations rather than by motivation or knowledge.

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A strong sense of ethical responsibility in the use of AI was observed among respondents. The mean score of 3.40 for using AI responsibly to avoid plagiarism shows a high level of awareness regarding academic integrity. Students also strongly agreed on the importance of acknowledging AI contributions (mean score of 3.33) and properly citing AI-generated content (mean score of 3.30). Additionally, the need for formal AI ethics training was supported (mean score of 3.31), suggesting that students understand the complexities involved in AI use and want structured guidance. Awareness of biases in AI-generated content was also high (mean score of 3.33), highlighting the critical thinking applied by students when interacting with AI outputs. These results show that students not only use AI to support their learning but also value responsible and ethical practices in doing so.

In relation to accuracy and reliability, students displayed a mature and cautious approach when dealing with AI-generated information. The highest mean score of 3.56 was given to the item emphasizing caution against misinformation, indicating that students are aware of the risks associated with unchecked content. They also showed a strong tendency to evaluate and verify AI-generated outputs, with mean scores of 3.52 for content evaluation and 3.50 for improving verification strategies. Regular cross-checking of AI-generated data (mean score of 3.46) and a sense of personal responsibility for verifying sources (mean score of 3.51) further confirm that nursing students actively work to ensure the credibility of information used in their academic tasks. These conclusions highlight their commitment to evidence-based practice and critical thinking.

The respondents demonstrated strong awareness regarding data privacy and the responsible use of AI in academic contexts. A high mean score of 3.57 reflected a strong agreement that sensitive data should not be uploaded to AI tools, indicating a good understanding of the risks involved. Students also recognized the broader implications of AI on privacy, with a mean score of 3.55, and agreed that institutions should require consent agreements before collecting data through AI platforms (mean score of 3.49). The same level of agreement was found regarding maintaining confidentiality in nursing education and understanding how data is stored and used (both with mean scores of 3.49 and 3.50, respectively). These findings show that students are not only aware of the utility of AI but are also mindful of their responsibilities when it comes to data protection and ethical use.

The results highlighted that students place a high value on human judgment and critical thinking, even when using AI tools. A mean score of 3.36 shows their belief in maintaining control over their academic work, ensuring that AI serves only as an aid rather than a replacement. When AI responses conflict with their understanding, students prioritize their own judgment (mean score of 3.35), reinforcing the importance of human oversight. Respondents also actively question and scrutinize AI outputs (mean scores of 3.48 and 3.49), suggesting a strong capacity for critical evaluation. Moreover, students believe that combining AI with critical thinking enhances learning and decision-making (mean score of 3.42). Overall, these results indicate that students use AI responsibly and with discernment, integrating it into their learning while still relying on personal insights and professional values.

The statistical analysis revealed several notable relationships between the level of utilization of AI tools and various educational factors. First, there was a moderate positive relationship between the level of utilization of AI tools and their extent of use in academic tasks, as indicated by a Spearman's rho value of 0.365 and a p-value less than 0.001. This suggests that as students use AI tools more frequently, they tend to integrate them more into their academic activities such as writing, research, and collaboration. The statistically significant p-value confirms that this correlation is not due to chance.

Additionally, the data showed a weak positive relationship between the level of AI utilization and the intent to adopt AI tools, with a Spearman's rho of 0.143 and a p-value of 0.043. Although the correlation is minimal, it remains statistically significant, indicating that students who currently use AI tools are slightly more inclined to continue or expand their use in the future.

However, when examining the relationship between the level of AI utilization and responsible AI usage, the analysis revealed a very weak negative correlation (Spearman's rho = -0.098) with a p-value of 0.166. This result is not statistically significant, suggesting that a higher frequency of AI use does not necessarily correlate

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with stronger ethical practices or responsible usage. This highlights the need for targeted ethics education regardless of how frequently students engage with AI tools.

The study also investigated whether there were significant differences in AI utilization and intent to adopt AI based on demographic and academic variables such as awareness, readiness, age, sex, and year level.

First, results from the Kruskal-Wallis test showed that there was no significant difference in the level of AI utilization and intent to adopt AI based on respondents' awareness and readiness, as the computed values were lower than the critical value of 7.815 at 3 degrees of freedom, and the p-value was above the alpha level of 0.05. This suggests that levels of awareness and readiness do not vary significantly in terms of their impact on how students use or intend to use AI.

The findings also revealed no significant difference in AI utilization and intent to adopt across different age ranges, supported by a p-value greater than 0.05 and a Kruskal-Wallis value below the critical threshold. This implies that students' age does not play a defining role in their engagement with AI technologies in education.

Similarly, there was no significant difference found between sex and the respondents' AI utilization and intent to adopt, as the computed Kruskal-Wallis value was less than the critical value of 3.841 with 1 degree of freedom, and the corresponding p-value exceeded the 0.05 threshold. This suggests that gender does not influence how nursing students utilize or plan to utilize AI tools.

On the other hand, a significant difference was identified in the level of AI utilization based on year level. The Kruskal-Wallis value exceeded the critical threshold, and the p-value was less than 0.05, indicating that as students progress through the nursing program, their use of AI tools varies significantly. However, there was no significant difference in the intent to adopt AI across year levels, as the results remained below the critical value and above the alpha threshold. This suggests that while usage increases with academic level, willingness to adopt AI remains consistently distributed among all year levels.

In conclusion, the findings of this study provide empirical support for the development of institutional artificial intelligence governance frameworks within nursing education. Establishing clear policies can guide ethical usage, promote academic integrity, and ensure that technology adoption remains human-centered. Furthermore, integrating AI literacy into pre-service health workforce training equips future nurses with the competencies required to function safely and effectively in digitally mediated care environments. Such initiatives are essential to fostering equitable, responsible, and sustainable AI implementation in healthcare education.

Recommendations

Given the findings of this study, it is recommended that nursing institutions implement structured AI integration within the curriculum. These programs should not only introduce students to a variety of AI tools but also emphasize their ethical use and practical application in nursing education. AI literacy sessions must be made compulsory across all year levels to ensure consistent exposure and confidence in using such technologies. Instructors should also be trained to guide students in the responsible and efficient use of AI in academic and clinical settings. Institutions should provide equitable access to tools and infrastructure, including internet connectivity, licensed software, and AI-supported learning platforms. Lastly, regular assessments and updates to AI-related policies should be conducted to stay aligned with technological advancements and student needs.

Allied Health Institutions - Allied Health institutions are encouraged to formally integrate commonly used AI tools such as ChatGPT, Grammarly, and Quillbot into academic support systems, as these have been shown to be moderately utilized by students. Institutions should recognize the disparity in tool usage and provide structured opportunities for students to explore underutilized AI platforms like Microsoft Copilot and Deep AI. Addressing access-related barriers is essential, as limited internet connectivity and device availability emerged as significant challenges. Institutions should invest in better infrastructure and offer accessible computer laboratories or loaner device programs. Additionally, clear institutional policies must be established concerning ethical AI use, data privacy, and citation practices, thereby aligning academic standards with the digital learning environment.

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Future Researchers - Future researchers should expand sample diversity by including nursing students from different institutions to better understand AI utilization. Conducting longitudinal studies can assess changes in attitudes over time, while qualitative methods like interviews can provide deeper insights into the barriers to AI adoption.

Health Educators/Faculty - Faculty and health educators play a pivotal role in guiding nursing students toward responsible and effective AI integration in academic and clinical settings. They should initiate structured training sessions and hands-on workshops that introduce students to a wider array of AI tools, including those that are currently underutilized. Given students' preferences for face-to-face learning and their limited engagement with more complex AI tools, educators must provide supportive and simplified instruction to increase students' confidence in using these platforms. AI should be incorporated into lessons, assignments, and simulations to enhance both theoretical understanding and practical skill development. Furthermore, faculty and educators must emphasize the importance of academic integrity, ethical usage, and critical thinking when using AI. They should facilitate discussions on AI-generated content, address concerns about data accuracy and bias, and mentor students on balancing human judgment with technological assistance in learning environments.

Nursing Students - Nursing students should be encouraged to broaden their familiarity and usage of AI tools beyond writing and grammar assistance. While the majority rely on tools like ChatGPT and Grammarly, they are advised to explore AI applications in clinical simulations, personalized learning, and research. To enhance academic integrity and learning outcomes, students should engage in training programs that teach proper citation of AI content, critical evaluation of AI-generated material, and data privacy protocols. By actively taking responsibility for verifying AI outputs and citing contributions, students can uphold ethical standards while maximizing the academic benefits that these tools provide.

Policy Makers - Policy makers should support the inclusion of AI literacy and ethics in the national nursing curriculum to ensure students are equipped with the competencies needed for responsible AI use. Given that readiness to engage with AI is moderate, policies must mandate institutions to offer orientation programs and training modules that cover both technical skills and ethical considerations. To bridge access gaps, especially in public or underserved institutions, funding and grants should be allocated for technological resources such as upgraded internet infrastructure, modern computer labs, and educational software licenses. Policy makers must also establish data privacy regulations specific to AI use in educational contexts to protect student information and promote transparency.

Research Community - The research community is encouraged to conduct follow-up studies that investigate the long-term academic and professional impact of AI usage among nursing students. Given the moderate positive relationship found between AI utilization and academic engagement, further studies could explore which specific tools contribute most to learning and retention. Researchers should also examine the reasons behind low usage of advanced AI platforms and assess the effectiveness of institutional interventions aimed at improving AI literacy. Additionally, qualitative research involving focus groups or interviews could yield deeper insights into students' perceptions, motivations, and challenges regarding AI use. Broadening the scope of research to include comparisons across institutions and disciplines could also help establish best practices for AI integration in health education. Future research may explore the level of AI use to enhance nursing students' learning outcomes. Future investigations may employ multivariate regression models to control for potential confounding variables and further strengthen causal interpretation.

Technology Developers - Technology developers are recommended to tailor AI tools to the unique needs of nursing students by designing platforms that are user-friendly, relevant to clinical settings, and supportive of both theoretical and practical learning. Features should include simple navigation, multilingual support, mobile compatibility, and offline functionality to address common access issues. Developers should also embed transparent indicators about the source, accuracy, and potential bias of generated content to aid students in evaluating reliability. Enhanced tools that simulate clinical scenarios or support personalized learning could also expand AI's role in nursing education. Partnerships with educational institutions can guide developers in producing tools aligned with student learning outcomes.

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