

Optimizing Academic Performance: Exploring the Influence and Advantages of AI Technology for 3rd Year Aeronautical Engineering Students at Holy Angel University

Arjhon S. Acordon¹, Edward Joseph C. Dungca¹, Clarence Darwin S. Estrella¹, Joefil C. Jocson²

¹Student, Graduate School, Nueva Ecija University of Science and Technology, Cabanatuan City, Philippines

²Professor, Graduate School, Nueva Ecija University of Science and Technology, Cabanatuan City, Philippines

Corresponding Author: acordonaj@gmail.com

Abstract— Recently, the integration of Artificial Intelligence (AI) in the educational system has attracted significant attention. This is because AI has the potential to enhance learning outcomes and streamline academic procedures. This study examines the impacts and benefits of incorporating Artificial Intelligence (AI) tools into the academic assignments of third-year students studying Aeronautical Engineering at Holy Angel University. This research aims to accomplish its objectives by utilizing a mixed-method approach that incorporates surveys and interviews. The study focuses on examining the effects of AI application on several aspects of student engagement, comprehension, and productivity. This study investigates the utilization of artificial intelligence (AI) in data analysis, simulation, problem-solving, and project management within the context of Aeronautical Engineering courses.

The influence of AI technology on students' learning experience becomes evident from the outset: it provides individualized assistance and facilitates the execution of cooperative tasks, while also enhancing comprehension of intricate engineering ideas. In addition, AI-powered tools enhance efficiency in completing assignments, tasks, and tests, providing students with an opportunity to manage their academic workload more effectively. This research contributes to the ongoing efforts in AI in education by offering implications and perspectives for students studying Aeronautical Engineering at Holy Angel University. By effectively utilizing AI technology, an educational institution can create a dynamic learning environment that equips learners with the necessary skills and knowledge in aeronautical engineering.

Index Terms— Aeronautical Engineering, AI, Academic Works, Virtual Literacy.

1. Introduction

In past years, the integration of Artificial Intelligence (AI) into instructional settings has received widespread interest for its ability to revolutionize studying strategies. Specifically, inside the realm of higher training, AI holds promise for reinforcing diverse facets of educational endeavors, which includes studies, trouble-solving, and information acquisition. This research endeavors to discover the consequences and

blessings of making use of AI tools in the academic works of third-year Aeronautical Engineering college students at Holy Angel University. By inspecting the reports and results of college students who combine AI into their instructional pastimes, this study seeks to shed light at the transformative capability of AI generation in improving the educational journey of budding engineers. The incorporation of AI tools into academic practices offers a mess of advantages, ranging from personalized studying stories to more desirable performance in academic duties. As cited with the aid of Siemens and Long (2011), AI-enabled technologies have the capacity to adapt to person student desires, thereby facilitating customized gaining knowledge of studies that cater to various studying styles and paces. For third-year Aeronautical Engineering college students, who grapple with complex theoretical concepts and sensible applications, AI equipment can serve as beneficial aids in comprehending problematic challenge count and refining problem-solving skills. Furthermore, the utilization of AI in instructional endeavors can streamline strategies related to research and task work, consequently optimizing productivity, and fostering innovation. Research conducted by Chieu and Herawan (2009) highlights how AI algorithms can assist students in information evaluation, hypothesis trying out, and simulation obligations, thereby expediting the research technique and enabling college students to delve deeper into their selected fields of observe. For Aeronautical Engineering college students, who often

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interact in sizable research initiatives and layout demanding situations, AI-powered equipment offers the capability to boost up development and facilitate the exploration of novel ideas and answers.

Moreover, the combination of AI into academic settings cultivates critical abilities which can be an increasing number of valued inside the modern personnel, consisting of essential questioning, problem-fixing, and virtual literacy. As emphasized through Hodges et al. (2018), exposure to AI technologies equips college students with the skills vital to navigate an increasing number of digitalized world and adapt to evolving technological landscapes. For third-year Aeronautical Engineering college students at Holy Angel University, the mixing of AI tools now not only enhances instructional performance but also nurtures the skill sets required for achievement in their destiny careers inside the aerospace enterprise. Researching the effects and advantages of the use of AI at the college works of 3rd-year Aeronautical Engineering college students at Holy Angel University holds vast implications for instructional practice and innovation. By elucidating the transformative capacity of AI generation in improving the mastering stories and consequences of students in a specialized engineering subject, this research objectives to tell academic stakeholders and policymakers about the possibilities and challenges related to the integration of AI into higher education curricula. Through empirical investigation and analysis, this observe seeks to make contributions to the ongoing discourse surrounding the function of AI in shaping the destiny of education and getting ready students for achievement in a more and more digitized global.

2. Research Methodology

A. Research Design

This study employs a quantitative research design, a method characterized by the systematic investigation of phenomena through the collection of quantifiable data and the application of statistical, mathematical, or computational techniques. Quantitative research is integral to understanding patterns, relationships, and trends within a specific population or context. It relies on numerical data to formulate facts and uncover patterns in research. The quantitative approach in this study involved collecting data from existing and potential respondents using various sampling methods. These methods included distributing online surveys, conducting online polls, and administering structured questionnaires. Such tools are essential in ensuring that the data collected is comprehensive, reliable, and suitable for statistical analysis.

For this study, an online questionnaire was specifically designed and utilized to gather data from third-year Aeronautical Engineering students at Holy Angel University. The questionnaire aimed to capture a wide range of responses that reflect the students' perspectives, experiences, and insights relevant to the study's objectives. By employing a structured questionnaire, the research ensured that the data collected was

consistent, making it easier to analyze and interpret using quantitative methods. This research design not only facilitates the collection of large datasets but also enhances the accuracy and objectivity of the findings. Through careful formulation and deployment of the questionnaire, the study aims to provide robust and empirically sound conclusions about the targeted population, thereby contributing valuable insights to the field of Aeronautical Engineering education and beyond.

B. Population and Sampling Techniques

The respondents of this study are third-year students enrolled at Holy Angel University in Angeles, Pampanga. Data collection was facilitated through Google Form surveys, streamlining the process, and enhancing efficiency. The calculated total sample size for this study is 293 respondents.

To select the participants, the researchers established the following criteria: (1) Students must be currently enrolled for the academic year 2022-2023; (2) They must be pursuing a degree in Aeronautical Engineering at Holy Angel University; (3) They must be in their third year of study. The study employs a purposive sampling technique, specifically targeting those studying at Holy Angel University. This approach ensures an accurate assessment based on the gathered data. The researchers conducted the survey using a questionnaire administered via Google Forms. This method enabled the collection of sufficient and relevant information required for the study, ensuring that the data obtained is both comprehensive and representative of the target population.

C. Data Gathering Procedure

The researchers employed Google Forms to collect data, distributing them specifically to third-year Aeronautical Engineering students at Holy Angel University. This method ensured that all data gathered was primary and obtained within a controlled environment, maintaining the integrity and reliability of the research process. The questionnaire began with a section where participants were asked to provide personal information, including their name, address, and year level, to confirm their identity and ensure the accuracy of the demographic data. Following the demographic section, the questionnaire included a comprehensive series of questions designed to explore the students' experiences and knowledge regarding AI platforms. These questions aimed to gather detailed insights into how these students interact with and perceive AI technologies in their academic and potentially professional contexts.

This structured approach allowed the researchers to collect nuanced data that could be analyzed to understand patterns and trends within the target population. By utilizing Google Forms, the researchers could efficiently distribute the questionnaire and collect responses in a streamlined manner. This digital tool also facilitated the classification, separation, and segregation of the gathered data, making it easier to organize and analyze the responses. The collected data provided a rich source of information, enabling the researchers to draw meaningful

conclusions about the adoption and impact of AI platforms among third-year Aeronautical Engineering students at Holy Angel University.

from current AI technologies compared to those requiring substantial research and documentation. These findings provide valuable insights into the current academic environment and highlight the potential areas for further integration of AI technologies to enhance educational outcomes across diverse fields of study.

3. Results

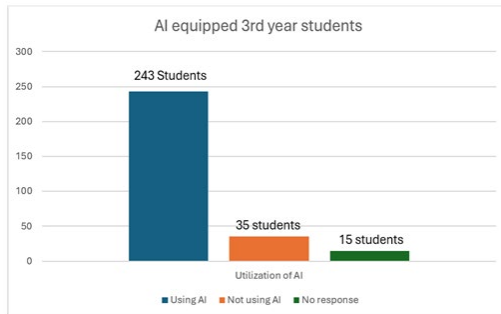


Fig.1. Utilization of Artificial Intelligence

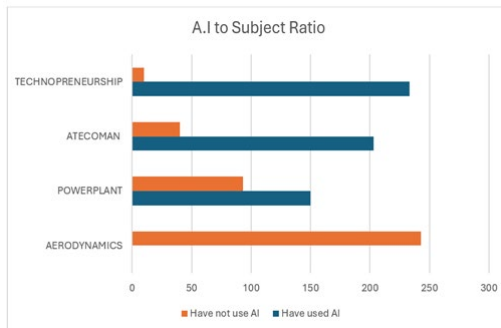


Fig.2. A.I on Related Subjects

The results of this research, conducted through a comprehensive methodology incorporating surveys, questionnaires, and interviews, shed light on the demographics and technological adoption among third-year students at Holy Angel University. The study identifies a total of 293 students currently enrolled for the academic year 2022-2023. These students are taking a range of subjects, including Technopreneurship, Airtecoman, Powerplant, and Aerodynamics, as mandated by their curriculum.

A significant finding from the research is that nearly all respondents are utilizing an AI platform, with 243 students, or 83% of the population, reported as active users. This high adoption rate underscores the integration and reliance on AI within this cohort. The survey further delves into the application of AI across various subjects. According to the results depicted in Figure.2., subjects that necessitate extensive writing and research, such as Technopreneurship and Atecoman, exhibit the highest levels of AI utilization.

Conversely, Aerodynamics, a subject that heavily focuses on problem-solving and the principles of lift and drag, demonstrates the lowest level of AI engagement, with some areas reporting a complete absence of AI usage.

This disparity in AI utilization suggests a correlation between the nature of the subject matter and the perceived utility of AI tools. For instance, subjects involving complex calculations and theoretical applications, such as Aerodynamics, might benefit less from current AI technologies compared to those requiring substantial research and documentation. These findings provide valuable insights into the current academic environment and highlight the potential areas for further integration of AI technologies to enhance educational outcomes across diverse fields of study.

4. Discussion

Out of the 293 students, 243 (approximately 83%) reported using AI platforms, indicating a high level of integration of these technologies in their academic activities. This substantial majority highlights the growing importance and reliance on AI tools within the student body. Conversely, 35 students (12%) did not use AI, and 15 students (5%) did not respond, suggesting a small segment of the population that either lacks access to or opts out of using AI resources.

The data further breaks down AI utilization by subject, revealing notable disparities. For example, in Technopreneurship, 233 students reported using AI, leaving only 10 students who did not use it. This trend is similarly high in Atecoman, with 203 students utilizing AI and 40 not. In Powerplant, 150 students used AI, while 93 did not. The stark contrast is seen in Aerodynamics, where no students reported using AI, and all 243 respondents did not utilize AI for this subject. The high adoption rates of AI in subjects like Technopreneurship and Atecoman can be attributed to the nature of these courses, which often require extensive research, project management, and innovative thinking—areas where AI tools can provide substantial support. AI platforms can aid in drafting business plans, analyzing market trends, and managing large datasets, thus enhancing students' productivity and learning experiences in these subjects.

On the other hand, the absence of AI utilization in Aerodynamics is intriguing and warrants further investigation. Aerodynamics, involving the study of forces and the physical laws of flight, may rely more heavily on traditional problem-solving techniques and manual calculations, areas where AI tools currently offer limited assistance. This could indicate a gap in the available AI applications for highly specialized engineering fields or a lack of awareness and training on how to effectively integrate AI into these areas. These findings suggest a need for a tailored approach to integrating AI across different disciplines. For subjects like Technopreneurship and Atecoman, where AI is already extensively used, there is an opportunity to further enhance AI tools and training to maximize their benefits. For Aerodynamics and potentially

other specialized subjects, developing AI applications that address specific academic needs and providing targeted training for students and educators could bridge the utilization gap. Within the Aeronautical Engineering Department, AI can be integrated into the on-the-job training (OJT) program during the third year of the curriculum. AI is significantly transforming various aspects of the aeronautical industry. In flight operations and safety, AI algorithms facilitate predictive maintenance by analyzing aircraft sensor data to predict failures, reducing downtime and enhancing safety. Additionally, AI-powered real-time monitoring systems provide alerts and recommendations to pilots and ground staff, improving situational awareness and operational safety.

In air traffic management, AI optimizes traffic flow, reduces congestion, and enhances efficiency, minimizing delays and fuel consumption. It also aids in collision avoidance by detecting potential conflicts and suggesting evasive actions, thus enhancing the safety of both manned and unmanned aerial vehicles.

AI is also making strides in pilot assistance and automation. Autonomous flight systems can handle routine tasks, allowing pilots to focus on more critical flight management aspects, while AI-driven decision support systems provide real-time recommendations based on flight data and weather conditions. In aircraft design and manufacturing, AI-driven tools help engineers create more efficient and aerodynamic designs and improve additive manufacturing processes (3D printing) by enhancing precision and reducing waste.

Moreover, AI is revolutionizing the customer experience by analyzing passenger data to offer personalized services, such as tailored in-flight entertainment and meal preferences, enhancing overall satisfaction. AI systems streamline boarding processes by predicting passenger flow and optimizing seating arrangements, reducing boarding times and improving comfort. In drone technology, AI enables the autonomous operation of drones for applications like surveillance, delivery services, and environmental monitoring, and coordinates drone swarms for tasks such as search and rescue operations.

AI also contributes to environmental sustainability in aviation by optimizing flight paths and engine performance to reduce fuel consumption and greenhouse gas emissions, and by mitigating noise pollution through optimized flight operations and aircraft design. As AI technology evolves, its integration into the aeronautical field is expected to expand, driving further innovation, enhancing safety, improving operational efficiency, and fostering a more sustainable and personalized travel experience. Furthermore, the trend towards AI adoption in higher education reflects global shifts towards digital learning environments. Educational institutions might consider adjusting curricula and support structures to ensure students across all disciplines can effectively leverage AI. This could involve investing in AI tools tailored to various academic requirements, offering professional development for faculty, and integrating AI literacy into the core competencies expected of graduates.

5. Conclusion

The study highlights a significant trend in the use of AI among third-year students at Holy Angel University, showing varying levels of adoption across different areas. AI is widely utilized in research and innovation-related fields, while more traditional problem-solving areas like aerodynamics have seen less advancement. By employing specific AI integration techniques and making curricular adjustments, all students can benefit from advancements in AI technology, enhancing their academic and field readiness. The ongoing progress in AI technology can accelerate the learning process by blending traditional methods with advanced techniques, summarized and learned through artificial learning and computing.

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