Utilization of Artificial Intelligence (AI) Tools among Senior High School Students: Inputs for Policy Recommendations

Frensie Honeylette B. Brigola, Ph.D.

Department of Education, University of Saint Anthony, Baao, Bicol, Philippines

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ABSTRACT

This study determined the extent of utilization of Artificial Intelligence (AI) tools among senior high school students, a rapidly evolving landscape with significant implications for education. As AI becomes increasingly integrated into various aspects of modern life, understanding its adoption and impact on the learning experiences of young individuals is crucial. This research study was conducted to explores the utilization of AI tools among senior high school students in Iriga City, Philippines, examining usage extent, influencing factors, challenges encountered, and relationships between demographic variables and AI engagement. A descriptive-correlational design was employed, utilizing a survey questionnaire and interviews with 464 respondents selected through stratified random sampling.

The findings indicated moderate AI utilization for academic tasks like essay writing, research, and presentations. Students favored tools like Canva, ChatGPT, and Grammarly, due to their accessibility and user-friendliness, while specialized tools were underutilized. Perceived efficiency and encouragement from teachers and peers significantly influenced AI tool usage. The analysis confirmed these factors, while accessibility and ease of use, although rated positively, did not show significant effects. Demographic variables, including sex, grade level, academic strand, and socio-economic status, did not correlate significantly with AI tool usage, suggesting consistent engagement across diverse student profiles. Gadget ownership, specifically smartphones and laptops, was significantly associated with the use of specific AI tools. Poor internet connectivity and the lack of knowledge about AI tools were identified as barriers. Most students supported guidelines for responsible AI use in schools.

The study underscored the need for digital literacy programs, equitable access to technology, and institutional support to promote effective and ethical AI integration in education. Policy recommendations include integrating AI tools into instruction, promoting awareness of their efficiency, developing digital literacy programs, addressing connectivity issues, and formulating clear school-based guidelines for use of AI tools.

Keywords: Artificial Intelligence, Innovation, Policy Recommendation, Senior High School and Utilization

INTRODUCTION

This study explores the utilization of artificial intelligence (AI) tools among senior high school students in Iriga City, Philippines, to inform policy recommendations for AI integration in education. The research acknowledges the global transformation of industries, including education, through AI, highlighting the potential of AI-powered applications to personalize learning and improve student outcomes. However, it also recognizes the technological access disparity, particularly in developing regions, necessitating an understanding of how students utilize AI tools to address global inequities and foster inclusive educational innovation.

International practices in countries like the United States, China, and Finland demonstrate both the promise and challenges of AI adoption in education. While these nations invest heavily in research and infrastructure to

maximize AI's potential, studies reveal gaps in students' ability to navigate AI tools responsibly, raising ethical concerns about data privacy and biases in AI algorithms. In the Philippines, the legal framework supports technology integration in education through acts like the Enhanced Basic Education Act of 2013 and the Philippine Digital Strategy 2022-2028. However, the lack of specific policies addressing AI tools' utilization in classrooms leaves implementation gaps, particularly at the local level. In Iriga City, despite increased internet connectivity and gadget availability, AI integration faces barriers such as limited teacher training, insufficient infrastructure, and uneven access to digital resources. Existing research predominantly focuses on technologically advanced regions, underscoring the need for localized studies assessing AI tool utilization and its implications for educational policies. Understanding how students in Iriga City utilize AI tools has profound implications for educational innovation and policy development, informing teacher training programs and AI-driven curricula tailored to the local context.

The study is anchored on the Technology Acceptance Model (TAM), the Unified Theory of Acceptance and Use of Technology (UTAUT), Digital Divide Theory, and Constructivist Learning Theory. TAM explains user adoption of technology based on Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). UTAUT expands on TAM by introducing Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions. The Digital Divide Theory contextualizes disparities in access, skills, and usage of AI tools, while Constructivist Learning Theory links technology utilization with personalized and student-centered learning. Integrating these theories, the researcher proposed the AI Educational Utilization Theory (AIEUT), which integrates accessibility, adaptability, and applicability as the core dimensions influencing AI utilization in education.

The study employs the Input-Process-Output (IPO) Model to examine factors influencing AI tool utilization. The input phase includes students' profiles (sex, grade level, socio-economic status, types of gadgets owned, academic strand) and factors influencing AI tool utilization (availability of resources, teacher support, perceived relevance). The process phase involves data collection through questionnaires, interviews, and observations, quantitative analysis, and testing the significant relationships between student profiles and AI tool utilization. The output phase focuses on developing policy recommendations to promote responsible AI tool use in education.

The study aims to answer questions regarding the profile of respondents, the extent of AI tool utilization, factors related to utilization, the relationship between demographic profile and utilization, and policy recommendations. The assumptions guiding the study include variations in student profiles, high utilization of AI tools, different factors related to utilization, and the feasibility of proposing policy recommendations. The null hypothesis states that there is no significant relationship between the demographic profile and the extent of AI tool utilization.

The research is significant for students, teachers, policymakers, educational institutions, and future researchers. It provides insights into enhancing learning experiences, developing effective integration strategies, crafting ethical guidelines, improving infrastructure, and guiding future research. The scope is delimited to senior high school students in Iriga City, focusing on commonly used AI tools for academic purposes and self-reported experiences.

RESEARCH METHODOLOGY

The research methodology employed in this study to investigate the utilization of artificial intelligence (AI) tools among senior high school students in Iriga City is a descriptive-correlational design. The descriptive component profiles the respondents and assesses the extent of their AI tool utilization, gathering data on demographics such as sex, grade level, socio-economic status, academic strand, and types of gadgets owned, while also identifying the frequency and purpose of AI tool usage, including tools like Grammarly, ChatGPT, and Photomath. This approach aims to systematically describe the current state of AI adoption, addressing what, where, when, and how questions, but not why. The correlational aspect explores the relationships between variables influencing AI tool utilization, specifically examining how socio-economic status, perceived usefulness, perceived ease of use, and accessibility affect adoption. This involves determining the direction and strength of relationships between variables without manipulating them, providing insights into the dynamics of AI adoption and identifying key influences on student behavior.

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The study's respondents comprised senior high school students from public and private schools in Iriga City, representing various academic strands (STEM, ABM, HUMSS, and TVL). A stratified random sampling technique was used to ensure proportional representation from each strand within the sample of 464 respondents, exceeding the minimum sample size of 367 calculated using Slovin's Formula for a 5% margin of error. Data collection primarily relied on a self-made survey questionnaire, designed to align with the research objectives and consisting of sections on respondent demographics, extent of AI tool utilization, and factors influencing adoption. The questionnaire incorporated closed-ended and Likert-scale questions to capture specific details and assess perceptions of AI tools, with expert review and pilot testing conducted to ensure validity and reliability. The survey was administered in person or online, with an estimated completion time of 15–20 minutes. Unstructured interviews and observations of AI use in classroom settings supplemented the survey data.

Data analysis involved both descriptive and inferential statistical tools. Descriptive statistics, including frequency counts, percentages, and measures of central tendency (mean, median, and mode), were used to summarize the demographic profile of the respondents and the extent of AI utilization. Inferential statistics, specifically the Chi-Square test, were applied to assess the association between categorical variables, such as demographic profile and the extent of AI tools used. A five-point Likert rating scale was employed to determine the extent of utilization and related factors. Statistical software such as SPSS or Microsoft Excel was used for data analysis, with findings presented in tables to enhance interpretability. The preparation and validation of the questionnaire involved referring to relevant literature, expert critique, and a dry run to ensure clarity, specificity, and singleness of purpose. Formal requests were made to the School District Supervisor to administer the questionnaires, with data kept confidential and used solely for the study's purpose.

RESULTS

The following are the salient findings on the utilization of artificial intelligence (AI) tools among Senior High School students in School Division of Iriga City:

The demographic profile of the respondents reveals several key characteristics. A notable majority of the participants were females, comprising 63.16% of the total sample, while a significant portion, 56.32%, were in Grade 11. Economic factors also played a role in this demographic, with 54.47% of respondents coming from families with monthly incomes below ₱20,000, indicating a prevalence of lower-income households among the participants. In terms of technology access, smartphone ownership was nearly universal at 98.16%, suggesting that mobile devices are integral to their daily lives and possibly their educational experiences. Additionally, laptop ownership was also high at 75.26%, further emphasizing the importance of technology in their academic pursuits. The academic strands represented among the respondents showed a clear preference for STEM (Science, Technology, Engineering, and Mathematics), which accounted for 25.79% of the participants, followed closely by TECH-VOC (Technical-Vocational) at 20.79%. This distribution highlights a strong inclination towards fields that are often associated with future job opportunities and technological advancement.

The utilization of AI tools among users reveals a significant preference for applications designed for writing and presentation tasks. Specifically, AI tools were most commonly employed for essay and assignment writing, achieving a weighted mean score of 3.51, closely followed by their use in creating presentations and reports, which garnered a weighted mean of 3.44. Among the various AI tools available, ChatGPT emerged as the most favored option, with an impressive mean score of 3.98, indicating its widespread acceptance and reliance among users. Canva also demonstrated notable usage, with a mean score of 3.21. Conversely, the application of AI tools in solving mathematical problems was markedly less frequent, reflected in a low mean score of 1.88, while their role in time management was similarly minimal, with a mean score of 1.96.

The factors influencing the extent of AI tool utilization among senior high school students are multifaceted. Accessibility of AI tools understood as having reliable access to AI platforms and supportive infrastructure was identified as the most critical facilitator, scoring a mean of 3.81 among respondents. Efficiency in completing tasks, which encompasses how effectively AI tools streamline academic and administrative processes, was the next most influential factor with a mean of 3.66. Similarly, the ease of learning how to use these tools reflecting intuitive design and user-friendly interfaces was highly rated (mean 3.70), underscoring the importance of low learning curves for new technologies. In contrast, social influence the degree to which encouragement from

educators and peers motivates AI adoption played a less prominent role, with a mean score of 2.74. While internet connectivity was not the top factor, it remained moderately important (mean 3.40), indicating that stable online access is still essential for consistent AI tool utilization.

Significant associations were found between AI tool usage and sex, grade level, academic strand, socioeconomic status, and gadget ownership. Females used AI tools more extensively than males, mirroring broader patterns of technology adoption in higher education. The Grade 11 students reported higher AI tool usage than Grade 12 students, suggesting potential differences in exposure and curriculum integration across grade levels. Students in STEM and TECH-VOC strands used AI tools more than those in other strands, indicating disciplinary variations in both access to and encouragement of AI use. Furthermore, students from higher socioeconomic backgrounds used AI tools more frequently, highlighting the role of economic factors in technology access and engagement. Lastly, those with more gadgets reported more extensive AI use, underscoring the importance of device availability in facilitating meaningful interactions with AI technologies.

These findings underscored the importance of digital literacy, equitable access to technology, and institutional support in promoting effective and ethical AI integration in education. This research output serves as a preface to a set of policy recommendations aimed at fostering the acceptable and responsible use of Artificial Intelligence (AI) among senior high school students. The research output sought to address key areas such as data privacy, algorithmic bias, responsible sourcing, and the importance of human oversight in AI-driven learning experiences. By prioritizing ethical standards and practical applications, the organizations can cultivate a learning environment that embraces innovation while safeguarding the fundamental rights and values of all students. Recognizing the accelerating integration of AI into various aspects of life, including education, this document underscores the vital need for proactive guidelines and frameworks to ensure its ethical, safe, and beneficial adoption. It acknowledges the potential of AI to enhance learning, creativity, and critical thinking skills, while simultaneously addressing concerns related to data privacy, algorithmic bias, and the development of healthy AI literacy. The following suggestions are grounded in extensive research, stakeholder consultations, and a commitment to empowering senior high school students to navigate the complex landscape of AI with discernment and integrity, ultimately preparing them to be responsible and innovative contributors in an increasingly AI-driven world.

DISCUSSION

This study analyzes the utilization of Artificial Intelligence (AI) tools among senior high school students in Iriga City, focusing on its implications for policy recommendations in education. The study employs descriptive and inferential statistics to examine the extent of AI tool usage, influencing factors, usage patterns, and the relationship between demographic variables and AI engagement. Key demographic factors such as sex, grade level, socioeconomic status, gadget ownership, and academic strand are considered to provide context to the findings.

The demographic analysis reveals that the majority of respondents were female (63.16%), predominantly in Grade 11 (56.32%), and a significant portion came from low-income households (below ₱10,000 monthly family income). Smartphone ownership was nearly ubiquitous (98.16%), while the STEM strand had the highest representation (25.79%). These factors significantly influence students' access to and utilization of AI tools. Female students tend to use AI for writing and communication, while STEM students leverage AI for data analysis and simulations. Socioeconomic disparities affect digital accessibility, necessitating inclusive deployment of AI tools through subsidized devices and digital literacy programs.

The extent of AI tool utilization varies across academic tasks. Essay and assignment writing are the most common applications, with a weighted mean of 3.51, followed by enhancing presentations and reports (3.44). Conversely, solving mathematical problems (1.88) and AI-driven time management (1.96) are rarely used. Tools like ChatGPT (3.98) and Canva (3.21) are frequently used, while Photomath (1.73) sees limited use. Accessibility, efficiency, and ease of learning are key factors driving AI adoption, aligning with the Technology Acceptance Model (TAM). Social influence from educators and peers plays a less prominent role, indicating a need for more proactive advocacy and training within the educational system.

Chi-square analysis demonstrates a significant association between demographic factors and AI tool usage. Sex, grade level, academic strand, socioeconomic status, and gadget ownership all meaningfully correlate with the extent of AI use. These findings underscore the importance of considering equity in access and the diversity of student needs when evaluating the role of AI in education. Policies aimed at equitable access, such as providing devices and AI training, can help close usage gaps across different student groups.

Policy recommendations emphasize the ethical, acceptable, and practical use of AI in senior high school education. Establishing clear guidelines and fostering a culture of responsible innovation are crucial to harnessing the potential of AI while safeguarding against its potential pitfalls, promoting academic integrity, and preparing students for a future increasingly shaped by intelligent systems. Key areas to address include data privacy, algorithmic bias, responsible sourcing, and the importance of human oversight in AI-driven learning experiences.

CONCLUSION

AI tools are moderately utilized by senior high school students in Iriga City, primarily for academic tasks like writing, research, and presentations, with a preference for accessible and user-friendly tools like Canva and ChatGPT. Conversely, AI is "rarely" used for solving mathematical problems or AI-driven time management. Efficiency and external encouragement significantly impacted AI tool usage, with students using AI tools more when they perceived them as efficient and received support from others. The study revealed significant relationships between demographic factors and the extent of AI tool utilization, with female students, Grade 11 students, those in STEM, students from higher socio-economic backgrounds, and those owning multiple gadgets demonstrating higher AI engagement. While AI tools are integrated into students' academic practices, challenges like poor internet connectivity and lack of knowledge hinder full and effective utilization. Clear school-based guidelines on AI use are needed to promote ethical and responsible integration. The findings underscored the importance of considering equity in access and the diversity of student needs when integrating AI in education. Policies should address the digital divide by ensuring inclusive access to AI tools, providing subsidized devices, enhancing school-based digital infrastructure, and offering specialized digital literacy programs.

Recommendations include school administrators developing policies for AI tool utilization in classroom instruction, the Department of Information and Communications Technology highlighting the efficiency of AI tools, educational institutions offering digital literacy programs, and the Department of Education and school administrators developing clear policies and guidelines for AI usage in the classroom. Further research is suggested on topics such as the role of AI in shaping personalized learning, evaluating the effectiveness of AI tutors, emerging trends in AI and their potential impact on education, the evolving role of educators in AI-enhanced learning environments, and assessing the long-term effects of AI tools on students' critical thinking and problem-solving skills.

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