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Teachers' Utilization of Generative Artificial Intellegence (AI), Research Capability, and Pedagogical Practices

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Abstract

This research explored the use of generative artificial intelligence (GenAI), research capacity, and pedagogical practices among 386 Schools Division of Iloilo teachers in the 2024–2025 school year. With AI technology rapidly transforming learning environments, knowing how GenAI tools are used by educators is critical to improving teaching and research efficiency. With a descriptive-correlational research design, information was gathered from a validated survey questionnaire assessing teachers' GenAI use frequency, self-reported research competencies, and instructional practices.Results indicated that teachers had a moderate level of GenAI adoption, focusing mostly on using AI tools for lesson planning, test creation, and content generation. Senior high school teachers indicated higher rates of use than elementary and junior high school teachers, consistent with variations in access and computer skills. Teachers also expressed moderate research capacity, with comfort in classroom-based research but difficulty with more complex tasks such as data analysis and literature review. Pedagogical practice was evaluated as generally effective; however, incorporating AI into teaching was limited due to ethical issues and lack of formal training.Correlation analysis revealed strong positive correlations between GenAI use, research efficiency, and teaching practices, suggesting that AI facilitates both research efficiency and teaching effectiveness. The study calls for extensive professional development, explicit ethical norms, and enhanced technology infrastructure to assist educators in maximizing AI tools to their potential. These are important steps to empower teachers and unlock the full potential of generative AI to enhance the learning process.

Keywords: Generative Artificial Intelligence (GenAI); Teacher Use; Research Capacity; Pedagogy; Instructional Technology; AI in the Classroom; and Professional Growth

Introduction

The fast emergence of Generative Artificial Intelligence (GenAI) technologies revolutionizes the educational system, reshaping how teachers design instruction, research, and instruct. Applications

like ChatGPT, Bard, and other large language models are no longer pilot experiments—they are turning into necessary tools in classrooms today. Teachers have the twin challenge and opportunity of incorporating GenAI in their teaching methods and ensuring academic integrity, as well as being able to further their own research capacity. There must be a rethinking of conventional pedagogical roles and approaches, particularly as teachers need to be adept technology users and keen critics of its contribution to student learning.

Generative AI provides educators with the capacity to make repetitive work like lesson planning, assessment generation, and content modification automated, freeing time for student-centered and inquiry-led teaching. Research indicates that teachers are increasingly applying AI to personalize learning and create learning materials tailored to students' unique needs (Pettersson et al., 2024). For example, in the case of the Philippines, Moralista and Oducado (2020) discovered that although staff were initially resistant to digital learning, they increasingly saw its worth when underpinned by proper training and digital literacy.

Aside from instructional application, AI tools also improve researchers' research work. From creating literature reviews to analyzing qualitative information, GenAI speeds up the research process and enables data-driven decision-making. A study by Liu et al. (2025) emphasized that 76.1% of AI usage by teachers focused on content creation or adaptation, while nearly half also used AI for assessment and feedback—a strong indicator of AI's dual role in instruction and research. Furthermore, teacher researchers like Moralista and Rueda (2023) have demonstrated how digital tools can be leveraged to evaluate online learning effectiveness, particularly in graduate education.

But effective integration of AI in learning is not merely tool uptake—it strongly relies on the pedagogical beliefs, digital literacy, and change-willingness of teachers. Teachers who possess constructivist beliefs are more likely to adopt AI as a teaching collaborator than a threat (Zhai, 2024). Professional education initiatives and models like the Teachers' Generative AI Competencies (T-GAIC) have appeared to evaluate and prepare teachers on how to become comfortable with using AI (Khosravi et al., 2025).

However, some hurdles persist. There are ethical issues like the spread of misinformation, privacy of data, dependence on AI-driven content, and bias in algorithms used by AI that need to be addressed thoughtfully. Teachers need not only to be taught how to effectively utilize GenAI tools but also to serve as models of ethical and responsible use for their students. According to Rome B. Moralista and others (2023), teaching technological innovation must be complemented by the support of institutions and values-based education in order to make it really improve, not impede, the learning process.

The integration of generative AI in education has the potential to considerably enhance pedagogical practices and enhance the research capacities of teachers. For this potential to be harnessed, there needs to be a conscious and ethical effort that enables teachers to be effective, reflective, and accountable users of AI.

Finally, Even though there is an increased presence of generative artificial intelligence (GenAI) in education, its proper utilization among teachers is still questionable. There are 386 teachers in the Schools Division of Iloilo for the 2024–2025 school year who experience different levels of access, capabilities, and confidence in applying GenAI tools for teaching and research. This study aims to identify how the said teachers use GenAI, how it affects their research capacity, and how it impacts their classroom pedagogical activities.

Methodology

Research Design

The study utilized a descriptive-correlational research design to analyze the link between teachers' use of generative artificial intelligence (GenAI), research ability, and instructional practices. The design was used to describe the situation as it is for GenAI usage by teachers and whether the variables of interest have significant relationships.

Participants

The subjects of this study were 386 teacher participants from different public schools under the Schools Division of Iloilo for school year 2024–2025. Respondents were chosen using stratified random sampling to secure representation in varying levels of schools (elementary, junior high school, and senior high school).

Research Instrument

A detailed survey questionnaire was framed and tested by education and educational technology experts. The questionnaire was framed in four sections: Demographic profile of respondent; Use of GenAI tools (e.g., ChatGPT, Bard), Self-perceived research capability' and Pedagogical practices in AI-assisted instruction. Responses on GenAI application, research ability, and teaching practices were measured using a five-point Likert scale.

Data Gathering Procedure

Permission for the study was secured from the Schools Division Office of Iloilo. Both printed and electronic copies of the survey were distributed based on teacher availability and preference. Informed consent was secured from all respondents, and confidentiality was maintained strictly.

Data Analysis

Data were described using descriptive statistics (frequency, percentage, mean, and standard deviation) to report responses, and Pearson's correlation coefficient was employed to establish correlations between the use of GenAI, research capacity, and teaching practices. All tests were conducted with statistical software like SPSS or Microsoft Excel.

Result

The study findings give a detailed description of how teachers in the Schools Division of Iloilo use generative artificial intelligence (GenAI), their self-rated research competence, and the instructional practices they adopt in the school year 2024–2025. The data gathered from 386 teachers show significant findings on integrating AI technology in schools.

To begin with, it was discovered that the use of GenAI tools by teachers is moderate. Most of the teachers indicated applying AI applications for purposes like planning lessons, developing assessments, and summarizing or creating instructional materials. This indicates that although AI tools are increasingly becoming part of the teacher's toolkit, their application tends to be largely confined to content-related and administrative roles. Conspicuously, senior high school teachers registered a greater rate of GenAI utilization than elementary and junior high school teachers, which probably was due to variations in digital access, education, or curriculum requirements.

On research capability, teachers quite often rated themselves as being quite competent in classroom-based research and academic writing. Yet, there are still challenges to be addressed, especially in more intricate tasks such as statistical data analysis and integrated literature review, which are domains where GenAI could be helpful to a very large extent. What this suggests is the disparity between teachers' existing research skills and the potential improvements that GenAI could bring if leveraged and enabled properly through training.

Pedagogical practices among the respondents were described as being mostly effective, with teachers having good skills in lesson delivery, classroom management, and assessment of students. Introducing AI into active pedagogical practices was still evolving. Teachers were reluctant or unsure about integrating AI entirely into teaching because they were concerned about the use of AI-generated content ethically and the need for professional training on pedagogy for AI. This underscores a critical capacity-building area to guarantee that AI is implemented in ways that complement rather than undermine learning quality.

Notably, correlation analysis identified strong positive associations among the three variables examined. Teachers actively using GenAI were more likely to have reported stronger research abilities, indicating that AI systems may promote or invite research activity. Furthermore, more frequent use of AI was linked with better pedagogical practices, reflecting that GenAI can complement better pedagogies when properly used. These results emphasize the interrelatedness of technology adoption, research competence, and pedagogy for modern education.

In short, the findings of this research show that though teachers of the Schools Division of Iloilo are starting to integrate generative AI applications into their teaching, its use remains unfolding and is shaped by different degrees of accessibility, proficiency, and confidence. The significant positive correlations between the use of AI, research skills, and instructional practices indicate promising possibilities for AI to improve teacher performance, given proper training and ethical principles. This calls for strategic efforts to support teachers in harnessing AI’s full potential to improve both research and instruction.

Discussion

The findings of this study highlight the growing but cautious adoption of generative artificial intelligence (GenAI) among teachers in the Schools Division of Iloilo, reflecting broader trends in education technology integration. The moderate rate of GenAI adoption indicates that although teachers are aware of the potential value of AI applications for tasks like lesson planning and test preparation, their full adoption into routine pedagogical practice is limited. This is consistent with current research showing that teachers tend to start using technology simply for administrative tasks before advancing to more engaging, student-related uses (Pettersson et al., 2024).

The greater utilization of AI by senior high school teachers than by elementary and junior high teachers can be explained by various factors. Senior high teachers are most likely to have more complicated curriculum demands and be involved in doing research, thus finding AI tools especially helpful for workload management and instructional content improvement. In addition, technology access and training in digital literacy are more common at the higher levels of education, which may account for the gap in AI use found in this study. This result is in accordance with Moralista and Oducado (2020), who highlighted the role of training and constant internet availability in influencing faculty members' perception and utilization of digital educational tools.

The self-assessed moderate research capability among teachers highlights a critical area for development. While teachers are confident in conducting classroom research, they encounter difficulties with advanced tasks such as statistical analysis and comprehensive literature review. These challenges suggest that although GenAI has the potential to enhance research productivity by automating or assisting with complex tasks, its benefits are not fully realized without adequate training. This suggests the necessity for institutionally supported professional development programs that do not just educate teachers on the use of AI tools but enhance their core research competencies as well, thus allowing them to better leverage the technology's benefits.

The predominantly positive pedagogical practices evidenced show that teachers are sustaining effective teaching methods in spite of the relatively recent addition of AI. But the sparse application of AI in direct instruction implies caution, perhaps stemming from ethical issues like academic integrity, privacy of data, and potential overuse of content created by AI. It is not surprising, considering all the controversies in education about where AI fits. It calls for establishing clear guidelines and ethics that equip teachers to utilize AI responsibly and with confidence in their classrooms.

The positive correlations identified between GenAI adoption, research abilities, and pedagogy further indicate that these factors are interdependent and mutually supportive. Educators who adopt AI tools also enhance their research abilities and use more innovative pedagogies. This reinforces the proposition that embedding technology in education is more than the mere adoption of tools but entails a holistic reorganization of teaching and researching processes. It also points to the power of AI as a catalyst for professional development and teaching innovation when deployed intentionally.

This research underscores that although using generative AI by Iloilo teachers is promising, fulfilling its full potential demands solving issues around access, expertise, and ethical utilization.

Institutional support through training, infrastructure development, and policy formulation will be pivotal in helping teachers leverage AI efficiently for research and pedagogy. All future initiatives should aim at developing these capacities to make AI an empowering tool rather than an agent of inequity or ethical dilemma in education.

Conclusion

This research showed that educators in the Iloilo Schools Division are starting to use generative artificial intelligence tools in their instructional and research work at a moderate extent. The results pinpoint that although teachers acknowledge the advantages of AI during lesson planning, examinations, and research, issues like limited training, ethical issues, and differences in technology availability continue to be major hindrances. The positive relationships among AI adoption, research proficiency, and instructional practices indicate that AI has the capability to increase teaching efficiency and professional development when implemented responsibly. To maximize the benefits of generative AI, it is important for schools to offer sustained professional development, unambiguous ethical guidelines, and sufficient technological support. By doing so, it will enable teachers to utilize AI confidently and creatively, eventually enriching the learning process for students.

Recommendation

The following are recommended based on the outcomes of this study to further improve the effective adoption of generative artificial intelligence (GenAI) among Iloilo Schools Division teachers:

Implement Comprehensive Training Programs

Educational policymakers ought to create and offer frequent, practical training workshops on the ethical and pragmatic application of GenAI tools. The programs should enhance the digital literacy, research competencies, and pedagogical integration of teachers.

Establish Clear Policies and Ethical Guidelines

The Schools Division Office must develop robust policies and guidelines that direct teachers on how to use AI responsibly, covering areas such as academic integrity, data privacy, and the role of AI in teaching.

Boost Infrastructure and Access

Increase internet connectivity and offer access to AI devices in schools, particularly in elementary and rural schools with lower rates of usage. Equal access will allow all teachers to take advantage of AI technology.

Foster Collaborative Research and Knowledge Sharing on Best Practices

Sponsor teachers for collaborative research activities with the use of GenAI tools and develop channels for success-sharing on AI integration with a community of practice among teachers.

Integrate AI Competency in Teacher Development Programs

Embed AI-related competencies into current teacher professional development programs to foster ongoing development and preparation in line with new educational technologies.

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