Extent of Artificial Intelligence (AI) Chatbot Usage and Academic Performance Among The Grade 9 Students

Nova Blern G. Angub
Self-Employed Brgy. San Jose, Sogod, Southern Leyte
Email: bernalyn.abenoja001@deped.gov.ph

Maria Theresa C. Lor
Teacher III, Mahaplag National High School, Brgy. Malinao, Mahaplag, Leyte
Email Add: mtheszlor2016@gmail.com

Emely D. Romaguera
Master Teacher I, Mahaplag National High School, Brgy. Uguis, Mahaplag, Leyte
Email Add: romagueraemely@gmail.com

Froilan N. Abenoja
Teacher III Mahaplag National High School Brgy. San Isidro, Mahaplag, Leyte
Email: froilan.abenoja@deped.gov.ph

Abstract — In today's fast-changing educational landscape, the integration of artificial intelligence (AI) in classrooms holds great promise for enhancing teaching and learning. This study examined the use of AI chatbots and their effects on academic performance among Grade 9 students at Mahaplag National High School, DepEd Schools Division of San Isidro, Mahaplag, Leyte, during the 2025–2026 school year. The demographic profile showed that teachers are mostly female, mid-career professionals with an average of 13 years of service, many pursuing or holding postgraduate degrees, and actively engaging in professional development. Students, primarily 13 to 14 years old and predominantly female, rely heavily on smartphones as their main learning tool, highlighting the need for mobile-friendly and inclusive digital strategies. The findings revealed a balanced approach to AI use. Teachers gave the highest importance to ethical considerations (AWM = 4.95, VGE) while limiting over-reliance on AI (AWM = 3.87, GE), demonstrating that technology serves as a supportive tool rather than a replacement for human guidance. Students echoed this

perspective, rating AI's effectiveness highly (AWM = 4.34, VGE) but maintaining low dependence (AWM = 3.88, GE), showing responsible adoption. Academic performance also improved modestly yet meaningfully, with general averages rising from 4.46 to 4.51 (HP), reflecting better comprehension, engagement, and efficiency in learning tasks. Correlation analyses indicated that both teachers' and students' profiles—such as age, experience, training, and access to technology—significantly influenced AI use and learning outcomes. The study concludes that ethically implemented AI, combined with continuous teacher development and equitable technology access, can meaningfully enhance learning. It recommends mobile-friendly strategies, targeted professional training, and responsible AI practices to support human-centered, inclusive, and future-ready educational environments.

I. INTRODUCTION

The study titled "Extent of Artificial Intelligence (AI) Chatbot Usage and Academic Performance among the Grade 9 Students." It begins by presenting the background and rationale of the research, situating it within global, national, and local contexts while emphasizing the increasing integration of AI technologies in education. It also highlights the Department of Education's initiative to promote digital transformation through the establishment of the Education Center for AI Research (E-CAIR), underscoring the Philippines' commitment to advancing responsible and innovative AI adoption in schools.

This further discusses the legal and ethical foundations guiding AI use in education, referencing international frameworks and Philippine laws that ensure AI implementation remains ethical, secure, and aligned with educational objectives. It also identifies existing research gaps,

particularly the scarcity of empirical studies examining the link between AI chatbot usage and students' academic performance in rural learning environments such as Mahaplag, Leyte.

In the age of rapid technological advancement, Artificial Intelligence (AI) has emerged as one of the most transformative innovations of the 21st century, reshaping the way people live, work, and learn. Its widespread application across industries has ushered in new paradigms of efficiency and accessibility, with education standing at the forefront of this digital revolution. Among the various forms of AI technology, AI chatbots have gained remarkable attention as intelligent digital assistants capable of providing students with real-time support, guiding them through problem-solving, clarifying lessons, and delivering instant feedback. Their growing presence in academic settings signifies a paradigm shift in which traditional learning materials are complemented and in some cases, challenged by intelligent systems designed to simulate human interaction. This transformation, while promising, also raises crucial questions about how students and teachers adapt to these innovations and how they ultimately influence students' academic performance. Globally, the integration of AI in education is accelerating at an unprecedented rate. According to UNESCO (2023), AI is projected to play a vital role in achieving inclusive and equitable quality education by 2030, particularly in addressing the persistent gaps in personalized learning and access to educational resources. In advanced economies such as the United States and Europe, AI-powered educational platforms have already been incorporated into classrooms to enhance homework assistance, automate assessments, and support differentiated learning approaches (Holmes et al., 2021). Meanwhile, several Asian countries, including China and South Korea, have integrated intelligent tutoring systems and adaptive learning technologies to improve student engagement and academic performance. These international developments demonstrate how AI-driven tools can foster individualized learning pathways, promote efficiency, and contribute to measurable academic gains.

Literature Review

In recent years, Artificial Intelligence (AI) has increasingly permeated the educational landscape, transforming how students' access, process, and produce knowledge. Among the

various AI-driven tools, AI chatbots have emerged as prominent educational companions due to their ability to simulate human-like conversations and provide immediate assistance to learners. Chatbots are designed to interact with users using natural language, offering explanations, generating ideas, and facilitating problem-solving. Studies by Okonkwo and Ade-Ibijola (2021) and Pereira et al. (2023) emphasize that chatbots are not only convenient tools but also flexible learning companions that can adapt to learners' pace, needs, and contexts. These technologies now occupy an important role in secondary education where students increasingly rely on digital means for academic support, making it essential to explore how the extent of chatbot usage relates to academic performance, particularly among junior high school learners.

Educational chatbots have evolved from simple rule-based systems to complex, data-driven large language models (LLMs) capable of generating human-like responses (Deng, 2023). With tools such as ChatGPT, Bing Copilot, and Google Gemini, students are now able to access vast information instantly. The widespread accessibility of these chatbots has sparked academic discussions about their impact on student learning outcomes (Kasneci et al., 2023). Empirical evidence suggests that chatbots can serve as virtual tutors, providing personalized feedback, guiding student inquiry, and fostering independent learning (Labadze, 2023). Their ability to provide consistent, immediate responses may help learners clarify misconceptions and strengthen comprehension especially for students who require additional support outside classroom hours (Pereira et al., 2023). Such technological developments raise questions about how often and in what ways students utilize chatbots for academic tasks and whether the frequency of use contributes to measurable improvements in performance.

The positive relationship between AI chatbot usage and academic achievement has been supported by several empirical and meta-analytic studies. Deng (2023) conducted a meta-analysis revealing that chatbot-assisted instruction often results in significant gains in knowledge retention and learning performance compared to traditional instruction. Similarly, Ma and Siau (2022) observed that students using conversational agents for learning reported higher engagement and improved test results due to the interactive and immediate nature of feedback. Furthermore, Chang et al. (2022) highlighted that chatbots enhance learners' self-efficacy by providing a safe, low-pressure environment where mistakes are treated as learning opportunities. When students gain

confidence in their ability to use technology for learning, they are more likely to engage in deeper cognitive processing, leading to improved academic outcomes (Chen et al., 2023). These findings collectively indicate that chatbots, when used appropriately, can serve as effective facilitators of student learning and performance.

On the other hand, researchers caution that the educational benefits of chatbot use depend on the quality, frequency, and purpose of use. For instance, Stöhr et al. (2024) found that excessive or unregulated reliance on AI chatbots may reduce students' critical thinking and problem-solving abilities, especially when students depend on chatbots to generate answers rather than to support understanding. Similarly, Dahdouh et al. (2021) argued that chatbots may encourage academic complacency when used as shortcuts to complete assignments. In such cases, students may experience superficial learning or fail to internalize concepts. Thus, the extent of chatbot usage can have both beneficial and detrimental effects depending on user intent, self-regulation, and academic integrity. These findings underscore the need to examine not only how frequently students use chatbots but also how responsibly and strategically they apply these tools to their studies.

Research on AI literacy and digital competence further illuminates the complex relationship between chatbot use and academic performance. Casal-Otero et al. (2023) emphasized that students' ability to critically assess AI-generated information determines whether chatbot use will lead to learning gains or misinformation. Without proper AI literacy, students risk accepting inaccurate or biased responses, potentially impairing their academic outcomes. Riedl (2023) explained that effective AI literacy includes understanding how algorithms generate responses, how to verify content credibility, and how to integrate AI outputs into original work. In K–12 settings, where learners are still developing research and critical analysis skills, educators play a pivotal role in guiding students toward responsible and ethical chatbot usage (Williamson & Kizilcec, 2023). This dynamic indicates that the extent of chatbot use may interact with students' digital literacy levels and teacher supervision in shaping academic results.

Additionally, studies have shown that AI chatbots positively affect student engagement and motivation. In a systematic review by Okonkwo and Ade-Ibijola (2021), chatbots were found to

improve learners' emotional engagement and satisfaction by offering interactive experiences that traditional lectures cannot provide. Similarly, Yeo et al. (2020) found that chatbot-assisted learning environments promote persistence and time-on-task behaviors, both of which are crucial predictors of academic success. Moreover, Alharthi and Kessler (2022) discovered that language learners who interacted regularly with chatbots developed greater confidence and communicative competence compared to those who relied solely on textbooks. These studies highlight that chatbots not only support cognitive learning but also influence affective and behavioral dimensions that contribute to academic performance.

Therefore, this study is anchored on a conceptual framework where extent of AI chatbot usage is presumed to influence academic performance both directly and indirectly through mediating factors such as engagement and self-efficacy, and moderated by AI literacy and teacher supervision. Understanding this relationship is vital for educators and policymakers to design interventions that promote productive, ethical, and effective AI-assisted learning among Grade 9 students.

II. METHODOLOGY

Research Design

This study examined the extent of Artificial Intelligence (AI) chatbot usage and its relationship to the academic performance of Grade 9 students at Mahaplag National High School, San Isidro, Mahaplag, Leyte, during the School Year 2025–2026, as a basis for developing evidence-based educational strategies and support mechanisms. The researcher utilized the descriptive-correlational method of research. According to Calderon and Gonzales (2020), the descriptive method is appropriate when the goal is to describe current conditions, practices, or beliefs of a particular group and to assess outcomes related to those practices. This method allows the researcher to determine the students' extent of AI chatbot usage by examining observable facts, characteristics, and statistical measures such as frequencies and averages. It is particularly suitable

for educational studies that aim to identify behavioral patterns and evaluate their perceived and actual effects on academic performance.

By employing the descriptive-correlational approach, the study not only presents a clear picture of the current trends in AI chatbot utilization among Grade 9 students but also explores the possible relationship between their level of chatbot use and their performance in core academic subjects. This approach provides a balanced understanding of both descriptive data and relational insights, aligning with Creswell and Creswell's (2018) assertion that correlational studies help determine the strength and direction of associations among naturally occurring variables without manipulation.

Sample of the Study

The respondents of this study consisted of Grade 9 students and teachers from Mahaplag National High School, San Isidro, Mahaplag, Leyte, for the School Year 2025–2026. The study included a total of 167 respondents out of 334 total population, composed of 147 Grade 9 students and 20 teachers. The Grade 9 students served as the primary respondents, as they represent the target group whose extent of AI chatbot usage and corresponding academic performance was examined. The teachers, on the other hand, served as secondary respondents, providing supporting insights and validation regarding students' performance and observable patterns in chatbot utilization within the classroom context.

The selection of respondents was guided by the principle of representativeness and data reliability. A stratified random sampling technique was employed for the Grade 9 students to ensure proportional representation from various sections within the year level. This approach minimized sampling bias and captures the diversity of student experiences and technology access. Meanwhile, purposive sampling was used for the teachers, as they possess specific knowledge relevant to assessing student academic behavior and AI usage trends. This dual approach strengthens the triangulation of data by combining perspectives from both learners and educators.

The rationale for this sampling strategy wa to obtain a comprehensive understanding of how AI chatbots are being utilized across different academic contexts while ensuring that the data collected accurately reflects the broader population of Grade 9 students. Moreover, the inclusion of teachers helps validate the findings from the students' responses, ensuring that the study results are both credible and grounded in classroom realities.

To gather data, the study utilized a structured questionnaire, designed to measure the extent of AI chatbot usage and academic performance of Grade 9 students. The tool was developed based on reviewed literature and validated by research experts to ensure content accuracy and relevance. Its structured format allows for the systematic collection of quantifiable data, which supports the application of descriptive and correlational analyses.

Table 1 presented the distribution of the respondent groups.

TABLE 1
DISTRIBUTION OF THE RESPONDENT GROUPS

Respondents	f	%
Teachers	20	88.02
Students	147	11.98
Total	**167**	**100.00**

As shown in the table, 88.02% of the total respondents are Grade 9 students, while 11.98% are teachers. This stratified distribution ensures balanced representation and strengthens the study's objective to analyze the relationship between AI chatbot usage and academic performance from both learner and educator perspectives.

Measures

The study employed a modified structured questionnaire as the primary instrument for data collection to determine the extent of artificial intelligence (AI) chatbot usage and its

relationship to the academic performance of Grade 9 students. The instrument was designed and adapted based on existing validated tools and related studies to ensure alignment with the research objectives. It was administered both online through Google Forms and face-to-face to maximize participation and accessibility among respondents.

The questionnaire was divided into two versions: one for Grade 9 students and another for teachers. The students' questionnaire consisted of four main parts. Part I shows the demographic profile of the students, including age, sex, and access to technology, to establish background variables that may influence the extent of AI chatbot usage. Part II measures the extent of AI chatbot usage using the indicators of perceived usefulness, ease of use, and trust and accuracy, which are essential constructs in evaluating user engagement with technology. Part III assesses the academic performance of students by referencing their grades in core subjects from the previous and current school years (School Year 2024–2025 and 2025–2026). Part IV explores student's perceived challenges and suggestions related to the use of AI chatbots for educational purposes, providing qualitative insights that may inform future educational strategies.

Meanwhile, the teachers' questionnaire comprises five sections. Part I collects teachers' demographic information, such as age, sex, civil status, highest educational attainment, number of years in teaching, and number of relevant trainings or seminars attended. Part II focuses on teachers' assessment of students' extent of AI chatbot usage using the same indicators applied to the student version perceived usefulness, ease of use, and trust and accuracy. Part III involves teachers' evaluation of students' academic performance, which were compared across grading periods. Part IV identifies observed challenges in relation to students' learning behaviors and technology integration. Part V seeks suggestions for educational strategies and support mechanisms, which may guide future policy or instructional improvements.

The measurement of variables in this study is systematically aligned with the objectives. Responses in the demographic profile section (Part I) were analyzed using simple percentage to describe the characteristics of the respondents. For Part II, which assesses the extent of AI chatbot usage, a four-point Likert Scale will be employed to quantify the level of agreement of respondents with various statements. The scale will be interpreted as follows: 3.26–4.00 (Strongly Agree),

2.51–3.25 (Agree), 1.76–2.50 (Disagree), and 1.00–1.75 (Strongly Disagree). For the academic performance variable, students' actual grades from the school records will be used as the quantitative measure. Meanwhile, qualitative responses from the sections on challenges and recommendations will be organized into themes, counted, and ranked based on frequency to identify the most common perceptions and suggestions.

Finally, to ensure the validity and reliability of the instrument, content validation will be conducted by a panel of research experts from Northwest Samar State University. The questionnaire will be revised based on their recommendations to guarantee that each item effectively measures the intended variable and aligns with the study's research objectives. This process ensures that the instrument accurately captures the extent of AI chatbot usage and its association with academic performance among Grade 9 students.

Procedures

The conduct of this study on the extent of artificial intelligence (AI) chatbot usage and academic performance among Grade 9 students followed a systematic and ethical research process to ensure the accuracy, validity, and reliability of the results. The process began with the development of a structured and modified questionnaire that served as the primary data-gathering instrument. The questionnaire was originally adapted from previous studies on technology integration and AI-assisted learning but was modified to align with the present study's specific context and objectives, focusing particularly on the Grade 9 students' extent of chatbot usage, perceived usefulness, ease of use, trust and accuracy, and their academic performance in core subjects such as English, Science, and Filipino. The modifications were made to ensure that the instrument was age-appropriate, culturally relevant, and reflective of the current educational setting in the Philippine context, especially within the framework of DepEd's ICT integration initiatives.

After the initial drafting of the instrument, it underwent content validation by a panel of experts composed of research and education specialists from Northwest Samar State University,

following the recommendations of David and Sutton (2011) on ensuring instrument validity through expert review. The experts evaluated the questionnaire in terms of content clarity, construct relevance, and overall suitability to the study's objectives. Revisions were made based on their feedback to simplify technical terms and to make the questions more comprehensible to Grade 9 learners. The validated questionnaire was then pilot-tested among a small group of non-participating students from a nearby school to assess the reliability and clarity of each item. Based on the pilot results, minor revisions were implemented, such as rewording certain questions to avoid ambiguity and restructuring the sequence of items for logical flow.

Once the instrument was finalized, the researcher sought formal permission from the school principal and the Department of Education (DepEd) authorities in Mahaplag National High School to conduct the study. Upon approval, the researcher coordinated with class advisers to identify and reach the Grade 9 students who would serve as respondents. A total of 167 respondents were included in the study, consisting of 147 Grade 9 students and 20 teachers. The students were selected through stratified random sampling, ensuring representation across different sections and academic tracks, while the teachers were chosen purposively as they could provide supplementary insights into students' performance and AI usage. The stratified sampling method was chosen to guarantee fair representation and minimize sampling bias, following the principles of probability sampling described by Creswell (2018).

Data collection was carried out in two modes to accommodate varying access to technology. For schools and students with reliable internet access, the researcher distributed Google Form questionnaires, while printed copies were provided to those in areas with limited connectivity. Before answering, the respondents were oriented on the purpose of the study, assured of confidentiality, and reminded to answer independently and honestly. During the data-gathering process, one of the main challenges encountered was the inconsistent internet connection, which caused delays in retrieving responses through online forms. Additionally, some students initially demonstrated hesitation to participate, fearing that their responses might affect their academic standing. This concern was addressed through reassurance that the data would be treated with utmost confidentiality and used solely for research purposes.

After data collection, the researcher carefully reviewed all responses for completeness and accuracy. Incomplete or improperly filled-out questionnaires were excluded from the dataset. Students were also asked to report their general average during the Fourth Quarter of School Year 2024-2025 and First Quarter, School Year 2025-2026, which were cross-verified with their class advisers whenever possible to ensure data accuracy. The validated and cleaned data were then encoded into a spreadsheet for analysis. Descriptive statistical tools such as mean, frequency, and percentage were used to summarize the respondents' profiles and levels of chatbot usage, while inferential statistics, particularly the Pearson correlation coefficient, was applied to determine the relationship between the extent of AI chatbot usage and students' academic performance.

Throughout the process, the researcher adhered to ethical standards in research by obtaining informed consent from all participants, maintaining anonymity, and ensuring voluntary participation. Despite the challenges encountered, including time constraints, data retrieval delays, and respondent hesitation, the data-gathering procedure was completed successfully. The systematic approach taken from instrument development to data analysis ensured that the results accurately reflected the relationship between AI chatbot usage and academic performance among Grade 9 students, providing valuable insights for educators and policymakers in the integration of AI tools in secondary education.

Data Processing

After all responses were collected, the researcher implemented a systematic data processing procedure to ensure that the dataset was accurate, consistent, and ready for analysis. The process began with data screening, where the retrieved questionnaires from the 167 respondents composed of 147 Grade 9 students and 20 teachers of Mahaplag National High School were manually checked for completeness and consistency. Questionnaires with missing or inconsistent responses were excluded from the dataset to preserve the reliability of the results. Only fully accomplished questionnaires, particularly those addressing the key variables such as the respondents' profile, extent of AI chatbot usage, and students' academic performance, were retained for processing.

After screening, valid responses were numerically coded to facilitate statistical analysis. The coded data were then encoded into Microsoft Excel and transferred to the Statistical Package for the Social Sciences (SPSS) for organization and computation. Descriptive statistics, including frequency, percentage, weighted mean, and standard deviation, were used to analyze and describe the respondents' demographic profiles, such as age, sex, civil status, highest educational attainment, years in teaching, and access to technology. These measures were also used to determine the overall extent of AI chatbot usage in teaching and learning activities in terms of frequency of use, purpose of use, level of dependence, perceived effectiveness, and ethical considerations.

To assess students' academic performance, their general averages from the Fourth Quarter of School Year 2024–2025 and the First Quarter of School Year 2025–2026 were collected and compared to determine potential changes or trends in performance over time. The comparison of mean scores helped in identifying whether differences in academic outcomes could be linked to varying levels of AI chatbot utilization.

In testing the relationships among variables, several inferential statistical tools were employed. The Pearson's r correlation coefficient was used to determine the relationship between the extent of AI chatbot usage and students' academic performance in core subjects. This statistical method was appropriate because it measures the strength and direction of linear relationships between two continuous variables. The Chi-square test of independence was applied to examine whether there were significant associations between categorical variables, such as the respondents' profiles (e.g., sex, age group, educational attainment) and their level of chatbot utilization. Additionally, an Analysis of Variance (ANOVA) was performed to compare the differences in AI chatbot usage across different demographic groups, while paired t-tests were used to evaluate significant differences in students' general averages between the two grading periods.

Throughout the data processing phase, the researcher maintained strict adherence to ethical standards and confidentiality protocols. All data were handled exclusively by the researcher to ensure privacy and data security. Moreover, the statistical computations were carefully verified to minimize human and computational error. These procedures ensured that the findings were based

on accurate, reliable, and ethically obtained data. The combination of descriptive and inferential statistical methods provided a comprehensive basis for analyzing the extent of AI chatbot usage and its relationship to academic performance among Grade 9 students, directly addressing the study's research problems and serving as the empirical foundation for the development of the proposed AI Bootcamp program.

Ethical Considerations

This study upholds the highest ethical standards in conducting research involving human participants, particularly Grade 9 students from Mahaplag National High School. Ethical considerations were carefully observed to ensure that the rights, dignity, and welfare of all respondents were protected throughout the research process. Every step of the study from participant recruitment to data collection, analysis, and reporting was guided by the ethical principles of respect for persons, beneficence, justice, and confidentiality.

Before data collection, the researcher secured approval and coordination with school authorities to guarantee that the study aligned with institutional protocols and Department of Education (DepEd) guidelines. Given that the participants were minors, informed consent from parents or guardians was obtained, alongside the students' own assent. Each participant was clearly informed about the purpose, objectives, and procedures of the study, including the voluntary nature of their participation. They were assured that they could withdraw from the study at any time without facing any academic consequences or penalties. This process followed the ethical recommendations of Resnik (2018) and Creswell and Poth (2018) regarding transparency and voluntary participation in educational research.

To preserve anonymity and confidentiality, no personal identifiers such as names or student ID numbers were included in the questionnaire or research report. Each response was assigned a code, ensuring that data could not be traced back to any individual. The collected data were used solely for academic purposes and were reported in aggregate form to prevent the identification of

individual participants or schools, consistent with the guidelines of the British Educational Research Association (2018).

III.   RESULTS AND DISCUSSION

This section provided, evaluated, and interpreted the information gleaned from the study participants' questionnaires. Together with related statistical analysis and interpretation, the data are given in tabular and graphical formats. The conversation focuses on the extent of artificial intelligence (AI) chatbot usage and academic performance among the grade 9 students.

Profile of respondents. This subsection provided the demographic profile of the respondents, which was used in obtaining data on the extent of artificial intelligence (AI) chatbot usage and academic performance among the grade 9 students in Mahaplag National High School, DepEd Schools Division of San Isidro, Mahaplag, Leyte, during School Year 2025-2026.

Teachers

Age. Based on data gathered as presented in Table 2, the age distribution of the respondents indicate that the majority of teachers fall within the 41–50 years old category, comprising 40% of the sample (n = 8). This is followed by the 31–40 years old group at 30% (n = 6), the 51–60 years old group at 15% (n = 3), and the 20–30 years old group also at 15% (n = 3). Notably, there were no respondents in the 61–65 years old range. The computed mean age of the teachers is 41 years, with a standard deviation of 9.34, suggesting a moderate variation in age among the participants.

This distribution indicates that the teaching workforce in the study is predominantly middle-aged, with a substantial portion of educators possessing significant experience, likely contributing to both pedagogical expertise and familiarity with instructional practices. The presence of younger teachers (20–30 years old) suggests a gradual influx of early-career educators, potentially bringing new perspectives and adaptability to emerging technologies in teaching.

Overall, the age profile reflects a balanced mix of experience and dynamism within the teaching population.

Age Category	f	%
61 - 65 years old	0	0.00
51 – 60 years old	3	15.00
41 – 50 years old	8	40.00
31 – 40 years old	6	30.00
20 – 30 years old	3	15.00
Total	20	100.00
Mean Age: 41		
StDev. 9.34		

Table 2. This table presents the profile as to age of teacher respondents at Mahaplag National High School, San Isidro, Mahaplag, Leyte.

The age profile of the teachers in this study, with a mean age of 41 years and a predominance of educators in the 41–50 years old category (40%), suggests that the teaching workforce is largely middle-aged and experienced. This demographic characteristic has important implications for the integration of AI technologies in teaching. Research indicates that teacher age can influence technology adoption, with middle-aged educators often balancing pedagogical experience with openness to digital innovations (Ertmer & Ottenbreit-Leftwich, 2020). While younger teachers may quickly adopt AI tools due to digital nativity, experienced teachers bring the professional judgment, instructional expertise, and classroom management skills necessary to effectively integrate technology into lesson delivery (Tondeur et al., 2021).

Moreover, the presence of early-career teachers (20–30 years old) implies the potential for intergenerational collaboration, where younger educators may support AI integration while older teachers apply their experience to maintain instructional quality. This aligns with findings by Al-Fadhli and Al-Ammari (2022), who emphasized that a mixed-age teaching workforce can foster both innovation and stability in educational settings, particularly when implementing technology-enhanced learning tools.

Therefore, the results suggest that professional development programs on AI integration should be differentiated according to age and experience, ensuring that all educators whether early-career or highly experienced can effectively leverage AI tools in teaching, thereby maximizing both instructional efficiency and learner outcomes.

Sex. Based on the data gathered (Table 3), the sex distribution of the respondents indicate that the majority of the teachers are female, comprising 70% of the sample (n = 14), while males represent 30% (n = 6). This distribution reflects a predominantly female teaching workforce within the study population.

Such a gender composition is consistent with broader trends in education, where female educators often outnumber males, particularly in primary and secondary levels (UNESCO, 2021). The predominance of female teachers may influence classroom dynamics, teaching approaches, and communication styles, as research suggests that gender can affect pedagogical interactions and the adoption of instructional innovations (Ertmer & Ottenbreit-Leftwich, 2020). Additionally, the presence of male teachers, though smaller in number, contributes to diversity in perspectives and teaching strategies.

Summary of Findings

This contained a concise summary of the results taken from the survey questionnaires in connection to the extent of artificial intelligence (AI) chatbot usage and academic performance among the Grade 9 students in Mahaplag National High School, DepEd Schools Division of San Isidro, Mahaplag, Leyte, during School Year 2025-2026. This summarized a brief upshots and insights obtained and used it with notable trends and patterns perceived.

1. **Demographic Profile of the Respondent Groups.** The demographic profiles of teachers and students paint a picture of a school community with distinct yet complementary strengths and challenges. Teachers are mostly female, mid-career professionals with an average of 13 years in service. Many are pursuing or have already

earned postgraduate degrees, and their active participation in professional development reflects a strong culture of academic growth and contributes to overall school stability. Students, on the other hand, form a relatively uniform group—most are 13 to 14 years old, predominantly female, and heavily dependent on smartphones as their primary learning device. While this opens up opportunities for mobile-assisted learning, it also highlights the limitations that come with limited access to other types of technology. Taken together, these characteristics point to the importance of mobile-friendly and inclusive learning strategies, paired with continuous teacher upskilling. By aligning these strengths, schools can foster a learning environment that is more effective, equitable, and responsive to the needs of today's learners.

2. **The extent of Artificial Intelligence (AI) chatbot usage in teaching and learning activities.** The findings reveal a clear contrast in teachers' attitudes toward AI. Ethical considerations received the highest rating (AWM = 4.95, VGE), while the level of dependence on AI scored lowest (AWM = 3.87, GE). This suggests that teachers are highly attuned to issues of fairness, privacy, accountability, and responsible AI use, reflecting global concerns about algorithmic bias and data protection (Zhao, Khan, & Ahmed, 2024; UNESCO, 2023). At the same time, their cautious approach to dependence indicates a preference for using AI as a supportive tool rather than a replacement for human judgment, creativity, and emotional connection in teaching (Filiz, Kaya, & Adiguzel, 2025). The gap between these ratings underscores a balanced mindset: while teachers value AI's effectiveness, they intentionally avoid over-reliance, echoing the U.S. Department of Education's (2023) advice that AI should complement—not replace—educators. Overall, these results point to the need for ethical frameworks, responsible AI practices, and professional development that strengthens both digital literacy and critical engagement with AI, all while preserving teacher autonomy. Similarly, Table 22 shows a parallel trend in students' perceptions of AI. Perceived effectiveness received the highest rating (AWM = 4.34, VGE), while the level of dependence was lowest (AWM = 3.88, GE). Students see AI as a powerful tool that enhances learning through personalization, instant feedback, and increased engagement, consistent with Ferdig and Pytash (2024) on AI-powered tutoring

systems. They also appreciate the role of generative AI in adapting instruction to diverse needs (García-López & Trujillo-Liñán, 2025). Yet, the lower score for dependence reflects students' preference for AI as a complement rather than a substitute for teacher guidance, mirroring concerns about over-reliance and potential reduction in critical thinking (Xue, Ghazali, & Mahat, 2025; Du, 2025). These findings suggest a thoughtful, balanced perspective among learners, emphasizing the importance of promoting responsible AI use through digital literacy, critical evaluation of AI outputs, and guidance that nurtures creativity and human-centered learning.

3. **Learners' general average across two grading periods.** The findings on students' general academic performance reveal consistently high achievement, with a noticeable improvement following the integration of AI tools in learning. In the Fourth Quarter of SY 2024–2025, before AI-assisted learning, students recorded a mean of 4.46 (SD = 0.34), rated as Highly Proficient (HP). After introducing AI chatbots in the First Quarter of SY 2025–2026, the mean rose slightly to 4.51 (SD = 0.36, HP), resulting in an overall weighted mean of 4.48 (SD = 0.35, HP). This upward trend suggests that AI-supported learning contributed to better understanding, increased efficiency, and higher engagement in academic tasks. Recent research supports these observations. Belda-Medina and Kokošková (2023) note that chatbots offer personalized guidance and instant feedback, while Labadze, Grigolia, and Machaidze (2023) highlight AI's role in promoting active engagement and mastery of skills. Likewise, Al-Ghassani (2022) points to AI's ability to foster independent learning and problem-solving. In conclusion, these results indicate that integrating AI chatbots into learning can enhance competency mastery, streamline task completion, and deepen comprehension. This demonstrates AI's potential as a valuable pedagogical tool that complements traditional teaching methods while supporting higher-order learning outcomes

4. **Test of significant relationship between the profile of the respondent groups and the extent of AI chatbot usage in teaching and learning activities.** The correlation analysis indicates that teachers' profiles are closely connected to how extensively they use AI chatbots in teaching and learning. Positive and significant relationships were observed across age, sex, civil status, educational attainment, years of experience, and

participation in trainings, showing that both demographic and professional factors influence AI adoption. Interestingly, mature and experienced teachers, as well as those with higher qualifications and more training, tend to integrate AI tools more effectively, challenging the common assumption that younger educators are the main adopters of technology. These findings emphasize the importance of tailoring support and professional development to the diverse needs of teachers. By considering these differences, schools and policymakers can foster inclusive and sustainable AI integration that enhances teaching quality, strengthens educators' confidence and autonomy, and responds to the varied contexts in which teachers operate.

5. **Test of significant relationship between the profile of the respondent groups and the student's general average during the Fourth Quarter of School Year 2024-2025 and First Quarter, School Year 2025-2026**. The correlation analysis reveals that learners' profiles play a significant role in shaping academic performance in AI-assisted learning. Positive relationships with age, sex, access to technology at home, and the main device used indicate that factors such as maturity, gender, and digital resources influence how students benefit from AI tools. For instance, older learners may approach AI-assisted tasks more responsibly, while having access to a smartphone or other reliable device can greatly enhance learning outcomes. These findings underscore the importance of addressing digital equity and designing interventions that consider the diverse needs of students. Effective AI integration, therefore, requires not just technological innovation but also inclusive strategies that ensure all learners have the access, support, and guidance needed to succeed.

6. **Test of significant relationship between the extent of AI chatbot usage in teaching and learning activities and the student's general average during the Fourth Quarter of School Year 2024-2025 and First Quarter, School Year 2025-2026.** The chi-square test results reveal a significant relationship between AI chatbot usage and students' academic performance, confirming that integrating AI has a tangible, positive impact on learning outcomes. Supported by Fisher's Exact Test, the findings indicate that students who actively engage with AI chatbots tend to achieve better comprehension, greater efficiency, and stronger mastery of competencies, benefiting

from personalized support and instant feedback. At the same time, the results highlight that the effectiveness of these tools depends on responsible and purposeful use. Structured guidance is essential to ensure that AI serves as a complement to—not a replacement for—critical thinking and teacher guidance. Overall, the findings position AI chatbots as a valuable pedagogical innovation, emphasizing the need for policymakers and educators to invest in training, infrastructure, and curriculum design that maximize AI's benefits while maintaining human-centered teaching.

IV.   CONCLUSIONS

This research study discovers that both teachers and students contribute unique strengths and face distinct challenges when integrating AI into education. Teachers, who are academically accomplished and professionally experienced, demonstrate a balanced approach recognizing AI's benefits while emphasizing ethical use and avoiding over-reliance. Students, on the other hand, maintain consistently high performance, with slight improvements following AI adoption, reflecting the positive influence of chatbots on understanding, efficiency, and engagement. The significant correlations between demographic profiles and AI usage highlight that factors such as age, experience, training, access to technology, and device availability shape how both teachers and students adopt and benefit from AI tools. Overall, these results emphasize that effective AI integration requires mobile-friendly, inclusive strategies, robust ethical frameworks, and ongoing professional development. By aligning teacher expertise with student needs and ensuring equitable access to technology, schools can leverage AI as a powerful educational tool enhancing learning while preserving human-centered values, critical thinking, and meaningful teacher-student interactions.

REFERENCES

[1.] Al-Ghassani, A. (2022). Artificial intelligence in English language learning: Potentials and challenges. Education and Information Technologies, 27(3), 2341–2356. https://doi.org/10.1007/s10639-021-10783-z

[2.] Alharthi, M., & Kessler, G. (2022). Investigating learners' engagement in AI chatbot-assisted language learning. Computer Assisted Language Learning, 35(9), 1953–1972. https://doi.org/10.1080/09588221.2021.2001847

[3.] Barghi, R. (2022). Design and evaluation of an educational chatbot for student learning support [Master's thesis, University of Tehran]. ProQuest Dissertations Publishing.

[4.] Boud, D., & Lawson, R. (2023). Chatbots and student learning: Understanding the illusion of competence. Assessment & Evaluation in Higher Education, 48(6), 799–812. https://doi.org/10.1080/02602938.2022.2164300

[5.] British Educational Research Association. (2018). Ethical guidelines for educational research (4th ed.). BERA.

[6.] Calderon, J. F., & Gonzales, E. C. (2020). Methods of research and thesis writing (Revised ed.). National Book Store.

[7.] Casal-Otero, L., García-Holgado, A., & García-Peñalvo, F. J. (2023). AI literacy and students' critical evaluation of chatbot responses. Education and Information Technologies, 28(2), 1239–1258.

[8.] Chang, T.-W., Chen, S.-C., & Huang, C.-Y. (2022). The impact of chatbot-assisted learning on students' motivation and performance. Interactive Learning Environments, 30(6), 1051–1067. https://doi.org/10.1080/10494820.2020.1789670

[9.] Chen, H., Li, X., & Xu, J. (2023). Exploring AI chatbot use in secondary education: Effects on learning and engagement. Computers & Education, 195, 104676. https://doi.org/10.1016/j.compedu.2023.104676

[10.] Creswell, J. W., & Creswell, J. D. (2018). Research design: Qualitative, quantitative, and mixed methods approaches (5th ed.). SAGE Publications.

[11.] Creswell, J. W., & Poth, C. N. (2018). Qualitative inquiry and research design: Choosing among five approaches (4th ed.). SAGE Publications.

[12.] Dahdouh, K., Dakkak, A., & Oughdir, L. (2021). Risks of overdependence on educational chatbots. International Journal of Emerging Technologies in Learning, 16(17), 187–200. https://doi.org/10.3991/ijet.v16i17.24403

[13.] David, M., & Sutton, C. D. (2011). Social research: An introduction (2nd ed.). SAGE Publications.

[14.] Deng, F. (2023). A meta-analysis on the impact of AI chatbots in education. Journal of Educational Computing Research, 61(1), 52–78. https://doi.org/10.1177/07356331221149762

[15.] Department of Education. (2025, February 20). DepEd launches Education Center for AI Research (E-CAIR). Department of Education.

[16.] Du, Y. (2025). Are Students Becoming Dependent on AI? Analyzing Risks of Generative AI in Learning. UCL.

[17.] Ferdig, R.E., & Pytash, K.E. (2024). Artificial Intelligence in Education: Opportunities and Challenges. Springer.

[18.] Field, A. (2018). Discovering statistics using IBM SPSS statistics (5th ed.). SAGE Publications.

[19.] Filiz, O., Kaya, M.H., & Adiguzel, T. (2025). *Teachers and AI: Understanding the Factors Influencing AI Integration in K-12 Education*.

[20.] Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2019). How to design and evaluate research in education (10th ed.). McGraw-Hill Education.

[21.] García-López, I.M., & Trujillo-Liñán, L. (2025). *Ethical and Regulatory Challenges of Generative AI in Education*. Frontiers in Education.

[22.] Gumus, M. (2025). Development of an academic assistant chatbot for blended learning [Master's thesis, Middle East Technical University].

[23.] Hasselqvist Haglund, A. (2023). Student acceptance of ChatGPT as a learning tool [Master's thesis, Lund University].

[24.] Holmes, W., & Tuomi, I. (2022). Designing for AI in classrooms: Teacher mediation and student engagement. Computers & Education: Artificial Intelligence, 3, 100049. https://doi.org/10.1016/j.caeai.2022.100049

[25.] Holmes, W., Bialik, M., & Fadel, C. (2021). Artificial intelligence in education: Promises and implications for teaching and learning. Center for Curriculum Redesign.

[26.] Kasneci, E., Seegerer, S., & Kasneci, G. (2023). ChatGPT and the future of education: Challenges and opportunities. Computers and Education: Artificial Intelligence, 4, 100119. https://doi.org/10.1016/j.caeai.2023.100119

[27.] Kim, S., & Kim, J. (2023). Investigating ChatGPT use and its effects on student academic self-concept. Educational Technology Research and Development, 71, 983–1002. https://doi.org/10.1007/s11423-023-10217-2

[28.] Kwon, J. (2023). Chatbot-assisted learning in second-language writing classes [Master's thesis, Seoul National University].

[29.] Labadze, A. (2023). Educational chatbots as personalized tutors: Evidence from secondary schools. British Journal of Educational Technology, 54(3), 912–929.

[30.] Lin, Y., & Yu, C. (2023). Extending the Technology Acceptance Model for AI in education: Perceived risk and motivation as mediators. Computers & Education, 196, 104699. https://doi.org/10.1016/j.compedu.2023.104699

[31.] Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). Intelligence unleashed: An argument for AI in education. Pearson Education.

[32.] Macedo, T., Pereira, A., & Silva, D. (2023). Cognitive load and attention in AI-mediated learning. Educational Technology & Society, 26(1), 140–155.

[33.] Mancheno Gutiérrez, S. (2021). Designing AI chatbots to enhance student motivation and satisfaction [Master's thesis, University of Granada].

[34.] Martins, L. (2024). Ethical dilemmas in AI tutoring systems [Doctoral dissertation, University of Lisbon].

[35.] Matar, A. (2024). Retrieval-augmented chatbot for context-based explanations in education [Doctoral dissertation, University of Jordan].

[36.] Mukhlis, M., Ismail, N., & Ahmad, Z. (2024). Revisiting Connectivism in the digital age: Implications for AI-mediated education. Education and Information Technologies, 29(4), 5211–5232.

[37.] National Privacy Commission. (2020). Implementing rules and regulations of the Data Privacy Act of 2012 (R.A. 10173). National Privacy Commission.

[38.] Okonkwo, C. W., & Ade-Ibijola, A. (2021). Chatbots applications in education: A systematic review. Computers and Education: Artificial Intelligence, 2, 100033. https://doi.org/10.1016/j.caeai.2021.100033

[39.] OpenAI. (2024). Educational uses of ChatGPT: Study mode and responsible AI learning. OpenAI.

[40.] Pereira, F., Almeida, S., & Ramos, C. (2023). Exploring students' perceptions of AI chatbots in learning environments. Education and Information Technologies, 28(3), 3129–3145.

[41.] Pérez-Marín, D. (2020). Chatbots and conversational agents in education: A state-of-the-art review. Springer.

[42.] Republic Act No. 10173. (2012). Data Privacy Act of 2012. Official Gazette of the Republic of the Philippines.

[43.] Republic Act No. 10175. (2012). Cybercrime Prevention Act of 2012. Official Gazette of the Republic of the Philippines.

[44.] Resnik, D. B. (2018). The ethics of research with human subjects: Protecting people, advancing science, promoting trust. Springer.

[45.] Riedl, M. (2023). Artificial intelligence literacy for K–12 education. AI & Society, 38(1), 1–13.

[46.] Selwyn, N. (2023). Critical perspectives on AI in education. Learning, Media & Technology, 48(2), 115–128.

[47.] Stöhr, C., Adawi, T., & Meier, B. (2024). Overreliance on generative AI tools in higher education: Risks and remedies. Computers and Education: Artificial Intelligence, 5, 100154.

[48.] Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. International Journal of Medical Education, 2, 53–55. https://doi.org/10.5116/ijme.4dfb.8dfd

[49.] U.S. Department of Education (2023). Artificial Intelligence and the Future of Teaching and Learning

[50.] UNESCO (2023). Ethics of Artificial Intelligence: Global AI Ethics and Governance Observatory

[51.] UNESCO. (2021). Recommendation on the ethics of artificial intelligence. UNESCO Publishing.

[52.] UNESCO. (2023). AI and education: Guidance for policymakers. UNESCO Publishing.

[53.] Williamson, B., & Kizilcec, R. (2023). Educating the AI generation: Policy and pedagogy for AI literacy. Computers & Education: Artificial Intelligence, 4, 100145.

[54.] Woering, J. (2025). Evaluating large language model-based chatbots for educational use [Master's thesis, University of Amsterdam].

[55.] Xue, L., Ghazali, N., & Mahat, J. (2025). Artificial Intelligence Adoption Among Students: A Systematic Review. IJTE.

[56.] Yeo, K., Lee, J., & Kim, M. (2020). The role of chatbots in sustaining learner motivation: An empirical study. Interactive Learning Environments, 28(5), 606–620.

[57.] Zaugg, H. (2024). AI assistants and student learning outcomes: A multi-institutional study [Doctoral dissertation, University of Central Florida].

[58.] Zhao, F., Khan, A., & Ahmed, I. (2024). Ethical Considerations and Future Prospects of AI Integration in Education. IEEE Computer Society