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Extent of Utilization, Perceived Advantages and Disadvantages and Effect on Teacher Productivity of Generative AI Tools

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ABSTRACT

Purpose of the study: Generative AI is now reshaping either positively or negatively the nature of instructional and administrative work of teachers which makes its effect on productivity an important matter for consideration. This study explores on the utilization, perceived pros and cons and the effects on teacher productivity of Gen AI tools.

Methodology: Quantitative descriptive type of research was utilized in the study involving 101 Filipino teachers teaching in the primary and secondary levels with major fields of specialization in Science, Math, English and Technology and Livelihood Education. A survey questionnaire using Google Form was used to collect data for one month with focus group discussion for validation of the results.

Main Findings: Result showed that ChatGPT, Grammarly and Quillbot are the most commonly used Gen AI tools by teachers. The use of Gen AI tools has positive effect on productivity in terms of preparing lessons, content materials, strategies and assessments which describes their intention to continue utilizing it towards achieving certain level of productivity regardless of sex and field of specialization. Teachers who expressed high level of Gen AI utilization are also those who perceived high advantages and observed higher effect on productivity.

Novelty/Originality of this study: The study provides an empirical evidence and multi-dimensional analysis on utilization of Generative AI tools among teachers who are considered developing users that will be used by educational managers to inform policy development, capacity-building programs, and strategic decision-making for the effective, ethical and responsible integration of Generative AI tools to enhance teacher productivity and instructional quality.

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1. INTRODUCTION

Generative AI tools have disrupted the education landscape by transforming how teaching, learning, and academic work are designed, delivered, and managed through automated, personalized, and data-driven instructional support. These are considered educational application tools, particularly when they are intentionally used to support teaching, learning, and educational management. Its adoption in education has accelerated rapidly since 2022 and it prompts urgent pedagogical, ethical, and policy discussions because it is now widely used in lesson planning, assessment generation, instructional material development, feedback automation, and academic writing support. However, there are teachers from elementary and secondary education who are still utilizing traditional or conventional way of doing things in teaching and learning process inside the classroom.

They are not adapting to the emerging trends of educational technology on how they can benefit from the use of Generative AI tools. Güneyli et al. [1] in their study found out the usage patterns indicated that secondary school teachers in Cyprus were less likely to incorporate AI in their teaching followed by primary and high school teachers than university lecturers who are more likely to utilize AI in teaching. Meanwhile, one study conducted in Nigeria shows lack of awareness and proficiency of university lecturers in English as a Second Language (ESL) is a major barrier to meaningful adoption [2]. Lacking digital skills and confidence hinders the teachers in Greece from successfully using Gen AI in classroom practice because it requires not only basic ICT skills but also pedagogical digital competence [3]. Other studies have found out that teachers have fear of ethical and legal issues, negative attitudes and beliefs towards AI and age-related and experience-related factors. The result of survey conducted by Cubio [4] in several Filipino teachers indicated that they would only consider using AI if data protection and ethics safeguards were guaranteed; others feared misuse of student data or biased output. Meanwhile, the study of Meivawati et al. [5] showed that negative or lukewarm attitudes of teachers in Indonesia significantly reduce adoption readiness in the use of Generative AI, even when perceived benefits exist.

Given all these barriers, some teachers are still hesitant to use Generative AI for lesson planning, assessment, feedback generation and other administrative tasks. Filipino teachers face various issues and challenges in the Department of Education due to persistent heavy administrative workload despite availability of digital tools. Teachers need to understand the Global trends of AI integration in K–12 which include AI Applications in teaching and learning wherein AI reduces workload in grading, and lesson planning, it supports differentiated instruction and individualized learning, and it is increasingly used to generate educational content and support teacher productivity. Evidence showed that using Gen AI tools reduces planning time, supports instructional quality and assists novice teachers. Yim and Su [6] discussed in their study some benefits of using AI in teaching which enhances instructional personalization, efficiency, formative feedback, and student engagement while Semwaiko et al. [7] categorized AI applications into personalized learning, automated assessment, intelligent tutoring, and administrative support. Despite the potential benefit of Generative AI tools, there are some teachers who are heavy users, moderate users while others avoid it completely.

The Technology Acceptance Model (TAM) of Davis [8] explains the extent of utilization of Generative AI tools among teachers. It describes the level of frequency on how the teachers accept the concept of Generative AI as a helpful assistant for lesson planning and instructional design, improving the quality of teaching materials, generating research ideas and simulating test questions. The perceived usefulness and ease of use describe the advantages and effect of using Gen AI in teaching productivity as measure of their behavioral intention to use the system. The basic assumption for this study is that those teachers who perceive Gen AI as useful and easy have higher tendency of utilization that leads to higher productivity. In addition, Task–Technology Fit (TTF) Theory by Goodhue and Thompson [9] also describes how Gen AI tools improve performance only if it matches the requirements, processes, and complexity of the task of the teachers. In this study, teachers perform a variety of tasks like lesson planning, assessment, content creation, grading and providing feedback where Generative AI tools can automate, enhance and simplify these tasks. Thus, the extent to which these AI tools fit the specific teaching tasks will influence whether teachers adopt them and whether they actually enhance productivity. Generative AI tools meet the criteria of educational application tools under the frameworks of TAM and TTF, as their perceived usefulness and alignment with instructional tasks influence their adoption and effective use in educational settings. Therefore, while Generative AI tools may be general-purpose technologies, their purposeful application in classrooms and schools justifies their classification as educational application tools in the context of this study.

Despite the growing body of literature on artificial intelligence in education, most existing studies focus broadly on attitudes, acceptance, or ethical concerns related to AI, with limited empirical attention to how generative AI tools specifically influence teacher productivity in terms of task efficiency, quality of outputs, and workload management. Moreover, prior research rarely examines teachers' extent of utilization alongside perceived advantages and disadvantages within a single analytical framework, particularly at the basic education level. Most of the studies conducted in the Philippines mainly focused on students, academic performance and general attitudes while only few studies simultaneously examine the extent of utilization, perceived advantages and disadvantages of Gen AI and its direct effect on teacher productivity. There is lacking local empirical data and specific evidence for teachers from basic and secondary education teaching science, mathematics, English and Technology and Livelihood Education. Most of the studies conducted are discussing language teaching and learning [10]-[18] and practices in higher education [19]-[22]. This study addresses these gaps by providing quantitative evidence that links utilization patterns of generative AI tools with teachers' perceived benefits, challenges, and productivity outcomes, thereby extending current understanding of AI integration in classroom practice.

The generative AI tools are being rapidly adopted in educational settings, while empirical evidence on their effects on teacher productivity, workload, and professional practice remains limited. This is an urgent concern of educational leaders on how it can generate positive results for teachers. The information derived from the study can also contribute contributes to the existing body of knowledge on the extent and impact of utilization of Generative AI tools among Filipino teachers in Elementary and Secondary education in performing their duties and responsibilities. This will also help teachers understand how AI tools can enhance their productivity and teaching quality and provide evidence for designing AI adoption strategies, policies, and resource allocation as guide for school leaders.

Thus, this study aims to determine the Extent of Utilization, Perceived Pros and Cons and Effect on Teacher Productivity of Generative AI Tools. Specifically, it aims to determine the profile of the teachers in terms of sex, field of specialization, and commonly used Gen AI tools; determine the Extent of Utilization of Generative AI Tools, Perceived Advantages and Disadvantages of Gen AI Tools and Effect on Teacher Productivity of Generative AI Use in terms of Task Efficiency and Time Management, Quality of Output, Stress and Workload Management; test the significant difference in the Perceived Advantages and Disadvantages of Gen AI Tools, Extent of Utilization and the effect on Teacher Productivity of Generative AI Tools when grouped according to sex and specialization; and test the significant relationship across major variables. Overall, this study seeks to provide empirical evidence by offering insights that can inform educational practice, policy, and future research in the evolving AI-driven educational landscape.

2. RESEARCH METHOD

2.1. Research Design

Quantitative Descriptive type of research method was utilized in the study using survey questionnaire. Creswell and Creswell [23] described quantitative research as a systematic investigation that uses numerical data and statistical analysis to test theories, examine relationships among variables, and generalize findings from a sample to a population. This research method is appropriate for this study because it Allows the study to quantitatively measure the extent of utilization of Generative AI tools, as well as the perceived pros and cons, using numerical indicators; it enables statistical analysis of the relationship between Generative AI utilization and teacher productivity, making it possible to determine significant effects and correlations; and it uses standardized instruments and statistical procedures that support objective data analysis and allow findings to be generalized to a larger population of teachers.

2.2. Participants

The participants of this study are the 101 teachers enrolled in the Graduate School with specializations in Mathematics, English, Science and Technology and Livelihood Education. Out of 155 students only 101 or 65 percent were able to accomplish the questionnaire. Only those students who are willing to participate in the study responded in the survey using Google Form. Graduate School students were chosen to be the respondents because the institution is providing student development program and the findings of the study will also serve as a basis in crafting necessary programs for them. They are teachers from different schools in the Bicol Region in the Philippines.

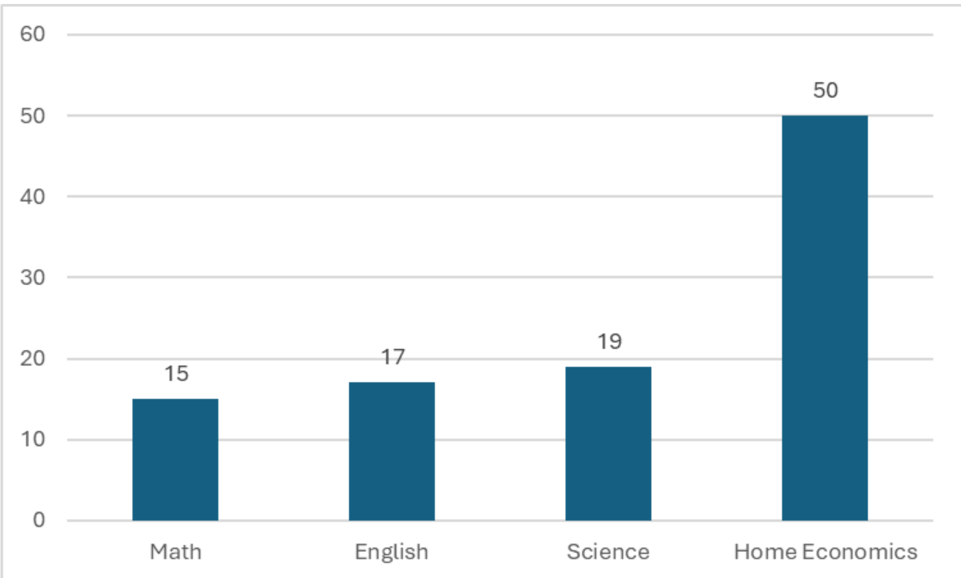

Figure 1. Frequency count of Teachers based on Specialization

The respondents of the study are composed of 50 teachers with specialization in Home Economics followed by 19 Science teachers, 17 English teachers and 15 Math teachers. Since there are only few schools offering Home Economics that is why the institution has more enrollees compared with other specializations which are available in many Graduate Schools in the city and province.

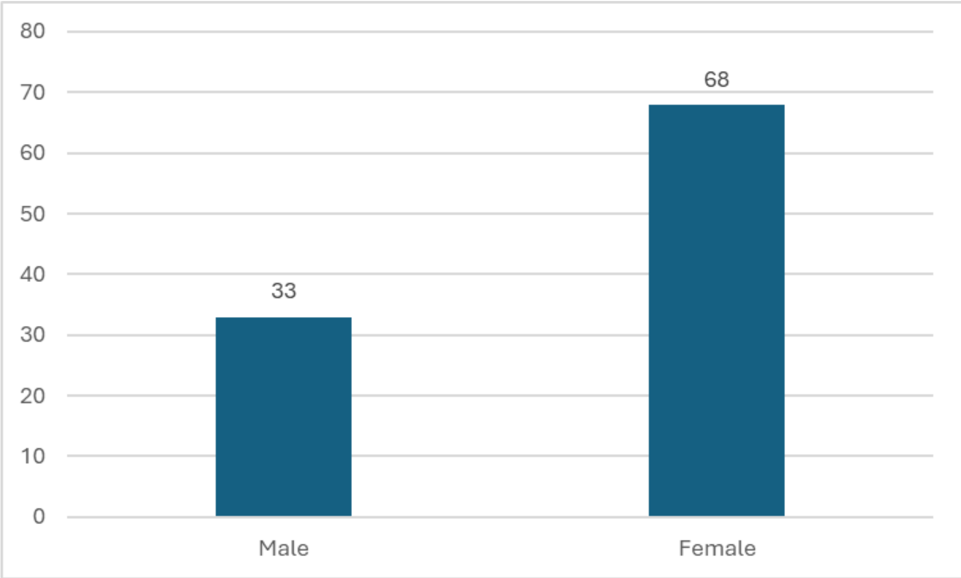

Figure 2. Frequency Count of Teachers According to Sex

Figure 2 presents the frequency count of teachers according to sex. Results showed that the teacher education is still dominated by Females (*n*=68) compared to males (*n*=33). Research studies showed that in-service teachers in the Philippines are reported that a substantial majority of teachers are females [24]-[26]. This result is attributed to the concept of cultural expectations that influence career choices differently for men and women and teaching is socially perceived as a nurturing and caregiving profession traditionally associated with women

2.3. Instrument

The survey questionnaires utilized for the study were adapted from the concepts and ideas of previously published papers. The instrument to determine the perceived advantages and disadvantages of Gen AI Tools was taken from Yeşilyurt et al. [27], Sadeghpour et al. [28] and Palpanadan and Eliana [29] while for the extent of utilization of Generative AI tools was adapted from the ideas of Gapol et al. [30], Kong et al. [31] and Miranda and Chamorro-Mera [32] and to assess the effect of Generative AI use on Teacher Productivity was taken from the idea of Diadid-Reyes [22], Amado et al. [33] and Echave et al. [34]. These instruments were content validated by experts in Educational Management, Technology Education, and Measurement and Evaluation. Furthermore, these questionnaires were also tested the reliability through conducting pilot testing to 40 teachers who are not included in the study. The reported results of Cronbach's Alpha values are as follows: perceived advantages and disadvantages of Gen AI Tools (α = 0.877), extent of utilization of Generative AI tools (α=0.913) and effect of Generative AI use on Teacher Productivity (α = 0.851). This signifies that the instruments have good internal consistency. The resulting Cronbach's alpha values support the use of these questionnaires as valid instruments for assessing teachers' perceptions, thereby reinforcing the robustness of the quantitative analysis and the overall quality of the research findings.

2.4. Procedure

This study was conducted through a systematic sequence of research stages. First, a review of related literature was undertaken to establish the theoretical framework and identify relevant variables related to generative AI utilization and teacher productivity. Second, a validated survey questionnaire was developed and administered to teachers using Google Forms to collect quantitative data. The study utilized Google Form in gathering data from the respondents. This is considered one of the most efficient and effective way of collecting data from the respondents without disrupting their work and they can answer the questionnaire in their most convenient time. The link for the questionnaire was sent in the Group Chat of the students and allow them one (1) month to access the link. Focus group discussion was also conducted to the selected students to validate the result of the data gathered from the survey. They were asked on reasons why the results of the survey have higher and lower responses in some indicators to further interpret and analyze the data.

Third, the use of a structured questionnaire aligned with the study objectives and supported by established constructs from related literature ensured the validity of the data. Data screening and statistical assumptions were carefully observed. This study utilized parametric test because of the result from Shapiro-Wilk Test with p-values for the perceived advantages and disadvantages of Gen AI Tools, extent of utilization of Generative AI tools, and effect of Generative AI use on Teacher Productivity are greater than 0.05. This signifies that the set of sample data comes from a normally distributed population.

Finally, descriptive and inferential statistical analyses were performed. Systematic coding, controlled data handling, and the application of suitable descriptive and inferential statistical techniques contributed to the accuracy and credibility of the findings in examining the extent of utilization, perceived advantages and disadvantages, and the effects of generative AI tools on teacher productivity.

2.5. Ethical Consideration

Informed consent was obtained from all participants prior to data collection. An informed consent statement was included at the beginning of the Google Form, clearly explaining the purpose of the study, the nature of participation, the expected time to complete the questionnaire, and the voluntary nature of participation. Participants were informed that they could withdraw from the study at any time without any consequences. Confidentiality and anonymity of responses were strictly maintained. No personally identifiable information such as names, student numbers, or exact school identifiers was collected. Responses were anonymized, and all data were reported only in aggregated form to prevent the identification of individual participants or institutions.

The data privacy and security were ensured throughout the data collection and storage process. The Google Form was configured with restricted access, and collected data were stored in password-protected files accessible only to the researcher. The data were used solely for academic and research purposes and were not shared with unauthorized individuals. Voluntary participation and absence of coercion were emphasized. Participants were invited to take part in the study without pressure from administrators or supervisors, and participation or non-participation had no impact on their school standing. Finally, the study adhered to ethical research standards by ensuring honesty and transparency in data handling, analysis, and reporting. The findings were presented accurately without fabrication, manipulation, or misrepresentation of data. Through these ethical measures, the data gathering process upheld respect for participants' rights and complied with accepted ethical guidelines in educational research.

2.6. Data Analysis

Upon completion of data collection, responses were downloaded from Google Forms in spreadsheet format for coding and statistical analysis. To ensure the confidentiality of data, all collected data were stored securely, accessible only to the researcher, and used solely for academic research purposes. Frequency count, percentage, rank and weighted mean are the descriptive statistics used to analyze the gathered data from the survey while Analysis of Variance and T-test were used to test the differences and Pearson product moment correlation coefficient was used to test the relationship on the Extent of Utilization with the Perceived Advantages and Disadvantages and Effects of Gen AI.

Meanwhile, Table 1 shows the user level of Generative AI tools when responses of teachers on the extent of utilization of Gen AI Tools are summarized and categorized into four user levels with the corresponding descriptors.

Table 1. Categories for Teachers' User Level on Generative AI Tools

Score Range	User Level Category	Descriptor / Description
7 – 12	Emerging User	Has minimal exposure to Generative AI tools and uses them infrequently for basic or exploratory tasks
13 – 18	Developing User	Demonstrates growing familiarity and occasional use of Generative AI tools for selected teaching and professional activities
19 – 23	Proficient User	Frequently uses Generative AI tools across multiple instructional and productivity-related tasks
24 – 28	Advanced User	Consistently and strategically integrates Generative AI tools into teaching, assessment, and professional work

Furthermore, Table 2 shows the productivity level of teachers on using Generative AI tools when responses of teachers on the effect of Generative AI use on Teacher Productivity are summarized and categorized into four levels with the corresponding descriptors.

Table 2. Categories for Teacher Productivity Level Using Generative AI Tools

Score Range	Productivity Level Category	Description
10 – 17	Low Productivity	Minimal improvement in work efficiency, output quality, and task completion due to limited use of Generative AI tools

18 – 25	Moderate Productivity	Noticeable but inconsistent improvements in teaching-related tasks and workload management
26 – 33	High Productivity	Significant enhancement in efficiency, quality of outputs, and instructional effectiveness
34 – 40	Very High Productivity	Substantial and consistent productivity gains, with Generative AI tools integrated into most professional tasks

3. RESULTS AND DISCUSSION

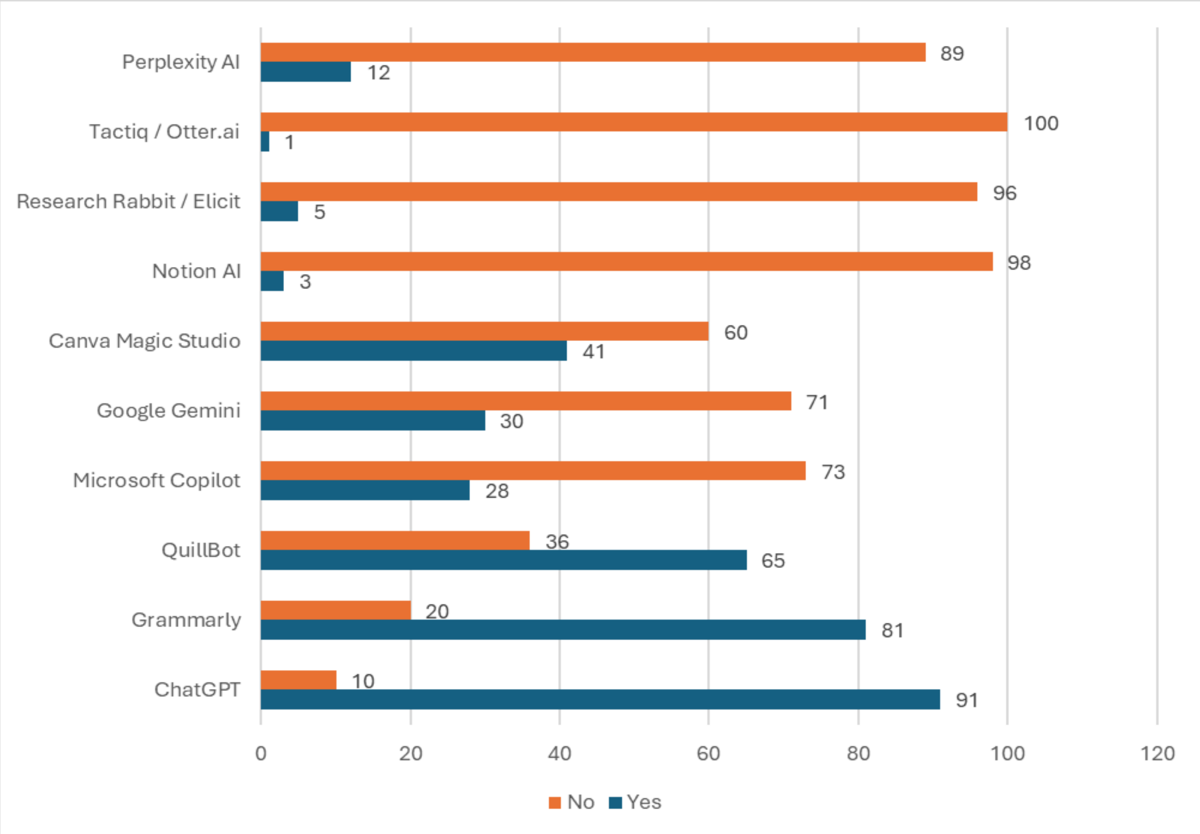

Figure 3. Frequency Count of Most Common Generative AI Tools Utilized by Teachers

Many educational applications are now considered for use by teachers like Generative AI tools to assist them in the delivery of instruction, advanced studies and other administrative tasks. Figure 3 shows the frequency count of most common Generative AI tools utilized by teachers. Majority of the teachers utilized the most popular ChatGPT (n=91) which is a conversational AI tool that generates text, explanations, lesson materials, and feedback based on prompts. This is being used by teachers in preparing their lessons and materials for instruction. Studies have shown that ChatGPT has the ability to enhance lesson planning, foster creativity, and support differentiated instruction [35] and has potential benefits to English language learners like translation and language comprehension support, conversational practice and language development, access to information and cultural understanding [36]. The features of technology available from ChatGPT fits the requirements of teachers for knowledge processing, saving teachers time and enhancing clarity in research, content creation, and academic writing. Teachers expressed that while ChatGPT can save time, it still requires manual editing, indicating that its effectiveness may vary based on the specific tasks and contexts [37].

Second on the list is the Grammarly (n=81) which is an AI-powered writing assistant that corrects grammar, enhances clarity, and improves writing style. The third commonly used AI tool is the Quillbot (n=65) which is an AI paraphrasing and summarization tool that rewrites text while maintaining meaning. Based on the Task-Technology Fit Theory, the features of Quillbot fit with the tasks of teachers for editing functionalities, improving task speed and reducing cognitive load.

Other AI tools which are not being used regularly by teachers are Microsoft Copilot (n=28) which is an AI assistant integrated into Microsoft 365 that helps generate documents, summarize emails, and automate tasks;

Google Gemini (n=30) which is a multimodal AI model capable of generating text, analyzing images, and supporting research and learning tasks; and Canva Magic Studio (n=41) which is an AI-enhanced design suite that creates layouts, visuals, presentations, and graphics instantly. Meanwhile, only few teachers have used the following AI tools: Notion AI (n=3) which is an AI productivity tool that assists in drafting notes, summarizing content, and organizing documents; Research Rabbit / Elicit (n=5) which is an AI-powered research assistants that help discover academic papers, summarize literature, and build citation networks; Tactiq/Otter.ai (n=1) which is an AI transcription tools that capture, transcribe, and summarize meetings or lectures in real time; and Perplexity AI (n=12) which is an AI answer engine that provides sourced, concise responses for research and information retrieval.

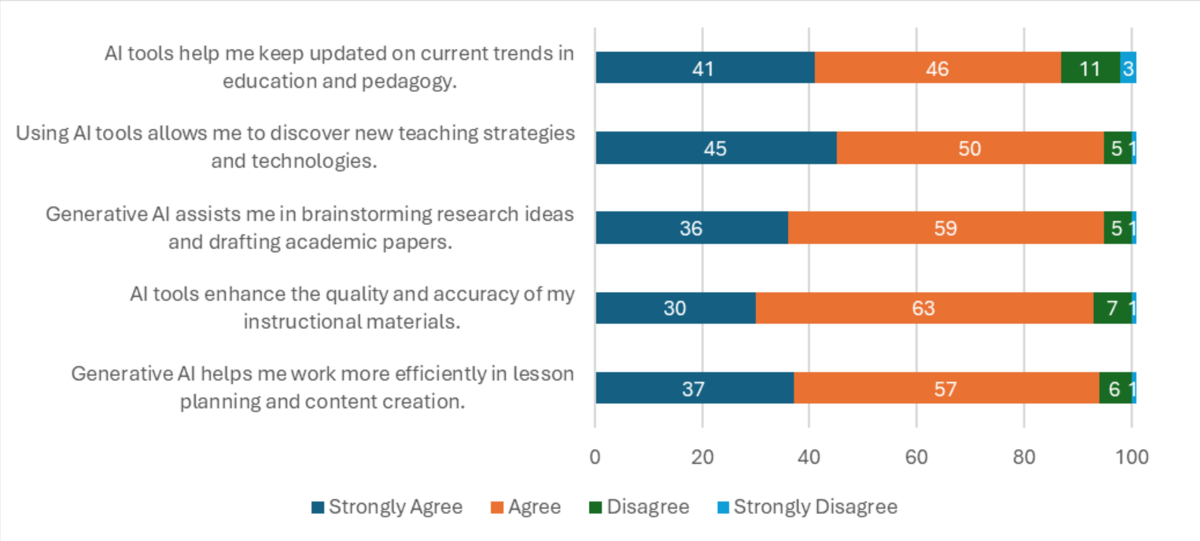

Figure 4. Perceived Advantages of Gen AI Tools with Overall Mean of 3.28

This variable on perceived advantages of Gen AI tools aims to gather data from the teachers on how they view this technology as beneficial, favorable and value-adding to their work as teachers in basic education. Figure 4 illustrates the perceived advantages of Generative AI tools as used in teaching and learning process. The findings reveal favorable responses from teachers on how they see positively the usefulness of Generative AI tools for the preparation of lessons, instructional materials and other administrative tasks in basic education.

First, according to survey that there are 45 percent of teachers strongly agreed while 50 percent of them agreed that using AI tools allows them to discover new teaching strategies and technologies. Teachers discover new strategies from AI tools by finding alternative ways of presenting lessons through AI-generated examples or models, AI recommendation on creative classroom activities, warm-up exercises or skill-building tasks, and introducing teachers to innovative instructional approaches like inquiry-based prompts and differentiated tasks. Teachers explore new technologies from AI tools by introducing them to digital tools and apps recommended by AI for lesson enhancement; identifying emerging EdTech platforms aligned with their subjects; and discovering technology-assisted assessment tools through AI suggestions. The study of Zaim et al. [38] emphasized the need for lecturers to still balance the efficiency of AI with the quality of human interaction in teaching, suggesting that personal guidance is essential for successful implementation

Second, teachers (n=41) strongly agreed that AI tools help them keep updated on current trends in education and pedagogy while 46 percent of them agreed. Teachers stay updated on educational and pedagogical trends from Generative AI tools through providing them timely updates on emerging teaching methods, suggesting newly published instructional resources, highlighting current best practices in pedagogy, recommending updated curriculum-aligned strategies and offering insights on global educational trends. With appropriate prompting, teachers could be able to get what they want based on their instructional needs. Generative AI helps them to summarize new research relevant to teaching, alert teachers to evolving student learning needs, provide examples of contemporary classroom activities, suggest updated tech tools for classroom integration, help teachers adapt lessons based on new educational frameworks, give quick access to the latest teaching guidelines and standards, enhance awareness of new policy directions in education, and encourage continuous updating of instructional materials. Consequently, the study of Thong and Kamsin [37] reminds teachers to have a cautious optimism regarding the implementation of ChatGPT to acknowledge its potential while also noting the need for content verification and contextual adjustments.

Third, teachers (37%) strongly agreed that generative AI helps them work more efficiently in lesson planning and content creation while 57 percent of them agreed on this benefit for teachers. Generative AI tools help teachers to improve efficiency in generating lesson plan drafts quickly, providing ready-to-use activity ideas, suggesting structured lesson outlines, creating differentiated learning materials, producing sample explanations or examples instantly, and summarizing long texts for easier lesson integration. Teachers also get suggestion for age-appropriate content for specific grade levels and AI also offers multiple versions of lesson content for comparison which creates visuals or graphics to enhance lessons. Based on the interviews conducted with the teachers, with the help of Gen AI, it reduces the time spent searching for appropriate teaching resources with corresponding templates for worksheets, quizzes, or rubrics.

Fourth, teachers agreed (59%) that Generative AI assists them in brainstorming research ideas and drafting academic papers while 36 percent of them strongly agreed. Teachers get suggestions for potential research topics from Gen AI which helps refine broad ideas into specific research questions. Gen AI tools also assist them in providing sample conceptual or theoretical frameworks, generating literature summaries for initial review, outlining research proposals, suggesting related studies for background writing and helping identify gaps in existing literature.

And last, teachers (63%) agreed that AI tools enhance the quality and accuracy of their instructional materials while 30 percent of them agreed. Teachers also use Gen AI to correct grammatical and typographical errors, improve the clarity and coherence of lesson content and ensure accurate explanations of key concepts. The findings of the study of Stan et al. [14] suggest that integrating ChatGPT into language teaching can positively impact learning outcomes, supporting contemporary pedagogical approaches. Teachers utilize the AI tools for the benefits of the students to achieve the appropriate learning outcomes and competencies prescribed from their curriculum. Teachers learn from experience the proper way of sending prompt that will provide updated and reliable information, suggest improvements to instructional wording, enhance the organization of learning materials and refine the structure of presentations or handouts. Gen AI tools offer precise examples and illustrations, recommend pedagogically sound revisions, enhance the readability of texts for learners and provide alternative phrasing to increase comprehension.

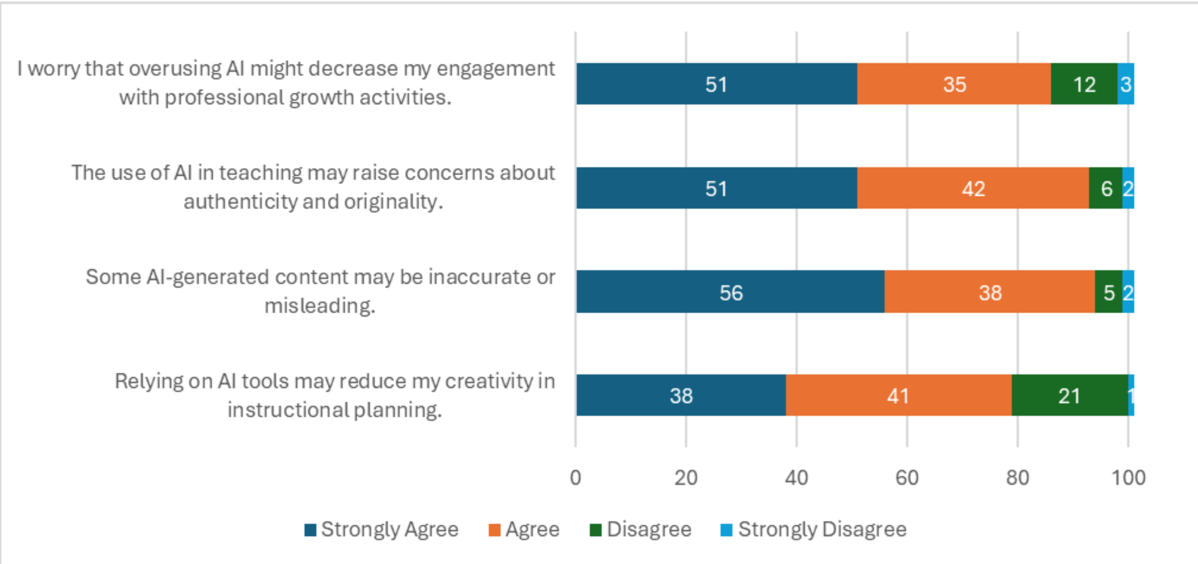

Figure 5. Perceived Disadvantages of Generative AI Tools with overall mean of 3.34

This variable on perceived disadvantages of Gen AI tools aims to gather data from the teachers on how they view this technology as disruptive and intrusive to their work as teachers. Figure 5 shows perceived disadvantages of Generative AI Tools to teachers. There are 56 percent of teachers who strongly agreed that some AI-generated content may be inaccurate or misleading while 38 percent of them agreed. Teachers already experienced that there are some AI-generated explanations contain factual errors, AI sometimes provides outdated information and suggestions may misrepresent concepts or ideas. Generative AI may produce content that is partially correct but misleading while some outputs require careful verification before use. Some teachers also observed that AI sometimes misinterprets prompts, producing irrelevant content. Respondents suggest that there is a need for teachers to cross-check references provided by AI and teachers must edit or correct AI content before classroom use. Some teachers also mentioned that over reliance on AI without verification may lead to misinformation. This finding confirms the study of Ampo et al. [39] that emphasized that teachers found ChatGPT to be a valuable instructional tool that supports diverse learning needs and fosters inclusive classroom environments, although its responses can sometimes be inaccurate, necessitating verification from reliable sources.

> *"A math teacher will surely regard the lack of depth or accuracy as the main warning signal. AI can be very powerful in generating text, but it is also capable of making up nonsensical problems and giving wrong answers for difficult topics. In my experience of using AI tools, I usually try to use different AI tools to check some the word problems I present in class, and sometimes, these tools give different answers, and so I have to still solve the problem on my own."*

In addition, teachers (51%) strongly agreed that the use of AI in teaching may raise concerns about authenticity and originality while 42 percent of them just agreed. Teachers believed that AI-generated content may encourage plagiarism or copying and may limit teacher creativity if overused for lesson planning. Study of Shean and Hanim [16] highlighted five common challenges in utilizing AI which include less accuracy of information, over-reliance on ChatGPT, inadequate cultural alignment, plagiarism, and data privacy concerns. There are also some outputs may lack personal or contextual relevance and challenges in maintaining academic integrity in assessments.

Half of the teachers (51%) also strongly agreed that they are worried about overusing of AI might decrease their engagement with professional growth activities while 41 of them agreed that relying on AI tools may reduce their creativity in instructional planning. Teachers have apprehensions that reliance on AI may reduce initiative to attend workshops or training; skip self-directed learning due to AI assistance; and spend less time reflecting on teaching practices.

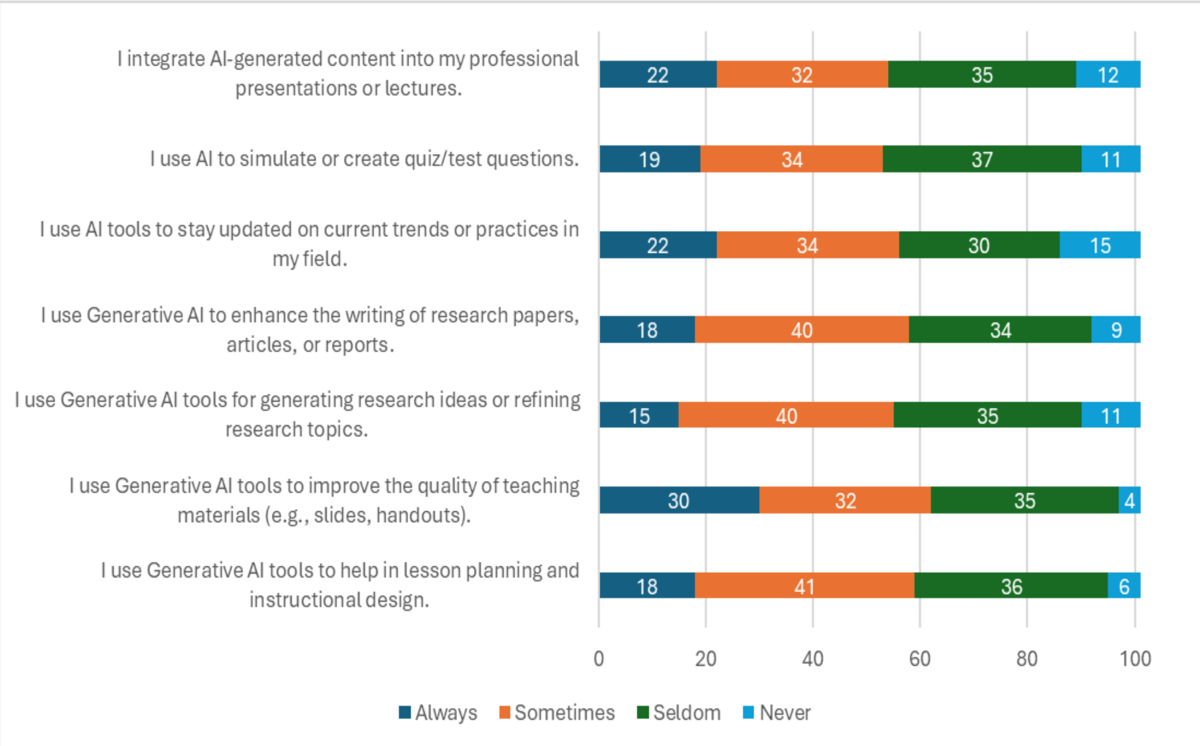

Figure 6. Extent of Utilization of Generative AI Tools

Figure 6 presents the extent of utilization of Generative AI Tools among teachers. It can be noticed from the figure that majority of the responses are within the categories of sometimes and seldom. This signifies that there is partial utilization of Gen AI tools among teachers in performing their tasks. Result showed that there are 30 teachers responded that they always use Generative AI tools to improve the quality of their teaching materials while 32 of them answered sometimes and 35 said seldom. Teachers responded that they use AI to enhance clarity of lesson content and consistently check AI suggestions for grammar and accuracy. They routinely verify factual accuracy using AI tools and leverage AI to save time while improving content quality. Teachers (n=40) sometimes use Generative AI to enhance their writing of research papers, articles, or reports while only 15 answered always and 35 said seldom. They (n=40) sometimes use Generative AI tools for generating research ideas or refining research topics while 40 of them responded sometimes, 35 said seldom and 11 answered never. Teachers used Gen AI occasionally for drafting research sections, refining grammar and sentence structure, requesting AI-generated outlines for papers, and paraphrasing selected parts of their research work. They also occasionally utilize AI for summarizing long readings, formatting citations or references, reorganizing content or improve structure, and verifying technical terms or concepts. Teachers sometimes use AI to explore emerging research trends and check relevance of proposed topics.

> *"Generative AI is a powerful productivity multiplier for English teachers, primarily in task efficiency and reducing stress. On the other hand, Generative AI also has a negative impact on English teachers' productivity, especially in double-checking AI-generated content to ensure the depth and accuracy of outputs."*

Teachers sometimes (*n*=34) use AI tools to stay updated on current trends or practices in their field. Teachers sometimes rely on AI for trends in pedagogy and assessment, updates on educational technologies, and current issues in basic education. Generative AI provides learning opportunity for teachers to explore new classroom management practices, recent developments in education, and emerging research in their subject area. Teachers can also use it for identifying professional development opportunities and comparing traditional and modern teaching trends. There are a lot of things that can be done using Generative AI for the benefits of the teachers towards achieving the quality on the delivery of instruction. But, Umali [40] emphasized that educators must ensure AI tools are used ethically and responsibly to enhance the teaching and learning experience.

They sometimes (*n*=41) use Generative AI tools to help in lesson planning and instructional design. Generative AI provides suggestions on how to adapt lessons for diverse learners with proper prompting. It provides ideas for formative assessments and designs of supplementary learning materials. The study of Thong and Kamsin [37] conducted in Malaysia emphasized that most teachers perceive ChatGPT as beneficial for various official tasks, including report writing, lesson planning, and communication with parents, which helps reduce their administrative stress. Study conducted in the Philippines by Delos Reyes and Corre [11] also emphasized that AI-powered tools effectively reduced time spent on lesson planning and material preparation, allowing teachers to focus more on pedagogical tasks. In addition, teachers seldom (*n*=35) integrate AI-generated content into their professional presentations or lectures and they seldom (*n*=37) use AI to simulate or create quiz/test questions. There are 32 teachers sometimes used AI to align test questions with competencies, generate multiple-choice questions and produce short-answer or essay questions while 12 respondents rarely use AI to create item banks for assessments.

Different fields of specialization have also different teaching requirements specific for the discipline. The content of the subjects or courses and sometimes teaching strategies have also their own identities but Generative AI tools can provide them whatever their needs. Technology and Livelihood education focuses on skills development and teaching strategies on how to teach technical knowledge and skills at the same time. TLE teachers integrate practical skills in classroom setting using Gen AI tools to provide sample troubleshooting steps for ICT-related tasks, suggest techniques or tips for cooking, baking, or food preservation and create practical projects for courses in home economics. Meanwhile, English Language teachers use AI for **a**dapting reading materials for struggling or advanced learners; generating enrichment tasks for high-performing students; creating scaffolding questions to guide comprehension; suggesting remedial exercises for writing or grammar difficulties and providing alternative lesson activities for diverse proficiency levels. Stan et al. [14] added that teachers recognized the benefits of ChatGPT for immediate feedback, interactive conversations, and diverse language learning activities, which may lead to improved academic performance.

Meanwhile, Mathematics teachers use AI for generating multiple versions of the same math problem, creating problems with different difficulty levels, producing contextualized word problems for local settings, generating challenging problems for advanced students and creating scaffolded practice sets for struggling learners. They also use Gen AI to generate analogies to explain abstract mathematical ideas; simplify definitions of mathematical terms; provide visual explanations like tables, graphs, and diagrams; creating real-world applications of math concepts and clarify misconceptions by offering correct reasoning. Magtoto et al. [41] have noted that the effectiveness of ChatGPT in subjects like mathematics and science suggests a need to adapt assessment methods and instructional content with AI assistance. In addition, Science teachers use AI for simplifying complex scientific concepts; generating analogies for abstract topics (e.g., atoms, forces, cells); providing step-by-step explanations for scientific processes; creating concept maps or flowcharts for science lessons; and producing alternative explanations to address misconceptions.

The following are responses of teachers on how Gen AI tools are utilized in the classroom setting and performing administrative tasks.

> *"There are also instances I frequently use AI if the school head gave me an additional load out of my knowledge, but even AI is a helping and supporting tool, I don't need to rely and replace it on my professional judgement and hands -on expertise in my daily lesson but AI really helps me to organize and revising my daily activities."*

"I usually utilized Generative AI in creating supplemental instructional materials for learners that need intervention. This task is considered additional load for teachers in conducting remedial classes. Generating relevant materails from AI is useful for teachers."

The concept of Task–Technology Fit posits that technology is most effectively utilized when its functionalities align closely with the tasks users need to perform. In the context of teachers, the extent of Generative AI tool utilization depends on how well these tools support instructional, administrative, and assessment-related tasks, such as lesson planning, content creation, and grading. When a strong fit exists between AI capabilities and teaching tasks, teachers are more likely to adopt and consistently use these tools, enhancing both productivity and the quality of educational outputs.

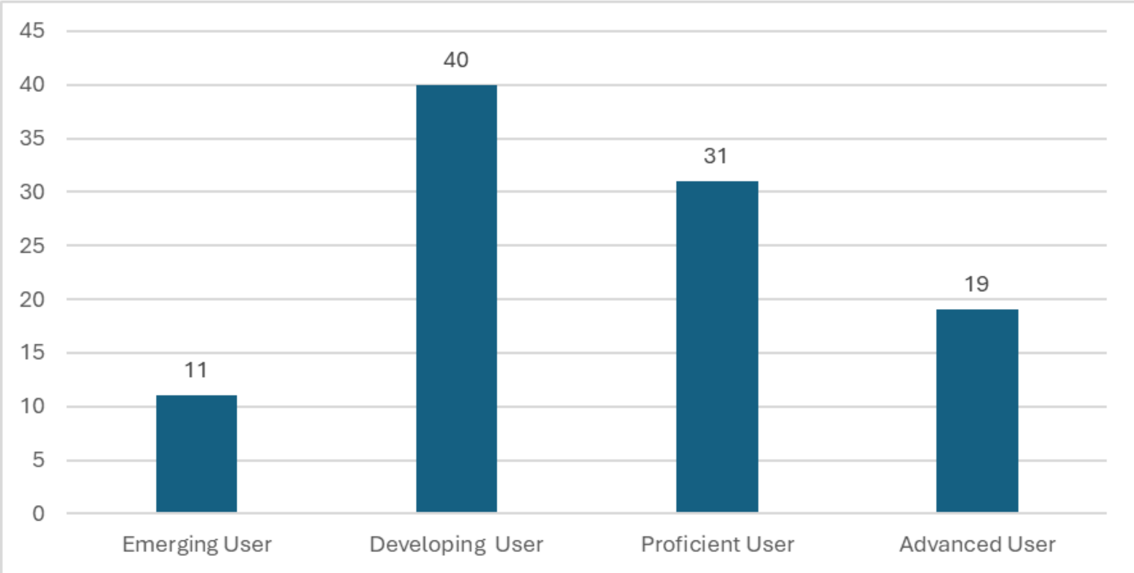

Figure 7. Frequency Distribution of Teachers' User Level on Generative AI Tools

Figure 7 presents the frequency distribution of Teachers' User Level on Generative AI Tools. Result showed that these group of Filipino teachers have varying levels of Gen AI user categories. There are 11 teachers who are still considered themselves as emerging users. This signifies that they have minimal exposure to Generative AI tools and use them infrequently for basic or exploratory tasks. Meanwhile, there are 40 developing users who demonstrate growing familiarity and occasional use of Generative AI tools for selected teaching and professional activities while 31 of them are considered proficient users who frequently use the tools across multiple instructional and productivity-related tasks. Furthermore, there are 19 advanced users who consistently and strategically integrate Generative AI tools into teaching, assessment, and professional work.

Overall, they did not fully embrace yet the use of AI in the delivery of instruction and research tasks. They still have some reservations and apprehensions on how it will be utilized for their own advantage. This result can be attributed to their response on higher mean score of perceived disadvantages than advantages of Gen AI tools. They said that they really appropriate the power of Gen AI Tools but since they have prescribed instructional materials being used in the Department of Education, they tend to use it rather than asking Gen AI tools to prepare another one. On the other hand, there are some teachers who are not contended with the content of the available materials, they added more value to it and improve some learning and assessment activities to make it more suitable to the learning needs. The present result confirms similar findings of the study conducted by Okafor and Anyanwu [42] in Nigeria which revealed that the majority of AI resources remain unknown in secondary education.

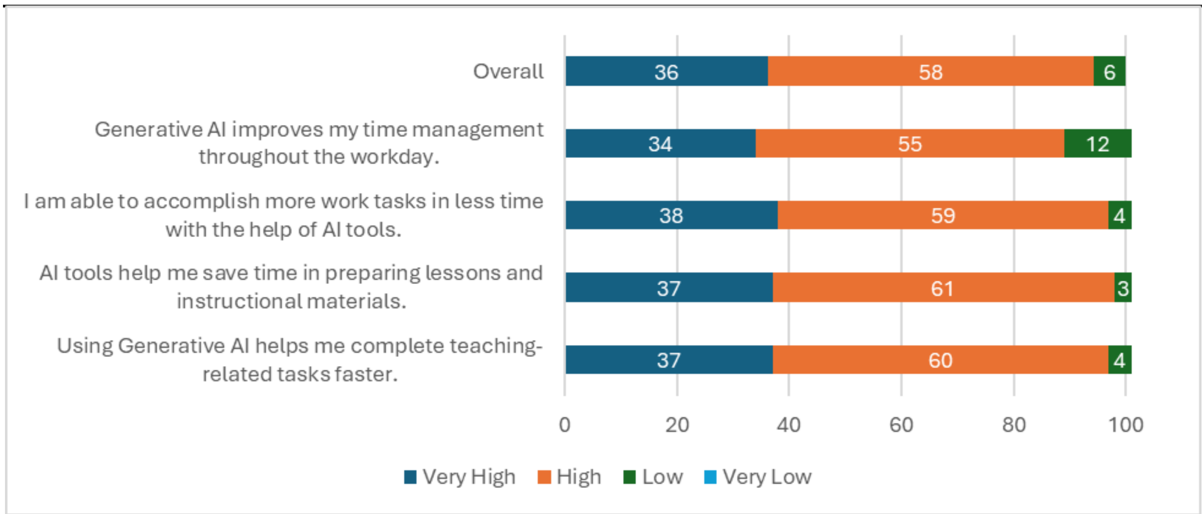

Figure 8. Effect of Generative AI Use on Teacher Productivity in terms of Task Efficiency and Time Management

Teachers believed on the high extent of effect of Gen AI use in terms Task Efficiency and Time Management as shown in Figure 8. The teachers expressed high agreement (*n*=60) that Generative AI meaningfully enhances efficiency in completing various instructional and administrative tasks while 37 of them answered very high. There are 59 teachers answered high effect level that they are able to accomplish more work tasks in less time with the help of AI tools while 61 of them responded with high effect level that AI tools help them save time in preparing lessons and instructional materials.

One teacher answered regarding her experiences on using Gen AI tools which is being seldom use due to reliance on prepared curriculum materials but acknowledges that AI enhances engagement and significantly saves time and reduces stress when developing instructional materials, particularly in teaching Fundamentals of Accountancy and Management.

> *"As a TLE classroom teacher, I seldom use AI in my discussion because we have our curriculum guide to follow, Module, Learning Activity Sheets, Learners Packet, and I have also prepared activities for my students in every lesson. Hence, AI is an accurate tool for everything, sometimes I used it as a tool to make my activities more fun and engaging. In this semester I'm handling Fundamentals of Accountancy and Management, AI definitely saving time and less stress in preparing my instructional materials for this subject as well as activities that I can treasure because AI is a reliable source."*

One teacher gave emphasize that AI is viewed as a complementary tool that enhances efficiency and output when used responsibly, while professional judgment and expertise remain essential to maintaining productivity and quality in educational work.

> *"As licensed teacher/office personnel in an institution that caters everyday not only to students, AI for me is just a supporting tool not as a replacement for professional expertise. By maximizing its benefits while remaining mindful and its limitations, we can improve our output and minimize its negative impact on productivity*."

These statements illustrate that Generative AI enhances teacher productivity by reducing time spent on routine instructional tasks, thereby allowing teachers to devote more time to classroom management, student support, and high-quality teaching interactions.

> *"Because of AI support, I can accomplish more tasks in less time and allocate my saved time to thoroughly check students' outputs and manage the classroom more effectively. This explains why teachers perceive AI as highly beneficial for managing daily tasks and workloads."*

> *"The ability of AI to quickly generate examples, step-by-step solutions, and alternative explanations allows me to complete teaching-related tasks faster and allocate more time to actual classroom instruction and student support."*

There are 55 teachers answered with high effect level that Generative AI improves their time management throughout the workday. There are also 58 teachers answered with overall high effect level of Gen AI use on teacher productivity in terms of task efficiency and time management.

> *"AI helps to do multiple tasks at the same time, it saves time and energy which I can use for more energy consuming tasks or activities, may it be in the classroom or outside work commitments."*

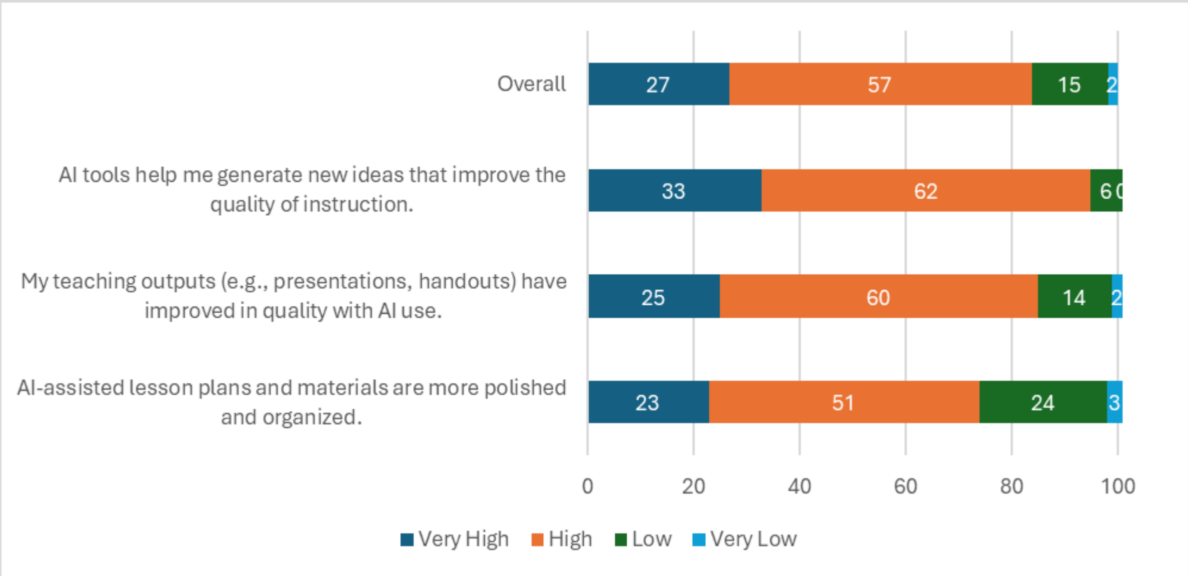

Figure 9. Effect of Generative AI Use on Teacher Productivity in terms of Quality of Output

Figure 9 shows the effect of Generative AI Use on Teacher Productivity in terms of Quality of Output. Teachers (n=62) believed that there is a high effect level on how AI tools help them generate new ideas that improve the quality of their instruction while 60 of them answered the same level on how their teaching outputs like presentations and handouts have improved in quality with AI use. Meanwhile, 51 of teachers answered with high effect level on how AI-assisted lesson plans and materials are more polished and organized. Overall, 57 of them answered with high effect level on teacher productivity in terms of quality of output while 27 responded very high and 15 with low level.

The teachers also recognized the contribution of Gen AI although they encountered difficulties along the way, they still manage properly and achieve the teaching and learning outcomes. Teachers can transform challenges posed by AI into opportunities to improve teaching and learning outcomes [41]. Although these are indirect outcomes still this is part of their productivity measures in terms of increasing student engagement through varied learning resources, providing more personalized or adaptive learning activities, providing more timely feedback to students, and facilitating more interactive and inquiry-based learning tasks.

> *"Using AI doesn't mean that all of it is correct, you must be very careful on some of the information because it is not always fully aligned on the curriculum standards, learners level or the overall contextual needs."*

Mathematics Teachers through Gen AI attain quality outputs through producing problem sets that are accurate and aligned with learning competencies, designing clear and well-sequenced mathematical explanations, preparing step-by-step solution guides that support learner understanding, creating higher-order thinking tasks for problem-solving and reasoning, and developing assessment items that measure both procedural and conceptual skills.

> *"For a math teacher, new ideas (highest indicator) are very important in making abstract concepts like calculus more understandable. I have turned to AI for help in coming up with fun real-world scenarios for problem modeling, or in creating interesting, project-based assessments that are not only limited to traditional exams."*

> *"In Mathematics teaching, AI contributes to producing more organized lesson plans, clearer explanations of abstract concepts, and well-structured presentations. AI-generated ideas also*

help in presenting multiple solution strategies, which is essential in developing students' mathematical reasoning and problem-solving skills."

Meanwhile, English Language Teachers produce quality outputs through Gen AI like well-organized instructional materials with correct grammar and syntax, designs of reading materials that match students' comprehension level, writing tasks with clear structure, criteria, and rubrics, engaging speaking and listening activities, detailed and constructive feedback on language use, texts and examples that promote critical and creative thinking, and assessments that accurately measure language skills across domains. The study of Kok Wei [43] concluded that ChatGPT is increasingly adopted by Malaysian polytechnic students as a supplementary tool for English language learning, enhancing grammar, writing, and vocabulary skills.

"Generative AI makes it easier for an English teacher to move from simple lesson drafts to come up with diverse, engaging, and culturally relevant role-playing scenarios."

Furthermore, Gen AI produces quality outputs for Science Teachers with designs of clear experiment guides and laboratory procedures; inquiry-based, hands-on learning activities; assessment tasks that reflect scientific thinking and analysis and learning materials that integrate real-world scientific applications. Gen AI tools also assist Science teachers on giving suggestions for interactive science activities and demonstrations, supporting creation of inquiry questions to stimulate curiosity, developing differentiated tasks for varied ability levels, providing enrichment activities for advanced learners and supporting remediation strategies for struggling students.

"Teachers' experiences and professional judgment remain essential to ensure accuracy, relevance, and meaningful learning."

"…as a science teacher, it is needed to consistently review and validate AI-generated content to ensure scientific accuracy and alignment with today's curriculum standards. This process ensures that while AI enhances quality, professional judgment remains central to instructional decisions."

For Technology and Livelihood Education (TLE) Teachers, Gen AI helps the them to produce competency-based lesson plans aligned with industry standards; design practical activity guides with clear procedures and safety protocols; develop visual or step-by-step demonstrations for hands-on skills; create instructional materials that reflect current technologies and workplace practices; prepare assessment tools that measure performance-based competencies and produce materials for technical skills training.
Teachers answered how they utilized Gen AI in lesson planning:

"As a TLE classroom teacher, I seldom use AI in making my lesson plans because in my eight years in teaching, I have my prepared plans for my lessons together with the output but sometimes I used AI asking a suggested activities to make my lesson more fun and engaging."

"While using AI, it improves the structure, clarity, and presentation of lessons, worksheets, and handouts. It enhances clarity in procedural tasks and competency-based instruction, which is crucial in TLE."

"As a TLE teacher focusing on food processing, I've seen how using AI tools has really enhanced my lessons. AI helps me brainstorm creative ideas for practical cooking projects, making my classes more interactive and fun."

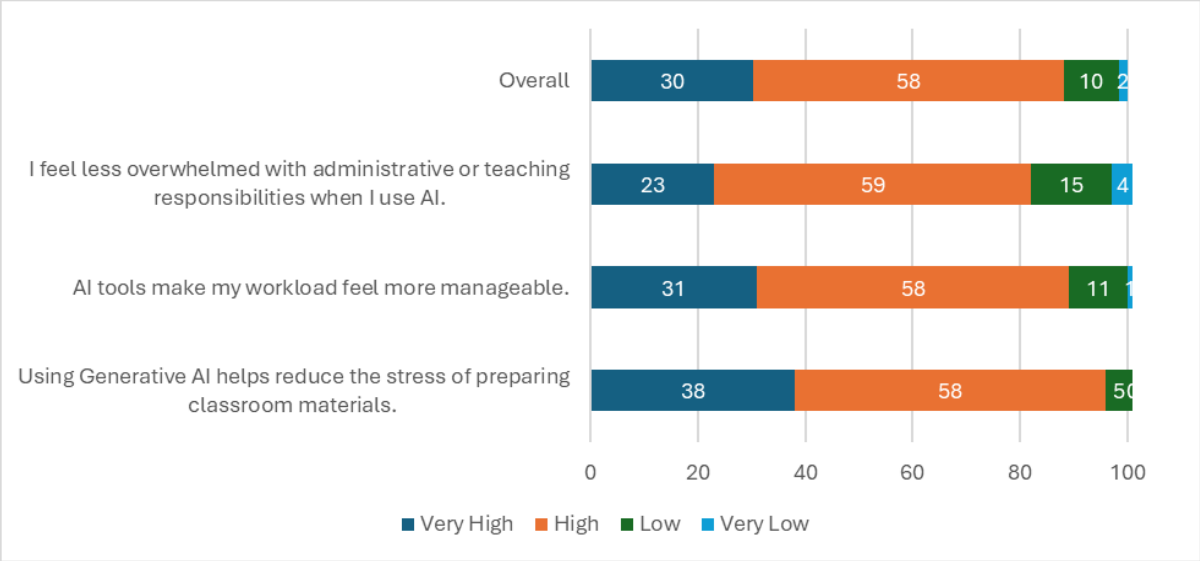

Figure 10. Effect of Generative AI Use on Teacher Productivity in terms of Stress and Workload Management

Figure 10 shows the effect of Generative AI Use on Teacher Productivity in terms of Stress and Workload Management. There are 58 teachers answered with high effect level on how Generative AI helps reduce the stress of preparing classroom materials while 38 of them responded with very high level and 5 replied low level. One teacher highlights how Generative AI significantly alleviates workload-related stress for mathematics teachers by expediting the creation of customized instructional materials and administrative documents, thereby easing the compounded demands of teaching and advisory responsibilities.

"The high agreement that AI reduces the stress of preparing materials is particularly relevant for Math, a subject often demanding extensive, customized problem sets. Using AI to quickly generate diverse word problems reduces the preparation time crunch. My experience confirms to this; the relief from the constant pressure of designing original materials is palpable. Aside from being a math teacher, I am a class adviser too, so AI tools really help me unload some of my stressors especially since we are also demanded to make a lot of school forms on top dealing with our students' personal baggage."

Meanwhile, 58 of them answered high level on how AI tools make them workload feel more manageable while 31 of them responded very high. Likewise, 59 of them answered high level on how they feel less overwhelmed with administrative or teaching responsibilities when they use AI while 23 of them responded very high and 15 with low level.

"Through AI assistance, it is really overwhelmed because of not feeling pressure if I need an urgent report especially in doing my development plan in our teaching career. It helps me not to comes late because of an urgent report but focusing on attending and mentoring of my students' skills and development rather than burdened in doing my paperwork."

"AI support allows me to focus more on actual teaching and student interaction, rather than being stressed by piled-up paperwork and preparation tasks. This explains why I feel less overwhelmed when using AI tools."

Gen AI tools help them in minimizing mental effort in organizing and structuring materials, providing instant suggestions, reducing uncertainty in lesson planning, managing workload during peak teaching periods, allowing them to focus on student interaction and facilitation and improving work-life balance by saving time and effort. Overall, 58 teachers answered high effect level of generative AU use on teacher productivity in terms of stress and workload management while 30 responded very high and 10 of them answered low level.

"The science teachers experienced less overwhelm during periods of heavy academic demand when using AI tools. AI support allows teachers to manage deadlines more effectively and maintain focus on student learning and safety during laboratory sessions, contributing to a more manageable and less stressful teaching experience."

"By handling the initial 'grunt work' of preparation, AI significantly reduces the mental exhaustion associated with teaching multiple English classes with varying needs, contributing directly to teacher well-being."

These explain that Generative AI reduces cognitive load and workload pressure across subject areas by handling preparatory tasks, enabling teachers to better manage deadlines, maintain instructional focus, and support student learning while promoting overall well-being.

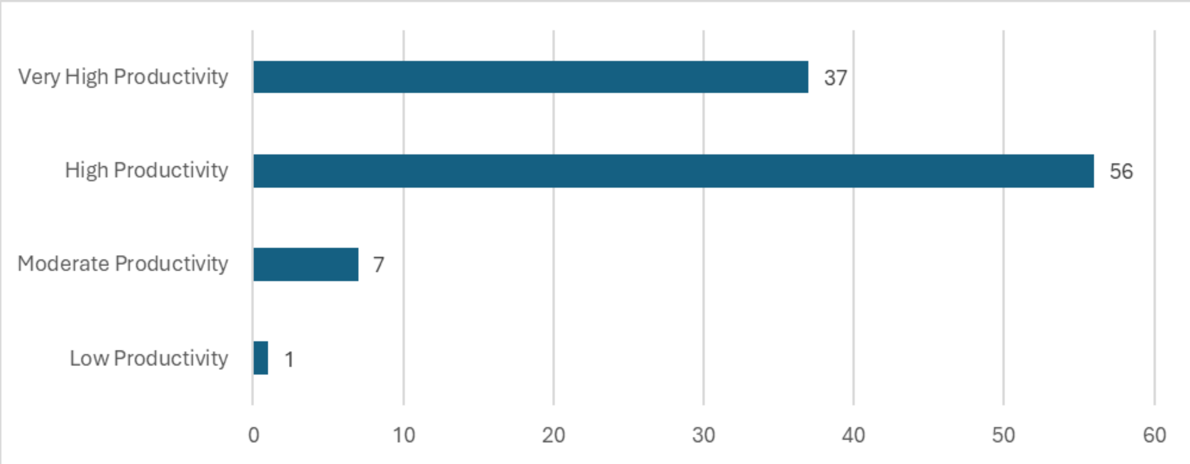

Figure 11. Frequency Distribution of Teachers' Productivity Level on the Effect of Using Gen AI Tools

Figure 11 shows the summary on productivity of teachers in terms of the effect of using Gen AI tools in the delivery of their duties and responsibilities. Result showed that more than half or 57 of them have considered with high productivity level which signifies that there is a significant enhancement in their efficiency, quality of outputs, and instructional effectiveness followed by the group of 37 teachers with very high level which signifies substantial and consistent productivity gains, with Generative AI tools integrated into most professional tasks. However, there are seven (7) teachers recorded with moderate level which implies noticeable but inconsistent improvements in teaching-related tasks and workload management while only one (1) teacher responded with low productivity level which signifies minimal improvement in work efficiency, output quality, and task completion due to limited use of Generative AI tools. Although majority of the teachers are considered still developing users and some have proficient levels, they find the use of Gen AI tools as beneficial and rewarding in preparing their lessons and improving their instructional materials. This study is consistent with the finding of Rochmad et al. [44] conducted in Indonesia that the use of AI significantly helps in reducing administrative workload, accelerating lesson planning processes, and facilitating more accurate and consistent student assessment. Another similar result of the study from Qodri et al. [45] showed that AI helps teachers create learning materials more easily while saving time and supporting innovative teaching practices.

Table 3. Test of Difference on the Extent of Utilization, Perceived Advantages and Disadvantages and Effects of Gen AI when grouped according to Specialization

	Weighted Mean					
	English	Math	Science	TLE	f-value	p-value
Extent of Utilization	2.68	2.69	2.81	2.62	0.300	0.820
Perceived Advantages	3.21	3.20	3.37	3.29	0.383	0.765
Perceived Disadvantages	3.18	3.29	3.43	3.36	0.589	0.624
Effects of Gen AI						
Task Efficiency and Time Management	3.19	3.29	3.39	3.31	0.466	0.707
Quality of Output	3.14	2.89	3.23	3.10	1.099	0.353
Stress and Workload Management	3.14	3.06	3.25	3.19	0.407	0.748

**Significant at p<0.05 at two-tailed*

Table 3 presents the test of difference on the extent of utilization, perceived advantages and disadvantages and effects of Gen AI when grouped according to specialization. The extent of utilization of Gen AI among teachers in English (*WM*=2.68), Math (*WM*=2.69), Science (*WM*=2.81) and TLE (*WM*=2.62) has no significant difference ($F(3,98)=.30$, $p=.82$, ns). The perceived advantages among teachers in English ($WM=3.21$), Math ($WM=3.20$), Science ($WM=3.37$) and TLE ($WM=3.29$) has no significant difference (($F(3,98)=.383$, $p=.765$, ns). In terms of perceived disadvantages of Gen AI among teachers in English ($WM=3.18$), Math ($WM=3.29$), Science ($WM=3.43$) and TLE ($WM=3.36$) has no significant difference (($F(3,98)=.589$, $p=.624$, ns). Overall, no significant difference exists on the extent of utilization, perceived advantages and disadvantages and the effects of Gen AI when the teachers are grouped according to specialization as denoted by the computed p-values of greater than 0.05 alpha level across all variables.

This signifies that regardless of specialization, teachers have diverse utilization and perception towards Generative AI. This also implies that there is cross-disciplinary applicability of Generative AI tools among teachers. Generative AI tools support common teaching tasks such as lesson planning, content creation, assessment drafting, and feedback generation, which are shared across all subject areas, leading to similar utilization and perceptions. There is shared pedagogical demands across specializations regardless of subject specialization where teachers face comparable instructional responsibilities (curriculum alignment, student assessment, classroom management), resulting in similar perceived benefits and challenges of Generative AI use. There is also a uniform level of digital literacy and institutional support. Teachers across different subject areas receive similar access to technology resources, institutional guidelines, and professional development activities, minimizing variation in AI adoption and perceived effects on productivity. The study conducted by Traga Philippakos and Rocconi [46] in USA confirmed with similar finding that subject area differences are present in awareness or context of use, but discipline-based differences in actual utilization are not consistently reported, making a non-significant difference by specialization plausible.

Table 4. Test of Difference on the Extent of Utilization, Perceived Advantages and Disadvantages and Effects of Gen AI Use when grouped according to Sex

	Male	Female	t-value	p-value
Extent of Utilization	2.67	2.67	0.026	0.979
Perceived Advantages	3.29	3.27	-0.129	0.897
Perceived Disadvantages	3.29	3.36	0.539	0.591
Effects of Gen AI				
Task Efficiency and Time Management	3.31	3.30	-0.080	0.936
Quality of Output	3.04	3.13	0.759	0.449
Stress and Workload Management	3.23	3.15	-0.613	0.541

**Significant at p<0.05 at two-tailed*

Table 4 reveals the test of difference on the extent of utilization, perceived advantages and disadvantages and effects of Gen AI when grouped according to sex. Results showed that no significant difference exists on the extent of utilization ($t=0.026$, $p=0.979$), perceived advantages ($t=-0.129$, $p=0.897$) and disadvantages ($t=0.539$, $p=0.591$) and the effects of Gen AI when the teachers are grouped according to sex as denoted by the computed p-values of greater than 0.05 alpha level across all variables. This signifies that regardless of sex, teachers have diverse utilization and perception towards Generative AI. Teachers have equal access and exposure to Generative AI tools**.** Both male and female teachers have similar access to digital devices, internet connectivity, and AI tools through institutional platforms, resulting in comparable levels of utilization and perceptions. This also implies that professional role outweighs gender differences. Teaching responsibilities, workload demands, and instructional tasks are similar regardless of sex, leading to parallel needs and experiences in using Generative AI tools to support productivity. There is also uniform institutional policies and training opportunities for teachers. The study of Dringó-Horváth et al. [47] in Hungary showed similar finding that gender did not significantly affect educators' technology adoption or digital competence related to AI. This signifies that schools and educational institutions provide the same technology policies, guidelines, and professional development opportunities to all teachers, minimizing differences in attitudes, perceived benefits, and challenges related to Generative AI use regardless of sex. The absence of significant gender effects may reflect uniform access to technology, similar professional responsibilities across genders, or evolving attitudes toward AI that minimize historic gender disparities.

Table 5. Test of Relationship on the Extent of Utilization with the Perceived Advantages and Disadvantages and Effects of Gen AI

	Extent of Utilization	
	r-value	p-value
Advantages	0.7016**	<.00001
Disadvantages	0.0669	.506234
Effects of Gen AI		
Task Efficiency and Time Management	0.5997**	< .00001

Quality of Output	0.596**	< .00001
Stress and Workload Management	0.5604**	< .00001

***Significant at p<0.01 at two-tailed*

Table 5 presents the result of the test of relationship on the extent of utilization with the perceived Advantages and Disadvantages and Effects of Gen AI. There is a significant relationship exists between the extent of utilization and the perceived advantages (r=0.7016, p<.01), effects of Gen AI on task efficiency and Time management (r=0.5997, p<.01), quality of output (r=0.596, p<.01) and stress and workload management (r=0.5604, p<.01). This signifies that those teachers with higher extent of Gen AI utilization are also those teachers with high level of perceived advantages of Gen AI and high perceived effects on task efficiency and Time management, quality of output and stress and workload management. Meanwhile, no significant relationship exists between extent of utilization and perceived disadvantages (r=0.0669, p=0.506) as denoted by the computed p-values of greater than 0.05. Results revealed negligible correlation which implies that there are some teachers who utilized Gen AI with diverse perspectives on its disadvantages to their daily activities. Meanwhile, the finding of the study Zaim et al. [38] indicates that perceived ease of use (effort expectancy) does not significantly influence lecturers' intentions to adopt generative AI tools, possibly due to their familiarity with similar technologies. Technology Acceptance Model [8] explains how teachers possess certain level of behavioral intention that describes their acceptance on the use of Gen AI towards productivity. They believe on the positive outcome of this technology, that is why they keep on using it to enhance their delivery of instruction and other administrative tasks. Umali [40] also noted that the integration of AI technology is seen as having a substantial positive impact on the overall learning experience when managed effectively.

The findings of this study have important implications for educational practice and management, particularly in guiding school leaders and policymakers in making informed decisions about the responsible integration of generative AI tools in teaching. The results highlight how generative AI can enhance teacher productivity by supporting instructional planning, content creation, and workload management, while also revealing areas of concern such as accuracy, ethical use, and overreliance. These insights may inform the design of targeted professional development programs that strengthen teachers' digital competence, promote task–technology fit, and encourage balanced AI use that complements rather than replaces professional judgment. Moreover, the study contributes empirical evidence to the growing body of literature on AI in education by contextualizing its effects within teachers' perceived advantages, disadvantages, and actual utilization.

This study has several limitations that should be considered when interpreting the findings. First, the data were collected using a self-reported questionnaire, which may be subject to response bias, such as social desirability or overestimation of Generative AI use and its perceived effects. Second, the study employed a cross-sectional research design, capturing teachers' perceptions and utilization of Generative AI tools at a single point in time, which limits the ability to establish causal relationships. Third, the study focused on teachers from a specific educational context and set of subject specializations, which may limit the generalizability of the findings to other educational levels, regions, or institutional settings. Lastly, the study examined Generative AI use in a general sense and did not differentiate deeply among specific tools or features, which may have nuanced effects on productivity.

Future research may address these limitations by employing longitudinal research designs to examine changes in Generative AI utilization, Ethical Use of Gen AI among teachers and its effects on teacher productivity over time. Mixed-methods or qualitative studies, such as interviews or classroom observations, may also be conducted to gain deeper insights into teachers' lived experiences, decision-making processes, and contextual challenges related to AI integration. Additionally, future studies may explore the impact of specific Generative AI tools or functionalities on distinct teaching tasks and learning outcomes, as well as investigate moderating variables such as digital literacy, institutional support, and policy frameworks. Expanding the scope to include different educational levels and cross-country comparisons may further strengthen the contribution of future research to the growing body of literature on AI in education.

4. CONCLUSION

The study provides an empirical, multi-dimensional analysis of teachers' extent of Generative AI utilization, perceived advantages and disadvantages, and its direct effects on teacher productivity across subject specializations within the basic education context. Results showed that ChatGPT, Grammarly and Quillbot are the most commonly used AI tools by the teachers in creating and editing content materials for classroom instruction. Teachers have high level of utilization of Generative AI tools primarily in improving the quality of teaching materials, helping them in lesson planning and instructional design and enhancing the research projects, articles and reports. However, whey they are categorized according to user level, most of the teachers belong to developing Gen AI tool users which can also be to the result of the overall mean on perceived disadvantages of Gen AI Tools as considered higher than the overall mean score of perceived advantages. Although teachers believed on positive effect of Gen AI Tools on productivity, there are still drawbacks that cannot be taken away negative consequences or effect to the teachers when talking about ethics and creativity. Using it ethically and professionally for educational purposes with proper fact checking data and validating information ensures the teachers that the source and content of the instructional materials are reliable and valid. Gen AI Tools also served as assistant in developing research ideas and concepts for their professional development. Although teachers have diverse levels of Gen AI utilization and its effects on productivity as well their perceptions on its pros and cons regardless of sex and fields of specialization, they still consider it as helpful tool in managing their stress and workloads as teachers and graduate school students. The findings serve as baseline data for developing a teacher training program that implements targeted professional development to improve digital competence and AI integration skills; designing curriculum that integrates AI tools into lesson planning and teaching strategies effectively; conducting monitoring and evaluation that establishes guidelines to assess AI effectiveness and productivity gains; and providing technical support and mentorship to encourage teacher adoption.

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