

## **Generative artificial intelligence as a teaching tool in research writing: a scoping literature review**

**Maria Karla N. Vinoya**

Bulacan State University, Malolos City

Bulacan, Philippines

Email: mariakarla.vinoya@deped.gov.ph

**Abstract:** Generative Artificial intelligence (AI) is widespread all over the world. It has become a topic of concern most especially in the field of education. In the present context, generative AI has become prevalent among students who are very reliant on online sources because of its ease of use making them produce written outputs instantaneously. Consequently, it adversely affects their critical thinking skills and limits their ability to produce an authentic written output which does not commit ethical concerns. The limited skills of students on paraphrasing, summarizing and citations are rooted on being reliant to generative AI. Thus, students' inability to draft their own research paper resorted to copying directly what is given by Generative AI leading to many underlying issues in the academe such as originality. The emergence of Generative AI in the field of education is inevitable and making a policy on its proper usage may help the educators and students to capitalize on its potential. AI opens other facets of learning such individualized instruction and self-paced learning. This scoping review examined important ideas and implications from peer-reviewed journals, published studies, and relevant articles on Generative AI. This study emphasizes the potentials of Generative AI as a teaching tool inside and outside the classroom.

Keywords: Generative artificial intelligence, Plagiarism, Critical thinking

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### INTRODUCTION

Research is an important aspect of life. People often use research to improve the quality of life. Scientists discover a lot of new things to help human beings. One of the notable discoveries is artificial intelligence (AI) which helps people with their basic decision making. AI has been used widespread in various fields including education. However, some students became so reliant to generative AI which led them to neglect the essence of writing their own research paper.

Evidently, research is quite challenging for most of our young learners from formulating the research problem to drafting their actual research paper. It causes them academic pressure knowing that they have limited experience of doing research, that is why many students see that generative AI is the solution to their writing problems.

The purpose of this scoping review is to investigate the potential of generative AI as a tool for teaching research writing. This scoping review will summarize available research to provide a complete overview and comprehensive insight into the potential and challenges of its inclusion into education. This can also assist in uncovering gaps in literature and studies, guaranteeing that this study contributes to the development of generative AI policy.

#### *Statement of the problem*

The objectives of this study are as follows:

- 1) What are the potentials of including generative AI in teaching research writing?
- 2) What are the major challenges of including generative AI in teaching research writing?
- 3) What are the policies made to regulate the use of generative AI in teaching research writing?

## METHODOLOGY

### *Protocol*

Prior to the current scoping review, a precisely planned study protocol was created. The author throughout the scoping review process utilized the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA, 2020), Population, Concept, and Context (PCC) framework (Joanna Briggs Institute, 2021) and Arksey and O'Malley Framework (2005).

The researcher attests that the paper precisely and completely describes the review that was conducted. There were no reported procedural compromises.

### *Search Eligibility Criteria*

In the present review, the researcher selected the literature based on the following criteria (1.) It dealt with the potential of artificial intelligence (AI) in education, (2) It investigated the challenges of AI integration in teaching research writing and (3) It appeared in peer-reviewed journals, conference proceedings, or theses.

### *Search Strategy*

A thorough search was conducted across scholarly databases such as Scopus, ScienceDirect, and Google Scholar. The keywords chosen were AI as a tool in teaching, challenges of AI driven education and potentials of AI driven education.

### *Study Selection*

The author searched for academic journals and filtered them based on the date of publication, subject area and language. Research articles from 2000-2025 were only selected. The journal articles must also be inclined with English subject specifically in writing. Only academic journals which are written in English language was included in the scoping review. The author initially reviews the titles and abstracts of the retrieved papers before selecting whether to include the actual paper. Articles which do not meet the PCC (Population, Concept, and Context) eligibility conditions were discarded. Following that, the entire text of each contained document was read and evaluated.

### *Data Extraction*

The title and review questions were determined under the PCC framework. Pre-protocol searches made the researcher identify the basic structure of the extracted data for the review:

- 1) data from the reviewed documents relating to the potential of generative AI in education,
- 2) data from the reviewed publications regarding challenges of including generative AI in education; and
- 3) data from the articles under review containing the policies made to regulate the use of generative AI in education

## FINDINGS

### *The potentials of including generative ai in teaching research writing*

#### *Supplement teachers' guidance*

The use of artificial intelligence in writing helps learners to formulate key concepts for their academic paper. ChatGPT supplements teachers' input in writing by providing possible topics which they could utilize (Elstad & Eriksen ,2024).

Further, Marzuki, Utami Widiati, Diyenti Rusdin, Darwin & Inda Indrawati (2023) proved that the writing skills particularly content and organization of the English as a Foreign Language (EFL) learners were positively developed because of Generative AI such as Quilbot, Jenni AI, ChatGpt, Worldtune etc.

#### *Reduced grammatical errors*

Teachers cannot attend to their students 24/7 and could not give immediate feedback along the process of research writing, it is therefore necessary to use generative AI such as Chatgpt that could potentially help teachers in giving direct feedback.

According to Fitria (2021), Grammarly is an AI tool that checks the spelling of words, sentence structure and even error of punctuation marks and capitalization. In her study, before using Grammarly EFL students' test score was 34 out of 100 but after using Grammarly it became 77 out of 100. It only means that Grammarly helps students to increase the quality of their written text.

Moreover, Grammarly contributes to the comprehension of grammatical rules and vocabulary because AI suggests a better term and explains as well what makes the students' composition erroneous (Wulandari, Astuti & Marhamah, 2024) .

Similarly, the application of AI-powered tools helps students in terms of cohesion and coherence, lexical resources, grammatical range and accuracy. It becomes an informative source of reference not just for students but also for teachers who are teaching academic writing (Tran, 2023).

#### *AI as a source of reference*

Students' use of generative AI may vary depending on their skills and demands. Most students often use artificial intelligence when thinking of a topic and starting to write their paper. Students believe that AI is important in the process of locating references. Generative AI provides references which may be valuable insights in the construction of their academic paper (Rosdiana, Noercolies & Fauzan, 2024).

#### *Generative AI tools are time-efficient*

Wulandari et al. (2024) discussed how AI could enhance the writing literacy of secondary teachers. Teachers also found writing to be more enjoyable because Grammarly, Quilbot, ChatGPT, Mendeley and Turnitin provide them with direct feedback and corrections making it easier for them to write articles. It only means that teachers saves time and effort with the help of AI tools in writing.

#### *AI Promotes students' engagement*

Nazari, Shabbir & Setiawan (2021) showed that AI tools are effective intervention in improving students' engagement in writing. Second Language learners become motivated to revise their research paper when they immediately receive feedback and scores from AI writing tools. They are encourage to write and revise their written works to get a better score in the generative AI tools.

In like manner, Wordtune, which an AI writing tool, helps EFL learners to translate their ideas into English making them stay motivated along the writing process because they are not stuck with difficult vocabulary words in English. Thus, learners improve the quality of their written works (Zhao, 2023).

#### *The challenges of including generative ai in teaching research writing*

##### *Accidental plagiarism*

While AI can be a powerful writing tool that corrects grammatical errors instantly, it can also produce inconsistencies and errors which not all students may be aware of. Students usually use generative AI tools without teachers' supervision or guidance which led them to commit accidental plagiarism since they are not reflective nor skeptical of the AI suggestions leading them to copy what was suggested (Burkhard, 2022).

Therefore, it is suggested that a continuous reinforcement of ethical considerations must be reiterated among learners to avoid unintentional plagiarism while using AI writing tools ( Song & Song, 2023).

#### *Lack of critical thinking skills*

Chiu (2023) stated that students should be able to develop critical reasoning and thinking skills before using GenAI particularly ChatGPT. Lack of critical thinking skills may lead to becoming reliant on the facts and knowledge provided by GenAI.

In like manner, Ju (2023) revealed that there is inaccuracy of learning when ChatGPT was used in writing assignments among college-educated participants. In the study, participants who did not use GenAI outscored the participants who used ChatGPT.

Therefore, teachers should hone first the students' ability to evaluate the information from GenAI so students will be able to organize and synthesize them based on how this knowledge is essential in their written output.

#### *Memory loss*

Since students can easily get answers from GenAI, they tend to procrastinate knowing that it is only one click away. Students have the tendency to become lazy in their academic tasks, especially in writing. Memorization of important concepts has been left behind knowing that this GenAI could easily produce references for their written topic. Therefore, the use of GenAI should adhere to strict policies which would limit them from merely copying so as to eradicate memory loss (Abbas, Jam & Khan, 2024).

#### *Cost-effectiveness*

Although the majority of GenAI tools are free to use they also have limitations in comparison to those paid accounts. The issue of using GenAI in education not only relies on the capacity of the students to pay for a premium account but also the ability of these students to own a gadget for their online research. Therefore, Educators must consider not only the cost of investing in ChatGPT software but also the computer set which the students will utilize in school. However, it may be a barrier to some schools which have limited budget on learning materials (Su and Yang, 2023).

#### *Insufficient Training among teachers*

GenAI has a very promising function in the field of education particularly when used as a tool in research writing. Hence, teachers' professional training in the use of GenAI may not be sufficiently enough to utilize it in the classroom setup. Teachers felt that they are not fully equipped with the knowledge and skills to effectively discuss among their learners the use of GenAI (Lee, Arnold, Srivastava, Plastow, Strelan, Ploeckl, Lekkas & Palmer, 2024).

#### *Policies regulating the Use of Generative AI in Teaching Research*

##### *4E (Embrace, Enable, Experiment, and Exploit) framework*

Shailendra, Kadel & Sharma (2024) introduced the 4E framework which includes the various stages--Embrace, Enable, Experiment, and Exploit. The framework indicates distinct stages of

adoption and gives strategy to help schools in adopting GenAI leading to improved teaching and learning process while at the same time assessing its impact on research methodologies.

Shailendra et al. (2024) 4E stages are as follows:

**Embrace:** This phase of the adoption framework focuses on articulating the intent of adopting GenAI in the education system. Decision makers, including university top management, leadership, and academic committee representatives, must reach a consensus and formally document this intent within their policy framework.

**Enable:** This phase constitutes the core of GenAI adoption within an academic ecosystem, where educators must identify the requirements and develop a plan for integrating GenAI into their curriculum. Course coordinators should analyse their curriculum for necessary changes in the whole course whereas unit coordinators must reevaluate and redefine learning outcomes, evaluation methodologies, and assessments to accommodate potential GenAI usage by both faculty and students.

**Experiment:** This phase aims to use and experiment with the developed course and unit curriculum, along with the tools and techniques learnt during previous phases. Unit coordinators play a crucial role in designing their respective units, modifying the evaluation approach, and providing feedback on the effectiveness and challenges faced during the adoption process.

**Exploit:** This marks the scaling-up phase of the framework. In this phase, faculty and students are exposed to the updated curriculum, along with the tools and techniques necessary to deliver high-quality education using GenAI. The ICT staff is involved in upgrading and expanding the systems to facilitate university-wide adoption.

#### *GenAI Adult Learning Ecology Framework (GenAI-ALE)*

According to Adarkwah (2024) GenAI-ALE framework is intended to assist the appropriate integration of generative AI technologies into the adult learning environment. It is divided into two categories: institutional factors and interpersonal elements, both of which have distinct components that serve as the framework's foundation. Interpersonal aspects include individual students' personal characteristics, interactions, and connections within the learning environment, as well as how they engage with the learning topic. Meanwhile, institutional factors are considerations about the educational institution as a whole, including the preparation, method, and support systems for incorporating GenAI into adult learning and education activities.

In order to effectively adopt the GenAI-ALE framework, there are 3 systematic steps that should be followed: (1) pre-perception & perception (awareness of GenAI technologies), (2) assessment (evaluating the performance of GenAI for educational operations) ; and (3) outcome (assessing the overall effect of GenAI adoption).

#### *Brave new word framework*

This framework is a three-step process that is meant to assist teachers in creating guidelines for students regarding how they should use technology for assigned writing. The following steps are as follows:

Step 1 is articulate the assignment's learning objectives. Learning objectives are the foundation on which assignments are built.

Step 2 is identify how students could use technology for the assignment, and impacts on the learning objectives. It involves consideration of what technologies could be used for an assignment, and the associated benefits or drawbacks to learning.

Lastly, Step 3 is developing your guidelines. The final step is to develop clear guidelines for students. The goal of step 3 is to identify whether a given technology is unacceptable,

acceptable, encouraged, or required for each written task ( August, Anderson & Laubepin, 2024).

#### *The community of inquiry (CoI) framework*

According to Avgerinou, Karampelas and Stefanou (2023), the Community of Inquiry (CoI) framework is a popular methodology for analyzing and enhancing online learning. The framework consists of the following elements: (1) Teaching presence. It refers to the degree to which an instructor is actively involved in the online course and interacts with students to facilitate learning, (2) Social presence. It refers to the degree to which learners feel connected to others in the online learning environment; and Lastly, (3.) Cognitive presence. It refers to the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse (Zhang, Huang, Hussain & Dong, 2023).

## DISCUSSION

Capacity building on the use of generative AI in education plays a crucial role in molding students' pride and dignity in research writing. The published journals reveal that students have limited knowledge on the appropriate usage of generative AI as a tool in writing. This highlights the importance of improving their critical thinking skills so that they can effectively examine a wide range of contents provided by generative AI. Teacher and Students' Training on GenAI utilization must be done in order to address accidental plagiarism and students' critical thinking skills. In like manner, teachers should also provide clearer instructions on how they could utilize the GenAI during the writing process.

## CONCLUSIONS AND RECOMMENDATIONS

Generative AI made important contributions to research writing, with both positive and negative effects. Looking at the positive usage of GenAI, it can be concluded that it increases students' productivity by automating related literature and studies. Students save time and effort because they do not need to visit physical libraries. It also makes summarizing easier because the generative AI already summarizes the sources. Moreover, it suggests well-structured drafts which they could use as a model in writing.

However, GenAI also has several negative impacts when not properly used in research writing. It becomes a threat to academic integrity because some students rely so much on GenAI content leading to accidental plagiarism. Furthermore, overreliance on GenAI may also limit critical thinking of the students which affects their ability to produce authentic research paper.

In conclusion, GenAI serves as a powerful tool in research writing both from the perspective of teachers and students, but it should be used carefully. Teachers must balance AI assistance in teaching research. They should not neglect what the human mind can give to the learners, which is to foster the value of ethics in research. Similarly, students must also be aware of their possibility to become hooked in using GenAI. They should first learn how to evaluate generated content and assess how they could utilize them in their research paper following the principles in research.

Based on the findings of the scoping review, several recommendations are proposed to enhance the effective utilization of Generative AI (GenAI) in research writing. First, teachers should receive comprehensive training in utilizing GenAI as a teaching tool. This training should focus on equipping educators with the necessary skills to generate and assess AI-generated content while ensuring academic integrity by eliminating possible plagiarism. Additionally, teachers must develop strategies to foster students' critical thinking, enabling

them to produce more comprehensive written outputs. Peer tutoring among colleagues who are experts in AI integration should also be encouraged to enhance teaching strategies. By strengthening their pedagogical approaches, educators can create an effective learning environment where students maximize the benefits of GenAI in research writing.

Second, schools should implement process-based assessment strategies to ensure the responsible use of GenAI in education. Teachers must assess not only the final written output but also the entire research writing process. A progress portfolio should be required from students, documenting the step-by-step development of their research, including reflections on their learning journey. This approach promotes transparency and encourages students to engage critically with their work. Additionally, scoring guides should be provided to differentiate between AI-generated and authentic student-written outputs. By reinforcing ethical considerations and academic integrity, students become more accountable for their learning and develop a deeper understanding of responsible AI use in research writing.

Lastly, integrating GenAI into the curriculum presents challenges that require a structured approach. The adoption of the 4E (Embrace, Enable, Experiment, and Exploit) framework can help guide policy implementation within the Department of Education. The "Embrace" phase involves securing agreements among teachers and school administrators to formally propose GenAI integration into research writing courses within the department's policy framework. The "Enable" phase focuses on identifying requirements and revising curriculum guides for subjects such as Practical Research 1 & 2, Inquiries, Investigations, and Immersion (III), and Capstone. Subject group heads (SGH) and master teachers (MT) should assess the proposed curriculum modifications, ensuring alignment with content, performance standards, and learning competencies. The "Experiment" phase involves piloting the revised curriculum to assess its effectiveness, with SGHs and MTs providing feedback on challenges and opportunities encountered during implementation. Finally, the "Exploit" phase ensures the full integration of the updated research writing curriculum, along with the necessary learning materials and instructional strategies. Collaboration with school ICT coordinators can further enhance and expand the use of GenAI for a possible school-wide adoption.

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