GENERATIVE ARTIFICIAL INTELLIGENCE TOOLS FOR RESEARCH ACTIVITIES OF POSTGRADUATE STUDENTS: THE REALITY OF ITS CONTINUITY

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Abstract
This paper focused on the use of generative artificial intelligence tools for research activities by postgraduate students. It highlighted the various aspect of research activities, the different types of generative Artificial Intelligence tools for research, positive and negative implications for research. The conclusion acknowledged the benefits and downside of using generation AI tools for research but called for attention to balancing these positive and negative implications.

Keywords: Artificial Intelligence; Generative Artificial Intelligence Tools; Research Activities; Postgraduate Students; Research Quality

Introduction

For postgraduate students, research projects are essential assignments that must be completed at the conclusion of their study. Writing papers, reviewing literature, gathering, reporting and analysing data, interpreting findings and giving seminars are all included. The ultimate aim of these activities is to increase knowledge and creativity in a certain field of study and their proper execution determines a postgraduate students' graduation or status in that subject. Therefore, there was pressure to find ways to speed up and ease the process of these research activities. Additionally, because current information is needed for research and there is an explosion of information, sorting, reading, and interpreting literature became more difficult, adding to the already laborious work involved in these activities (Roopa and Hunashyal 2020). Prior to now, conducting research required a lot of time and mental strain. Postgraduate students are typically heavily involved in reading publications, organising and categorising pertinent information, analysing and interpreting research data, and data interpretation. Even though the researchers completed all of these manually or with the help of a librarian or information analyst, it still took time and mental effort. Moreover, Laminoska and Augiene (2017) reported that postgraduate students view research projects as demanding and unpleasant endeavors that one would prefer to avoid but are typically undertaken out of necessity andompulsion. Their interest and desire to fully engage to the processes involved in research endeavors are thereby impacted.

Aspects of Research Activities

Research activities of postgraduate students are similar to any other researches, although they tend to dive deeper into the problem and it entails the following:

1. Paper writing and publication
2. Literature review
3. Attending seminar
4. Data collection
5. Data analysis
6. Result presentations
7. Identification and formulation of research question

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Artificial Intelligence

The development of technology has made it easier to carry out research operations, and artificial intelligence is one such technology that has had a big impact on how these activities are conducted. Machine learning models that have been trained on a variety of tasks to generate predictions using data are what make up artificial intelligence (AI). A much simpler model called the Makov Chain, which was named after Andre Marco's statistical technique, serves as an early example of generative artificial intelligence. It was used to simulate the behaviour of random processes in email programmes for tasks like autocomplete functions and other next-word prediction tasks (Zewe, 2023).

Regarding applications that may help in the creation of images, texts, audios, movies, and 3D modelling, generative artificial intelligence stands out for its capacity to produce original and distinctive content that is akin to that of the human mind. Machine learning models trained to generate new data rather than forecast certain data sets are known as generative artificial intelligence models. These models are widely used; some examples include chatGPT, aithor.com, quillbot, paperbot, R discovery, and AI art generator

Types of Generative AI Research Tools and Their Functions

Kumar *et al*., (2020) identified some generative AI tools which are useful for carrying out research:

1. Grammarly is an AI tool which improves writing quality and clarity of PG research.
2. Tableau enables interactive and informative visualisation
3. Mendeley is a reference management tool for streamlining citations
4. Semantic scholar provides personalised paper recommendations
5. Claude is used for summarising documents
6. Research rabbit helps to organise research paper
7. ChatGPT is used for generating data based on user request
8. Quillbot is used for paraphrasing
9. Humata AI is used for summarising articles

Positive Implications of Generative AI Tools for Research Activities

Owing to the wide scope of postgraduate research, students are often looking for ways to expedite and streamline research procedures. Similarly, research may now be done much more quickly and easily thanks to generative artificial intelligence techniques. It facilitates easy reference, speedy write-ups, error detection in write-ups, and quick text or picture generation based on supplied information, all of which improve the research writing process.

Barros *et al*., (2023) averted that this cutting-edge technology known as generative artificial intelligence is making its way into several industries, including education. Researchers can use it to search the literature, make intelligent summaries, and edit research articles. The future of postgraduate students and the advancement of the country depend critically on our acceptance and integration of this technology into our teaching, learning, and research. By automating repetitive processes like literature reviews, data analysis, visualization, research collaboration, and management, generative artificial intelligence systems help postgraduate students' research activities be more productive, efficient, and of high quality. (Hernandez *et al.,* 2019).

Benefits of AI Tools for Research

Improve Efficiency- Generative AI tools can analyse data fast identifying patterns and generating insights that would have taken a longer time to achieve. This enhances efficiency

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by maximising time allowing the PG students to focus on other task and reducing chances of error (Smith, 2022).

Streamlined literature review- These tools provide means for quick scanning of articles, extractions of vital information and relevant summaries which not only saves time of the PG student but also improves the quality of the research as these tools provide up-to-date information (Brown *et al*., 2023).

Negative Implications of Generative AI Tools for Research Activities

Generative AI tools have offered numerous benefits to education system especially in research activities but their impact has not been entirely positive, some negative effects have also occurred which if left unchecked can result in greater problem than the education system is prepared for. Generative AI tools can easily be misused or overused due to its undeniable advantages towards research, drawing more attention for ethical utilisation of these tools. Unethical use of these AI tools for research activities can undermine the quality, reliability and originality of the research.

Downside to Using Generative AI Tools for Research Activities

Some downsides in the use of generative AI for research are discussed below:

Overreliance- This is a situation where PG students go beyond merely consulting these tools to totally depending of their outputs or suggestions. According to Carr (2020) generative AI tools comes with an ease that can be quite addictive, luring PG students to solely rely on them and avoid the PG student's active involvement in the research processes.

Decreased critical thinking skills- This is a decline in the PG students' ability to construct strong arguments and make logical conclusions. AI tools are known for generating data based on request which leaves very little room for students to develop their problem-solving skills and critical thinking (Bennett and Maton, 2020).

Decreased originality and creativity- This is a situation where the research work constitutes more of the AI generations than that of the researcher. Susnjak (2022) opined that most of the content generated by generative AI tools are similar to existing published works which raises a question of credibility and originality of the research.

Deepfakes- These are image, audio or video generations that do not exist or alterations of the original. AI tools are trained on existing data and could generate false or outdated information which could be included in the research if proper verification and cross examination are not done leading to misinformation (Bender et al., 2021)

Superficial analysis- This occurs when analysis is not thorough but based on obvious observations. AI tools are unable to capture understated differences, complexities and context-dependent variations in data, resulting in generalised or inaccurate analysis. This is likely due to quality of the data the AI tool was trained on or binary classification systems which AI tools rely on that fail to account for the gray areas (Georgiou and Lycouris, 2022).

Conclusion

Generative AI tools have been able to improve the quality, productivity and efficiency of PG students' research activities, allowing them to focus on high-level thinking and strategy. Although, this has not been achieved without some negative impact on the PG students as well as their research outputs. The use of these tools have brought about conflicts in research

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originality and critical thinking of the PG students. Hence, in spite of the benefits of using generative AI tools for research activities, it is crucial to acknowledge their limitations and promote a balance usage.

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