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A Review Article – Facebook’s Meta AI: A Potential Boon or Doom for Learning?

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ABSTRACT

Artificial intelligence (AI) tools have made significant leaps in various sectors, including education. Recently, Facebook released its latest open-source AI platform called the Meta AI, which may offer unique and endless opportunities for educators and students to automate content creation, enhance language processing, and facilitate interactive learning. This review investigates the possible impact of meta-AI on higher education, including its potential benefits and challenges. It highlighted versatility, capabilities, and accuracy, making it particularly useful for research and science subjects. However, it also emphasizes the risks associated with limited accessibility, steep learning curve, ethical and privacy concerns, and over-reliance, which can hinder student learning and deepen educational inequality. Considering these findings, this paper calls for broader and equitable access to technology, provides comprehensive training and support, establishes clear data protection policies, and a responsible and balanced approach to the use of this platform to maximize the benefit. In conclusion, Facebook’s Meta AI holds the potential to revolutionize the teaching and learning experience in the education sector, but challenges must be considered and must be addressed to ensure inclusivity and safeguarding privacy, ultimately determining whether its integration will be a boon or a doom.

INTRODUCTION

The advent of big data, cloud computing, artificial neural networks, and machine learning has empowered engineers to develop a computer capable of simulating human intelligence. Artificial intelligence (AI) is defined as machines capable of perceiving, recognizing, learning, reacting, and solving problems, based on these technologies (Kumar & Thakur, 2012). In recent days, many AI tools have proliferated over the internet (e.g. ChatGPT), making their way into enterprises, research, and even academics (Dwivedi *et al.*, 2019). Given these advancements, many scholars are concerned about the possible hazards that AI technologies may bring to education as they started to proliferate (Hockly, 2023; Ifelebuegu, 2023). Others, however, concurred that AI technologies can improve education, by using these tools as an aid to the educational system (Limna *et al.*, 2022). A recent example of such technology is Facebook’s Meta AI, a newly created tool that has received a lot of attention (Meta, 2022).

Meta AI, a recently announced chatbot built by Facebook’s parent company, META, provides educators with a valuable tool for incorporating artificial intelligence into their teaching and learning activities. AI may generate replies that are very similar to human conversation by utilizing powerful natural language processing (Eagle *et al.*, 2021). Its capacity to generate cohesive, organized, and useful information (Berente *et al.*, 2021) has sparked considerable global interest, emphasizing its potential to improve teaching approaches and educational outcomes. Nonetheless, due to the fact that this AI has also limitations, such as knowledge cut off, lack of common

sense, language limitations, no personal opinions or beliefs, no creative originality, bias, limited emotional intelligence, dependence, vulnerability to misuse, limited multi-stem problem, no physical interaction, and data privacy concerns (Meta AI 3.2), misuse of this tool could hinder the learning acquisition of the learners, and may foster an overreliance on technology.

While it is critical to acknowledge both the good and bad consequences of AI in education, it would be unduly simple to speculate on whether Meta AI would provide more risks than benefits. As Euchner (2019) points out, while AI can provide enormous benefits, it also poses huge problems and disruptions that influence not only education but also a variety of other sectors. Hence, this review article collates available information on Facebook’s Meta AI to generate a rapid review of its potential effects in education.

MATERIALS AND METHODS

Identification and Filtration of Potential Literature

Methods used in the extraction of literature were adopted from Barrot (2020), Gonzalez-Calatayud *et al.* (2021), Chen *et al.* (2020), Sapci and Sapci (2020), Zhai *et al.* (2021), and Ouyang *et al.* (2022).

The relevant literature was extracted from various repository websites which include Google Scholar, and Google Search Engine. The subjects used to filter the numerous literatures in the databases were Meta Ai, Llama, Advantages/disadvantages of Llama, and AI in Education. The published years of the articles were covered from 2020 to 2024 to ensure the information of the articles were up to date. Initially, the total articles

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retrieved were 165 related topics to Meta AI. After the initial screening of the titles, duplication and irrelevant articles were excluded, which reduced the total number of articles to 102. Two reviewers concurred on the selected articles used in this review.

Eligibility and Inclusion Criteria

The relevance and rigor of the selected studies were validated by the two reviewers. Articles included were based on the following conditions:

- Focus on the implication of AI tools in the educational system under higher educational institution (HEI).
- Research methodology that demonstrated rigor.
- The advantages and disadvantages of Meta AI in education.

- Published in English, peer-reviewed, and accessible in full-text.

The integration of these criteria provided help in the final selection of the article; it comprised 20 articles out of 165 related papers. These studies aimed to provide insights and possibilities on the newly launched AI tool called Meta AI: Llama.

Data Extraction and Synthesis

Extraction of the data was conducted manually using computerized database searches. The data extracted from the literature were subjected to standardized form to eliminate irrelevant contents. This was not limited to author(s), study design, year of publication, and educational level.

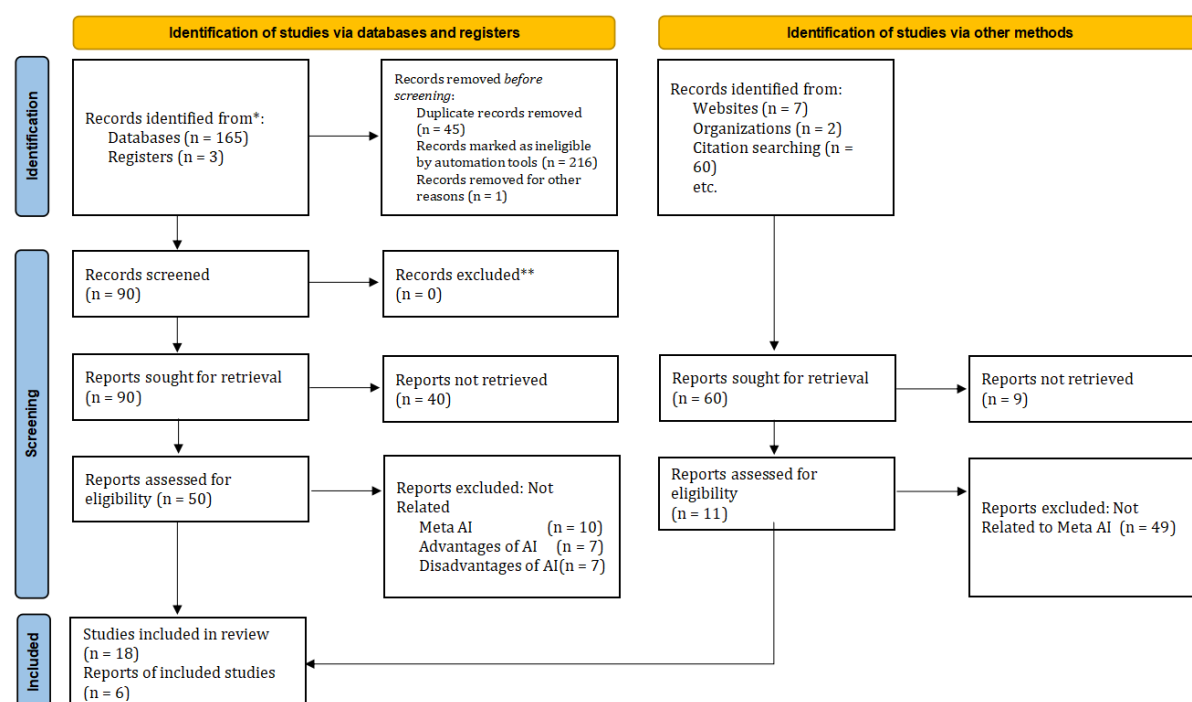


Figure 1: PRISMA flow diagram

The PRISMA flow diagram (Fig. 1) shows the screening and evaluation process of the selected literature.

LITERATURE REVIEW

Meta AI: Llama 3.2

Meta AI was just introduced on Facebook, Instagram, Messenger, and WhatsApp. It has a unique blue ring in the top corner of the device's screen, as do other AI tools (The Indian Express, 2024). Unlike many closed-source AI tools, Meta AI includes open-source datasets and algorithms, giving customers more flexibility. Notably, this AI tool has unique features, such as generating photos while conforming to ethical guidelines and operating transparently. Meta AI is a pioneer of open-source tools, CEO of Meta Mr. Mark Zuckerberg pushed his limits to produce the largest open-source AI model in the history of mankind which as a large language model, capable of creating multiple conversations (Mirjalili, 2024). Meta AI is

a powerful social media management program powered by Meta AI (previously Facebook). It is especially developed to help businesses and digital marketers automate critical social media tasks including content scheduling, publishing, and performance monitoring across many platforms such as Facebook, Instagram, and Twitter. One of the platform's most significant characteristics is its ability to create interesting content using artificial intelligence. Meta AI utilizes the full power of Meta AI, allowing users to easily generate high-quality text, photos, videos, GIFs, and other media forms targeted to their target audiences with no effort. This saves a huge amount of time and work when curating or designing multimedia pieces from scratch. Meta AI also streamlines the process of scheduling and posting social media updates across many platforms, allowing users to plan posts for specified days and times or publish them quickly across numerous networks with a single click. The software also includes

sophisticated analytics and reporting features, allowing users to track the performance of their social accounts and determine the sorts of material that are most popular with their followers. This data-driven strategy enables users to fine-tune their social media tactics for maximum engagement and effectiveness (Modley, 2024; Arielle, 2024; Pathak, 2024)

Boon of Meta AI

Today, several articles state the advantages of AI tools in various sectors of mankind, from business, medicine, industry, and even education. AI tools are some of the most exploited platforms on the internet that people use freely. As an effect, these tools lighten the tasks and duty of some personnel/student that need to generate reports or output faster than normal. One great advantage of Meta AI is the characteristics of being an open-source availability. This advantage fosters innovation and collaboration in the AI community and provides improvement in the algorithm and functions needed for the advancement of the field in AI technology (Prasanth, 2024). Moreover, versatility is one of the best features of Meta AI that can handle a wide range of Natural Language Processing (NLP). This feature is advantageous to students who will do tasks such as research, reflection document, and reports in their subjects. Another focal point of the advantages of Meta AI is the multilingual capabilities. This feature enables the AI tool to answer different questions using numerous linguistic processes aligned with global applications. Also, the database of this AI tool is quite recent up to year 2024, hence it could generate accurate answers based on the recent information (Zybaczynska *et al.*, 2024). With this feature, it will be best to study subjects related to sciences (Wu & Yang, 2022), information technology (Chen *et al.*, 2020), and other related subjects that require new knowledge. Furthermore, another advantage of Meta AI in education is the application of this software in creating interactive modality, materials, and various formative and summative assessment like practical/written examination.

Doom of Meta AI

One potential adverse effect of Meta AI is that it could generate answers related to math equations, IT codes, and even complex questions used to assess the higher-order thinking skills (HOTS) of the students in HEIs. As stated by Booc *et al.* (2023), students have utilized AI tools to obtain higher grades/scores in mathematics. In addition, Fyfe (2023) mentioned the application of AI tools to generate codes and submit students' papers. Even though AI could help students, it compromises authenticity and creativity. Moreover, one of the confounding problems of Meta AI is the need for more knowledge of data privacy, where personal information is being unveiled. Also, over-dependence on AI is the primary concern in the educational system, where the students do not try to achieve their subject's outputs, which could lead to mediocrity (Sidorkin, 2024) and procrastination

(Swargiary, 2024). Moreover, another potential disturbing con of Meta AI is the potential misuse by outspreading incorrect data (Williamson & Prybutok, 2024; Ifelebuegu *et al.*, 2023) or disturbing information (Wood, 2024; Hodgson *et al.*, 2022). In this context, Meta AI could be a potential source for criminal activity and malicious deeds if not handled properly (Blauth *et al.*, 2022; Jeong, 2020). Another possible consequence of meta-AI is the biased algorithm, which fosters discrimination (Ferrer *et al.*, 2021), inequality (Lainjo, 2020; Luengo-Oroz *et al.*, 2021), and perpetuates stereotypes (Fosch-Villaronga & Poulsen, 2022) harming the community and users. Furthermore, the gender equality of Meta AI is biased in terms of how it provides information to gay people. As mentioned by UNESCO, 70% of generated ideas related to gay people have negative implications (Van Niekerk *et al.*, 2024).

Limitations of Meta AI

MetaAI can indeed serve as a valuable learning platform, particularly with the aid of its various features. However, several potential limitations must also be considered. Yousuf and Wahid (2021) stated that AI-driven platforms hold potential, they also pose challenges and areas requiring improvement, which create opportunities for future research about e-learning. This review focuses on several key challenges learners may encounter using the MetaAI as an educational platform, including access to technology, ethical considerations, privacy concerns, steep learning curve, and over-reliance.

Access to technology remains a pressing concern, as students have unequal opportunities to use AI-driven tools. Underprivileged students, particularly those regions with limited digital infrastructures, may struggle to fully benefit from AI-enhanced learning platforms, as it requires reliable connection, which may not be accessible to all learners or educational institutions. A recent study by Li (2023) concluded that AI-driven education disproportionately benefits more advantaged learners, potentially exacerbating educational disparities between privileged and disadvantaged groups. This digital divide calls for targeted interventions to ensure that all students can access and benefit from AI-enhanced learning environments. In relation to accessibility, many AI-driven platforms, including MetaAI, require a certain level of technical proficiency, which can be a problem for beginners. These systems may not always be user-friendly requiring additional training and support to be effectively used.

Ethical and privacy concerns also arise with the widespread adoption of AI in education. According to Ayeni (2024), AI-driven systems collect and analyze vast amounts of student data, including performance metrics, learning patterns, and behavioral information, raising significant concerns about data security and the potential for misuse. Furthermore, AI integration in education can inadvertently create disparities, particularly for students from economically challenged backgrounds. Therefore,

establishing robust ethical guidelines to govern the use of AI in education is essential to protect student privacy and ensure equitable access.

Lastly, as students are exposed to vast amounts of information, students may also become overly dependent on technology. This might hinder their critical thinking and problem-solving skills. Stojanov *et al.* (2024) found that in a study across 490 universities, nearly 40% of students exhibited low levels of independent problem-solving due to over-reliance on AI tools like ChatGPT. This highlights the need for a balanced integration of AI and human interaction in education to ensure that students continue to develop essential cognitive skills.

Therefore, while MetaAI offers valuable opportunities for advancing education as platform, several challenges must be addressed establishment of ensure fair access and promote educational equity, robust ethical guidelines to govern its implementation, balance integration of AI and human interaction is a must. Improving accessibility, establishing clear ethical guidelines, and fostering critical thinking are critical steps toward maximizing the benefits of MetaAI in education.

RESULTS AND DISCUSSION

The analysis of Meta AI reveals both beneficial features and critical challenges (table 1) that influence its effectiveness and impact in various contexts, especially in educational and productivity settings.

One of the most notable advantages of Meta AI is its capacity to enhance productivity by accelerating tasks and promoting efficient workflows, as indicated by Chubb *et al.* (2022). This productivity boost is complemented by Meta AI's open-source nature, which encourages innovation and collaborative development. Langenkamp and Yue (2022) emphasize that open-source tools not only attract a broader user base but also stimulate continuous improvements from a global community of developers, fostering inclusivity and innovation.

Meta AI's multilingual capabilities further support equality among users, providing accessibility to diverse linguistic groups and minimizing language barriers, as noted by Yu *et al.* (2024). This inclusivity aligns well with its continuously updated database, which ensures users receive the latest information and knowledge. Moreover,

Ruiz-Rojas *et al.* (2023) highlight Meta AI's contribution to education, noting that it generates a variety of innovative educational modalities that can be tailored to different learning needs. Overall, these advantages underscore Meta AI's role as a progressive, inclusive tool that aligns with modern demands for flexibility and accessibility.

However, despite its strengths, Meta AI presents several notable disadvantages. A primary concern is its lack of mathematical problem-solving skills, as identified by Spreitzer *et al.* (2024). This limitation reduces its applicability in fields that require complex calculations or quantitative analysis. Additionally, Ifelebuegu (2023) warns of a broader issue: the potential erosion of authenticity and creativity among users. By relying on AI-generated outputs, users may become less inclined to develop original ideas or invest effort in personal problem-solving, potentially fostering a dependence on technology.

Data privacy concerns also emerge as a significant disadvantage. Gupta *et al.* (2020) and Kim *et al.* (2023) suggest that Meta AI may inadvertently compromise sensitive information, given the vast amount of user data processed to generate responses. Furthermore, Feng *et al.* (2023) highlight the potential for Meta AI to inadvertently encourage procrastination and mediocrity by providing easily accessible solutions. The risk of inaccurate data dissemination also poses a threat to reliability, as AI-generated information may occasionally lack verifiability. The limitations of Meta AI present additional challenges. Ethical and privacy issues continue to persist, impacting user trust and adoption rates. Meta AI's requirement for constant internet connectivity limits its use in regions with limited or unreliable internet access, thus potentially excluding significant user populations. Finally, as Fitria (2021) observes, AI reliance can compromise collaborative learning experiences, as users might prioritize individual AI-driven solutions over peer interaction and teamwork. In summary, while Meta AI offers several advantages that make it a valuable tool, particularly in enhancing productivity and supporting diverse user needs, its disadvantages and limitations underscore the need for careful, responsible usage. Addressing its ethical, privacy, and dependency concerns is crucial to maximizing its benefits without undermining user creativity, collaboration, and data security.

Table 1: Summary of the advantages and disadvantages of Meta AI

Descriptions	Statements	References
Advantages of Meta AI	Speeding up the task and alleviates productivity. Open-source AI tool foster innovation and collaboration. Multi-lingual feature promotes equality to the users. Updated knowledge and information in the Database. Generate various innovative educational modalities	Chubb <i>et al.</i> (2022) Langenkamp & Yue (2022) Yu <i>et al.</i> (2024) Fitria (2021) Ruiz-Rojas <i>et al.</i> (2023)
Disadvantages of Meta AI	Unequipped with Mathematical problem-solving skills Kills authenticity and creativity Neglects data privacy Promotes procrastination and mediocrity Fosters inaccurate data/information	Spreitzer <i>et al.</i> (2024) Ifelebuegu (2023) Gupta <i>et al.</i> (2020) Feng <i>et al.</i> (2023) Kim <i>et al.</i> (2023)

Limitations of Meta AI	Ethical and privacy concerns Compromises the collaborative learning Requires internet connectivity	
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CONCLUSION

Meta AI offers promising tools that can transform by enhancing learning through content automation, interactive materials, and language processing, especially in research and science subjects. While Meta AI can offer various tools and ways through its features, it is still essential to be mindful of its limitations and ensure that these AI-driven tools should be used responsibly. Challenges such as over-dependence on AI, data privacy, ethical issues, and unequal access must be carefully addressed to prevent these benefits from exacerbating educational inequality. Moreover, it also risks the traditional cognitive engagement by automating tasks. Further research and responsible implementation are necessary to ensure AI complements rather than replaces traditional educational methods.

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