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Advancing Education through GAI Tools: A Comprehensive Review of Student Experiences

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Abstract

The rapid development of Generative Artificial Intelligence (GAI) tools has drastically transformed the landscape of education by making individualised, effective, and engaging learning experiences possible. This article discusses the impact of different GAI tools such as ChatGPT, Gemini, Khanmigo, Grammarly, Notion AI, Google Classroom, Cognii, Gradescope, Turnitin, and QuillBot on student engagement, learning, and academic integrity. These tools offer personalised academic assistance in the form of content creation, writing improvement, adaptive feedback, and automated marking. ChatGPT and Gemini have adaptable learning support, whereas Khanmigo encourages step-by-step problem-solving to cultivate critical thinking. Grammarly and QuillBot polish writing mechanics but are weak on content analysis. Notion AI and Cognii enable self- regulated learning but are limited in data quality and flexibility. While Google Classroom and Gradescope simplify classroom management and grading, they have challenges in terms of inclusivity and policy flexibility. Turnitin is central to ensuring academic integrity, yet the danger it poses is to diminish learning as a compliance- based process. The conclusion drawn is that while GAI solutions augment 21st-century learning with personalisation and automated processes, using them effectively has to be based on ethical use, fair access, good pedagogical foundations, and human monitoring. Educators and institutions have to adopt a balanced strategy that protects education quality while harnessing the transformative capacity of AI for lifelong learning.

Keywords: Generative Artificial Intelligence (GAI), Student Engagement, Academic Integrity, Personalized Learning, Education Technology

1. Introduction

The rapid evolution of technology has revolutionised different sectors considerably, and education is no different. One of the most notable developments in recent years has been the rise of Generative Artificial Intelligence (GAI) tools that have started changing the face of education by offering new-age solutions for teaching and learning. The purpose of this paper is to investigate the complex influence of GAI tools like ChatGPT, Gemini, Khanmigo, Grammarly, Notion AI, Google Classroom, Cognii, Gradescope, Turnitin, and

QuillBot on students' experiences in educational environments.GAI represents a paradigm shift in how educational material is produced and disseminated. Such tools utilise advanced algorithms to create instructional material that not only varies but is also customised to cater to students with different needs. The ability of GAI to generate customised content is especially revolutionary; it enables instructors to design resources that account for dissimilar learning styles, backgrounds, and levels of knowledge. This personalisation makes the learning experience more meaningful and interactive for students. With the adoption of GAI technologies by more educational institutions, they are seeing a trend away from uniform methodologies towards more individualised ones that centre on student profiles, learning patterns, and perceptions.

2. Enhancing Learning and Addressing Ethical Risks with GAI

One of the most impressive aspects of GAI is its capacity to support adaptive learning. Through student interaction and performance analysis, GAI instruments can alter the content and instructional approaches used in real-time so that every student gets the help they require at the appropriate moment. Such personalisation, in addition to encouraging improved academic performance, also engenders a sense of

agency in students as they can take charge of their learning processes. As GAI advances, its implementation in cutting-edge education systems holds promising potential for developing conversational interfaces that simulate human-like interaction, which will further boost student outcomes and engagement. These interfaces can give immediate feedback, respond to questions, and take students through difficult concepts, thus making learning more interactive and supportive. However, discussing GAI in the education sector involves more than just its advantages. With the increasing prevalence of these technologies, it is essential to address the downsides and ethical issues that arise with their use. Data privacy, algorithmic bias, and accountability in AI-based educational systems are some of the most pressing areas of concern to be watched out for. Securing that student information is safe and handled ethically is of utmost importance, as privacy violations can erode the credibility of learning institutions and the technology they use. Additionally, the possibility of biases embedded in AI codes questions fairness and equity in academic achievement. As

GAI instruments become part of learning spaces, it becomes important to develop frameworks that ensure transparency, accessibility, and ethical use in their implementation.

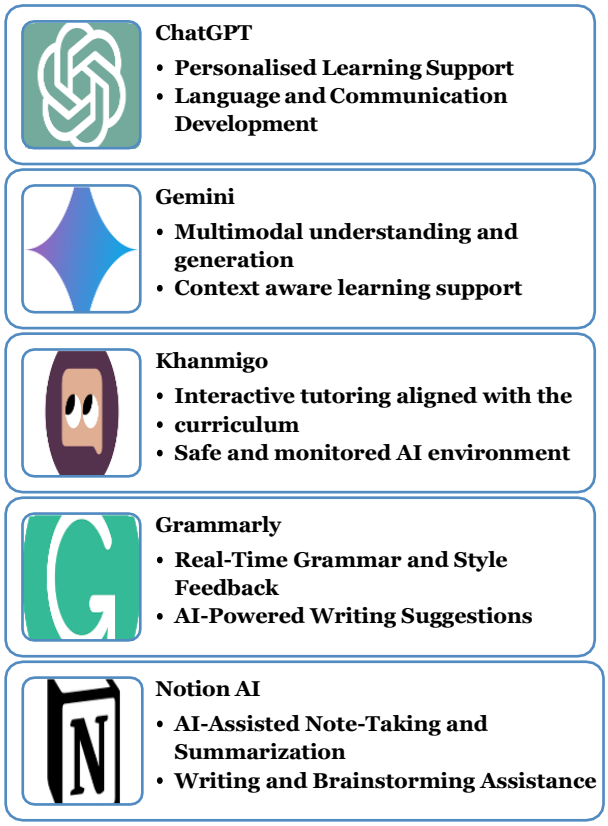

Fig.1 Important features of GAI tools in Education

Figure 1 illustrates some of the important features of GAI tools predominantly used in the education sector by students and teachers from academia. The upcoming sections will discuss briefly every GAI tool used in education.

3. Popular Gai Tools in Education

A. ChatGPT

ChatGPT, an advanced large language model created by OpenAI, has gained widespread popularity among students for academic use. Its capacity to produce human-like text and comprehend intricate questions makes it a handy tool in the educational environment (Adeshola and Adepoju, 2024). The model's capacity to produce coherent essays and content can be used as a learning device for students, providing them with examples of well-structured writing. This exposure can improve students' knowledge of effective writing practices. The convenience of finding solutions in ChatGPT might discourage students from interacting extensively with the content, which can harm their long-term educational progress. Overdependence on AI tools has the potential to cause a surface-level understanding of topics since students do not deeply

interact with the learning content (Rahman and Watanobe, 2023).

B. Gemini Platform

It is a multimodal generative AI solution, provides various capabilities that assist students in their learning. With the use of its powerful features, Gemini optimises the learning experience through personalised support, multimodal content generation, and interactive learning environments. Gemini acts as a study buddy, providing personalised learning experiences tailored to individual needs and understanding levels (Imran and Almusharraf, 2024). Gemini helps in preparing study materials, developing outlines, and writing lesson plans. It also offers customised feedback, examining students' work to determine where they need improvement and recommending resources for additional study. Gemini promotes collaborative learning through peer engagement and increased learner interaction. Gemini can produce study questions and research topics, urging students to collectively explore and research different topics. Although Gemini promises great potential in personalised learning, there are pitfalls, such as authenticating generated materials and academic honesty, that need to be overcome. Researchers and instructors must critically scrutinise the contents generated by Gemini to prevent incidental plagiarism and uphold the credibility of educational content (Barrot 2024).

C. Khanmigo

Khanmigo, an educational app built on Generative AI by Khan Academy, is intended to assist students in all academic fields. Although it is not built to be a particularly useful tool for learning languages, features of the app have been analysed to see how it can help in academic achievement. Khanmigo

assists students by simplifying difficult problems into steps that are easy to handle, thus promoting a better understanding of the content. This assistance is essential for students working on difficult topics. This technique makes students think more critically and engage more intensely with the content, potentially leading to improved learning results (Bailey and Warner, 2025). Khanmigo does not well support all learner levels, especially new learners, since the language and subject matter can be beyond their level. The absence of customised content for various levels of proficiency compromises its value for a range of learners (Shetye 2024).

D. Grammerly

The application of Grammarly as an automated writing assessment tool has been in the spotlight for its ability to improve students' writing abilities, especially in an English as a Foreign Language (EFL) environment. Studies have identified several important advantages that come with using it in schools. The use of Grammarly in writing assignments resulted in fewer grammatical mistakes and better overall writing quality. Students showed a substantial improvement in writing performance during a 16-week intervention period when they used Grammarly. Students were satisfied with Grammarly, enjoying its immediate feedback, which differed from teacher feedback (Fitria, 2021). Grammarly targets grammar, spelling, and punctuation, but fails to assess the content and structure of writing. The lack of capability to offer in-depth feedback about writing structure in the software might decrease its potential for enhancing general writing quality (Huang et al., 2020).

E. Notion AI

Notion AI is a cutting-edge technology that improves students' academic work by combining automated writing support and self-regulation capabilities in an e-portfolio environment. The technology seeks to assist learners during the writing process and in their overall academic performance. Notion AI promotes better study habits by motivating students and improving their attitudes toward learning. It identifies struggling learners and offers targeted interventions, thereby improving overall academic performance (Mallillin 2024). Notion AI offers automatic written corrective feedback (AWCF), assisting students in the identification and correction of grammatical, spelling, and punctuation errors. Notion captures the whole writing process, allowing students to track their drafts and revisions, thus encouraging self-regulation. The platform also allows for teacher feedback through comments, which supports student-teacher interaction (Osawa 2024). The performance of Notion AI is highly dependent on the quality and coverage of the data on which it has been trained. Narrow or biased datasets can result in imbalanced outputs and poor generalization for real-world use. The model is poor at dealing with hard tasks that involve real-world

adaptation, tending to produce reduced returns with increasing model size (Bhuiyan 2024).

F. Google classroom

Google Classroom is a Learning Management System (LMS) meant to support online learning, especially in distance education. It is a platform upon which students and teachers can talk, share materials, and arrange assignments promptly. It facilitates assignment distribution and return, making the management of study tasks more effective, thereby encouraging a paperless culture, mitigating waste from conventional study approaches (Sudarsana et. al., 2019). Google Classroom is based mainly on visual content and creates issues for students with visual impairments who are using screen readers and other assistive technologies. The design of the platform inherently remains far from perfect to provide level-playing-field opportunities for learning to every student, especially those who are disabled (Metatla et. al., 2018).

G. Cognii

Cognii can greatly revolutionise the education industry by utilising Artificial Intelligence to provide customised learning experiences. It can institute AI-powered platforms that modulate teaching material based on students' performance and mental capabilities so that every student has material that accommodates their learning rate (Chatwal et al. 2023). AI systems like Cognii are vulnerable to algorithmic bias, which can produce unequal or incorrect results in learning tests and recommendations. There is also the issue of privacy and data security, as AI programs need access to confidential student information to work properly. This poses questions regarding data protection and possible privacy violations. Compliance with legal and ethical standards on how data is used is a significant challenge that has the potential to affect the implementation of Cognii in schools (Xu 2020).

H. Gradescope

Utilisation of automated grading systems such as Gradescope has become more prevalent in learning environments, especially in computer science courses. The application is meant to improve grading accuracy and efficiency while giving students worthwhile feedback. The feature of the tool is to provide in-depth feedback, making it easier for students to learn from their errors and enhance their work, which is crucial in learning. Grading systems such as Gradescope can minimise human error and prejudice in grading, resulting in more uniform assessments across student assignments (Acuña and Bansal 2024). Several instructors have noted that applying certain features, like capping overall submission numbers or handling late policies, is very burdensome. This hardship might discourage educators from leveraging the full capacity of the platform. While Gradescope is commended for its adaptability, some respondents were unsatisfied with its inability to easily accommodate multiple grading policies. Educators want tools that easily accommodate grading approaches with less effort, which Gradescope fails to offer in full (Ruth and Hott 2025).

I. Turnitin

The application of Turnitin provides immense advantages to students, most importantly ensuring academic integrity and originality in their work. Through the use of a plagiarism- detecting platform, Turnitin helps students appreciate the value of originality and provides them with tools to improve their writing skills. Turnitin is an educational tool that promotes the cultivation of honesty, trust, and responsibility among students. The capacity of the software to compare work submitted with a large database ensures that students identify and shun plagiarism, encouraging integrity in the academic environment (Hapsari et al., 2020; Daoud et al., 2019). Turnitin, as a learning tool, can unintentionally reinforce the idea of creating unique papers instead of learning deeper about the course content (Pavelich 2019). The measurement of academic integrity in terms of similarity scores can disconnect originality from integrity and result in viewing the acquisition of knowledge as transactional (Nuhrat 2025).

J. Quillbot

QuillBot is a useful resource for students seeking to improve writing, especially in English. Its AI-powered capabilities aid in enhancing grammar, vocabulary, and the overall coherence of writing. QuillBot helps identify and correct grammatical mistakes and provides paraphrasing features that enable students to present ideas more effectively and creatively, which is important for academic writing. Studies show remarkable improvement in the test scores of students' writing tests after utilising QuillBot (Safrida and Puspitasari 2024). It helps to improve sentence form and coherence, since it is a requirement for efficient

communication through writing (Amyatun and Kholis, 2023).

Table 1. Overview of Popular Generative AI Tools in Education – Advantages and Limitations

Tools	Author/s	Advantages	Limitations
ChatGPT	Adeshola & Adepoju, 2024; Rahman & Watanobe, 2023	Produces coherent essays; models effective writing; helpful for understanding complex queries	Risk of overdependence; encourages surfacelevel learning
Gemini	Imran & Almusharraf, 2024; Barrot, 2024	Personalised support; multimodal content; collaborative learning	Challenges in verifying authenticity; academic honesty concerns
Khanmigo	Bailey & Warner, 2025; Shetye, 2024	Simplifies complex problems; encourages critical thinking	Not suitable for beginners; lacks adaptive content for all levels
Grammarly	Fitria, 2021; Huang et al., 2020	Improves grammar and writing quality; offers immediate feedback	Limited structural feedback; cannot assess writing content depth
Notion AI	Mallillin, 2024; Osawa, 2024; Bhuiyan, 2024	Enhances writing and study habits; supports self-regulation and feedback	Limited real-world adaptability; sensitive to training data quality
Google Classroom	Sudarsana et al., 2019; Metatla et al., 2018	Simplifies assignment management; supports digital learning	Accessibility issues for visually impaired users
Cognii	Chatwal et al., 2023; Xu, 2020	Customises learning material; supports varied learning speeds	Vulnerable to bias; raises data privacy concerns
Gradescope	Acuña & Bansal, 2024; Ruth & Hott, 2025	Improves grading accuracy; detailed feedback; reduces bias	Cumbersome to use with multiple grading policies
Turnitin	Hapsari et al., 2020; Daoud et al., 2019; Nuhrat, 2025; Pavelich, 2019	Promotes academic integrity; detects plagiarism	Overemphasis on similarity scores; may reduce deep learning
QuillBot	Safrida & Puspitasari, 2024; Amyatun & Kholis, 2023	Enhances grammar, vocabulary, and coherence; supports creative writing	Paraphrasing may weaken originality if overused

Table 1 provides a comparative summary of the proposed tools applied in education. It emphasizes the major benefits of each tool, including enhancing writing or facilitating individualized learning, in addition to their drawbacks, such as overreliance risks, accessibility problems, or data privacy issues, as realized in recent academic research.

4. Summary and Conclusion

The integration of Generative Artificial Intelligence (GAI) tools into the learning ecosystem has dramatically transformed the process of education and learning. Such tools as ChatGPT, Gemini, Khanmigo, Grammarly, Notion AI, Google Classroom, Cognii, Gradescope, Turnitin, and QuillBot are a rich, diverse landscape of AI-powered educational support, each of which provides varying strengths alongside significant weaknesses. Together, these technologies create an environment that is friendly to personalised learning, writing support, critical thinking, and academic honesty—characteristics of 21st-century education. Gemini and ChatGPT, for example, offer flexible generative text and personalized academic assistance, thereby proving useful in assisting learners in essay writing, content generation, and engagement with intricate academic matters. Yet, the risks of over-reliance and shallow knowledge reflect the importance of teachers applying these tools in precise pedagogical practice and academic standards. Conversely, tools such as Khanmigo encourage more in-depth conceptual grappling through stepped procedures through intricate problems, leading to critical thinking and metacognition. However, its lack of content adaptation for beginners indicates the necessity of greater adaptability and accessibility. Grammarly and QuillBot, commonly used to enhance writing skill, show distinct superiority in grammar editing and paraphrasing. However, they do not go deep enough in evaluating other structural aspects of writing, calling for additional human feedback towards complete writing improvement. Notion AI and Cognii differentiate themselves through encouraging adaptive learning and self- directed instruction. Although they support learner autonomy and customized feedback, issues with data bias and limited real-world adaptability require ongoing vigilance and adjustment. Their success depends heavily on the quality of training data, highlighting the need for diverse and rich datasets to guarantee fairness in educational outcomes. Tools such as Google Classroom and Gradescope simplify classroom organization and grading. They promote paperless communication, effective grading, and timely feedback. They are not without their usability challenges, however, especially in terms of inclusivity for disabled students and flexibility in grading policies. Teachers need to pressure platform developers to make adjustments to align more with varied teaching strategies and learner requirements. Turnitin continues to be crucial in upholding academic integrity by identifying plagiarism and encouraging originality. However, the tool has the potential of diverting the focus of students from knowledge acquisition to strategic content manipulation. Therefore, academic

organizations have to balance the enforcement of integrity with substantial learning assessments.

In conclusion, although GAI tools in education hold revolutionary potential in boosting learner engagement, personalisation, and productivity, their application must be framed by ethical considerations, inclusivity, sound pedagogy, and critical human intervention. Institutions and teachers are at the forefront of selecting and situating these technologies in response to educational objectives, guaranteeing ethical use, and promoting richer cognitive processing. With the education industry increasingly embracing AI tools, it is critical to keep a student-centred focus while maintaining educational integrity, equity, and lifelong learning principles.

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