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GENERATIVE ARTIFICIAL INTELLIGENCE IN TERTIARY LEVEL EDUCATION IN BANGLADESH: PRACTICES, BENEFITS, CHALLENGES, AND PROSPECTS

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ABSTRACT

Aim/Purpose This study aimed to investigate the potential of integrating Generative Artificial Intelligence (GenAI) in tertiary education. It examined current practices among teachers and learners regarding GenAI, as well as their perceptions of its benefits and challenges.

Background Higher education worldwide is seeing the increasing use of GenAI. However, its usage patterns and teachers' and learners' perceptions of its adoption are yet to be studied. The feasibility and viability of this emerging tool can be assessed by examining early usage patterns as predictors of formal adoption, as supported by the Technology Acceptance Model (TAM) and the Task-Technology Fit (TTF) frameworks. This study aims to fill that gap by examining both teachers' and students' practices and perceptions regarding various aspects of AI and its adoption in education.

Methodology A mixed-method approach was employed. Data were collected from 44 teachers and 186 students at Jashore University of Science and Technology through workshops and structured questionnaires based on the TAM and TTF frameworks. Quantitative data were analyzed with SPSS and MS Excel, while qualitative data were thematically analyzed.

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Contribution	This study contributes empirical evidence on the adoption of GenAI in a South Asian tertiary education context, enriching the body of knowledge on technology acceptance, digital pedagogy, and GenAI in education policy. By revealing the pictures of relevant variables of Generative Artificial Intelligence in Education (GenAIEd) in a unique context, such as Bangladesh, the findings have implications for similar situations. They can inform others about possible challenges and the usefulness of GenAIEd.
Findings	Teachers and students are both moderately familiar with GenAI. The teachers primarily use it to prepare courses and materials, while students sporadically engage with GenAI, mainly for academic problem-solving, and they emphasize its role in personalized, learner-centered learning. GenAI familiarity is found to be a strong predictor of usage frequency. However, teachers express concerns about the reliability of GenAI, ethical implications, and the potential for deskilling. While the benefits and usefulness dominate, possible challenges and threats are marginally associated with the future adoption and use of GenAI. This finding is unique because, despite the overpowering ‘ease of use’ of the TAM model, ‘benefits or usefulness’ of the TTF model, challenges, and threats have been found as catalysts for GenAI adoption.
Recommendations for Practitioners	Practitioners are to utilize GenAI to support, rather than replace, their teaching expertise. They should also encourage students to strike a balance between GenAI-assisted learning, critical thinking, and independent work. Furthermore, the institutions should introduce guidelines to ensure the ethical use of GenAI and academic integrity.
Recommendations for Researchers	Researchers should explore the longitudinal effects of GenAI adoption on learning outcomes and skill development. They can also conduct comparative studies across different universities and disciplines. Investigating the role of GenAI in inclusive education and support for learners from disadvantaged backgrounds also demands research focus.
Impact on Society	The findings highlight how GenAI can transform higher education in Bangladesh and similar contexts. It shows the importance of addressing the risks of overreliance and the unethical use of GenAI for effective learning. A balanced adoption could strengthen human–technology collaboration in education. On the other hand, it has revealed the aspects of GenAI, preferred by educators, that AI developers should consider.
Future Research	Further studies should examine hybrid learning models that integrate GenAI with human expertise. Cross-cultural perspectives on GenAI in education remain another area of study. Furthermore, studies should be carried out to develop frameworks for maintaining academic authenticity while GenAI is being used in education.
Keywords	GenAI in education, challenges and prospects of GenAI in tertiary education, adoption of AI in education, Technology Acceptance Model, task-technology fit

INTRODUCTION

The advancement of technology has significantly influenced higher education worldwide. Artificial Intelligence (AI) is a technology that has had a notable and innovative impact on educational change. AI is not a new concept, but its use in education, popularly known as Artificial Intelligence in Education (AIEd), has gained unprecedented attention following the public release of Generative Artificial Intelligence (GenAI) models. These models can generate descriptive, narrative, and analytical content instantly. The basic versions are easily accessible, which could positively influence traditional teaching and learning practices (Mulyani et al., 2025). For example, this can make class preparation easier and faster and provide more understandable, student-friendly, and individualized (Hrastinski et al., 2019) instructions, thereby engaging students more effectively in learning activities. Bangladesh is not an exception; its tertiary education has been expanding rapidly, facing challenges and incorporating the benefits of ever-growing technological tools, including GenAI.

GenAI platforms, such as ChatGPT, OpenAI, Gemini, and Deepseek, are now utilized by billions of users worldwide due to their widespread adoption and educational benefits. These tools respond to questions and queries, reduce the time spent preparing assignments and materials, and provide access to relevant data sources (Pavlenko & Syzenko, 2024). They reduce the time and effort required for academic preparation, provide feedback, analyze data, support problem-solving, translate texts, and offer personalized learning experiences (Oranga, 2023). Overall, these abilities enable academic work to be completed faster, more efficiently, and at a lower cost. However, the integration of GenAI in education (GenAIEd) is still in its early stages (K. Zhang & Aslan, 2021). To understand the effectiveness and potential of GenAI in education, exploring contextual challenges and constructs is recommended in technology adoption models, such as the Technology Acceptance Model (TAM) and the Task-Technology Fit (TTF) Model.

The integration of Generative AI in education (GenAIEd) presents several challenges, particularly a lack of localized evidence on its effectiveness and a need to better understand the perceptions of key users, such as educators and learners. Despite these uncertainties, higher education students and faculty in Bangladesh are already using GenAI for a variety of academic tasks, including enhancing learning, drafting assignments, conducting research, and developing instructional materials (Munni & Rafique, 2025). With the growing reliance of academicians on GenAI, several limitations have also been identified, including insufficient user knowledge, the absence of source citations, a lack of humanization, and potential for academic misuse. There also remain concerns about data privacy and algorithm bias (Williamson & Eynon, 2020), which complicates implementation. Holmes et al. (2019) argue that GenAI tools lack the capacity to interpret the social and emotional aspects of learning and therefore cannot effectively support motivation. Some additional limitations noted by Oranga (2023) include a lack of context awareness and critical thinking, an inability to verify information without human intervention, the risk of misinformation, and overreliance on technology. Thus, understanding both the benefits and challenges of GenAI in educational settings is crucial.

In the context of the increasing adoption of GenAI-enabled educational technologies in Bangladeshi tertiary-level education, it is imperative to understand teachers' and learners' perceptions and usage patterns of GenAI. "To effectively integrate AI in education, several factors must be considered, including the prerequisites of students and teachers, e.g., knowledge, skills, beliefs, and motivation" (Bauer et al., 2025). Moreover, understanding stakeholders' perceptions is highly valuable for making informed strategic decisions and integrating them into educational endeavors in a responsible manner (Wu et al., 2020, as cited in Arowosegbe et al., 2024). To address these issues, the present study aims to explore teachers' and learners' experiences with GenAI to identify perceived strengths, challenges, and areas for improvement. Through this, context-sensitive evidence can inform practice and policy in Bangladesh and similar higher-education settings.

With these issues in mind, the paper presents a literature review of GenAI and AI integration in education, followed by a research methodology section that includes the research design, instruments,

and data analysis procedures. The subsequent section presents the results in relation to the research questions, and the final section discusses the findings, implications for policy and practices, and suggests directions for future research.

LITERATURE REVIEW

The literature review on GenAI in education examines not only its pedagogical applications but also the technological models that underpin its effective adoption in educational contexts. In addition, it discusses learning theories that support the use of GenAI in education, followed by an exploration of the challenges, risks, and potential threats. GenAI is a special form of AI that can create new content, including text, images, video, audio, and code. Turing (1950) laid the foundation of AI as a field of machine intelligence in the 1950s. Later, natural language processing (NLP) laid the foundation for modern language models (Kanbach et al., 2024). Over the last 5 decades, improvements in programming languages and chipsets have enabled the creation of images, text, and construction capabilities.

Based on Large Language Models (LLMs), Generative Pretrained Transformer (GPT) (OpenAI & Pilipiszyn 2021, as cited in Kanbach et al., 2024) can perform tasks such as generating text, images, videos, audio, and code. Besides OpenAI's ChatGPT, newer GenAI platforms are being launched, such as Gemini (Google), Deepseek, and Copilot. At present, customized and discipline-specific GenAI tools are being designed and increasingly used across almost every field, from medical science to education (Kang & Ahn, 2025). Because it is widely used, GenAI is often used synonymously with AI. Therefore, to provide a comprehensive understanding, the review synthesizes existing research on teachers' and learners' perceptions of GenAI tools. As GenAI represents a dominant and widely applied form of AI in educational practices, studies that refer more broadly to AI in education are, where conceptually relevant, considered alongside GenAI-focused research in this review.

THE ROLE OF ARTIFICIAL INTELLIGENCE IN EDUCATION

For more than a decade, academics have focused on new technologies, particularly Artificial Intelligence as a tool in education (Selwyn, 2019; Zawacki-Richter et al., 2019). Digital technologies have been enhancing education by making learning more social, contextual, and authentic. It can also improve learners' engagement, motivation, and ability to study (Selwyn, 2016, p. 9). AI, with its continuous development, offers education systems revolutionary opportunities by facilitating individualized learning and reducing teachers' workload (Gocen & Aydemir, 2020). AI-enhanced tools and intelligent instructional systems can substitute for adaptive learning, personalized to each learner's unique style (Gocen & Aydemir, 2020).

With the help of GenAI tools, teachers can become learning facilitators rather than mere information carriers, thereby enhancing the classroom experience and inspiring student creativity (Huang et al., 2021). GenAI supports administrative duties, such as student assignment and assessment design, thereby reducing teachers' bureaucratic responsibilities (Reiss, 2021). Oranga (2023) cites 15 benefits of GenAI tools, each highlighting the importance of using artificial intelligence in education. Among the advantages are reducing time and work, answering questions, providing feedback, writing cogent prose and verse, analyzing data, solving science and math problems, translating languages, designing tests, and facilitating personalized learning. However, its efficiency varies across subjects and relies on human competence for evaluating research data. Pence (2019, p. 8), for example, notes, "An AI program may be able to suggest future directions for research, but the researcher must examine the options and decide which is best." To remain relevant amid disruptions, educational institutions should leverage GenAI to deliver personalized feedback, generate evaluations, tailor instruction to meet learners' diverse needs, and predict academic performance (Crompton & Burke, 2023, p. 8).

Bauer et al. (2025) mention several impacts of AI on education in their article. They report that AI affects cognitive processes and deep learning. They have demonstrated that cognitive engagement

can be augmented or compromised by AI, and deep learning relies on meaningful and interactive engagement. AI can lead learners to surface engagement, and over-reliance can reduce cognitive processing. Thus, they contend that AI is neither inherently beneficial nor harmful, but its value depends on how learners interact with it.

CONCEPTUAL MODELS OF TECHNOLOGY INTEGRATION

To understand the use and adoption of Information Technology (IT) in education, the IT adoption models, the Technology Acceptance Model (TAM), and the Task-Technology Fit (TTF) Model, are used worldwide (Lai, 2017; Lee & Lehto, 2013; Lemay et al., 2018; Saifi et al., 2025; Wu & Chen, 2017). According to the TAM model of Davis (1989, as cited in Mediaty et al. (2023)), perceived usefulness and perceived ease of use psychologically determine behavioral intention to adopt IT. If technology seems too challenging to use, users decide to avoid it. These factors can also predict whether users intend to continue using it or discontinue it. On the other hand, the TTF model emphasizes alignment between technologies and task demands (Goodhue & Thompson, 1995; Mediaty et al., 2023). If technology's capabilities can effectively perform certain tasks, it is likely to be adopted and used by people. Of course, IT must promote improved performance; otherwise, it will be avoided. TTF is also a powerful determinant of continued intention to use and future adoption of IT (Valaei et al., 2019).

THEORIES OF LEARNING AND THE SCOPE OF GENAI

Several learning theories have implications for teaching and learning with technology, including the latest GenAI tools. Most of the factors and dimensions of learning, as determined by dominant learning theories, can be facilitated and delivered by AI-based platforms. Among such noteworthy theories, Behaviorism asserts that knowledge is shaped by reinforcement (Skinner, 1965), a concept supported by a rule-based system in GenAI. Apart from rule-dominated learning perspectives, Constructivism (Piaget, 1970) holds that learners construct knowledge through active engagement and problem-solving. These active-learning strategies are encouraged by AI platforms, which promote collaboration, problem-solving, and relevant exercises. GenAI-enabled tools offer personalized learning opportunities, various resources, and provide feedback, enabling learners to monitor their own progress. All these are crucial for promoting self-efficacy, an important aspect of learning proposed by Bandura's Self-efficacy Theory (Bandura & Walters, 1977). Another noteworthy theory is Bandura's Social Learning theory, which emphasizes observation, modeling, and interaction, and parallels natural language processing (NLP) systems trained on large language models. The social dimension of learning is extended through Vygotsky's Socio-cultural theory and the Zone of Proximal Development (ZPD) (1978). Learning is most effective when students interact with others in various situations. ZPD asserts that adaptive scaffolding stimulates learning and prepares learners to exercise self-efficacy. GenAI tools can provide guided support or scaffolding through conversational agents and offer feedback aligned with learners' schema (Gu & Yan, 2025).

Addressing the varied cognitive strengths of learners, as proposed by Gardner's Multiple Intelligence Theory (2006), is a significant challenge for educators, which can be addressed by providing diverse learning activities. GenAI tools can play a crucial role by catering to different learning styles and preferences, as well as to diverse yet relevant activities. This capability supports the Master Learning framework (Bloom, 1968), as GenAI provides continuous assessment and tailored feedback, enabling learners to achieve mastery at their own pace.

Furthermore, learning is often successful when it is contextualized. Situated Learning theory (Lave & Wenger, 1991) posits that learning should occur in authentic contexts. AI-supported simulations and virtual environments support these ideas and offer an immersive experience. GenAI tools provide personalized learning experiences, enabling them to plan, monitor, and evaluate their own learning. Sweller's (1988) cognitive load theory emphasizes the need to reduce extraneous mental effort. GenAI's deep learning structures prioritize relevant information and compress complex inputs effectively, helping to manage cognitive load.

Finally, in this digital age, Connectivism (Siemens, 2004) posits that effective learning occurs within networks and digital interconnectedness. GenAI can play the role of a peer, an expert, and a resource, promoting collaborations. Continuous or lifelong learning is also effortless with GenAI learning tools. Thus, GenAI-supported learning platforms align with most of the key learning theories, providing a strong, theoretically sound foundation for the development and use of GenAI tools in education. Table 1 illustrates Various AI concepts and models developed on the principles of learning theories.

Table 1. Learning theory vs AI concepts
(adapted from Khrishna et al., 2024)

Learning theory concepts	AI concepts
Behaviorism	Rule-Based System
Constructivism	Machine Learning
Social Learning Theory	Natural Language Processes
Cognitive Load Theory	Deep Learning
Connectivism	Neural Networks

CHALLENGES OR POTENTIAL THREATS OF USING GENAI

Although GenAI has transformative value for education, it poses some significant threats to users, particularly learners. Fundamental risks include privacy, fairness, data protection, and ethical considerations (Garrett et al., 2020; Holmes et al., 2022; Ilkka, 2018). A very important concern is the misuse and overuse of GenAI. Students may resort to submitting GenAI-generated text as their own work. These unethical practices harm academic integrity and significantly hinder self-development and self-paced learning, which are essential for both academic and professional success.

Consequently, unbridled use of GenAI will make them overly dependent on AI and neglect their own efforts. This overreliance will lead to a decline in critical thinking and learning outcomes (Farrokhnia et al., 2024), ultimately limiting their learning capability. Again, using GenAI effectively requires some technological and content-related knowledge that learners may lack. It will lead them to receive plausible but incorrect information and content ideas (Shen et al., 2023). Being exposed to irrelevant content may also demotivate them. Ultimately, learners using GenAI are vulnerable to privacy and data security breaches. Moreover, when using GenAI, individuals may inadvertently expose their identities and preferences, which hackers or others could exploit to harm them.

USERS' PERCEPTIONS OF GENAI TOOLS

Generative artificial intelligence is a branch of artificial intelligence that can generate ideas, answer questions, and perform diverse tasks in response to user input by utilizing learned knowledge representations and algorithmic models. GenAI tools like ChatGPT, Claude, and Microsoft Copilot, powered by advanced machine learning, can generate new content. They are widely used to automate tasks, increase performance and productivity, and produce creative content. In educational contexts, GenAI has been increasingly used to support learning, instruction, and assessment. GenAI is used for personalized learning every day; it is also largely used in research and as a tool for drafting and refinement. Imran and Almusharraf (2023) and AlQershi et al. (2025) used ChatGPT, a generative AI tool, to assist graduate students in developing research ideas. The findings revealed that, while GenAI-generated content helped students generate basic ideas and structure proposals, they still needed to polish and build on the material they had created. Wider applications of AI language models, a major subset of GenAI for content creation, have been reported by Bhatia (2023), Roe et al. (2023), Yasin and AL-Hamad (2023), and Zhao et al. (2025). Huang et al. (2021), Dizon and Gayed (2021), and Thi and Nikolov (2022) investigated the impact of Grammarly, another AI tool, on undergraduate students' academic writing. They found that AI assistance improved the writing and grammatical accuracy of the treatment group over the control group.

However, the use of these tools is not without threats. Yan (2023) and Lingard (2023) conducted surveys to assess students' perceptions of GenAI tools and their capacity to effectively utilize GenAI-generated data. Their surveys emphasized the importance of providing adequate guidance and GenAI literacy to prevent plagiarism and maintain academic integrity. Reducing challenges associated with technology use in education will also remain important (Banh & Strobel, 2023). Notwithstanding the challenges of using GenAI tools, they have become an integral part of learners' academic lives in Bangladesh, as in other parts of the world (Hughes et al., 2025).

The literature review indicates that GenAI is increasingly used in education for diverse purposes. Despite being instrumental in teaching and learning, significant threats and challenges are also consistently reported. However, usage patterns, challenges, and threats are inherently contextual. To mitigate the challenges and to optimize the potential of GenAI in education, preparing students and establishing clear guidelines for acceptable use are essential. Prior to this, a thorough understanding of the current status quo is imperative. Existing literature has primarily focused on learning outcomes, lacking an examination of contextual factors-in-action (Topali et al., 2025), which leaves a gap in exploring user readiness and the specific social and technical knowledge required. Addressing this lacuna, the present study aims to map the preparedness and behavioral intentions of tertiary-level stakeholders in Bangladesh regarding GenAI. By revealing and analyzing the experiences and attitudes of teachers and students, this study offers critical insights into the adoption of GenAI technologies in education, using the TAM and TTF models, which are applicable to educational contexts with similar characteristics. Accordingly, the following research questions guided this study.

RQ1: To what extent do teachers and students of Jashore University of Science and Technology utilize GenAI in their teaching and learning activities?

RQ2: What are their perceptions of the benefits, challenges, and overall impact of GenAI on teaching and learning, and its future adoption in education?

METHODOLOGY

This section describes the study design, including the sampling procedure, participants, and their characteristics. It also presents the data collection tools and their design, as well as the data collection and analysis process.

STUDY DESIGN

This exploratory perceptual study aimed to map users' practices and perceptions of GenAI in education. It employed a quantitative design, as quantitative research can reveal participants' practices and perceptions, ensuring reliability and validity (Bhattacharjee, 2019; Shepard, 2024). Besides revealing factors driving the use of GenAI and adoption patterns in education, the study design allowed a parallel with the existing literature, using empirical results to evaluate pedagogical aspects of technology use.

PARTICIPANTS

The participants included both learners and teachers (Table 2) from different departments of Jashore University of Science and Technology (JUST). Two teachers from each of 26 departments were invited to participate in a workshop. 44 teachers attended and completed a survey. In addition, 186 learners from different departments, selected through convenience sampling, participated in a student questionnaire survey. The questionnaire was available in both printed and Google Form formats.

Table 2. Profile of the respondents

Participants	Number	Male	Female	Designation/academic year
Teachers	44	35	9	Professor 3, Associate Professor 6, Assistant Professor 17, Lecturer 18
Students	186	113	73	BA 1st year – 37, BA 4th year – 131, Masters – 18

INSTRUMENTS

The study employed survey questionnaires (Appendices A and B) that addressed relevant issues for both teachers and students. The questionnaires were developed through a literature review and expert consultations and then customized based on existing research on AI tools in education (Almassaad et al., 2024; Fischer et al., 2023; Jisc, 2023; Ngo, 2023; UNESCO, 2024).

Both questionnaires included three sections: demographic information; students' practices and purposes for using GenAI tools; and their perceptions of GenAI tools regarding ease of use, challenges, benefits, threats, and prospects. The questionnaires were in English and included necessary instructions, including a consent section.

The Technology Acceptance Model (TAM) and the Task-Technology Fit (TTF) framework were considered for the perceptual and practice questions. TAM is reflected in the Awareness and Familiarity section in the questions, such as “Do you use generative AI tools in higher education?”, and Purpose-related questions like “I use GenAI tools in education” align with TAM's constructs of Perceived Ease of Use and Perceived Usefulness, as well as TTF's focus on Task Requirements. Furthermore, TTF is illustrated through perceived benefits, such as “enhance academic performance”, and challenges encountered when using GenAI tools, like “provide inaccurate or false references”, which correspond to Technology Functionality (Almassaad et al., 2024).

To determine validity, the questionnaires were reviewed by two faculty members. It was then revised based on their feedback. Internal consistency was high, with Cronbach's alphas of 0.82 for both questionnaires. Additionally, a pilot study was conducted with a small group of students and teachers prior to the final survey to identify and refine any confusing phrasing, thereby ensuring greater clarity and accessibility.

The data collection was conducted in workshop format, as outlined in Appendix C. Both teachers and students attended workshops on the utilization of GenAI in education, facilitated by an expert and researchers. At the outset of the workshop, the participants completed the questionnaire. Subsequently, they were provided with an understanding of the basics of GenAI technology, including available tools, potential opportunities, and the challenges and threats it poses to education.

DATA COLLECTION AND ANALYSIS

The researchers were engaged in data collection. Several workshops were arranged for the students and teachers. They received training and information on the fundamental aspects of GenAI use in education. They shared their current practices in GenAI, as well as their perceptions of its usefulness and challenges in teaching and learning, through questionnaires and discussions. The collected data were prepared for analysis using standard procedures, such as data filtering. MS Excel and SPSS (version 25) were used for analyzing data in line with the objectives. The researchers used OpenAI (2025) to generate ideas for the structure and explanations of the self-prepared statistics, figures, and results, solely for comparison purposes; no content was copied or directly taken from it.

RESULTS

This section presents the results of a survey administered to 50 teachers and 186 students. Almost all of them used an Android device or an iPhone, and most also used a laptop. It is a significant issue

that all students have access to devices that enable them to utilize technological facilities, including artificial intelligence.

FAMILIARITY AND FREQUENCY OF GENAI USAGE

Table 3 and Figure 1 display the distribution of participants’ familiarity with GenAI. They reported varying levels of familiarity. Most of them indicated at least moderate familiarity. Fifty percent of teacher respondents were moderately familiar with GenAI, 22.7% considered themselves very familiar, and 25% considered themselves somewhat familiar. Only one of them reported being unfamiliar with GenAI, and none were considered experts in the field. However, student participants showed a slightly higher tendency toward higher familiarity. At least one in every three (37.1%) students reported being moderately familiar, and almost an equal number (38.2%) reported being very familiar. A few of them (1.6%) described themselves as experts. However, 22% considered themselves somewhat familiar, and at the lowest end of the continuum, 1.1% reported being completely unfamiliar with them.

Table 3. Familiarity with GenAI

Level of familiarity	Teacher		Student	
	Frequency	Percentage	Frequency	Percentage
Not familiar at all	1	2.3	2	1.1
Somewhat familiar	11	25	41	22.0
Moderately familiar	22	50	69	37.1
Very familiar	10	22.7	71	38.2
Expert	0	0	3	1.6

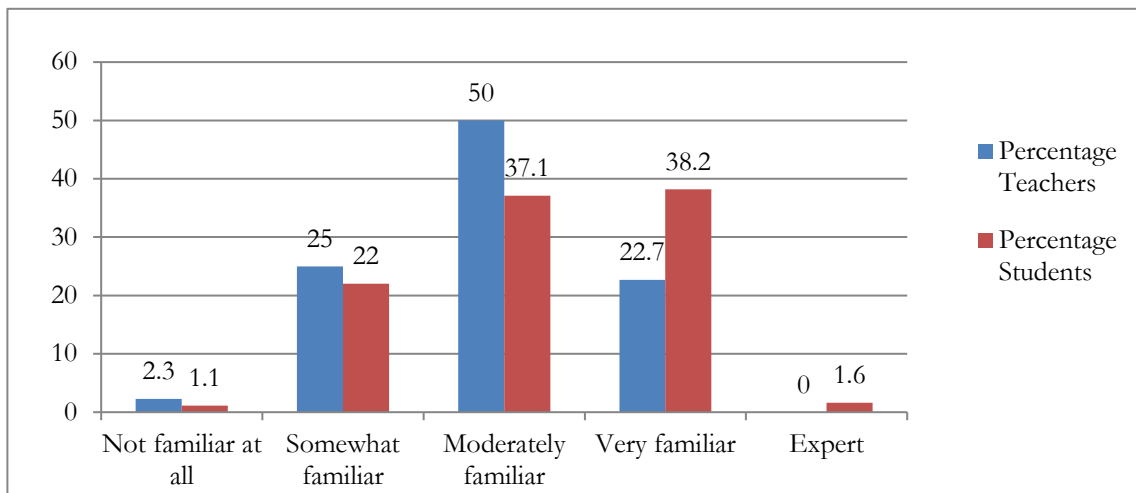


Figure 1. Familiarity with GenAI

GENAI USER TYPE AND FREQUENCY

Table 4 and Figure 2 show the frequency of GenAI use by teachers and students for academic purposes. Statistics indicate a contrast between the two groups: teachers are more engaged with GenAI, while students are occasional users. While almost half (47.7%) of the teachers were regular users (using GenAI a few times a week), the other half (43.2%) were infrequent users (a few times a month).

Among the rest, a small portion (9.1%) described themselves as frequent users who used GenAI multiple times a day. It is worth noting that no teachers considered themselves occasional users or users of GenAI only once.

Table 4. Frequency of using GenAI for educational purposes

Type of user	Teacher		Student	
	Frequency	Percentage	Frequency	Percentage
Frequent user (multiple times a day)	4	9.1	0	0
Regular user (a few times a week)	21	47.7	9	4.8
Infrequent user (a few times a month)	19	43.2	15	8.1
Occasional user	0	0	79	42.5
Used once	0	0	83	44.6

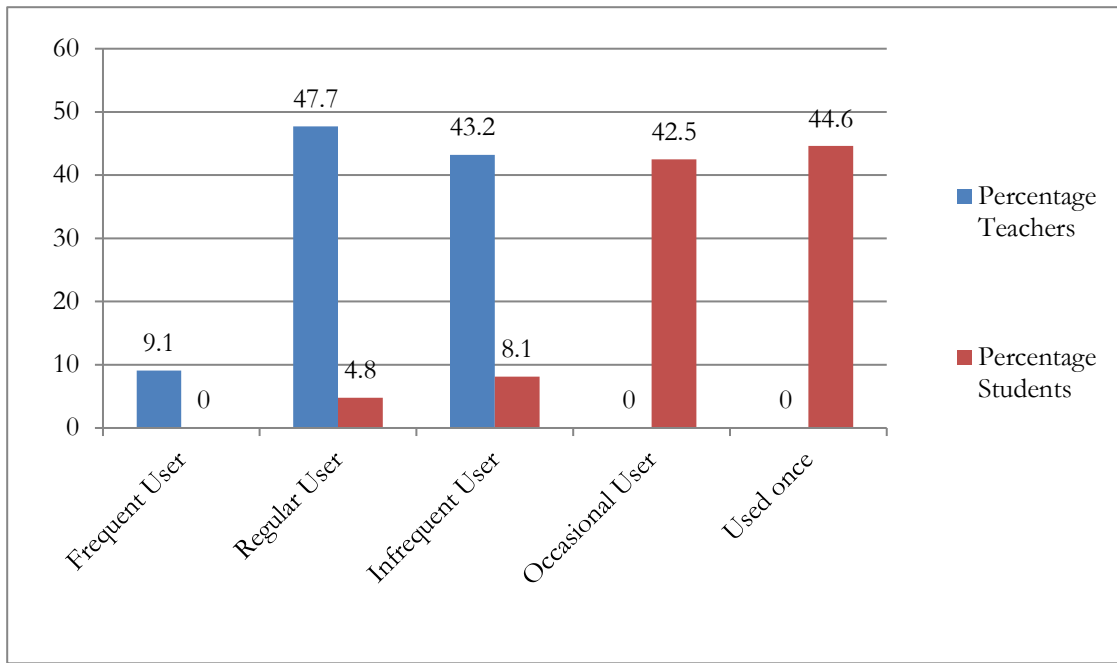


Figure 2. Frequency of GenAI use

Surprisingly, students reported a different pattern: nearly half (44.6%) had used GenAI only once, while a similar proportion (42.5%) categorized themselves as occasional users. Besides, a few of them (8.1%) used GenAI infrequently, and only 4.8% reported as regular users of GenAI. Moreover, none of them reported being frequent users (multiple times a day).

FAMILIARITY AND FREQUENCY OF GENAI USAGE

One-way ANOVA was conducted to determine whether participants’ familiarity with artificial intelligence influences the frequency of their use of GenAI tools (Table 5). For learners, the results showed a statistically significant effect of GenAI familiarity on the frequency of GenAI tool use ($F = 3.569$, $p = 0.008$). To understand which specific familiarity groups differ from each other in their usage pattern, a post hoc test, Fisher’s Least Significant Difference (LSD), was conducted. These comparisons showed mean differences in the frequency of GenAI use across various levels of familiarity (ranging

from 1 = “Not at all familiar” to 5 = “Extremely familiar”). The ‘moderately familiar’ group reported significantly higher GenAI tool usage than the “slightly familiar’ group (M difference = 0.503, p = 0.001), and the “somewhat familiar” group (M difference = 0.290, p = 0.030). Those who were extremely familiar with GenAI also reported significantly higher usage than the slightly familiar group (M difference = 1.024, p = 0.031). The lowest familiarity group and others showed no significant differences, suggesting that the increase in GenAI tool usage becomes more evident at moderate to high familiarity levels.

On the other hand, findings regarding teachers (Table 5) reveal a significant effect of GenAI familiarity on the frequency of its use for academic purposes ($F(3, 40) = 3.073, p = 0.038$).

Table 5. Influence of GenAI familiarity on GenAI usage frequency

		Sum of squares	DF	Mean square	F	Sig.
Students	Between groups	8.814	4	2.204	3.569	0.008
	Within groups	111.745	181	0.617		
	Total	120.559	185			
Teachers	Between groups	3.350	3	1.117	3.073	0.038
	Within groups	14.536	40	0.363		
	Total	17.886	43			

TEACHERS’ EDUCATIONAL PRACTICES INVOLVING GENAI

Table 6 displays how teachers use GenAI tools in their academic practices, categorized by task type.

Table 6. Teachers’ purposes of GenAI use

Purposes N = 44	Very frequently	Frequently	Sometimes	Rarely	Never
Private	5	8	16	6	5
In/for teaching	4	12	22	6	0
For work outside teaching	0	9	23	10	2
Research-related activities/tasks	3	19	15	7	0
Conceptualizing/preparation for teaching	5	10	18	6	1
For preparing examination questions/evaluation	0	4	21	8	11
For preparing materials for teaching	0	7	28	5	4
In the future, I will use GenAI tools more	9	21	12	2	0
For evaluating the student’s assignment/thesis paper	0	5	13	7	19

Teachers reported varying purposes and frequencies of using GenAI tools in education. Of the five scales, ‘sometimes’ has almost the highest frequency, meaning most of the teachers use GenAI at least sometimes for multiple purposes. Twenty-nine teachers have reported using GenAI for private purposes at least ‘sometimes’, with eight teachers using it frequently and five very frequently. Except for six of them, all others used GenAI at least sometimes for teaching or in the teaching process. Even outside teaching, the majority reported using GenAI (‘frequently’ = 9 and ‘sometimes’ = 23),

while in research-related activities, most reported using GenAI ‘sometimes’ (n=15) and ‘frequently’ (n=19). For conceptualizing or preparing to teach, only one teacher reported never using GenAI, and six teachers used it rarely. Teachers also used GenAI to prepare examination questions and to evaluate students’ answers (sometimes = 21 and frequently = 4).

GenAI was highly used by most teachers at least ‘sometimes’ (n = 28) for preparing materials. A firm positive intention was observed when they were asked if they would use GenAI in the future. Nine teachers reported that they would use it very frequently, 21 that they would use it frequently, and 12 that they would use it sometimes. Finally, for evaluating student assignments or thesis papers, use was found to be limited, with 19 reporting ‘never’, 13 ‘sometimes’, and only 5 ‘frequently’. Overall, it was found that the teachers’ use of GenAI is most consistent for research-related tasks, teaching preparation, and private purposes. Notably, a clear trend toward increased GenAI use emerged.

STUDENTS’ EDUCATIONAL PRACTICES OF GENAI

To understand how students integrate GenAI tools into their academic practices, participants were asked about the frequency with which they used GenAI tools for various academic purposes. Table 7 presents their responses categorized into five levels. Most students reported varying frequency of educational practices: 34.4% reported using GenAI tools very frequently, 40.3% reported using them frequently, and only 24.7% reported using them sometimes. Only one respondent reported rarely using GenAI tools. Thus, all of them used GenAI tools at least once. It suggests that GenAI tools have been widely adopted for educational purposes.

There were nine cases in which the students were asked about the frequency of their GenAI use. The responses were categorized into top, moderate, and low use cases. Finding information on a topic was the most common use, with 48.4% of respondents using GenAI tools very frequently and 36% using them frequently. Seventy percent of respondents reported using GenAI tools for personalized learning and preparing assignments at least occasionally. Solving academic tasks or math problems received high usage, with 32.3% students using them very frequently and 34.9% using them frequently. GenAI tools were found to be used moderately for reading text summaries, conducting research, and practicing language skills, with an almost even distribution across the “frequent,” “sometimes,” and “rarely” categories (Figure 3). Finally, low-use cases included drawing pictures and diagrams (33.9% reported rare use and 19% never used), as well as communication with teachers and peers via GenAI (28% reported never using it). These findings reveal that GenAI was widely used for tasks such as information gathering, content generation, and problem-solving; however, its limited use was found for creative or interpersonal academic tasks. The distribution of GenAI tool strengths across text-based and computational tasks suggests the potential spread of GenAI applications in multimodal and interactive educational settings. Overall, students appeared to view GenAI as a tool for studying and completing basic academic tasks.

Table 7. Students’ purposes of using GenAI in education

Frequency of using GenAI-powered tools in education	64	34.4	75	40.3	46	24.7	1	0.5	0	
Personalized learning	40	21.5	96	51.6	39	21	9	4.8	2	1.1
Preparing assignment	52	28	76	40.9	44	23.7	12	6.5	2	1.1
Finding information on a topic	90	48.4	67	36	24	12.9	5	2.7		
Reading a summary of a text	53	28.5	64	34.4	42	22.6	27	14.5		
Doing research, finding research-related information	49	26.3	59	31.7	44	23.7	24	12.9	10	5.4

Drawing pictures and diagrams	8	4.3	37	19.9	43	23.1	63	33.9	35	18.8
Communicating with teachers and peers	6	3.2	41	22.2	43	23.1	44	23.7	52	28
Practice speaking and listening	16	8.6	44	23.7	51	27.4	39	21	36	19.4
Solving academic tasks, math problems, and equations	60	32.3	65	34.9	39	21	17	9.1	5	2.7

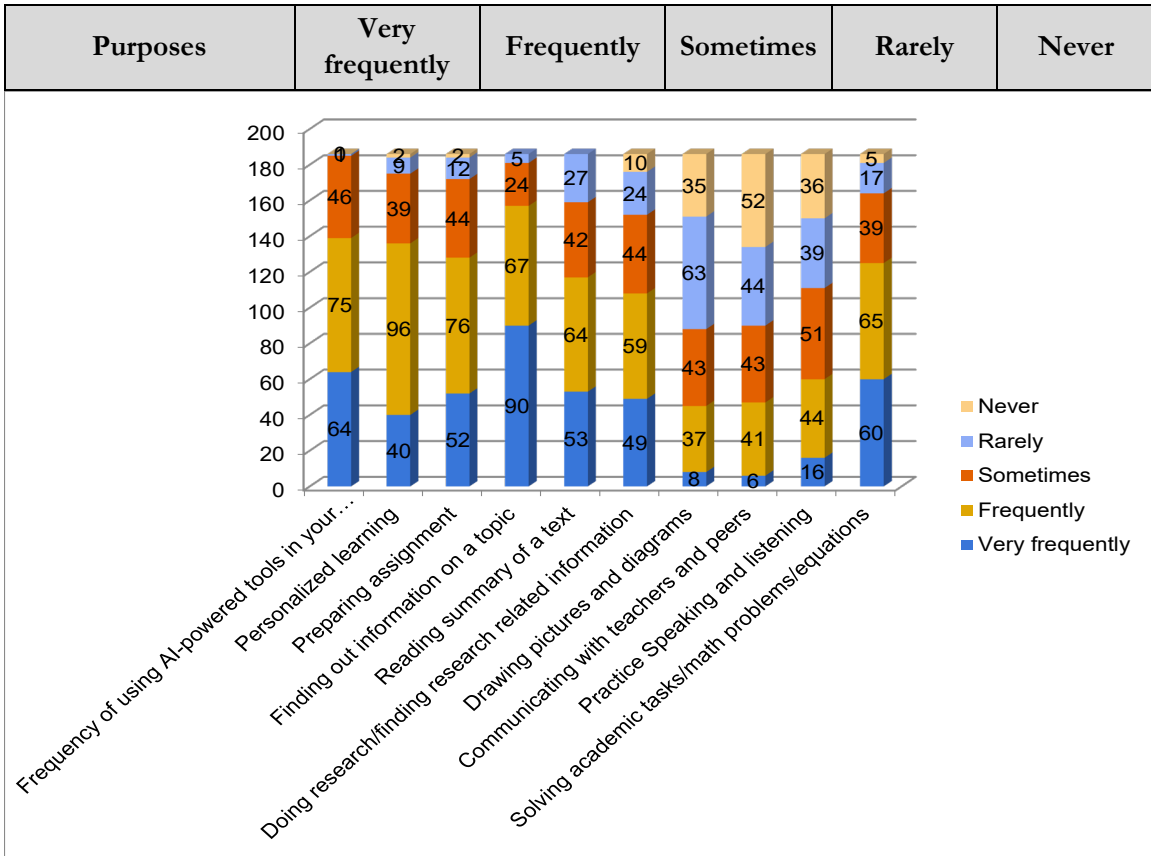


Figure 3. The primary purposes of using GenAI by students

GENDER, YEAR OF STUDY, AND USE OF GENAI

To investigate the potential influence of students’ gender and study duration on their use of GenAI for academic purposes, a one-way ANOVA was conducted. Neither gender nor the duration of students’ studies had a significant effect on their use of GenAI (Appendices D and E). It suggested the widespread use of GenAI tools by all students at all levels of study, reflecting the academic community’s reliance on GenAI for educational purposes. Adoption seems to be affected more by personal familiarity and academic use than by demographic or technical factors.

ESSENTIAL EDUCATIONAL ADVANTAGES OF USING GENAI

When asked about their perceptions of essential educational advantages (Figure 4), teachers reported that GenAI primarily offers opportunities for virtual tutoring. 30% of them also opined that GenAI is important for having tailored feedback and inter-language understanding. Only a few supported the use of GenAI for collaboration.

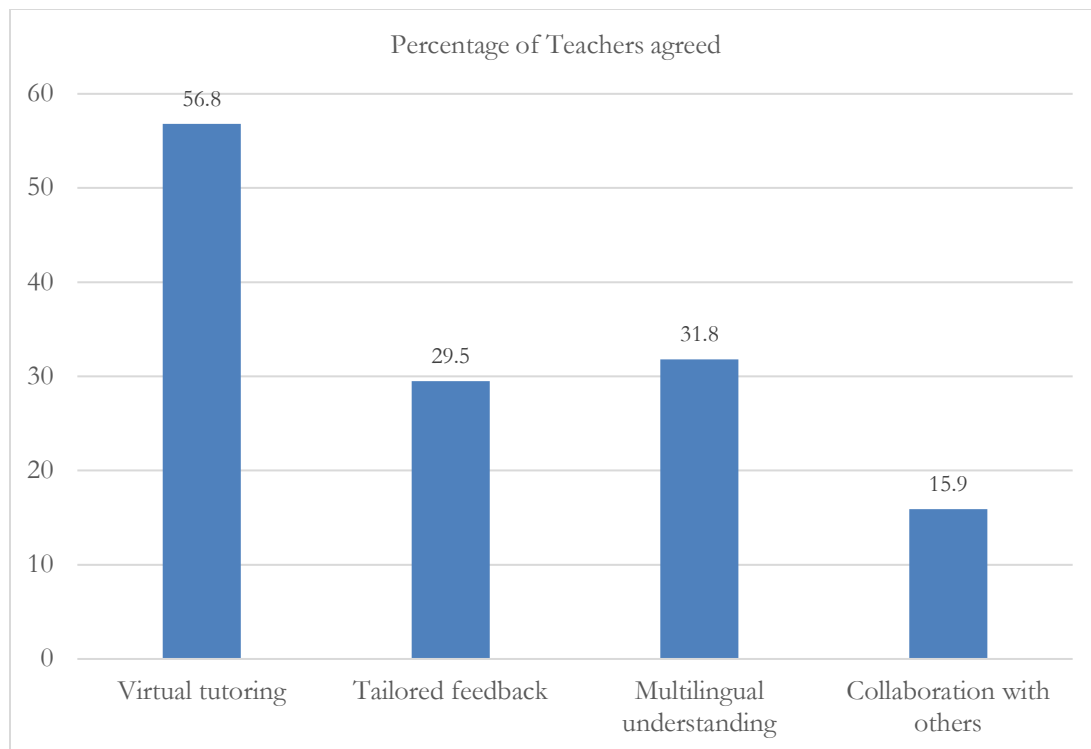


Figure 4. Essential advantages of using GenAIED

EASE OF USE OF GENAI

As Table 8 demonstrates, both teachers and students thought that GenAI tools are comparatively easy to use (T: M = 4.33, SD = 0.79; S: M = 4.44, SD = 0.61, where T = Teachers, and S = Students) and provide quick responses (T: M = 4.26; S: M = 4.45). Ease of use and study-related usefulness were rated slightly higher by students than by teachers. Students were likely to be more confident in using GenAI, and it offered them greater adaptability. The tools provided utility to both teachers and students across multiple input languages (T: M = 4.14; S: M = 4.23), and both found them helpful study aids (T: M = 4.21; S: M = 4.44). However, the respondents moderately agreed that use of GenAI tools can contribute to 'laziness to think' (T: M = 3.63, S: M = 3.97). These findings align with previous literature indicating that GenAI tools can be fast information providers and may demotivate users to think critically, especially when overused.

Table 8. Ease of use, challenges, benefits, and threats of using GenAI in education

	Items: A GenAI tool ...	Teachers (T)		Students (S)	
		Mean	SD	Mean	SD
Ease of use	Is easy to use	4.33	0.786	4.44	0.61
	Can give answers quickly	4.26	0.759	4.45	0.63
	Makes me lazy to think	3.63	1.178	3.97	0.99
	Has functions as a search engine	4.10	0.790	4.14	0.63
	Can be used with various input languages	4.14	0.647	4.23	0.74
	Is a valuable tool for study	4.21	0.742	4.44	0.75
Benefits	Personalizes learning	3.71	0.864	4.18	0.82
	Reduced planning and administration time for teachers	3.84	0.898	3.85	0.85
	Can provide personalized tutoring and feedback based on the student's learning needs and progress	3.65	0.870	4.02	0.72

	Items: A GenAI tool ...	Teachers (T)		Students (S)	
		Mean	SD	Mean	SD
	Improves the engagement and motivation of the students	3.42	1.006	3.53	1.01
	Positive influence on learning outcomes	3.74	0.790	3.85	0.87
	Ensures greater equity in education	3.33	0.928	3.76	0.92
	Easily translate learning materials into different languages, making them easy to access	4.09	0.868	4.26	0.73
	Offers a precise and easy assessment and feedback	3.58	0.879	4.03	0.75
Challenges	Can provide unreliable information on topics	3.65	0.997	3.49	1.01
	Is difficult as the faculties lack relevant literacy	3.26	0.954	3.45	0.92
	Is unable to cite sources accurately	3.57	1.151	3.10	1.06
	Lacks ethical consideration	3.74	1.061	3.27	1.04
	Makes lesson planning difficult	2.57	1.085	2.70	1.02
	Is unable to examine the quality and reliability of sources	3.51	0.978	3.09	1.01
	Cannot be used for infrastructural scarcity	3.19	1.052	3.07	0.98
Threats	Is unable to measure the value of complex mathematical formulas/ difficult concepts	3.14	1.014	2.81	1.17
	Will decrease the personal connection between teachers and students	3.65	1.173	3.44	1.14
	Threatens data privacy and security	3.79	1.013	3.44	1.05
	Has bias in GenAI algorithms	3.60	0.979	3.32	0.97
	May make users over-reliant on technology	4.19	0.852	4.13	0.86
Future	Will lessen the skill of the users	3.95	1.090	3.88	0.99
	Will replace teachers/tutors	2.84	1.252	2.94	1.17
	Play a central role in personalizing education	3.67	0.892	3.82	0.92
	Should not be used at all	2.37	1.328	2.31	1.19
	Should be formally used in academic activities	3.81	0.958	3.77	0.93

PERCEIVED BENEFITS

The respondents put forward their perceptions of eight benefits of using GenAI. Overall, they moderately agreed about its benefits in education (M = 3.80), but students considered it offered more benefits (M = 3.94) than teachers did (M = 3.67). The ability of GenAI for personalized learning (S: M = 4.18; T: M = 3.71) and personalized tutoring and feedback (S: M = 4.02; T: M = 3.65) was perceived as more effective by students than by teachers. Teachers acknowledged that GenAI tools reduced administrative time and improved learning outcomes. GenAI can improve equity by translating materials into multiple languages, and this feature was strongly agreed upon by both groups of respondents (T: M = 4.09; S: M = 4.26). However, its ability to improve engagement and motivation was less supported (T: M = 3.42; S: M = 3.53). Thus, GenAI can play a significant supportive role in educational activities, but it is uncertain how much it can foster active engagement.

CHALLENGES AND CONCERNS

Teachers, more than students, found GenAI challenging, especially in terms of ethical and academic precision. They reported that GenAI is unable to cite accurate sources (M = 3.57) and lacks ethical consideration (M = 3.74). Students were not so concerned about these aspects (M = 3.10; M = 3.27). Some other concerns that both groups expressed were about the unreliable information (T: M = 3.65; S: M = 3.49) provided by GenAI, which is further complicated by infrastructural scarcity (T: M = 3.19; S: M = 3.07). Both groups preferred to use GenAI to reduce the difficulty of lesson planning. These findings suggest that the respondents’ perceptions are more aligned with the group-related

utilities and responsibilities. The students focused more on immediate usability, while the teachers focused on scholarly accuracy and ethical aspects aligned with pedagogical requirements.

THREATS

The respondents expressed significant apprehension that GenAI makes one overly reliant on technology (T: M = 4.19; S: M = 4.13) and threatens to erode users' skills over time (T: M = 3.95; S: M = 3.88). Some other substantial concerns were reported about data privacy and security (T: M = 3.79; S: M = 3.44), and bias in algorithms (T: M = 3.60; S: M = 3.32). The teachers also believed that the connection between teachers and students would decrease due to the overuse of GenAI (T: M = 3.65; S: M = 3.44). These concerns are important phenomena that underscore the need to make technological tools more human and to promote human interaction in educational contexts.

PROSPECTS OF GENAI

Participants were asked whether GenAI can be used formally in education. They expressed a cautious yet optimistic view (T: M = 3.81; S: M = 3.77) regarding this, despite the challenges and threats reported. No group thought that teachers would be replaced by GenAI (T: M = 2.84; S: M = 2.94). They also disagreed that it should not be used at all; instead, they thought that GenAI tools play an important, supportive, and personalized role (T: M = 3.67; S: M = 3.82). These capacities will complement, rather than replace, conventional teaching practices.

ADOPTION OF GENAI IN EDUCATION

A hierarchical regression analysis (Table 9) was conducted to determine whether psychological and usage-related variables explained additional variance in teachers' and students' future use of GenAIED beyond demographic variables. Descriptive Statistics and Pearson Correlations showed that teachers' "perceived benefits of GenAI" was the only variable significantly associated with future acceptance of GenAI ($r = 0.29$, $p < 0.05$). In contrast, "perceived challenges" ($r = 0.24$, $p = 0.06$) and "perceived threats" ($r = 0.24$, $p = 0.07$) showed positive but non-significant relationships. Ease of use, familiarity, user type, and purposes of GenAI use were not significantly correlated with the outcome. Teachers' demographic variables were also not significantly related to their future perceptions of GenAIED.

Similarly, among students, demographic variables did not significantly predict future perceptions ($R^2 = 0.011$, $F(2, 183) = 1.043$, $p = 0.354$). Among all the predictors, 'benefits of GenAI' came out to be a significant positive predictor ($\beta = 0.246$, $p = 0.009$), showing that positive expectation of GenAI's future integration in education is favored by those who perceived GenAI to be 'useful'. Ease of use ($p = 0.085$) and threats ($p = 0.054$) were marginally associated with future acceptance. Other variables, such as challenges, familiarity, and purpose, were not significant.

Coefficient interpretation in the complete model revealed that the benefits of GenAI emerged as the only statistically significant predictor of future acceptance of GenAI ($\beta = 0.396$, $t = 2.255$, $p = 0.031$). This suggests that teachers who perceive greater benefits from GenAI are more likely to have positive expectations for its future use in education. Multicollinearity diagnostics were acceptable; all VIF values were below 2.0, indicating stable and interpretable regression coefficients. Similarly, in the case of students, the benefits of GenAI emerged as the strongest and the only statistically significant positive predictor ($\beta = 0.246$, $p = 0.009$), indicating that students who believe GenAI improves learning efficiency, supports personalization, or enhances academic tasks are more likely to express confidence in the future integration of GenAIED. Other predictors, including ease of use ($\beta = 0.167$, $p = 0.085$) and perceived threats ($\beta = 0.167$, $p = 0.054$), were marginally associated, but none of them reached the traditional significance level of $p < 0.05$.

Overall, the findings support a refined understanding of GenAI acceptance in education: usefulness is the central mechanism shaping teachers' and students' views of GenAI's future. This aligns with the TAM aspect of theoretical primacy, emphasizing the tangible advantages of GenAI for teaching

and learning rather than solely addressing usability or risk concerns. Once usefulness is met, other predictors may come into play, which supports TAM's claim that usefulness outweighs effort expectancy in predicting behavioral intention. The VIF indicates no multicollinearity concerns.

Table 9. Hierarchical regression predicting future acceptance of GenAI

Predictor	B (un-standardized coefficient)		β (beta/standardized coefficient)		T-value		P (sig./p-value)		VIF (variance inflation factor)	
	Teachers	Students	Teachers	Students	Teachers	Students	Teachers	Students	Teachers	Students
Gender	-0.129	0.089	-0.078	0.069	-0.496	0.955	0.623	0.341	1.15	1.02
Education/current year	-0.220	0.009	-0.119	0.019	-0.703	0.257	0.487	0.797		1.33
Ease of use	-0.397	-0.254	-0.293	-0.167	-1.507	-1.730	0.142	0.085	1.75	1.82
Benefits	0.458	0.279	0.396	0.246	2.255	2.624	0.031	0.009	1.43	1.72
Challenges	0.232	-0.067	0.217	-0.066	1.161	-0.824	0.254	0.411	1.62	1.27
Threats	0.259	0.160	0.284	0.167	1.602	1.940	0.119	0.054	1.45	1.44
Purposes	0.259	0.053	0.285	0.058	1.372	0.642	0.180	0.522	1.99	1.61
Familiarity	0.014	0.067	0.014	0.088	0.077	1.139	0.939	0.256	1.56	1.16
User type	-0.271	0.002	-0.258	0.002	-1.35	0.029	0.186	0.977	1.68	1.32
Model summary for teachers: R = 0.326, R ² = 0.106, Adj R ² = 0.055, F(10,175) = 2.076, p = 0.029 Δ R ² = 0.095, Δ F(8,175) = 2.319, p = 0.022					Model summary for students: R = 0.326, R ² = 0.106, Adj R ² = 0.055, F (10,175) = 2.076, p = 0.029 Δ R ² = 0.095, Δ F (8,175) = 2.319, p = 0.022					

DISCUSSION

The findings demonstrate a clear pattern in participants' use, familiarity, and attitudes towards GenAI in Education, which echoes and enriches findings from global research.

Teachers at JUST show moderate to high familiarity with GenAI tools, with most categorized as 'regular' users, a smaller proportion as 'frequent' users, and a minority as 'infrequent' users. This distribution suggests growing normalization of GenAI integration within teaching practice. Consistent with the findings of Jensen et al. (2025), familiarity appears closely associated with the frequency of tool integration, particularly in course design and instructional material preparation. Similarly, it echoes the findings of Bearman et al. (2023) that engagement with such tools is becoming a significant component of contemporary academic practice, and GenAI adoption is shaping pedagogical practices. However, through the lens of the Technology Acceptance Model, this suggests that Perceived Ease of Use is high, but the Perceived Usefulness of GenAI remains mostly limited to administrative tasks rather than pedagogical delivery.

In contrast, most students reported moderate to high levels of familiarity with GenAI. However, their actual use of GenAI for learning purposes remained limited, with the majority identifying themselves as occasional or one-time users. Thus, a Familiarity-Usage Gap is evident among students.

This gap in awareness and active engagement suggests that familiarity does not necessarily translate into sustained academic integration. A similar pattern of sporadic engagement has been reported by Arowosegbe et al. (2024). Though many students use GenAI tools for academic purposes, their applications are largely limited to basic tasks such as generating ideas for a topic, writing summaries, preparing assignments, solving academic problems, or performing mathematical calculations. Overall, student engagement appears exploratory rather than systematic. Ketsman and Lazarevic (2026) reported similar findings that most students interact with GenAI only occasionally and remain at the early stages of applying GenAI tools, despite being moderately familiar with them.

In their readiness to integrate GenAI into academic practice, the findings indicate a clear disparity between teachers and students. Teachers demonstrate a more consistent tendency to incorporate GenAI tools into their pedagogical activities, while students largely remain at an exploratory phase of adoption. This distinction is clearly visible in Figure 2, which highlights the contrasting usage patterns between teachers and students. Teachers are more inclined to use GenAI regularly, while students are more inclined to use it occasionally. This divergence reflects that GenAI is viewed by teachers as very useful, making pedagogical tasks easier, while students are at an early stage of adopting GenAI across diverse academic activities.

Moreover, the frequency of teachers' GenAI use appears closely associated with their self-reported familiarity with GenAI. It consistently shows that teachers with greater familiarity are more likely to integrate GenAI tools into their teaching practices than their less familiar counterparts. Thus, increased familiarity reduces uncertainty about new technologies and enhances perceived usefulness and ease of integration, and positively affects the adoption and integration of GenAI in academic contexts. In this respect, this study agrees with Chukhno's (2024) findings that familiarity with technologies may contribute to a positive outlook. Participants further emphasized the convenience, efficiency, and adaptability of GenAI tools in meeting diverse academic needs, suggesting that positive experiential engagement may reinforce sustained usage (Granić, 2025).

The ANOVA results further indicate that teachers' level of familiarity predicts the frequency of GenAI use. It reflects that technological competence is a key determinant of adoption, as X. Zhang et al. (2026) reported that motivational and technological constructs significantly influence continuation intention. In contrast, though students often feel they are familiar with GenAI tools, they lack the necessary structures or motivation to use them consistently. Teachers' extensive application of GenAI in research, teaching preparation, and materials development supports the TTF framework, which emphasizes that effective adoption occurs when technological functionalities align with users' task demands.

Regarding the usefulness, benefits, challenges, and threats of GenAI, teachers and students shared several common perceptions, though they differed in their views on usability versus academic accuracy. Students considered it more useful for studying. Teachers are cautious yet optimistic about GenAI's potential for extracting benefits from pedagogical activities. Students' emphasis on GenAI's ability to personalize and translate materials suggests it is more learner-centric. The teachers appear to be increasingly integrating GenAI into pedagogy and acknowledging its effectiveness and resourcefulness in activities such as lesson plan creation, practice items, and differentiated content preparation, which aligns with the findings of Jensen et al. (2025). However, teachers are not convinced that GenAI can improve interaction and equity. Citation-related inaccuracies, ethical gaps, and unreliable information are serious concerns about GenAI, as participants expressed.

Despite GenAI's immediate use and important functionality, it cannot meet respondents' expectations regarding academic standards and integration. Both groups acknowledge that over-reliance and skill degradation are serious potential risks. This type of risk has already been reported in several studies identified by Karan and Angadi (2023) in their systematic review. For example, Ilkka (2018), as in Karan and Angadi (2023) stated that if learners become dependent on AI, they will find it difficult to develop higher-order mathematical abilities, reasoning, and logical skills.

There remains a convergence of views among respondents regarding the future of GenAI in education. They neither support nor reject its formal adoption in education, nor do they advocate for banning or replacing teachers altogether. Consistent with Tzirides et al. (2024), respondents favor a hybrid education model in which GenAI complements, rather than replaces, human expertise to enhance teaching and learning effectiveness. This finding agrees with Karan and Angadi (2023), who concluded that AI integration in education will replace human teachers in many teaching and learning activities. Thus, the teachers' role will undergo a significant transformation, and, as Du and Wang (2025) noted, they need not only to "adapt to technology" but also to "master technology."

Regarding the factors that determine the adoption of GenAIEd, teachers' perceptions offer important insights. Disregarding demographic traits, perceptual and usage-related variables, such as familiarity, ease of use, benefits, challenges, threats, and purposes, contributed substantially to the model's predictive power (31%), although not at the traditional significance level. Perceived Benefits of GenAI emerged as the sole significant predictor, indicating that teachers tend to support the integration of GenAIEd when they believe that it can enhance learning and offer functional advantages. These findings align with technology acceptance models, such as TAM and TTF. They are similar to those reported by Taheri et al. (2025) in their meta-analysis of factors determining AI adoption. Thus, performance expectation is a key driver of adoption. It is worth noting that other variables in the acceptance models, such as ease of use and familiarity, were not significant. It may be due to the early-stage adoption, and teachers are still judging the operational value of GenAI. Although they acknowledge challenges and threats, they do not yet perceive them as barriers.

Although both teachers and students shared similar perceptions, some differences deserve consideration. Teachers utilized GenAI for advanced tasks, while students focused primarily on gathering information. It is only natural that the academic responsibilities and expectations of these two groups differ. The former, as knowledge producers and facilitators, emphasize the use of GenAI to enhance efficiency and creativity, but students seek support for task completion. However, students perceived GenAI as more useful despite their comparatively limited use. This may stem from the direct and immediate benefits they experience, while teachers evaluate its utility more critically, considering issues of quality, reliability, and long-term educational impact. These differences highlight the need to develop institutional policies that address the priorities of both groups without compromising academic standards.

Overall, both groups expressed a vigilant but positive view toward GenAI in education. It is not viewed as a replacement for human instructors, but rather as a complementary tool within a hybrid pedagogical model. The reported perceptions of utility and task alignment are consistent with the core propositions of TAM and TTF, which reflect an early yet potentially meaningful transition toward integrating GenAI into tertiary-level teaching and learning.

ALIGNMENT WITH TAM AND TTF

The findings strongly support the TAM and TTF models. The significance of perceived usefulness aligns with TAM's prediction that adoption is driven by performance expectancy. Participants' familiarity influences behavior, supporting TAM's emphasis on exposure and effort expectancy. Likewise, GenAI's role in task-specific completion aligns with TTF's argument that technology's capacity to support real tasks determines its adoption. High task-technology alignment is evident in teachers' extensive use of it. Although both frameworks are in play, the findings support the TTF model more than the TAM. TTF's premise of 'suitability of user task technology' (Afshan & Sharif, 2015, as cited in Mediaty et al., 2023) is dominant in the adoption and the use frequency of GenAI over TAM's 'perceived ease of use' (Davis, 1989) premise.

IMPLICATIONS FOR EDUCATIONAL PRACTICE

The findings highlight several implications for higher education institutions. Training programs should be implemented to enhance the literacy of teachers and students, enabling them to use GenAI

effectively. GenAI cannot be denied, as there remains a strong link between familiarity and use. Such training should focus on critical evaluation, ethical use, and discipline-specific applications, in addition to basic features. It seems to be a *fait accompli* that GenAI will be used in education. Thus, teachers and students should be equipped to utilize GenAI for various academic and research purposes. Furthermore, policies should be established for the acceptable use of GenAI in academic activities. Finally, to address participants' concerns about the accuracy of GenAI information, likely due to limited access to paid or commercial versions, institutions should provide access to reliable, professional GenAI platforms to ensure safer, more effective GenAI use.

CONCLUSION

The study investigated the potential integration of GenAI into tertiary education by examining existing practices and perceptions among teachers and learners. Using the Technology Acceptance Model and Task-Technology Fit frameworks, the study finds that although both groups have moderate familiarity with GenAI, their usage patterns differ. Teachers primarily use it for course preparation, while students engage with it sporadically for academic problem-solving and personalized learning.

Furthermore, this study identifies familiarity with GenAI as a robust predictor of usage frequency. An important contribution of this study is the nuance it offers regarding the driving agents of adoption. While perceived benefits and usefulness remain dominant factors associated with TTF and TAM, this study uniquely reveals that challenges and threats, such as concerns about reliability, ethics, and potential deskilling, also act as catalysts for adoption rather than merely as barriers. Consequently, GenAI architecture should prioritize practical utility and user-centric design, thereby facilitating the integration of human expertise to deliver hybrid, balanced solutions.

Finally, this study, by revealing teachers' and students' perceptions and practices, has clearly elucidated their level of readiness for the formal introduction of GenAI tools in teaching, learning, and assessment at the tertiary level in Bangladesh. It also reflects broader educational trends, such as teachers' familiarity translating into more frequent GenAI use, and high familiarity among students may not prove high engagement. The experiential gap plays a catalytic role, underscoring the importance of providing structured support and digital literacy to utilize GenAI. Consequently, students can use these tools for writing and critical thinking, saving their time, but they should be careful about potential threats to their development. For educators, professional development, combined with hands-on training, will enable them to critically evaluate these tools and their integration. At the institutional level, strict but precise policies and equitable access are of prime importance. Aspects of GenAI use, such as ethical concerns, equity, and academic integrity, call for guidelines that balance pedagogical potential with ethical and moral considerations. To fully realize the potential of generative AI in education, strategic collaboration among end-users, developers, and key stakeholders is imperative (Dimeli & Kostas, 2025). Guided by participants' optimistic yet measured perspectives, this research reaffirms the efficacy of GenAI as a powerful academic tool. Ultimately, this study advances the broader theoretical understanding of GenAI's capabilities in educational settings, aligning with Crompton and Burke's (2023) opinion drawn on Hrastinski et al. (2019) and Zawacki-Richter et al. (2019). Furthermore, it offers critical insights to inform its future adoption and sustained integration at the tertiary level.

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APPENDIX A: SURVEY ON THE PRACTICES AND PERCEPTIONS OF USING GENAI IN EDUCATION FOR THE TEACHERS

Dear colleague/sir/madam,

This survey aims to gather information on how artificial intelligence (GenAI) is being used by the teachers and the students of JUST and what they think about its impact on learning and teaching practices. Your responses will help us understand the current trends and inform future decisions. The survey should take about 15 minutes to complete. Submitting your response means you are giving us your consent to use it for academic purposes.

With thanks in advance,

SECTION 1: INTRODUCTION

1. The department you are teaching in:
2. Your designation: 1. Professor 2. Associate Professor 3. Assistant Professor
4. Lecturer
3. Your gender: 1. Female 2. Male
4. Your education level: 1. Graduate 2. Post graduate
5. Which devices do you use for your academic activities?
 - i. Mobile and Tablet/Laptop/Desktop
 - ii. Only Mobile
 - iii. Only Tablet/Laptop/Desktop
6. How familiar are you with GenAI technologies in general?
1: Not familiar 2: Somewhat familiar 3: Quite familiar 4: Very familiar 5: Expert
7. What type of GenAI (**ChatGPT, Google Bard, Virtual Assistant**) user would you consider yourself?
 - 5: Frequent user (multiple times a day)
 - 4: Regular user (a few times a week)
 - 3: Infrequent user (a few times a month)
 - 2: Rare user
 - 1: Used once

SECTION 2: PRACTICES OF GENAI IN EDUCATION

8. What essential educational advantages do you find when using GenAI-based tools?
 - 1) Virtual tutoring
 - 2) Tailed feedback
 - 3) Multilingual understanding
 - 4) Collaboration with others
9. For what purpose do you use GenAI tools? (Select all that apply)

Purposes	Very frequently	Fre- quently	Sometimes	Rarely	Never
Private					
In/for teaching					
For work outside teaching					
Research-related activities/tasks					
Conceptualizing/preparation for teaching					
For preparing examination questions/evaluation					
For preparing materials for teaching					
In the future, I will use GenAI tools more and more.					
For evaluating the student's assignment/thesis paper					

SECTION 3: PERCEPTIONS OF GENAI IN EDUCATION

10. What are your opinions regarding the following aspects of using GenAI in education?

(5: Strongly Agree 4: Agree 3: Somewhat Agree 2: Disagree 1: Strongly Disagree)

Sl.	A GenAI tool - Items	5	4	3	2	1
Ease of use	is easy to use					
	can give answers quickly					
	makes me lazy to think					
	has functions as a search engine					
	can be used with various input languages					
Benefits	is a useful tool for study					
	personalizes learning					
	Reduced planning and administration time for teachers					
	can provide personalized tutoring and feedback based on the student's learning needs and progress					
	Improves engagement and motivation of the students					
	Positive influence on learning outcomes					
	ensures greater equity in education					
	easily translate learning materials into different languages, making them easy to access					
Offers precise and easy assessment and feedback						
Challenges	can provide unreliable information on topics					
	is difficult as the faculties lack relevant literacy					
	is unable to cite sources accurately					
	lacks ethical consideration					
	makes lesson planning difficult					
	is unable to examine quality and reliability of sources					
	cannot be used for infrastructural scarcity					
is unable to measure the value of difficult mathematical formulas/ difficult concepts						

Sl.	A GenAI tool - Items	5	4	3	2	1
Threats	will decrease personal connection between teachers and students					
	threatens data privacy and security					
	has bias in GenAI algorithms					
	may make users over-reliant on technology					
	will lessen the skill of the users					
Future	will replace teachers/tutors					
	play a central role in personalizing education					
	should not be used at all					
	should be formally used in academic activities.					

Thank you for participating!

Your responses will help shape the future of GenAI in education.

APPENDIX B: QUESTIONNAIRE FOR STUDENTS

Dear participant,

This survey aims to gather information on how artificial intelligence (GenAI) is being used by teachers and students at JUST, and what they think about its impact on learning and teaching practices. Your responses will help us understand the current trends and inform future decisions. The survey should take about 10 minutes to complete. Submitting your response means you are giving us your consent to use it for academic purposes.

With thanks,

SECTION 1: INTRODUCTION

The department you are studying:

Current Year: 1. 1st 2. 2nd 3. 3rd 4. 4th 5. MA/MSc

Your gender: 1. Female 2. Male

Which devices do you use for your academic activities?

I. Mobile and Tablet/Laptop/Desktop

II. Only Mobile

III. Only Tablet/Laptop/Desktop

How familiar are you with GenAI technologies in general?

1: Not familiar 2: Somewhat familiar 3: Quite familiar 4: Very familiar 5: Expert

What type of GenAI (**ChatGPT, Google Bard, Virtual Assistant**) user would you consider yourself?

5: Frequent user (multiple times a day) 4: Regular user (a few times a week)

3: Infrequent user (a few times a month) 2: Rare user 1: Used once

SECTION 2: PRACTICES OF GENAI IN EDUCATION

For what purpose do you use GenAI tools? (Select all that apply)

(5: Very frequently, 4: Frequently, 3: Sometimes, 2: Rarely, 1: Never)

Purposes	5	4	3	2	1
The frequency of using GenAI-powered tools in educational activities					
Personalized learning					
Preparing assignment					
Finding out information on atopic					
Reading a summary of a text					
Doing research/finding research-related information					
Drawing pictures and diagrams					
Communicating with teachers and peers					
Practice speaking and listening					
Solving academic tasks/math problems/and equations					

SECTION 3: PERCEPTIONS OF GENAI IN EDUCATION

What are your opinions regarding the following aspects of using GenAI in education?

(5: Strongly Agree 4: Agree 3: Somewhat Agree 2: Disagree 1: Strongly Disagree)

Sl.	Items	5	4	3	2	1
	A GenAI tool					
Ease of use	is easy to use					
	can give answers quickly					
	makes me lazy to think					
	has functions as a search engine					
	can be used with various input languages					
	is a useful tool for study					
Benefits	personalizes learning					
	Reduced planning and administration time for teachers					
	can provide personalized tutoring and feedback based on the student's learning needs and progress					
	Improves engagement and motivation of the students					
	Positive influence on learning outcomes					
	ensures greater equity in education					
	easily translate learning materials into different languages, making them easy to access					
Offers a precise and easy assessment and feedback						
Challenges	can provide unreliable information on topics					

	is difficult as the faculties lack relevant literacy					
	is unable to cite sources accurately					
	lacks ethical consideration					
	makes lesson planning difficult					
	is unable to examine the quality and reliability of sources					
	cannot be used for infrastructural scarcity					
	is unable to measure the value of difficult mathematical formulas/ difficult concepts					
Threats	will decrease personal connection between teachers and students					
	threatens data privacy and security					
	has bias in GenAI algorithms					
	may make users over-reliant on technology					
	will lessen the skill of the users					
Future	will replace teachers/tutors					
	play a central role in personalizing education					
	should not be used at all					
	should be formally used in academic activities.					

Thank you for participating!

Your responses will help shape the future of GenAI in education.

APPENDIX C: OUTLINE OF WORKSHOP CONTENT

Duration: 60 minutes Format: Lecture, Interactive Discussion and Q&A

- 1. Introduction to Generative Artificial Intelligence:** Definition, Classification of GenAI: Narrow AI, General AI, Super AI
- 2. GenAI Integration in Teaching and Learning:** Daily Utilities, Idea Generation, Learning Platforms, Research and Writing, Assessment Mechanism, and ease of use.
- 3. Benefits:** Efficiency improvements and time-saving capabilities, personalized learning, and enhancement of critical thinking and creativity.
- 4. Risks and challenges:** Ethical issues, and over-reliance leading to deskilling, data privacy, and algorithmic bias
- 5. Ethics and Responsible Use:** Ethical guidelines, best practices.
- 6. Outlook and Conclusion:** Emerging Trends, Adoption, and Integration in Education
- 7. Discussion and Q&A:** Discussion on Experiential Gaps and readiness, ethics, and tool adoption.
- 8. Closing Perspective:** “GenAI won’t replace teachers, but teaching will be more effective with the use of GenAI”.

APPENDIX D: INFLUENCE OF DURATION OF STUDY ON THE USAGE OF GENAI FOR DIFFERENT PURPOSES (ANOVA)

			Sum of squares	df	Mean square	F	Sig.
Frequency of using GenAI-powered tools in your educational practices * Current Year	Between Groups	(Combined)	1.241	2	0.620	1.019	0.363
	Within Groups		111.383	183	0.609		
	Total		112.624	185			
Personalized learning * Current Year	Between Groups	(Combined)	2.423	2	1.211	1.735	0.179
	Within Groups		127.733	183	0.698		
	Total		130.156	185			
Preparing assignment * Current Year	Between Groups	(Combined)	1.080	2	0.540	0.624	0.537
	Within Groups		158.318	183	0.865		
	Total		159.398	185			
Finding out information on a topic * Current Year	Between Groups	(Combined)	0.495	2	0.248	0.388	0.679
	Within Groups		116.645	183	0.637		
	Total		117.140	185			
Reading summary of a text * Current Year	Between Groups	(Combined)	0.196	2	0.098	0.093	0.911
	Within Groups		192.863	183	1.054		
	Total		193.059	185			
Doing research/finding research-related information * Current Year	Between Groups	(Combined)	1.970	2	0.985	0.726	0.485
	Within Groups		248.380	183	1.357		
	Total		250.349	185			
Drawing pictures and diagrams * Current Year	Between Groups	(Combined)	2.825	2	1.412	1.101	0.335
	Within Groups		234.767	183	1.283		
	Total		237.591	185			
Communicating with teachers and peers * Current Year	Between Groups	(Combined)	3.084	2	1.542	1.063	0.347
	Within Groups		265.394	183	1.450		
	Total		268.478	185			
Practice Speaking and listening * Current Year	Between Groups	(Combined)	7.383	2	3.692	2.439	0.090
	Within Groups		277.031	183	1.514		
	Total		284.414	185			
Solving academic tasks/math problems/equations * Current Year	Between Groups	(Combined)	3.373	2	1.687	1.510	0.224
	Within Groups		204.412	183	1.117		
	Total		207.785	185			

APPENDIX E: INFLUENCE OF GENDER ON THE USAGE OF GENAI FOR DIFFERENT PURPOSES (ANOVA)

		Sum of squares	df	Mean square	F	Sig.
Frequency of using GenAI-powered tools in your educational practices	Between Groups	0.002	1	0.002	0.003	0.957
	Within Groups	112.622	184	0.612		
	Total	112.624	185			
Personalized learning	Between Groups	1.837	1	1.837	2.635	0.106
	Within Groups	128.319	184	0.697		
	Total	130.156	185			
Preparing assignment	Between Groups	0.003	1	0.003	0.003	0.953
	Within Groups	159.395	184	0.866		
	Total	159.398	185			
Finding information on a topic	Between Groups	0.818	1	0.818	1.293	0.257
	Within Groups	116.322	184	0.632		
	Total	117.140	185			
Reading a summary of a text	Between Groups	0.028	1	0.028	0.027	0.869
	Within Groups	193.031	184	1.049		
	Total	193.059	185			
Doing research/finding research-related information	Between Groups	0.997	1	0.997	0.736	0.392
	Within Groups	249.352	184	1.355		
	Total	250.349	185			
Drawing pictures and diagrams	Between Groups	0.153	1	0.153	0.118	0.731
	Within Groups	237.439	184	1.290		
	Total	237.591	185			
Communicating with teachers and peers	Between Groups	0.002	1	0.002	0.001	0.972
	Within Groups	268.477	184	1.459		
	Total	268.478	185			
Practice speaking and listening	Between Groups	1.350	1	1.350	0.877	0.350
	Within Groups	283.064	184	1.538		
	Total	284.414	185			
Solving academic tasks/math problems/equations	Between Groups	1.108	1	1.108	0.987	0.322
	Within Groups	206.677	184	1.123		
	Total	207.785	185			

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