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Generative AI in Modern Education: Exploring Teachers' Readiness, Benefits, and Challenges

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Abstract

This study explores teachers' readiness to implement generative artificial intelligence (GenAI) in their teaching and learning processes, alongside the benefits and challenges related to its utilizations in the Omani context. The data analysis process involved analyzing responses from the 5-point Likert scale questionnaire using descriptive statistics. A sample of 61 teachers with different qualifications from different educational institutions in the Sultanate of Oman participated in the study. The findings revealed that teachers had a positive level of readiness to implement GenAI, highlighting a spectrum of readiness levels, such as attending training sessions about GenAI, and a significant willingness of utilizing GenAI tools in their classes. On the other hand, teachers reported a positive benefit and experience in improving their teaching, stating that GenAI enables them to save their time, improves their teaching experience and job satisfaction, and offers them adaptive learning and instant feedback. However, findings revealed number of challenges for teachers such as a lack of awareness about policies and ethics in implementing GenAI tools, and their cost. Moreover, teachers indicated a moderate concern regarding the challenges of integrating GenAI tools into their teaching practices. Based on the findings, the study provides significant insight for teachers,

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policymakers, and syllabi designers, stressing the significant importance of preparing teachers to efficiently integrate GenAI in their pedagogical duties to make the most educational potential while mitigating related risks.

Keywords: Generative Artificial Intelligence (GenAI), readiness, benefits, challenges, teachers.

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1. Introduction

At the present time, Generative Artificial Intelligence (GenAI) is steadily making its way into every aspect of human life and modern education is not excluded. GenAI has the potential to digitalize education in various fields including, healthcare, entertainment, and research (Sidhu, 2024; Uppin, 2024). GenAI has made a revolution in the educational context by offering personalized learning experiences, automating tasks, and enhancing content creation (Matsumoto, 2023; Vafadar & Amani, 2024). It has the potential to transform instructional strategies, improve student engagement, and alleviate teachers' workloads (Alali et al., 2024; Kadaruddin, 2023). Furthermore, AI-powered applications present flexible learning opportunities, enabling personalized educational experiences. By utilizing these findings, AI application developers can optimize their designs to better serve learners, ultimately contributing to their business growth and success (Wu et al., 2024). Furthermore, Wang and Xue (2024) declared that AI chatbots have had a positive effect on how students engage in Chinese EFL classrooms.

However, the utilization of AI tools in educational contexts raises concerns about certain challenges such as copyright infringement, privacy, bias, and ethical use (Garon, 2023; Sidhu, 2024). As the technology continues to develop, it is crucial for educators and practitioners to understand its distinctive characteristics such as readiness for use, benefits, and challenges to harness its potential and address associated challenges (Banh & Strobel, 2023; Xin & Derakhshan, 2025). The rapid adoption and investment in GenAI suggest that it may have far-reaching impacts comparable to the internet (Batchu & Satya, 2024; Garon, 2023).

In the same vein, GenAI tools in education include adaptive assessments, interactive content, and automated feedback (Rajendran, 2023; Uppin, 2024). While GenAI presents numerous opportunities, challenges such as algorithmic bias, data privacy, and ethical concerns must be addressed (Rehman et al., 2025). Successful implementation of GenAI in education requires collaboration between educators, policymakers, and AI developers to ensure responsible and equitable integration even students (Kadaruddin, 2023; Mudhsh et al., 2025). As GenAI continues to evolve, it is crucial for higher education stakeholders to stay informed about its potential

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impacts and develop adequate practices for its use in academic settings (Alali et al., 2024).

More related to the context of the study, as technology advances, it is essential for Omani educators to comprehend their readiness towards GenAI, and explore its benefits and challenges. Therefore, this study is intended to unveil the teachers' readiness, benefits, and challenges in utilizing GenAI in today's education in Oman. Moreover, after reviewing the existing literature in the Omani context, it was found the necessity and recommendations for additional research on GenAI to explore the Omani context in this innovative area (Al-Raimi et al., 2024; Al-Saiari et al., 2024). The significance of this study lies in its rarity within the Omani context. As it aims to make a valuable contribution to the initiatives outlined in Oman Vision 2040, particularly in enhancing the technological teaching and learning capabilities of Omani teachers.

2. Literature Review

Recent literature on Generative Artificial Intelligence (GenAI) technologies in education highlights its transformative potential across various domains, including language learning (Al-Raimi et al., 2024; Al-Saiari et al., 2024; Derakhshan, 2025), higher education (Bannister et al., 2023), and medical and engineering education (Bahroun et al., 2023). GenAI tools, mainly ChatGPT, has gained significant attention and acceptance in educational settings (Bahroun et al., 2023; Baytak, 2023; Derakhshan & Ghiasvand, 2024). These technologies, generally, offer benefits such as personalized learning, automated assessment, and enhanced content creation (Alali et al., 2024; Sekli et al., 2024). Nevertheless, challenges persist, including ethical concerns, data privacy issues, and potential biases (Baek & Wilson, 2024; Kadaruddin, 2023). Researchers have emphasized the need for responsible integration, continuous professional development for educators and users, and further empirical studies to assess the long-term impact of GenAI on learning outcomes (Bannister et al., 2023; Law, 2024). Future research directions include exploring and investigating AI-enhanced curriculum design, interdisciplinary applications, and developing pedagogical strategies to optimize GenAI use in education (Bahroun et al., 2023; Sekli

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et al., 2024). In the following paragraphs, researchers addressed studies related to readiness, benefit, and challenges of GenAI in modern education contexts.

When it comes to GenAI teachers' readiness to utilize these tools in their teaching, earlier studies have examined teachers' readiness and attitudes towards GenAI in education (Kohnke et al., 2023; Moorhouse, 2024; Wang et al., 2023; Zhang & Villanueva, 2023). For instance, a study by Moorhouse (2024) investigated the readiness and perceptions of English language teachers first-year (beginners) regarding the use of GenAI tools in their learning and teaching process. The study revealed that teachers were mostly ready to use GenAI tools like ChatGPT and recognized their potential benefits for their professional work. In addition, beginner teachers (in their first year) were not prepared to use GenAI technologies and had inadequate knowledge about these tools. The study provided understandings into the contributors' awareness, readiness, and views on using GenAI tools in language teaching, as well as how to prepare language students to use them efficiently and critically. In a similar vein, Zhang and Villanueva (2023) assessed the technological competence and readiness of teachers at a Chinese university regarding GenAI, finding high overall competence but significant differences based on gender, age, and college affiliation, and a positive correlation between GenAI readiness and technological competence. In addition, Kohnke et al. (2023) explored the preparedness and attitudes of university language instructors towards using GenAI tools in their teaching, and provides direction for the design of training and sessions to address the concerns and challenges related with implementing AI in language learning and teaching. Lastly, Wang et al. (2023) empirically examined teachers' AI readiness, including its four components "cognition, ability, vision, and ethics" and their implications for teachers' work, such as AI-powered revolution and job fulfilment, and recognized three groups of teachers based on their AI tools readiness levels.

On the other side, GenAI has potential benefits to enhance education process, particularly for teachers' professional development. Besides that, GenAI can enhance preservice teachers' self-efficacy and higher-order thinking skills (Lu et al., 2024), support lesson planning and personalized learning (Alali et al., 2024; Derakhshan et al., 2025; Fathi et al., 2024), and promote interactive learning experiences (Baidoo-Anu &

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Owusu Ansah, 2023). However, challenges such as ethical concerns, privacy issues, and potential biases must be addressed (Su & Yang, 2023; Vartiainen & Tedre, 2023). In this regard, a study by AlAli (2024) examined the benefits and challenges of implementing GenAI in education. The study identified actual strategies for implementing GenAI in classrooms, concentrating on pedagogical goals, ethical considerations, and privacy concerns. The study presented case studies of successful utilizations of GenAI, which can offer outline for educators and policymakers to improve teaching and learning practices. Similarly, Yadav (2024) conducted a study on progress of AI with generative abilities and its outcome on education. The study revealed that GenAI has the potential to be used in various educational applications, such as personalized learning, feedback and evaluation, content creation, administrative work automation, forecasting and prediction, interactive learning environments, natural language processing, and collaborative learning. Nevertheless, there are several drawbacks and challenges that may restrict the widespread adoption of GenAI in education, including the difficulty of upholding and advancement of these systems, ethical and privacy problems, and the possible for bias in the formed information.

Finally, it can be concluded that GenAI presents both opportunities and challenges in education. However, its integration raises ethical concerns, including data privacy, algorithmic bias, and academic integrity (Preiksaitis & Rose, 2023; Walczak & Cellary, 2023). Educators must develop new skills to effectively utilize AI tools and critically evaluate AI-generated content (Faccia et al., 2023; Vafadar & Amani, 2024). The implementation of GenAI in education requires careful consideration of ethical guidelines, transparency, and inclusive design principles (Alali & Wardat, 2024). Successful integration demands collaboration among stakeholders, including educators, policymakers, and AI developers (Alali et al., 2024; Kadaruddin, 2023). Although GenAI holds promise for revolutionizing education, addressing challenges such as maintaining human-AI interaction, preventing biases, and ensuring data privacy is crucial for its widespread adoption (Yadav, 2024). Overall, many previous studies emphasized the need for teachers' and users' awareness and strong policies with accurate ethical guidelines to harness the maximum benefits of GenAI tools in education or beyond (Duah & McGivern, 2024; Luo, 2024). After having discussed

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the above potentials and concerns presented by GenAI, this study aims to address the following research questions:

1. What is the current level of readiness for implementing GenAI in education among teachers in Oman?

2. What are the perceived benefits of using GenAI from the perspectives of teachers in Oman?

3. What are the main challenges to implement GenAI technologies in education by teachers in Oman?

4. Is there a correlation between the levels of study and the teachers' perspectives towards implementing GenAI technologies?

3. Methodology

This study aimed to explore the teachers' readiness, perception of benefits, and challenges of using GenAI tools in their teaching context. The main aim of the study is to gather insight onto the teachers' level of readiness to use GenAI tools in their teaching context, the usefulness of using such tools as well as the challenges they believe come with the use of GenAI tools in teaching and learning. The study employed a descriptive research design to achieve its research questions. A sample of 61 teachers, based on their consent by answering the question "*Do you agree to participate in this questionnaire?*" participated at the end of the second semester of the 2023-2024 academic year. These teachers were from different educational institutions in the Sultanate of Oman. The following table illustrates demographic information about the participants:

Table 1

Demographic Information of the Sample of the Study

Items		N	%
Do you use Generative Artificial Intelligence (GenAI) tools in the classrooms/education?	No	10	16.4%
	Yes	51	83.6%
Gender	Female	32	52.5%
	Male	29	47.5%

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Items		N	%
Educational Qualification	BA	25	41.0%
	MA	29	47.5%
	PhD	7	11.5%
Teaching experience	0-3	6	9.8%
	4-7	20	32.8%
	8-10	14	23.0%
	More than 10	21	34.4%
How many years have you been using GenAI tools?	0-1	15	24.6%
	2-3	29	47.5%
	4-5	8	13.1%
	More than 5	9	14.8%

3.1. Instrument of the Study

A 5-point Likert questionnaire was used to collect the data for the study. The questionnaire was divided into three statistical variables with six items in each variable. The first variable aimed at gathering data on the levels of readiness teachers have toward GenAI tools. The second variable focused on gathering data on the perceived usefulness of using the tools. The final variable was used to collect data regarding the challenges faced by teachers.

3.2. Instrument Reliability

Table 2

Instrument Reliability of the Sample of the Study

	Cronbach's Alpha	N of Items
Readiness	.840	6
Benefits	.843	6
Challenges	.844	6

As presented in table (2), the reliability of the scales for readiness, benefits, and challenges in using GenAI tools was assessed using Cronbach's Alpha. The readiness scale (6 items) had a Cronbach's Alpha of 0.840, indicating very good reliability. The benefits and challenges scales (both 6 items) showed very good reliability, with Cronbach's Alpha values of 0.843 and 0.844 respectively.

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3.3. Data Analysis and Results

The data and results obtained are presented in tables and analyzed in relation with the current literature regarding the utilization of GenAI in modern education globally. The results and their analysis are organized in accordance with the research questions.

Table 3

Means and Standard Deviations of the Readiness Items

Item	Mean	SD
I am ready to use GenAI tools in my classes.	3.92	.781
I am ready to show my students how to use GenAI tools.	3.69	.941
I am ready to attend training, workshops, seminars, and other events about GenAI tools in teaching and learning.	3.97	.730
I use GenAI tools to prepare assignments and materials for my students.	3.41	1.039
I am ready to integrate GenAI tools into the curriculum.	3.62	1.003
I am interested in using GenAI tools in my teaching context.	3.90	.676
Total	3.7514	.57544

As presented in Table (3), the descriptive statistics for the readiness scale indicate that teachers generally have a positive attitude towards using GenAI tools in education. The highest readiness indicator was for attending training and events about GenAI tools (*M = 3.97, SD = 0.730*) and using these tools in their classes (*M = 3.92, SD = 0.781*). Teachers also showed interest in integrating GenAI tools into their teaching context (*M = 3.90, SD = 0.676*) and preparing materials for students (*M = 3.41, SD = 1.039*). Overall, the average readiness score was 3.75, with a standard deviation of 0.575, reflecting a generally positive level of readiness.

Table 4

Means and Standard Deviations of the Benefits Items

Item	Mean	SD
Using GenAI tools improve my teaching experience and job satisfaction.	3.87	.645
GenAI tools enhance my students' creativity and learning outcomes.	3.64	.857
GenAI tools save my time.	3.92	.690
GenAI is beneficial for generating students' assignments and materials.	3.79	.710
GenAI tools offer adaptive learning and instant feedback	3.82	.719
GenAI tools provide insights and recommendations for curriculum development.	3.67	.926
Total	3.7842	.45780

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Table (4) shows the descriptive statistics for the benefits scale. The findings show that teachers generally perceive GenAI tools positively in improving their teaching experience. The highest-rated benefit was time-saving (*M = 3.92, SD = 0.690*), followed by improvements in teaching experience and job satisfaction (*M = 3.87, SD = 0.645*), and offering adaptive learning and instant feedback (*M = 3.82, SD = 0.719*). Teachers also believe GenAI enhances students' creativity and learning outcomes (*M = 3.64, SD = 0.857*) and provides insights for curriculum development (*M = 3.67, SD = 0.926*). The overall mean for the Benefits scale was 3.78 with a standard deviation of 0.458, reflecting a generally positive perception of the benefits of GenAI tools in education.

Table 5

Means and Standard Deviations of the Challenges Items

Item	Mean	SD
GenAI tools have limited tasks and resources.	3.18	1.190
I am not aware of how to use GenAI tools.	3.23	1.071
I am not confident in using GenAI tools in my classes.	3.23	1.007
I am not aware of the policies and ethics of using GenAI tools.	3.70	1.160
GenAI tools provide incorrect and biased information.	3.59	.616
GenAI tools are costly for teachers.	3.67	.926
Total	3.4344	.60727

As shown in Table (5), the descriptive statistics for the challenges scale highlight several concerns teachers have regarding the use of GenAI tools. The most significant challenge identified was a lack of awareness about policies and ethics surrounding GenAI use (*M = 3.70, SD = 1.160*), followed by concerns over the cost of GenAI tools (*M = 3.67, SD = 0.926*) and the delivery of incorrect or biased information (*M = 3.59, SD = 0.616*). Teachers also expressed uncertainty about using GenAI tools, with scores for limited tasks and resources (*M = 3.18, SD = 1.190*), lack of confidence (*M = 3.23, SD = 1.007*), and lack of awareness about how to use the tools (*M = 3.23, SD = 1.071*). The overall mean for the challenges scale was 3.43 with a standard deviation of 0.607, indicating moderate concern among teachers regarding the challenges of integrating GenAI tools into their teaching practices.

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3.4. Correlational analysis

Table 6
Correlations

		Readiness	Benefits	Challenges
Readiness	Pearson Correlation	--		
	N	61		
Benefits	Pearson Correlation	.566**	--	
	Sig. (2-tailed)	<.001		
	N	61	61	
Challenges	Pearson Correlation	-.234-	-.108-	--
	Sig. (2-tailed)	.069	.406	
	N	61	61	61

**. Correlation is significant at the 0.01 level (2-tailed).

The correlational analysis shown in Table (6) reveals that readiness and benefits are significantly positively correlated ($r = 0.566$, $p < 0.001$), indicating that teachers who feel more prepared to use GenAI tools perceive greater benefits. However, the correlations between readiness and challenges ($r = -0.234$, $p = 0.069$) and between benefits and challenges ($r = -0.108$, $p = 0.406$) are weak and not statistically significant, suggesting that readiness and perceived benefits are only minimally related to the challenges faced. The positive correlation between readiness and benefits underscores the role of teacher preparedness in realizing the advantages of GenAI tools.

3.5. Differences Overall

Table 7
The Overall Differences

Categorical variable	Test used	Asymp. Sig. (2-tailed)		
		Readiness	Benefits	Challenges
Gender	Mann-Whitney U	.140	.476	.074
Education	Kruskal-Wallis H	.357	.229	.005*
Teaching experience	Kruskal-Wallis H	.117	.511	.104
Years of Using GenAI tools	Kruskal-Wallis H	.147	.516	.933

As shown in Table (7), the analysis of categorical variables using appropriate statistical tests revealed the following findings: For Gender, the Mann-Whitney U test

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showed no significant differences in perceptions of Readiness (p = 0.140), Benefits (p = 0.476), or Challenges (p = 0.074). The Kruskal-Wallis H test for Education indicated no significant differences in Readiness (p = 0.357) or Benefits (p = 0.229), but revealed a significant difference in Challenges (p = 0.005*), suggesting educational qualification affects how challenges are perceived. Teaching experience and the number of years using GenAI tools, as assessed by the Kruskal-Wallis H test, showed no significant differences in readiness (p = 0.117), benefits (p = 0.511), or challenges (p = 0.104 and p = 0.933), respectively.

4. Discussion

This section is divided into three subsections related to the study's variables namely: readiness, benefits, and challenges of GenAI in education. The first subsection addresses the readiness of teachers in Oman towards the use of GenAI in education, whereas the second subsection addresses the teachers' benefits of GenAI in education. The last subsection discusses the challenges of GenAI in education.

4.1. Readiness

As presented in the data analysis, teachers showed a positive attitude towards using GenAI tools in education. As listed in Table (1) that the highest readiness indicator was for attending training and events about GenAI tools with mean 3.97. Moreover, teachers showed a significant willingness to utilize GenAI tools in their classes with a mean of 3.92. Teachers also showed positive attitude towards integrating GenAI tools into their teaching context with mean 3.90, and preparing materials for their students using GenAI with mean 3.41. Generally, the average readiness score was 3.75, with a standard deviation of 0.575, reflecting a generally positive level of readiness of teachers to utilize GenAI in their teaching and learning contexts. These findings align with the results of some previous investigations, including Al-Saiari et al. (2024), Kohnke et al. (2023), Moorhouse (2024), and Wang et al. (2023). This array of previous studies demonstrated the high level of teachers' readiness of utilizing GenAI in education contexts. In addition, these studies underscore the importance of training teachers' to be ready to integrate GenAI in education in general.

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4.2. Benefits

In terms of the perceived benefits in utilizing GenAI, in this study, teachers generally indicated a positive benefit and experience in improving their teaching. The analysis revealed that the highest-rated benefit of GenAI was for time-saving with a mean of 3.92, followed by improvements in teaching experience and job satisfaction with a mean of 3.87, and offering adaptive learning and instant feedback with mean 3.82. In all, the overall mean for the perceived benefits rate was 3.78 with a standard deviation of 0.458, which reflects a generally positive perception of the benefits of GenAI tools in education. This finding confirms the results of the previous studies such as AlAli (2024), Lu et al. (2024), Baidoo-Anu and Ansah (2023) Mohammed et al (2025). However, some studies indicated the significant benefits of GenAI tools, but some challenges such as ethical concerns, privacy issues, and potential biases must be addressed (Su & Yang, 2023; Vartiainen & Tedre, 2023).

Based on the analysis, teachers also believe that GenAI enhances students' creativity and learning outcomes and provides insights for curriculum development. This finding goes in line with a study which was conducted to identify the level of readiness of school teachers at the Sultanate of Oman to employ new technologies in education (Al-Nasri & Al-Mufararji, 2022).

4.3. Challenges

As shown in Table (5), there is a several challenges that teachers encounter while implementing GenAI in their education contexts. The most significant challenge identified was a lack of awareness about policies and ethics in implementing GenAI tools with mean 3.70. This finding was previously supported by several studies such as Duah and McGivern (2024), Luo (2024), and Rahman et al (2025). These studies stressed the necessity for teachers' and users' awareness and solid policies with accurate ethical guidelines to harness the maximum benefits of GenAI tools in education.

The other challenges stated by teachers concerns the cost of GenAI tools with a mean of 3.67, and the incorrect or biased information with a mean of 3.59. in addition,

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teachers also stated doubt about using GenAI tools, with scores for limited tasks and resources with mean 3.18, lack of confidence with mean 3.23 and lack of awareness about how to use the tools with mean 3.23. The overall mean for the challenges scale was 3.43 with a standard deviation of 0.607, indicating moderate concern among teachers regarding the challenges of integrating GenAI tools into their teaching practices.

5. Recommendations and Pedagogical Implications

In light of the findings, it is recommended that institutions in Oman should provide continuous training on GenAI technologies to update teachers on the recent advancements of these technologies and their tools in education. It is also recommended that workshops and seminars should be conducted regularly, focusing on specific GenAI tools that have potential in helping teachers in their classrooms, with hands-on sessions. In addition, a particular training on the ethical considerations of GenAI tools should be given priority to address issues concerned with bias, data privacy, and the ethical utilizations of GenAI tools in education. On the other side, the implications for teachers, policymakers, and syllabi designers are that they should keep in their attentions the importance of adaptive learning systems of GenAI that tailor the learning process for students needs to enhance their engagement and their learning outcomes. Teachers should also be equipped with GenAI tools that provide personalized learning, assessment and feedback tools, and teachers' roles and duties. It is hoped that implementing these recommendations and the pedagogical implications will effectively enhance both teaching and learning outcomes in Oman and beyond.

6. Conclusion

To close, the current study explored the teachers' readiness to implement GenAI technologies, highlighting the benefits and challenges related to these GenAI technologies implementation. The findings revealed that teachers had a positive level of readiness to integrate GenAI technologies in their teaching and learning settings. They also showed a great enthusiasm to attend and participate in training and sessions

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associated to GenAI tools. When it comes to GenAI technologies benefits, teachers affirmed that GenAI tools are very beneficial for saving their time, improving their teaching performances and job satisfaction, and offering adaptive learning and instant feedback. Despite these potential benefits, the findings revealed a few challenges persist. These challenges include their lack of awareness about policies and ethics in implementing GenAI tools, and the fear of incorrect or biased information GenAI tools may provide. Teachers also pointed out their uncertainty about using GenAI to perfume some tasks and provide reliable resources which lead them to a sort of lack in these GenAI technologies. On the other side, the study has some limitations, such as its application to one Omani institutions, which limits its applicability to many other universities. In addition, the relatively small sample size and mono-method data collection narrow the breadth of the findings, and thus their generalizability to some other populations is rather cautionary. These limitations may be beneficial points for future research. Future studies could examine strategies to increase teachers' confidence in using GenAI technologies by exploring the development of clearer policies and guidelines that ensure the effective and accurate use of these tools in educational contexts.

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