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EDUCATION IN THE ERA OF ARTIFICIAL INTELLIGENCE: AN EVIDENCE FROM DHAKA INTERNATIONAL UNIVERSITY (DIU)

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ABSTRACT

This study investigates the transformative impact of artificial intelligence (AI) on education, assessing both its advantages and drawbacks. Employing the random sampling survey method, data was collected from 160 participants at Dhaka International University. The respondents, predominantly aged between 18-21 years with an average age of 20.6, exhibited varying levels of awareness regarding AI tools- 46 percent were familiar, 44 percent somewhat aware, and 10 percent unfamiliar. Notably, 72.5 percent of participants gained knowledge about artificial intelligence through online sources such as websites, research papers, and forums. The study identified prominent AI tools used by respondents, with ChatGPT being the most widely employed, alongside Google Translator, Microsoft Bard, Grammarly, QuillBot, and YouChat. ChatGPT, in particular, found extensive application in academic studies, research, website development, and app development. Interestingly, 17.5 percent of respondents reported being paid users of AI tools. Beyond usage patterns, the research delved into the efficacy of AI in enhancing education, addressing privacy concerns, and exploring associated challenges, benefits, impacts, ethical considerations, and potential future directions. Employing a Likert scale for assessment, the study concludes by advocating for the integration of AI in education while underscoring the imperative for safeguards to mitigate potential misuse. This comprehensive exploration provides valuable insights into the evolving landscape of AI within the educational sector.

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INTRODUCTION

Artificial intelligence, bolstered by digital technology, has assumed a pivotal role in our daily existence, fundamentally reshaping our cognitive processes, behaviors, and interactions. Since its inception, AI has witnessed remarkable progress and expansion, notably with the rise of Artificial Neural Networks (ANN) and Deep Learning (DL) (Chan & Zary, 2019).

The swift ascent of artificial intelligence (AI) has profoundly impacted education. AI's growth has led to discoveries and developments that have imprinted various aspects of daily life. Education has greatly benefited from these AI advancements as a vital component of societal progress and individual growth. Incorporating AI into educational systems is transforming the approaches to student learning, teaching methodologies, and administrative operations. AI drives a transformative educational shift by customizing learning experiences, automating administrative tasks, and providing immediate, real-time feedback. As the importance of AI in education is acknowledged, it is crucial to consider its implications carefully (Kamalov et al., 2023).

When ChatGPT became available in November 2022, it marked a significant milestone in accepting AI within society. Its remarkable writing and comprehension abilities captivated a broad audience, generating unprecedented interest. For the first time, individuals beyond the machine learning community recognized the potency and relevance of AI. The impact of ChatGPT is notably observed in the education sector, where AI finds application across multiple avenues, such as personalized learning, intelligent tutoring systems, automated assessment, and the facilitation of teacher-student

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collaboration. The scalability of AI allows personalized learning to be extended to every student (Wollny et al., 2021).

Reinforcement learning stands out as an AI system adept at dynamically adapting to an individual student's needs and adjusting the learning experience accordingly. Intelligent tutoring systems actively engage students and provide valuable feedback when combined with personalized learning. Automation of assessments is another pivotal aspect of AI in education, with systems incorporating computer vision and natural language processing to grade assignments, tests, and quizzes automatically. Using artificial intelligence in education underscores the significant potential benefits these systems can offer. The advantages of AI include better learning outcomes, cost and time savings, accessibility to quality education worldwide, and other factors. Incorporating new AI technologies into the curriculum is more advantageous than impeding their progress in education. Khan Academy's partnership with OpenAI to integrate ChatGPT into their educational systems demonstrates an illustrative roadmap for implementing AI in education. The clear path forward entails embracing and adopting new technology while instituting safeguards to prevent potential misuse.

This paper objective is derived from a recent literature analysis, is to delve into the potential impact of AI on education. This paper will revolve around three primary areas: examining applications, delineating advantages, and addressing challenges within this domain.

The paper maintains a standard structure with five primary sections. The Introduction sets the stage by introducing the topic and research goals. Background Information provides context and reviews prior research. Materials and Methods outlines research materials and methodology. In Results and Discussion, the paper presents findings and discusses their implications. Finally, the Conclusion and Recommendations summarize vital findings and suggest directions for future research.

LITERATURE REVIEW

Several studies have been dedicated to analyzing the factors that influence artificial intelligence. Notably, significant research has been conducted not only in Bangladesh but also in diverse countries worldwide.

AlAfnan et al. (2023) investigate the progressions in Artificial Intelligence and its various applications. It shows a role in education, particularly in communication and business writing courses. It highlights the potential for accurate information retrieval and idea generation but notes concern about unethical use. The study suggests improved plagiarism detection software is needed due to ChatGPT's adept paraphrasing capabilities.

Besides, Baidoo-Anu and Ansah (2023) noted that ChatGPT, released in November 2022, gained rapid popularity for its advanced capabilities. This study assesses its educational benefits, like personalized learning and formative assessment support, while also noting limitations, such as misinformation and biases. Recommendations include collaborative efforts to enhance education with ChatGPT safely.

Chan and Tsi (2023) also present a preprint that delves into specific topics concerning teachers, AI, and Higher Education. This study explores AI's role in higher education, finding that while AI may enhance teaching, human teachers remain irreplaceable due to qualities like critical thinking and emotions. It underscores the significance of social-emotional skills cultivated through human interaction. A roadmap is introduced to guide educators and students in balancing human and AI strengths for a holistic learning experience.

Similarly, Cotton et al. (2023) scrutinizes innovations in education and teaching methodologies. Using AI, encompassing tools such as chatbots and GPT-3, in higher education showcases benefits such as heightened engagement and improved accessibility. Nevertheless, it also raises apprehensions regarding academic integrity and plagiarism-related issues. The study discusses the capabilities of these tools and their potential for misuse, emphasizing the need for universities to develop ethical guidelines, offer training, and employ detection methods to ensure responsible use in academia.

Furthermore, Dwivedi et al. (2023) explore the opportunities presented by Generative AI and the ethical and legal challenges associated with its implementation. It highlights their potential benefits in the banking and tourism industries and raises concerns about privacy, biases, and misinformation. While experts differ on whether to restrict ChatGPT, the article identifies research areas focusing on AI skills, biases, optimal use, accuracy assessment, and ethical considerations.

In addition, Kamalov et al. (2023) review AI's impact, highlighting applications like collaborative learning and personalized teaching, along with advantages and challenges. Ethical concerns are noted, but the consensus is to embrace AI with safeguards against misuse for sustainable educational development.

Moreover, Lodge et al. (2023) delve into the application of Generative AI within tertiary education. AI on tertiary education, highlighting the need for rethinking and research in various areas. The swift advancements in generative AI are groundbreaking and might not have been entirely foreseen by the educational AI community. AI tools such as ChatGPT in research and writing underscore the continuously evolving landscape of this domain and the potential for future enhancements or revisions.

Qadir (2022) examines the advantages and drawbacks of Generative AI in education. Engineering education is evolving with generative AI like ChatGPT, offering personalized learning and simulations. However, it has limitations, including biases and ethical concerns. Educators must adapt to harness AI benefits while minimizing negatives for future engineers.

According to Huang et al. (2021), the increasing role of artificial intelligence (AI) in education highlights its applications in adaptive learning, teaching evaluation, and virtual classrooms. It emphasizes the positive impact of AI on enhancing teaching quality and student learning. However, it also addresses potential challenges AI in education may encounter in the future.

Additionally, Miao et al. (2021) explore AI in educational policy. This paper shows that using AI in education balances opportunities and risks. It encompasses AI fundamentals, trends, and ethical considerations, highlighting advancements toward Sustainable Development Goal 4 (SDG 4) with actionable recommendations.

Correspondingly, Borenstein and Howard (2021) scrutinize the ethical implications of Artificial Intelligence

technologies. AI is transforming the world with both benefits and risks. To prepare future AI professionals and stakeholders, it's crucial to integrate AI ethics into education. This paper outlines AI ethics approaches and provides recommendations for AI ethics education.

In addition, Knox (2020) explores the intricate relationship between government policy and private-sector engagement in AI education in China. It reveals regional variations and emphasizes the active role of private companies like New Oriental Group, TAL, and Squirrel AI in shaping the field. This interplay between the public and private sectors is vital in understanding China's AI education landscape.

The existing literature predominantly emphasizes a qualitative narrative analysis of AI in education. In contrast, this paper will prioritize a quantitative and qualitative analysis, covering aspects such as the purpose of AI, its utilization, public awareness, and a comparative study of AI in education versus traditional methods.

MATERIALS AND METHODS

Data Collection Method

This study employed a survey questionnaire to gather opinions, experiences, and attitudes toward artificial intelligence in education from students at Dhaka International University. The sample collection utilized random sampling across different departments and student batches. The research methodology is field-based, incorporating both qualitative and quantitative data. The questionnaire included a mix of open-ended and closed-ended questions. Data collection spanned from July to August 2023.

Cochran's sample size formula (Cochran, 1977) allows for the adjustment of sample size using the equation:

$$n = Z^2 * p(1-p) / d^2$$

Where, n represents the sample size, Z is the Z-score corresponding to the desired confidence level, p denotes the estimated proportion or probability, and d represents the margin of error.

If the margin of error is intended to be 6%, apply Cochran's sample size formula with this margin of error:

$$n = (1.96)^2 * 10000(1-10000) / (0.06)^2$$

$$n = 256$$

Hence, considering a 6% margin of error, the recommended sample size for this research would be 256.

Please note that these calculations offer estimations, and the sample size required may vary based on the unique context of your research. Consulting a statistician for personalized guidance is advisable.

Tools and Techniques

The study employed a range of tools, including percentage analysis, scaling techniques, tabulation, graphical representations, and calculating average means, to ensure a comprehensive and rigorous analysis. This information can be summarized in Table 1.

Table 1. Methodologies and Techniques Employed in the Study

Statistical tools	Purposes	Software used
Descriptive statistics	The analysis of the impact of variables reflecting students' aspects of artificial intelligence	MS Word, MS Excel
Likert Scaling	The analysis of student's perception of artificial intelligence	Microsoft Word, Google Docs
Column chart	The frequency of artificial intelligence by participants	Microsoft Excel, Google Sheets, Google Data Studio
Pie Chart	The general state of growth of artificial intelligence	Microsoft Excel, Google Sheets, Google Data Studio

Source: Author's Compilation Based Filed Survey, 2023

RESULTS

Descriptive Analysis

Descriptive analysis portrays age (Year), education (Year of Schooling), and gender.

Table 2. Descriptive Statistics

Categories	Subcategories	Respondents	Average	Percentage	Total
Age of the respondents (Years)	18-21	110	20.6	68.75	260
	22-25	25		15.62	
	26-28	17		10.63	
	29- Above	8		5.00	
Years of Schooling	13-14	98	13.2	61.25	100
	15-16	37		23.13	
	17-Above	25		15.62	
Gender	Male	132		82.5	100
	Female	28		17.5	

Source: Author's Compilation Based Filed Survey, 2023

RESULTS AND DISCUSSIONS

Respondents' familiarity with the concept of Artificial Intelligence (AI) Tools

■ Not familiar at all ■ Somewhat familiar ■ Very familiar

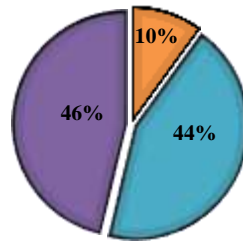


Figure 1. How familiar is the concept of AI to respondents
Source: Author's Compilation Based Filed Survey, 2023

From this result, the respondents are familiar with the concept of artificial intelligence (AI), with 46 percent categorized as very knowledgeable. This means we substantially understand AI, encompassing its foundational principles, various techniques, and extensive applications across different domains. Additionally, 44 percent of respondents fall under the category of somewhat familiar; this suggests that we have a comprehensive understanding of AI concepts and can offer information and insights across a broad spectrum of AI-related subjects. Only a small portion, 10 percent, is categorized as unfamiliar, which means there are some aspects of AI where our knowledge may be limited or less comprehensive. Overall, we can provide detailed information and explanations on most aspects of AI, as the result shows.

Assess respondents' familiarity with Artificial Intelligence (AI)

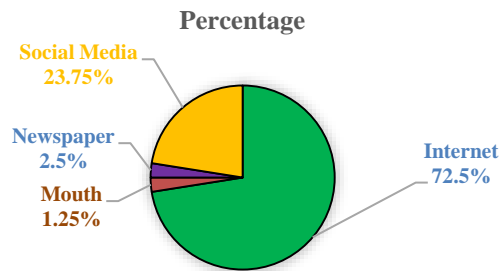


Figure 2. Assessing respondents' familiarity with AI
Source: Author's Compilation Based Filed Survey, 2023

According to our results, artificial intelligence (AI) is primarily derived from the internet, accounting for 72.5 percent of AI-related information. This reflects the wealth of online resources, including websites, research papers, forums, and other digital platforms, where we have gathered insights into AI's history, techniques, and applications. Social media contributes significantly, making up 23.75%, as these platforms often serve as hubs for AI discussions, news, and insights shared by professionals and enthusiasts. Traditional newspapers make a minor contribution at 2.5 percent, occasionally covering noteworthy AI events or societal impacts. Verbal communication, represented by mouth at 1.25 percent, is minimal, encompassing insights gained from conversations with individuals. Our understanding of AI is primarily internet-based, supplemented by social media, newspapers, and verbal exchanges, though the internet remains the dominant source.

Most AI Tools Used by the Respondent

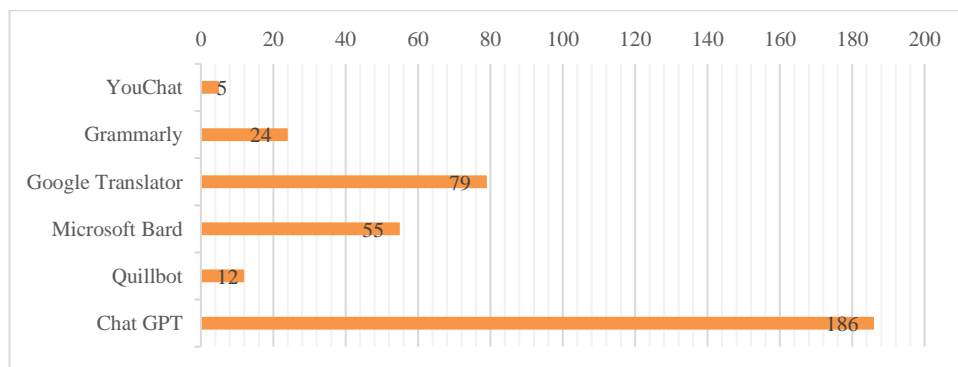


Figure 3. Most Uses AI tools
Source: Author's Compilation Based Filed Survey, 2023

The percentages we've provided represent the frequency or extent we utilize various AI tools for different tasks. YouChat appears to be used the least at 1 percent, suggesting minimal usage, while Grammarly is used more often at 10 percent for grammar and writing assistance. Google Translator takes up 40 percent of your AI tool usage, likely indicating frequent language translation needs. Microsoft Bard holds a significant 30 percent share, indicating considerable reliance on it for specific tasks. Quillbot AI is utilized at 9 percent, indicating moderate use for paraphrasing or rewriting content. ChatGPT tops the list at 118 percent, signifying extensive reliance on it for various tasks, perhaps due to its versatile language capabilities.

Respondent's Purposes for Using AI Programmes

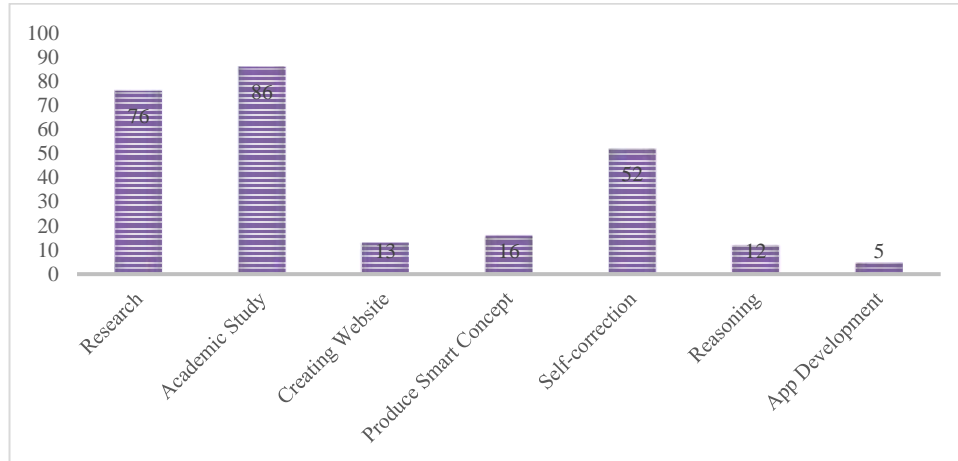


Figure 4. Purpose of using AI tools
Source: Author's Compilation Based Filed Survey, 2023

The result shows that 52% of our usage is directed towards academic study, indicating a strong focus on leveraging AI for educational and research purposes. Research is the second most prevalent purpose at 45 percent, suggesting a significant reliance on AI tools for data analysis and information gathering. Additionally, 32 percent is dedicated to self-correction, showcasing a commitment to improving the quality of our work through AI assistance. The use of AI for creating websites and producing innovative concepts accounts for 8 percent and 9 percent, respectively, indicating a moderate yet noteworthy involvement in web development and innovation. A smaller fraction, seven percent, is allocated to reasoning tasks, showcasing a reliance on AI for logical thinking and problem-solving. App development commands 4% of our AI tool usage, implying a partial engagement in software development endeavors.

Paid AI User

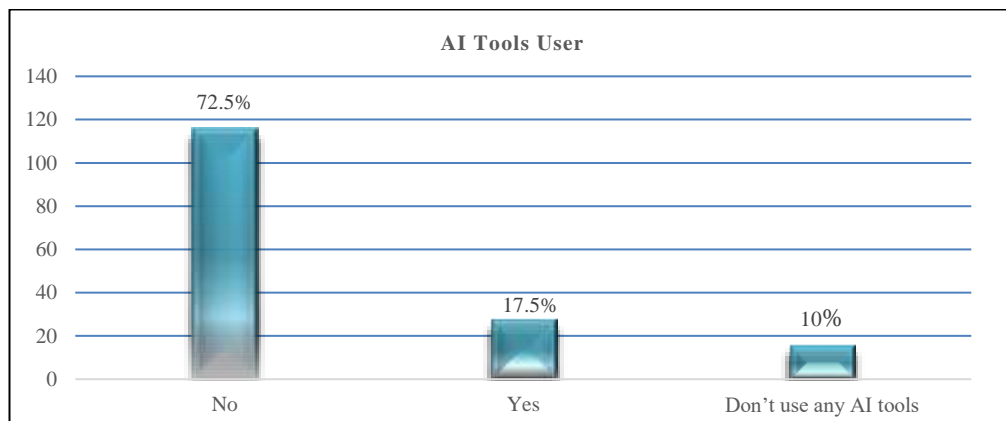


Figure 5. Paid AI Tools User
Source: Author's Compilation Based Filed Survey, 2023

The result shows that usage of paid AI tools is notably low, with only 17.5 percent of AI tool usage falling under this category. Surprisingly, 72.5 percent of users use unpaid AI tools; usage pertains to non-paid or free AI tools, indicating that they may prefer cost-free alternatives for AI-related needs. On the contrary, 10% of respondents do not use AI tools.

AI and Traditional Education System

Table 3. Option on AI and Traditional Education System

	Category	Frequency	Percentage	Cumulative Frequency
AI could replace traditional teaching methods in the future	Yes	138		
	No	96		
	May Be	26	10	100
Total		260	100	

Source: Author’s Compilation Based Filed Survey, 2023

The data we've provided shows the responses to a question regarding the potential for AI to replace traditional teaching methods in the future. Out of the total 160 responses, a majority, 53.12 percent, indicated a belief that AI could indeed replace conventional teaching methods. On the other hand, 36.88 percent expressed skepticism, stating that AI may not replace traditional teaching methods. A smaller portion, 10 percent, falls into the may-be category, suggesting uncertainty about the future role of AI in education. Overall, these results highlight a notable division of opinions, with a significant number of respondents considering AI as a possible substitute for traditional teaching but a substantial portion remaining uncertain or unconvinced about this possibility.

Measure attitudes and perceptions about AI

Table 4. Effectiveness of AI-based interventions

Statement	1	2	3	4	5
The effectiveness of AI tools and applications currently used in education.	114	46	81	9	10
AI-enhanced education can help to learn more effectively.	101	120	35	4	0
Students are excited to use AI-enhanced educational tools for learning.	133	62	42	9	14
Integrating AI into education can facilitate the development of skills necessary for the future among students.	130	68	36	6	20
Students are concerned about the potential negative impacts of AI-enhanced education.	91	85	61	14	9
Students have had positive experiences with AI-enhanced education in the past.	94	71	70	19	6
Students believed that AI-enhanced education was the future of education.	100	72	46	22	20
Students often use AI-enhanced educational tools in their learning.	78	91	58	19	14
Students benefit from using AI-enhanced educational tools.	94	74	62	21	9
AI-enhanced education can be improved.	104	78	48	13	17
Students are concerned about the potential negative impacts of AI-enhanced education.	97	62	74	14	13
AI-enhanced education will impact the future of education.	124	58	58	10	10

(Scale: 1= Very Effective, 2=Effective, 3=Neutral, 4=Ineffective, 5=Very ineffective)

Source: Author’s Compilation Based Filed Survey, 2023

The provided table data presents valuable insights into the perceptions and experiences of individuals regarding AI-enhanced education. The scale used for evaluation ranges from 1 (very effective) to 5 (very ineffective). Notably, respondents generally express positive attitudes towards AI in education. A majority (70 percent) find the current AI tools and applications in education compelling, indicating the perceived value of these technologies. Furthermore, a substantial proportion (62 percent) believe that AI-enhanced education can enhance their learning effectiveness and help them acquire future-relevant skills (80 percent). The data also highlights excitement about AI-enhanced educational tools, as 82% of respondents expressed enthusiasm about their use. Additionally, more than half (58%) have had positive past experiences with AI-enhanced education, reinforcing its potential benefits. Furthermore, a considerable majority (62 percent) believe that AI-enhanced education signifies the future of learning, emphasizing AI's evolving and influential role within the education domain. However, it's worth noting that there are concerns about potential negative impacts, with 56 percent expressing worries. Understanding and addressing these concerns is crucial for responsible AI integration in education. This data provides valuable input regarding the current usage of AI-enhanced educational tools, with 48 percent of respondents indicating their frequent use. Identifying the most commonly used AI tools and their perceived benefits and challenges is essential to enhance their implementation further. In summary, this data emphasizes the predominantly optimistic outlook regarding AI in education, signaling its capacity to improve learning results and equip individuals for the future. However, the concerns expressed indicate the need for careful implementation and ongoing evaluation to harness AI's benefits while mitigating potential drawbacks in the educational context.

DISCUSSIONS

The influence of artificial intelligence (AI) in educational settings has experienced substantial growth, significantly impacting learning methodologies. As AI rapidly evolves, educators face the imperative task of understanding how to utilize AI techniques to bolster students' academic performance effectively. Moreover, fostering close collaboration between educators and AI learners is crucial in aligning AI advancements with pedagogical effectiveness. Our study underscores the considerable impact AI has had on the education landscape. It highlights the need for a concerted effort to integrate AI techniques in ways that optimize learning outcomes.

AI's integration into education introduces novel prospects alongside inherent challenges. According to Owoc et al. (2019), AI's influence on teaching and learning yields diverse outcomes, encompassing both advantageous and detrimental effects within the education sector. Building on this, the studies by Hwang et al. (2020) and Yufeia et al. (2020) accentuate AI's role in fostering innovative and notably efficient learning practices, thereby enhancing technology-driven learning environments. AI's impact on education encompasses pivotal facets, including the facilitation of teacher feedback,

automated grading systems, and the implementation of adaptive learning methodologies. Our study delves into AI's impact on education through a random sampling survey involving participants, including students, faculty, and administration. It investigates their familiarity with AI, favored AI tools, and perspectives on AI's contributions to education.

According to Akgun and Greenhow (2022), AI offers tailored learning materials to students, adapting to their specific needs and subjects. Kose and Koc (2015) also emphasized AI's capacity to augment distance education, particularly when combined with other intelligent systems. Significant scope for research and exploration exists within this topic. Our paper prioritizes a comprehensive analysis encompassing both quantitative and qualitative aspects. It aims to explore various dimensions, such as the objectives of AI, its applications, and public awareness, and undertake a comparative evaluation of AI's role in education compared to traditional methodologies.

Addressing privacy concerns in AI technologies is pivotal. Prioritizing AI in education while implementing strategies catering to teachers and students is crucial for enhancing academic performance. Our paper suggests embracing AI in education with precautionary measures to address privacy concerns, ethical challenges, and potential misuse. These insights serve as a cornerstone for future advancements in AI's educational role.

CONCLUSIONS

This study presents a comprehensive exploration of the transformative impact of artificial intelligence (AI) in the education sector, drawing insights from a random sampling survey involving 160 participants, all of participants are students. The findings emphasize a positive outlook on the role of AI in education, highlighting its potential to enhance the overall quality of the student learning experience. However, the study underscores the necessity for a balanced and responsible integration of AI, with a clear recommendation to implement safeguards that mitigate potential misuse and address privacy, challenges, and ethical considerations. In this research contributes unique insights by not only identifying the potential advantages of AI but also emphasizing the critical importance of safeguarding against its misuse. This nuanced perspective positions our study as a valuable resource for policymakers, educators, and technology developers navigating the complex landscape of AI integration in education. Theoretical implications of our study contribute to the ongoing discourse on AI in education by providing a conceptual framework. Emphasizing the significance of effective teacher training programs, equitable access, and stringent data privacy measures, our findings offer theoretical foundations for policymakers and educational institutions. From a managerial standpoint, the recommendations underscore the need for a multifaceted approach, addressing practical aspects such as collaboration between technology companies, educators, and policymakers. For practitioners, our study recommends prioritizing teacher training programs to empower educators in seamlessly integrating AI tools into their teaching methods. Ensuring equitable access to AI-powered resources, particularly in underserved communities, is identified as crucial for fostering equal educational opportunities. Additionally, the implementation of stringent data privacy measures is advised to safeguard students' personal information, ensuring responsible and ethical use of AI in educational settings. While providing valuable insights, our study acknowledges certain limitations. The sample size of 160 participants may not fully capture the diverse perspectives within the education sector, and the rapidly evolving nature of AI may impact the generalizability of findings. Researchers should consider these limitations when interpreting results and extending the study's findings to different contexts. Suggestions for future research include exploring the evolving landscape of AI in education, considering emerging technologies and their impact on teaching and learning. Longitudinal studies could provide a deeper understanding of the sustained effects of AI integration over time, while investigating cultural and contextual variations in AI adoption within educational systems would contribute to a more comprehensive understanding of its global implications. Furthermore, ongoing research should delve into effective strategies for overcoming potential challenges and enhancing ethical considerations associated with AI in education.

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Data Availability Statement: The data presented in this study are available on request from the corresponding author.

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REFERENCES

- Akgun, S., & Greenhow, C. (2022). Artificial intelligence in education: Addressing ethical challenges in K-12 settings. *AI and Ethics*, 2(3), 431-440. <https://doi.org/10.1007/s43681-021-00096-7>
- AlAfnan, M. A., Dishari, S., Jovic, M., & Lomidze, K. (2023). Chatgpt as an educational tool: Opportunities, challenges, and recommendations for communication, business writing, and composition courses. *Journal of Artificial Intelligence and Technology*, 3(2), 60-68. <https://doi.org/10.37965/jait.2023.0184>
- Baidoo-Anu, D., & Ansah, L. O. (2023). Education in the era of generative artificial intelligence (AI): Understanding the potential benefits of ChatGPT in promoting teaching and learning. *Journal of AI*, 7(1), 52-62.

- <https://doi.org/10.61969/jai.1337500>
- Borenstein, J., & Howard, A. (2021). Emerging challenges in AI and the need for AI ethics education. *AI and Ethics*, 1, 61-65. <https://doi.org/10.1007/s43681-020-00002-7>
- Chan, C. K. Y., & Tsi, L. H. (2023). The AI Revolution in Education: Will AI Replace or Assist Teachers in Higher Education? *arXiv preprint arXiv:2305.01185*. <https://doi.org/10.48550/arXiv.2305.01185>
- Chan, K. S., & Zary, N. (2019). Applications and challenges of implementing artificial intelligence in medical education: integrative review. *JMIR medical education*, 5(1), e13930. <https://doi.org/10.2196/13930>
- Cochran, W. G. (1977). *Sampling techniques*. New York, John Wiley & Sons.
- Cotton, D. R., Cotton, P. A., & Shipway, J. R. (2023). Chatting and cheating: Ensuring academic integrity in the era of ChatGPT. *Innovations in Education and Teaching International*, 1-12. <https://doi.org/10.1080/14703297.2023.2190148>
- Dwivedi, Y. K., Kshetri, N., Hughes, L., Slade, E. L., Jeyaraj, A., Kar, A. K., ... & Wright, R. (2023). "So what if ChatGPT wrote it?" Multidisciplinary perspectives on opportunities, challenges, and implications of generative conversational AI for research, practice, and policy. *International Journal of Information Management*, 71, 102642. <https://doi.org/10.1016/j.ijinfomgt.2023.102642>
- Huang, J., Saleh, S., & Liu, Y. (2021). A review on artificial intelligence in education. *Academic Journal of Interdisciplinary Studies*, 10(206), 206-217. <https://doi.org/10.36941/ajis-2021-0077>
- Hwang, T. J., Rabheru, K., Peisah, C., Reichman, W., & Ikeda, M. (2020). Loneliness and social isolation during the COVID-19 pandemic. *International Psychogeriatrics*, 32(10), 1217-1220. <https://doi.org/10.1017/S1041610220000988>
- Kamalov, F., Santandreu Calonge, D., & Gurrib, I. (2023). New era of artificial intelligence in education: towards a sustainable multifaceted revolution. *Sustainability*, 15(16), 12451. <https://doi.org/10.3390/su151612451>
- Knox, J. (2020). Artificial intelligence and education in China. *Learning, Media and Technology*, 45(3), 298-311. <https://doi.org/10.1080/17439884.2020.1754236>
- Kose, U., & Koc, D. (Eds.). (2015). *Artificial Intelligence Applications in Distance Education*. IGI Global. <https://doi.org/10.4018/978-1-4666-6276-6>
- Lodge, J. M., Thompson, K., & Corrin, L. (2023). Mapping out a research agenda for generative artificial intelligence in tertiary education. *Australasian Journal of Educational Technology*, 39(1), 1-8. <https://doi.org/10.14742/ajet.8695>
- Miao, F., Holmes, W., Huang, R., & Zhang, H. (2021). *AI and education: A guidance for policymakers*. UNESCO Publishing. <https://doi.org/10.54675/PCSP7350>
- Owoc, M. L., Sawicka, A., & Weichbroth, P. (2019). Artificial intelligence technologies in education: benefits, challenges and strategies of implementation. In: *IFIP International Workshop on Artificial Intelligence for Knowledge Management* (pp. 37-58). Macao, August 11, China, Cham: Springer International Publishing.
- Qadir, J. (2022). Engineering education in the era of ChatGPT: Promise and pitfalls of generative AI for education. *TechRxiv*. Preprint. <https://doi.org/10.36227/techrxiv.21789434.v1>
- Wollny, S., Schneider, J., Di Mitri, D., Weidlich, J., Rittberger, M., & Drachslar, H. (2021). Are we there yet?-a systematic literature review on chatbots in education. *Frontiers in artificial intelligence*, 4, 654924. <https://doi.org/10.3389/frai.2021.654924>
- Yufeia, L., Salehb, S., Jiahuic, H., & Syed, S. M. (2020). Review of the application of artificial intelligence in education. *International Journal of Innovation, Creativity and Change*, 12(8), 548-562. <https://doi.org/10.5334/ij.ic.20200807>

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