Exploring Learners Attitude, Benefits and Threats in using Artificial Intelligence Tools in Distance Education

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ABSTRACT

Artificial intelligence (AI) tools are used in all spheres of life. These tools are getting smarter with the passage of time and their use dynamics are also being changed accordingly. It has taken key place in all walks of life especially in distance education. This study aimed to explore the attitude benefits and threats of distance learners in using AI tools. The study was descriptive in nature, having positivist lens followed by a quantitative approach. Survey method was employed for the study. The population comprised students enrolled in B.Ed, MPhil and PhD programs in the faculty of Education at Allama Iqbal Open University. The questionnaire was adopted, shared through google docs and 664 students responded. The data were analyzed through descriptive statistics, ANOVA and t-test to find the difference across gender, program of the study and their age. Findings of this study indicated that students of M.Phil degree reported a greater AI tools benefits than those with B.Ed degree and there were no significance differences in perceived AI tools benefits across age and gender. Both M.Phil and doctoral student showed more positive attitude in using AI tools than B.Ed students and there were no significance difference in attitude with AI tools based on age and gender. Additionally, threats posed by AI tools did not differ significantly by education level, age group and gender. In addition, policymakers should make rules and regulations that protect students privacy, promote digital inclusion, and ensure equitable access to all learners of distance education.

Key words: Artificial intelligence, distance learners, attitude, benefit and threat

INTRODUCTION

Artificial Intelligence (AI) refers to non-human machines that perform numerous tasks like human beings, which include logical reasoning, learning, adapting, self-correction, and complex data processing (De Zúñiga et al., 2023; Crompton & Burke, 2023). Moreover, the concept of AI is focused on understanding human intelligence to perform tasks related to human cognition and emotion, as AI can imitate human cognitive and emotional abilities and even simulate thought processes and human behavior (Guzman & Lewis, 2019; Nah et al., 2020). Simultaneously, AI tools are used in the education sector for analyzing, interpreting data, creating content, identifying patterns, making predictions, and enhancing learning experiences (Alneyadi et al., 2023; Peres et al., 2023; Khan et al., 2022). Furthermore, AI tools significantly transformed educational practice by providing personalized learning experiences for learners, where AI can adapt to individual student needs and learning paces (De-Lima-Santos & Ceron, 2021). Moreover, the attitude of

people toward using AI tools is different. For instance, Saihi et al. (2024) stated that there is generally positive attitude toward AI adoption and believe that AI increases learning experience; nevertheless, they are concerned about privacy, trust, quality, and reliability of information.

Additionally, AI chat as well as other Large Language Models (LLMs) exist to help students learn in a personalized way that meets their speed and needs and is aligned with the curriculum. As a consequence, with distance learning, students are involved in their education and play an active role, unlike with the passive learning of traditional education (Steele, 2023). Students with particular challenges can also find a lot of support from LLMs. They help all students learn by giving them access to special tools and resources that deal with different learning challenges (Garg & Sharma, 2020). Researchers frequently use AI for tasks such as summarizing, editing, analyzing, interpreting and academic writing. Also, according to Berdejo-Espinola & Amano (2023), researchers can rely on AI for text analysis, translation and developing research paper summaries.

There are still several difficulties that AI introduces for researchers and those making decisions. Gaining knowledge of what information can be accessed by AI is important when using social platforms because different AI tools work by gathering users' personal data (Lutz & Tamò-Larrieux, 2020). Besides, Open AI admits that sometimes Chat GPT provides intelligent-sounding replies, but these replies are erroneous (Open AI, 2022). Strau (2021) also points out that AI tools in the study and teaching field can be harmful because their results can be false, misleading, unethical, discriminatory or social unacceptable. The findings may result from poor data, improper modeling or already existing misconceptions in developing AI. Plagiarism is also considered a main concern for AI in education, says Baidoo-Anu & Ansah (2023). An essay or creative writing piece generated by Gen-AI can be used by students to get assessed and the teacher will not know it is not real student work.

Younger students might not use AI tools the same way as adults do. A study by Marquis et al. (2024) found that because they are comfortable with technology, many young adults particularly 30 or younger are the most apt to use and adopt AI. Also, Ahmed et al. (2024) found that over fifty percent of students who use AI are not yet thirty years old. Electronic gadgets were used by these kids for reading books, learning, studying and for fun. Growing up, they had technology as a regular and relied on it more than those from older generations. People over 40 seem to use AI solutions less often, so it is necessary to form a digital divide to encourage them to use these technologies (Marquis et al., 2024). Olaniyi et al. (2023) mentioned that elderly people rarely got used to new technologies because they were afraid of change and unfamiliar things. There was also a link between using new AI solutions and gender inequalities. Liang et al. (2023) claim that surveys studied by them found mixed results about gender inequality in information technology. In many Asian and African countries, it was much easier for men to get access to IT resources (Ahmad et al., 2024). Similarly, Ahmad et al. (2024) reveal that fifty five percent of students enrolled in bachelor's and master's degree programs mainly rely on AI, while many institution are including AI-based platforms as part of their coursework (Timotheou et al., 2023). Also, young people were able to learn about new technologies because their minds were flexible and one of the least expensive ways to support brain growth (Kulkov, 2023).

AI tools influence on students is changing as scholars study the topic more. As reported by Miranty and Widiati (2021) and Fahmi and Cahyono (2021), students who previously were skeptical about AI tools are now happy with the usefulness of AI tools in their research work and share positive thoughts about it in a variety of areas. Besides, students devote many hours to using

AI tools and the most popular tool they use is Chat GPT, according to a Lattie et al. (2022) study. Besides, helping students understand AI tools will be key to building trust and acceptance for AI in classrooms.AI could revolutionize education and support students with various challenges. Even today in developing countries like Pakistan, there is a big gap in knowledge about the attitudes, benefits and risks of using AI tools among distance learners. A way to assess their familiarity with the field is to get their thoughts on how it can be applied.

Objectives of the study

1. To examine the attitude of learners about the use of AI tools in distance learning.

2. To determine the benefit associated with the use of an AI tool in distance learning.

3. To identify the threat faced by learners in adopting AI tools in distance learning.

4. To examine differences in AI tool adoption among distance learners across gender, qualification, and age group.

Questions of the study

1.1 What is the attitude of distance learners about the use of AI tools in learning?

1.2 What support do AI tools provide to distance learners?

1.3 What is the role of AI tools in improving learners' learning experiences?

2.1 What is the infrastructure provision for influencing the use of AI tools in distance learning?

2.2 What are the ethical concerns that affect learners' trust in AI-generated content?

3.1 What is the difference in the adoption of AI tools across genders?

3.2 What is the difference in the adoption of AI tools across education levels?

3.3 What is the difference in the adoption of AI tools across age groups?

RESEARCH METHODOLOGY

The philosophical underpinning of this study aligns with positivism, focusing on the exploration of using AI tools among distance learners. The study employed a quantitative method to study the effect of one variable on another (Creswell, 2018) and to collect data in order to better understand the problem. This method provides a complete understanding of phenomena based on students' opinions and understandings.

Research Design

Quantitative approach provides a specific direction for research design. Within this approach, a survey method was employed as a research design. This specific design was selected to identify the students' opinion on using AI tools and to assess participants' beliefs about their attitude, potential benefits, and the threat of using AI tools in academics. Furthermore, literature highlighted that survey design was most suitable for this study (Ghimire et al, 2024; Ahmad et al., 2024).

Population

Table 1

Population of the study

S.No	Program	No. of Students
1	B. Ed	15217
2	M. Phil	1307
3	PhD	423
	Total	16947

The study population was 16947 students of three programs, including B.Ed, M.Phil, and PhD programs of Allama Iqbal Open University. The number of students enrolled in the B.Ed program was 15217, the M.Phil program was 1307, and in PhD program was 423.

Sample and Sampling Technique

The study sample was 664 students. The age, gender and education level of the participants are presented in Table 2. The data reveals that males constituted 32.4% of the respondents, while females accounted for 67.6%. Regarding the respondents' education level, 88.9% were bachelor's students, 9.9% were M.Phil students, and 1.2% were doctoral students. The age distribution of the respondents was as follows: 5.1% were between 18 and 22 years old, 59.9 % were between 23 and 27 years old, 21.2 % were between 28 and 32 years old, 9.6 % were between 33 and 38 years old, and 4.1 % were above 39 years old.

Table 2

Sample of the study

Variable	Category	Frequency	Percentage (%)
Gender	Male	215	32.4
	Female	449	67.6
Education	B.ed	590	88.9
	M.Phil.	66	9.9
	Ph.D.	8	1.2
Age	18-22	34	5.1
	23-27	398	59.9
	28-32	141	21.2
	33-38	64	9.6
	Above 39	27	4.1

Instruments of the Study

The instrument was divided into two sections. Section A was designed to provide demographic information about the respondents, such as education, gender, and age. Section B elicited responses on students' attitudes, benefits, and threats of AI tools in academics. This section, for clarity, was divided into three parts including attitudes, benefits, and threats. Attitude was measured with 15 items, and benefits were measured with 5 items. Similarly, threats were measured with 14 items. These responses were to be obtained using a five-point Likert modified option of strongly disagree (0) to strongly agree (4). The instrument used in the study was adopted.

Validity and Reliability

This study employed an instrument that was adopted to explore the attitude, benefit, and threat of students using AI tools in distance learning (Ahmad et al., 2023). The instrument is extensively used for the said purpose in different regions across the globe. The instrument is validated by experts from different programs, like information technology, medical education, nursing, physics, and sociology reviewed the items, and those with a content validity index (CVI) score below 0.07 were removed. The instrument, which achieved a CVI score of 0.95, showed strong content validity. Additionally, construct validity was evaluated by using exploratory factor analysis (EFA), which divided the 35 items into three constructs, including attitude (15 items), benefits (5 items), and threats (14 items).

Furthermore, the reliability of the instrument was found by using Cronbach's Alpha, which showed a high level of consistency, with the score of 0.90 for attitude, 0.82 for the benefits, 0.91 for threats, and the overall reliability score was 0.93. Given its well established validity and reliability this instrument was adopted for the present study to asses attitude, benefits and threats of distance learners in using AI tools.

Ethical Consideration

This study followed ethical research guidelines to protect all participants' rights, privacy, and confidentiality. In the first section of the questionnaire a brief introduction, purpose of research, voluntary participants, and confidentiality assurance, was given by a researcher. Participants are informed that they participate in research voluntarily and have the right to leave at any stage without any consequences. The collected data will be kept strictly confidential and used only for research purposes. The authorized members will have access to data, and no third party will have access without their consent.

RESULT AND INTERPRETATION

Descriptive statistics (mean, standard deviation) and inferential statistics (independent sample t test & one-way ANOVA) were applied to analyze the data. The results related to the benefits were presented in the form of a graph, given in Figure 1.
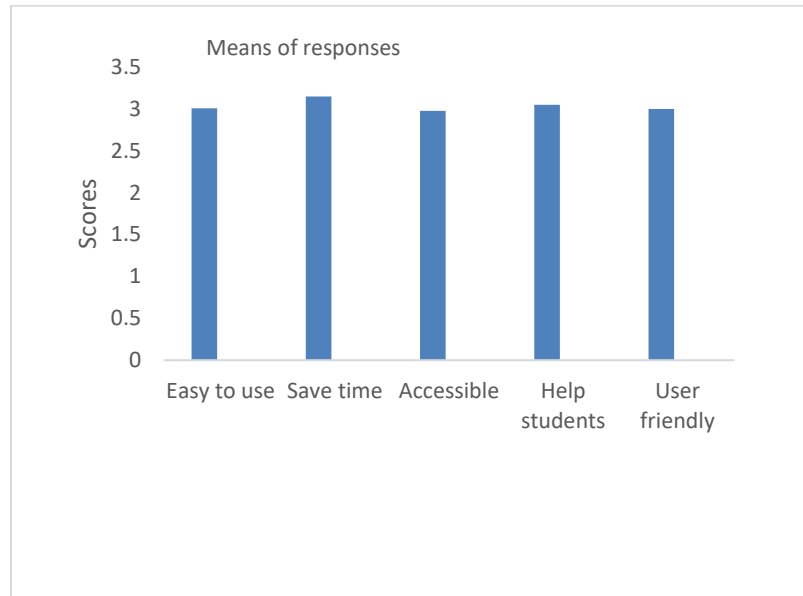
Figure 1

Benefits of using AI tools

Figure 1 shows the mean score of various benefits of using AI tools in distance learning. Distance learners used AI tools confidently (3.01) in their study, and distance learners had trust in AI-generated content. They believe that AI tools save their time (3.15) by providing support and reducing workload. Students were moderately confident about tool accessibility (2.98), which shows that tools were accessible. Students show that these tools helped (3.05) in their learning journey. They found that AI platforms were user-friendly (3.0) and provided guidance and assistance. The responses of distance learners related to the AI tool benefit indicated that it becomes helpful for distance learners in their academic journey.

Table 3

Descriptive statistics of learners' attitude in use of AI tools

Statement	Means	SD
Al tools content can be used if properly cited and documented	2.83	0.91
Authors should have proper knowledge on how to use Al tools	3.01	1.02
I recommend Al tools to a friend or colleague	2.82	0.96
I'm interested in using of a premium version of Al tools	2.82	1.05
Al tools has a positive impact on my education/learning	2.93	1.01
There is a need for specific training on how to use Al tools.	2.96	0.97
I suggest providing information on ethical guidelines for use of Al tools.	2.99	0.89
I think Al tools should be included in the study curricula	2.82	0.97
To improve Al applications, method of researchers must be honest	3.04	0.87
AI tools can be listed as an author based on its significant contribution	2.91	0.87

I review and edit the response that generated by AI tools.	2.68	0.93
I feel comfort with ethical and responsible use of AI generated content.	2.80	0.91
Al tools could enhance research quality.	2.89	0.94
I think the responses generated by Al tools are overall easy and coherent	2.78	0.93
I trust the information that I read and see on Al tool	2.83	0.95

(N=664)

Table 3 shows the mean value of the attitude of students using AI tools. Distance learners showed concern about the citation, which means they slightly agree (2.83), SD=0.91, with using AI tools for content. Users agree (3.01) SD= 1.02 that there is a need for knowledge about the use of AI tools, and the learners use them only when they have a proper understanding of AI tools. Learners slightly agree (2.82), SD=0.96, and show concern about recommending AI tools to others for their studies. The premium version of AI tools is costly, so students slightly agree (2.82), SD=1.05, about using a premium version of an AI tool. The AI tools play a crucial role in learning, so learners agree (2.93) SD 1.01 that the influence of AI on learning is positive. Training in innovative technology is needed for all individuals everywhere, so learners slightly agree (2.96) SD=0.97, that there is a need for AI tools training. Students agree 2.99 SD=0.89 that AI tools provide unethical information, so there is a need for ethical guidelines for genuine information. Students slightly agree (2.82), SD=0.97, that study curricula should consist of AI tools knowledge for innovation. Mostly students agree (2.82), SD=0.92, that the proper use of AI tools in their work is important they must follow the ethical guidelines. Students agree (3.04), SD=0.87, that researchers use AI tools and being honest about their methods must improve AI applications. Users slightly agree (2.68), SD=0.93, that they edit and review the AI-generated content before using it. Students agree (2.80), SD=0.91, about the use of AI-generated content ethically. Distance learners agree (2.89), SD=0.94, that AI tools help in their research work and improve the quality of research work. Students slightly agree (2.78), SD=0.93, that the AI-generated content is easy and coherent. Students slightly agree (2.55), SD= 0.95, that they trust the information that they saw and read on AI tools, while many students were still not completely on AI-generated responses.

Table 4

Descriptive statistics of threats related to the use of AI tools

Statement	Means	SD
Lack of human interaction	2.63	0.98
Legal issue e.g copyright issues authorship	2.69	0.98
Decrease creativity and critical thinking	2.83	1.09
Al tools does not replace practical training	2.73	1.06
Security concerns	2.68	0.98
Technical issues	2.64	0.96
Over-reliance on technology	2.80	0.94
Ethical dilemma concerns such se plagiarism	2.82	0.96

Need Internet all the time	3.10	0.95
Difficulty in handing complex task in research	2.78	0.93
Inaccurate incorrect or biased information	2.43	1.03
Over-detailed redundant excessive content	2.52	1.97
Using Al tools will reduce skills and abilities of person who use it.	2.83	1.09

N=664

Table 4 shows the mean value of the threats posed to students using AI tools. Students slightly agree (2.63), SD= 0.98, that using AI tools as an assistance result in a loss of human interaction. Users agree (2.69) SD=0.98 that they face legal issues like copyright and authorship, which shows learners are concerned about this. Students agree (2.83), SD=1.09, that AI tool-usage decreases creativity and critical thinking, which indicates that using AI tools makes students lazy. Students agree (2.73), SD= 1.06, that AI does not replace practical training, meaning AI is helpful for them. Distance learners agree (2.68), SD=0.98, that they have security problems. Users agree (2.64) SD= 0.96 that they face a technical issue related to AI tools usage. Users also slightly agree (2.80), SD=0.94, that they use technology all the time. Students agree (2.82), SD=0.96, that they are concerned about ethical issues like plagiarism. Students agree (3.1) SD= 0.95 that technology needs internet connectivity, all the time. Students agree (2.78), SD=0.93, that they had faced challenges in handling complex tasks in research. Somehow, students were slightly in agreement (2.43), SD= 1.03, that the AI tool provides inaccurate information. Students slightly agree (2.52,) SD= 1.97 that AI tools provide over-detailed and excessive content. Users slightly agree (2.83), SD= 1.09, that AI tools reduce the skill and abilities of a person. Somehow, students agree (2.46) SD=1.08 that the use of AI tools poses a threat to human ethics.

Table 5

Gender-wise comparison of attitude, benefits, and threats of distance learners

Variable	Group	N	M	SD	t	P
Attitude	Male	436	**42.79**	8.87	-0.49	0.62
	Female	208	**43.17**	9.82		
Benefits	Male	436	**18.35**	0.19	0.50	0.61
	Female	208	**18.17**	0.33		
Threats	Male	436	**38.04**	8.88	0.59	0.55
	Female	208	**37.59**	9.11		

N=664

The first three rows of the table 5 provide the descriptive statistics frequency, mean and standard deviation on the attitude, benefit and threat variable for the men, and for women in the study i.e., (N=436+ 208), the 436 men got average 42.79 at attitude, at 18.35 of benefit, and average 38.04 at threat. The 208 females got an average of 43.17 at attitude, 18.17 at benefit, and 37.59 at threat. The p-value of the overall attitude, benefit, and threat variables is p>.05 (0.612,

0.62, and 0.55), so there is no significant difference between male and female distance learners' attitude, benefit, and threat of using AI tools.

Table 6

Education level-wise analysis of variance of attitude, benefit, and threat of distance learners

Variable	Catagories	N	M	SD	F	Scheffe post hoc
Attitude	B.Ed	570	42.55	5.37	0.004	B.Ed<M.Phil (P=0.026<0.05)
	M.Phil	66	45.09			B.Ed<Ph.D (P=0.01<0.05)
	Ph.D	8	50.87			
Benefits	B.Ed	570	18.10	5.59	0.004	B.Ed<M.Phil (P=0.003<0.05)
	M.Phil	66	19.66			
	Ph.D	8	20.62			
Threats	B.Ed	570	37.66	1.79	0.167	
	M.Phil	66	39.81			
	Ph.D	8	39.12			

N=664

The first three rows of the table 6 provide the descriptive statistics frequency, mean, standard deviation on the attitude, benefit and threat variable for the three education level including B.Ed, M.Phil and Ph.D in the study i.e., (N=570+ 66+8), the 570 B.Ed students got average 42.55 at attitude, at 18.10 of benefit and average 37.66 at threat. The M.Phil students got an average of 45.09 at attitude, 19.66 at benefit, and 39.81 at threat. Also, the Ph.D students got an average of 50.87 on attitude, 20.62 on benefit, and 39.12 on threat. The p-value of the overall attitude and benefit variables is p<.05 (0.004 and 0.004), so there is a significant difference in three different degrees related to attitude and benefit of distance learners in using AI tools. Whereas, the P value of the threat variable is p>.05 (.167), there is no significant difference in the different degrees of threat of using AI tools by students. According to the test of Scheffe, post hoc students of Ph.D and M.Phil. were confident in using AI tools as compared to B.Ed students.M.Phil students reported a higher attitude (p= 0.026) and benefit (p= 0.003) than B.Ed students also, Ph.D students showed high attitude (p=0.010) than B.Ed students.

Table 7

Age-wise analysis of variance of attitude, benefits, and threats of distance learners

Variable	Catogries	N	M	SD	F	P
Attitude	18-22	34	42.85	42.8	2.137	0.075
	23-27	386	42.53	42.5		
	28-32	134	43.02	43.0		
	33-38	63	42.94	42.9		
	Above 29	27	7.85	47.8		

Benefits	18-22	34	17.94	3.97	1.985	0.095
	23-27	386	18.16	4.40		
	28-32	134	18.47	3.92		
	33-38	63	18.03	4.78		
	Above 29	27	20.41	2.83		
Threats	18-22	34	37.91	8.18	0.554	0.096
	23-27	386	38.29	9.14		
	28-32	134	37.23	8.84		
	33-38	63	37.41	8.58		
	Above 29	27	36.66	8.66		

N=446

The first three rows of Table 7 reveal the descriptive statistics for five age groups of the distance learners of the study, including frequency, mean, and standard deviation. The mean and standard deviation of all three groups in benefit, threat, and attitude show the difference between the groups. This difference is statistically not significant because the P value of the groups shows $P>.05$ (0.075, 0.095, and 0.096), so statistically no significant difference existed between all five groups.

FINDINGS AND DISCUSSION

The current study explores the benefits of AI tools usage among distance learners. In distance learning, teachers do not directly interact with them, so the AI tools play a crucial role in distance learning. According to the findings of this study, most learners agreed on the benefits of AI tools, including saving time, being easy to use, and being user-friendly (Figure 1). There were significant differences related to the benefits of AI tools among students of different programs. The M.Phil students perceived greater benefits of AI tools than B.Ed students (Table 6). These findings were aligned with the study of the previous literature review. For instance, AI tools provide customized learning experiences, support to the students and researchers in having better learning, results interpretation, academic writing, and summarizing in a short period (Steele, 2023; Garg & Sharma, 2020; Pinzolits, 2023).

The present study also examined the attitude of distance learners in using AI tools for their learning purposes. The findings of this study reported the mean score value of different statements related to AI tools usage (Table 3), showing that the students agreed on AI tools usage in their academic journey and had a positive attitude. The differences among learners' attitudes at different levels of education indicated a significant difference (Table 6). Literature has focused on the attitude of people toward the adoption of AI tools, which was generally positive, and believes that AI enhances the learning experience and researchers use AI tools for text analysis, translate text, and write abstracts for research papers (Saihi et al., 2024; Berdejo-Espinola &Amano, 2023)

There were various threats highlighted by distance learners posed by AI tools, for instance, AI content, plagiarism, and unauthentic information, in this study (Table 4). It showed that using AI tools in academics was a big challenge for learners in their academic journey. This finding is aligned with previous studies that showed different threats posed by AI tools (Lutz & Tamò-

Larrieux, 2020; Strau,2021; Baidoo-Anu & Ansah, 2023). Moreover, students in the education field may use AI tools to write the whole assignment and do not revise it; the data created by ChatGPT needs continuous updating Periaysamy et al., 2023). Furthermore, Benvenuti et al. (2023) reported that AI tools cannot replace human beings and that they may lose critical thinking skills among students.

Furthermore, it was also identified in the present study that there was no significant difference between males and females perceiving AI technologies as a threat (Table 5). However, Ahmed et al. (2024) reported in their study that females were more than males, and those with a master's degree were more likely than those with a diploma degree to pose a threat in using AI tools. Furthermore, according to Novitzky et al. (2023), no research has yet directly examined threats in education by age or gender, but it might be presented as violence due to technology. Furthermore, Asian and African women do not have easier access to IT resources than men do (Kukulska-Hulme et al., 2023).

Additionally, there was no significant difference among age groups in using AI tools related to attitude, benefit, and threat (Table 7). The findings revealed that the learners have the same opinion about AI tools. This finding is inconsistent with the findings of (Marquis et al.,2024; Olaniyi et al. 2023), which highlight those younger demographics particularly those with under 30 years old were active users of AI tools also there were lower engagement level among older demographics, particularly those over 40 years and the older demographics oppose to adopt new technologies, usually because of fear of the unknown of emerging technologies and resistance to change.

CONCLUSION

Even in its earliest days, artificial intelligence could bring major changes to the way humans learn and teach. AI plays a tough and detailed role in distance learning. Since we want the future to be ready, addressing this problem is necessary. From the research, it was found that learners are more likely to use AI tools if they think they will be helpful and simple to learn. When students think that AI products are both useful and easy to use, they tend to have a better attitude toward them. The research pointed out that a user-friendly design and good features help keep distance learners involved and also gave importance to security and privacy issues in students' school life. Furthermore, solving privacy issues and providing powerful security might help consumers rely more on AI products. This work gives useful information on how distance learners use AI tools. Taking all of this into account allows educators and administrators to bring AI tools into education, helping distance learners be more involved in their studies. Philosophy shows making AI tools simple and explaining their value might lead to better opinions and greater acceptance among those learning online.

RECOMMENDATION

1. It is recommended that learners use AI tools to extend readability and creativity by analysing information on scientific parameters rationally and relying on them. They should always cross-check the output for accuracy, and the learners should make decisions accordingly.

2. AI tools provide an outcome when someone gives a prompt as input. It adapts biased language or ideas of the learners for further response when the learners interact with it. So, teachers should continuously monitor and educate students about AI bias.

3.   Personal data of learners, including their grades, learning patterns, and personal interests granted access to AI tools, there is a risk of data misuse, which could significantly harm the learners. So, learners should fully understand data provided to AI tools, like what data is being collected, how they are being used, and how they can control their data.

4.   Policies and guidelines dealing with data privacy, bias, academic dishonesty and wrong information must be developed by public organizations. All AI policies should provide details about how the system operates and what happens to user data.

5.   Distance learners should have digital literacy skills. For instance, they should learn to use AI tools skillfully, check and verify results critically it produces and avoid depending too much on them. As a result, learners will be able to use AI in their learning without challenging their academic integrity.

REFERENCES

Ahmad, T., Zhang, D., & Huang, C. (2024). AI in academic research: A multi-group analysis of students' awareness and perceptions using gender and programme type. *Journal of Applied Learning & Teaching*, *7*(1), 1–15. https://doi.org/10.37074/jalt.2024.7.1.9

Ahmed, S., Alzahrani, A., & Khan, R. (2024). Awareness, benefits, threats, attitudes, and satisfaction with AI tools among Asian and African higher education staff and students. *Journal of Applied Learning & Teaching*, *7*(1), 1–18. https://doi.org/10.37074/jalt.2024.7.1.10

Alharbi, W. (2023). AI in the foreign language classroom: A pedagogical overview of automated writing assistance tools. *Education Research International*, *2023*, 1–15. https://doi.org/10.1155/2023/4253331

Alneyadi, S., Wardat, Y., Alshannag, Q., & Abu-Al-Aish, A. (2023). The effect of using smart e-learning app on the academic achievement of eighth-grade students. *Eurasia Journal of Mathematics, Science and Technology Education*, *19*(4), em2248. https://doi.org/10.29333/ejmste/13067

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

Benvenuti, M., Cangelosi, A., Weinberger, A., Mazzoni, E., Benassi, M., Barbaresi, M., & Orsoni, M. (2023). Artificial intelligence and human behavioral development: A perspective on new skills and competences acquisition for the educational context. *Computers in Human Behavior*, *148*, 107903. https://doi.org/10.1016/j.chb.2023.107903

Berdejo-Espinola, V., & Amano, T. (2023). AI tools can improve equity in science. *Science*, *379*(6636), 991. https://doi.org/10.1126/science.adg9714

Chan, C. K. Y. (2023). A comprehensive AI policy education framework for university teaching and learning. *International Journal of Educational Technology in Higher Education*, *20*(1), 1–25. https://doi.org/10.1186/s41239-023-00408-3

Creswell, J. W. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). Sage.

Crompton, H., & Burke, D. (2023). Artificial intelligence in higher education: The state of the

field. *International Journal of Educational Technology in Higher Education*, *20*(1), 1–22. https://doi.org/10.1186/s41239-023-00392-8

De Zúñiga, H. G., Goyanes, M., & Durotoye, T. (2023). A scholarly definition of artificial intelligence (AI): Advancing AI as a conceptual framework in communication research. *Political Communication*, *41*(2), 317–334. https://doi.org/10.1080/10584609.2023.2290497

De-Lima-Santos, M., & Ceron, W. (2021). Artificial intelligence in news media: Current perceptions and future outlook. *Journalism and Media*, *3*(1), 13–26. https://doi.org/10.3390/journalmedia3010002

Fahmi, M. A., & Cahyono, B. Y. (2021). EFL students' perception on the use of Grammarly and teacher feedback. *JEES (Journal of English Educators Society)*, *6*(1), 18–25. https://doi.org/10.21070/jees.v6i1.849

Garg, S., & Sharma, S. (2020). Impact of artificial intelligence in education. *Journal of Physics: Conference Series*, *1531*(1), 012034. https://doi.org/10.1088/1742-6596/1531/1/012034

Ghimire, A., Pather, J., & Edwards, J. (2024). Generative AI in education: A study of educators' awareness, sentiments, and influencing factors. In *2024 IEEE Frontiers in Education Conference (FIE)* (pp. 1–9). IEEE. https://doi.org/10.1109/fie61694.2024.10892891

Guzman, A. L., & Lewis, S. C. (2019). Artificial intelligence and communication: A Human–Machine Communication research agenda. *New Media & Society*, *22*(1), 70–86. https://doi.org/10.1177/1461444819858691

Himeur, Y., Elnour, M., Fadli, F., Meskin, N., Petri, I., Rezgui, Y., Bensaali, F., & Amira, A. (2022). AI-big data analytics for building automation and management systems: A survey, actual challenges and future perspectives. *Artificial Intelligence Review*, *56*(6), 4929–5021. https://doi.org/10.1007/s10462-022-10286-2

Kelly, A., Sullivan, M., & Strampel, K. (2023). Generative artificial intelligence: University student awareness, experience, and confidence in use across disciplines. *Journal of University Teaching and Learning Practice*, *20*(6), 1–18. https://doi.org/10.53761/1.20.6.12

Khan, A., Khan, S., & Khan, M. (2022). Artificial intelligence in education: A review. *International Journal of Emerging Technologies in Learning*, *17*(3), 4–18. https://doi.org/10.3991/ijet.v17i03.29877

Kukulska-Hulme, A., Bossu, C., Coughlan, T., Ferguson, R., FitzGerald, E., Gaved, M., Herodotou, C., Rienties, B., Sargent, J., Scanlon, E., Tang, J., Wang, Q., Whitelock, D., & Zhang, S. (2023). *Innovating pedagogy 2023: Open University innovation report 11*. The Open University.

Kulkov, I. (2023). Next-generation digital transformation and the role of AI in strategic decision-making. *Journal of Business Research*, *165*, 114021. https://doi.org/10.1016/j.jbusres.2023.114021

Lattie, E. G., Adkins, E. C., Winquist, N., Stiles-Shields, C., Wafford, Q. E., & Graham, A. K. (2022). Digital mental health interventions for depression, anxiety, and enhancement of psychological well-being among college students: Systematic review. *Journal of Medical*

Internet Research, *24*(7), e39128. https://doi.org/10.2196/39128

Liang, Y., Li, X., & Zhang, H. (2023). Gender differences in the acceptance and use of AI tools in higher education: A cross-cultural study. *Computers & Education*, *204*, 104870. https://doi.org/10.1016/j.compedu.2023.104870

Lutz, C., & Tamò-Larrieux, A. (2020). The robot privacy paradox: Understanding how privacy concerns shape intentions to use social robots. *Human-Machine Communication*, *1*, 87–111. https://doi.org/10.30658/hmc.1.6

Marquis, Y. A., Oladoyinbo, T. O., Olabanji, S. O., Olaniyi, O. O., & Ajayi, S. A. (2024). Proliferation of AI tools: A multifaceted evaluation of user perceptions and emerging trend. *Asian Journal of Advanced Research and Reports*, *18*(1), 30–35. https://doi.org/10.9734/ajarr/2024/v18i1596

Miranty, D., & Widiati, U. (2021). An automated writing evaluation (AWE) in higher education. *Pegem Journal of Education and Instruction*, *11*(4), 1–12. https://doi.org/10.47750/pegegog.11.04.12

Nah, S., McNealy, J., Kim, J. H., & Joo, J. (2020). Communicating artificial intelligence (AI): Theory, research, and practice. *Communication Studies*, *71*(3), 369–372. https://doi.org/10.1080/10510974.2020.1788909

Novitzky, P., Franks, A., & Smeaton, A. F. (2023). Ethical and social implications of AI in education: A systematic review. *International Journal of Artificial Intelligence in Education*, *33*(2), 1–28. https://doi.org/10.1007/s40593-023-00343-4

Olaniyi, O. O., Oladoyinbo, T. O., Okunleye, O. J., & Ajayi, S. A. (2023). Age and technology adoption: Examining barriers among older adults in using AI-powered educational tools. *Journal of Educational Technology & Society*, *26*(4), 112–124.

OpenAI. (2022). *ChatGPT: Optimizing language models for dialogue*. https://openai.com/blog/chatgpt

Peres, R., Schreier, M., Schweidel, D., & Sorescu, A. (2023). On ChatGPT and beyond: How generative artificial intelligence may affect research, teaching, and practice. *International Journal of Research in Marketing*, *40*(2), 269–275. https://doi.org/10.1016/j.ijresmar.2023.03.001

Periaysamy, A., Sathesh, A., & Ramachandran, M. (2023). AI in academic writing: Opportunities and ethical challenges. *Journal of Academic Ethics*, *21*(3), 321–335. https://doi.org/10.1007/s10805-023-09467-7

Pinzolits, R. F. J. (2023). AI in academia: An overview of selected tools and their areas of application. *MAP Education and Humanities*, *4*(1), 37–50. https://doi.org/10.53880/2744-2373.2023.4.37

Saihi, A., Awad, M., & Ben-Daya, M. (2024). Generative AI in education: A systematic review of benefits, challenges, and future directions. *Education and Information Technologies*, *29*(5), 1–30. https://doi.org/10.1007/s10639-024-12529-x

Steele, J. L. (2023). To GPT or not GPT? Empowering our students to learn with AI. *Computers and Education: Artificial Intelligence*, *5*, 100160. https://doi.org/10.1016/j.caeai.2023.100160

Strauß, S. (2021). Deep automation bias: How to tackle a wicked problem of AI? *Big Data and Cognitive Computing*, *5*(2), 18. https://doi.org/10.3390/bdcc5020018

Timotheou, S., Miliou, O., Dimitriadis, Y., Sobrino, S. V., Giannoutsou, N., Cachia, R., Martínez-Monés, A., & Ioannou, A. (2023). Impacts of digital technologies on education and factors influencing schools' digital capacity and transformation: A literature review. *Education and Information Technologies*, *28*(6), 6695–6726. https://doi.org/10.1007/s10639-022-11431-8