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Conceptualizing Importance of Artificial Intelligence Literacy from the Perspective of Distance Learners

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Abstract

AI literacy encompasses proficiencies and skills to use AI applications and tools, considering them critically and interpreting their context and underlying principles. While students, as digital citizens, possess the ability to harness AI for enhanced learning outcomes, there remains a potential gap in utilizing suitable AI techniques effectively within specific learning contexts. This study focused on conceptualizing artificial intelligence literacy from the perspective of distance learners. By using a quantitative approach, a survey was conducted on distance learners of teacher training programs (B. Ed and M. Ed) from AIOU, Pakistan. A randomly selected sample of 104 students was approached through an online survey. Based upon the objectives of the study, the researcher developed a questionnaire with extensive effort by focusing on the psychometric properties of the scale and sought expert opinion on it. Findings of the study indicated that most of the respondents agreed that distance education taught by AI has a high impact on students learning and it indicates a positive response towards the students. Gender differences on t-test indicated no difference in conceptualizing role of AI literacy in their education. This study indicated the overall effectiveness of AI in education. effectiveness of artificial intelligence videos in education. It is recommended that in distance learning scenario, artificial intelligence may be encouraged to be used in the learning process.

Keywords: *Literacy, Artificial Intelligence literacy, Distance Education, Distance Learners*

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Introduction

Artificial intelligence (AI) literacy is the latest trend in education. Students around the globe are taking benefit from AI. In the rapidly evolving landscape of education, the integration of technology has become synonymous with progress. One of the most revolutionary technological advancements shaping the educational sphere is Artificial Intelligence (Alam, 2021). As educational institutions seek innovative ways to facilitate learning, AI has emerged as a transformative force, particularly in the realm of distance learning (Kamalov et al; 2023). Over the past few decades, distance learning has evolved from traditional correspondence courses to sophisticated online platforms.

Over the past few years, artificial intelligence (AI) education and literacy have been achieving momentum. Artificial intelligence networks, cloud computing, machine learning, and big data have all come together to make it easier to create machines that can mimic human intellect. Artificial intelligence (AI) is the term used in study to describe these computers, which are defined as systems that possess the ability to observe, recognize, learn, react, and solve problems (Kumar & Thakur, 2012). Future workplaces will undoubtedly undergo a revolution because of this intelligent technology. Thus, even while AI can interact with people and enhance human performance, it is quickly becoming the next disruptive innovation (Lawler & Rushby, 2013). Many people now believe that artificial intelligence (AI) will play a key role in the fourth industrial revolution and could even spark a four revolution in education.

Additionally, AI education is also being included in school curricula (Dai et al; 2020, & Knox ,2020). While the advent of television and computers was initially hailed as a revolutionary force in education, it became evident that these technologies primarily improved access to information without fundamentally altering core educational practices. In a similar vein, the current surge in attention towards artificial intelligence (AI) in education prompts educators to critically assess its capabilities. The imperative is to identify pathways for optimizing learning through a nuanced understanding of AI. According to Dong and Magerko (2020) "AI literacy as a set of competencies that enables individuals to critically evaluate AI technologies; communicate and collaborate effectively with AI; and use AI as a tool online, at home, and in the workplace".

Distance education, also known as distance learning, is a branch of education that focuses on instructional design, technology, and pedagogy/andragogy that are successfully integrated in providing student-teacher instruction. Students and teachers can interact both synchronously and asynchronously. When distant learning first appeared on the Web, it

was difficult to define and comprehend. As a result, there have been several important attempts to enhance distance learning by making it easier for students to learn remotely. A cursory examination indicates that digital technology is becoming smaller, quicker, cheaper, and better in a smooth and unstoppable manner (Kumar, 2004). It appears to be true in the broad sense, but every new game-changing invention, the iPhone being the most recent and evident, has invariably upended the smooth curves and established paradigms (Furfie, 2010). However, the commercial imperatives of the manufacturers and vendors of digital technology drive both the general trends and the game-changers. The current trend of technology becoming more and more accessible to individual consumers is expected to persist due to the influence of worldwide competitive markets. This will also lead to the disintegration of the institutional monopoly on digital technology, which in turn affects institutional distance learning. Students now have greater agency and control over their education in addition to greater technical capability. When we look back, we can see that there was a dramatic shift in the balance between institutional and individual digital technology (Wortham, 2009)

There is a growing acknowledgment that the progression of AI necessitates adjustments to the professional roles of teachers, subsequently prompting the emergence of novel organizational structures (Fenwick, 2018). Additionally, challenges on the horizon encompass the attitudes of students towards these evolving educational landscapes (Flogie and Aberšek, 2015). While students, as digital citizens, possess the ability to harness AI for enhanced learning outcomes, there remains a potential gap in utilizing suitable AI techniques effectively within specific learning contexts. This gap, if unaddressed, may lead to negative attitudes towards the learning experience (Ijaz et al; 2017).

Statement of the Problem

The technological revolution has brought advancement all around the world. The world has become a global village, says advancement of computer and internet lots of innovation have been made and among those ones is artificial intelligence, which is used in all the fields of life. Its use in education is now more popular. We have seen that robots have replaced teachers in the modern world. Many artificial intelligence tools have revolutionized the world in terms of animation videos, movies, sounds, and research engines. Pakistan is a developing country. So, this study was aimed with the prospective in mind that to what extent artificial intelligence has placed a significant positive role in prospective of education and learning in distance education. So, keeping in mind this perspective, this research was conducted on "exploration of students 'perception on role of artificial intelligence in distance education".

Objectives of the study

The objectives are as following:

1. To compare gender differences towards importance of artificial intelligence literacy in education.
2. To investigate area wise differences in participants' views towards importance of artificial intelligence literacy in education.
3. To compare differences of employed and unemployed distance learners towards importance of artificial intelligence literacy in education.

Hypotheses

$H0^1$: There is no gender difference regarding the use of artificial intelligence literacy in education.

$H0^2$: There is no area-wise difference regarding the use of artificial intelligence literacy in education.

$H0^3$: There is no employment-wise difference regarding the use of artificial intelligence literacy in education.

Research Methodology

This study used survey, and it was descriptive in nature.

Participants

The population was 6030 students, B. Ed and M. Ed students of AIOU. The sample was comprising of 104 participants. The sampling technique employed in this research is known as random sampling. This method ensures that each member of the population has an equal chance of being included in the study, enhancing the representativeness of the sample and the generalizability of the findings to the larger population.

Research Tool

The researcher designed a questionnaire for data collection, that comprises of 20 items. This questionnaire served as a structured tool to gather specific information from the participants. Each item in the questionnaire aimed to capture relevant data related to the research objectives, providing a systematic approach to collecting responses and insights from the study participants. It was based on 5 points Likert scale (1) strongly disagree (2) disagree (3) neutral (4) agree (5) strongly agree. The language of the questionnaire was English. Validity was checked by five educational experts and their suggestions were incorporated.

Data Collection

Data collection was facilitated through an online Google Docs form. The form was created and shared within a WhatsApp group containing the relevant students. Utilizing this digital platform allowed for the efficient and convenient collection of responses, enabling participants to provide their answers electronically.

Data Analysis. The data was analyzed in terms of descriptive statistics (percentage and graphs), and t-test**.**

RESULTS

Following section describes the results of this project:

Table 1

Demographic Information of the Respondents

Male	Female	Rural	Uban	Adolescents	Adults
40 (37%)	64 (63%)	43 (44%)	51 (56%)	22 (20%)	82 (80 %)

The results of above table 1 shows that there were more females than males 37% respondents were male, and 63% respondents were females. There were more urban areas (55.7%) than rural areas (44.3%). There were more adults 80% than adolescents who were 20%. Since distance education deals with students at mass level, and they come from diversified backgrounds, so in the sample of present study there was quite a diversified sample having multiple demographic characteristics which helped in in depth analysis of data as per their characteristics.

Table 2

Comparison of male and female distance learners towards importance of artificial intelligence literacy in education (N=104)

	Gender	f	Mean	S.D	t-value	P-value
AI Literacy	Male	41	89.93	8.31	1.465	0.14
	Female	63	87.79	6.48		

Table 2 shows that there is no significant difference between male and female students' views towards importance of artificial intelligence literacy in education (p-value 0.14 > 0.05). Females showed a bit high mean (m=89.93)) that males (m=87.79). However, this difference is statistically non-significant which indicates that both genders prefer equally to use AI in education. This may be since in this modern era,

computer learning, and AI are equally important for all students irrespective of their gender differences. People want to excel and grow academically and professionally. Students want to improve in their studies and that's why they equally preferred I tools and used these.

Table 3

Comparison of rural and urban distance learners towards importance of artificial intelligence literacy in education (N=104)

	Gender	f	Mean	S.D	t-value	P-value
AI Literacy	Rural	48	88.88	8.48	.310	0.75
	Urban	56	88.43	6.17		

Table 3 reveals that there is no statistically significant difference between rural and urban students' views towards importance of artificial intelligence literacy in education (p-value 0.75 > 0.05). Mean scores of rural (m=88.88) and urban (m=88.43) has also no difference. So, participants in remote and advanced areas support the use of AI literacy in education. This result may be because now a days, internet has reached in every corner of the country. People are now having internet access on their handheld devices. So, they are using AI tools in their educational uplift from far flung rural and advanced urban areas more or less on equal basis.

Table 4

Comparison of employed and unemployed distance learners towards importance of artificial intelligence literacy in education (N=104)

	Gender	f	Mean	S.D	t-value	P-value
AI Literacy	Employed	47	89.26	7.56	.786	0.43
	Unemployed	57	88.12	7.094		

Table 4 reveals that there is no statistically significant difference between employed and unemployed students' views towards importance of artificial intelligence literacy in education (p-value 0.43 > 0.05). Mean scores of employed (m=89.26) and unemployed (m=88.12) has also no difference. So, all participants support the use of AI literacy in education. In distance education, students whether employed or unemployed seek equal access to modern teaching and learning packages. So, their job tatus is not affecting on the amount of their preference and use of AI tools in educational uplift and studies. That's why they equally use AI tools in their learning.

Findings and Discussions

This study indicated a significant aspect of artificial intelligence literacy in distance education. Khedrane (2024) also indicated AI is an important factor in success of distance learners. Pullen (2023, papa 1) that "artificial intelligence (AI) is transforming various aspects of our lives, and education is no exception. AI holds the promise of revolutionizing the way we learn, teach, and administer educational programs." All the participants of this study from different areas, and job roles indicated artificial intelligence as an effective educational tool for students of all abilities. There were more females than males 37% respondents were male, and 63% respondents were females. There were more urban areas (55.7%) than rural areas (44.3%). There were more adults 80% than adolescents who were 20% (Table 1).AI is also perceived effective by students as an educational tool and its positive contribution to education. AI has positively contributed to advancing the learning process and students showed positive attitude toward artificial intelligence. These findings are supported by Khan (2023) that AI applications are advancing, enhancing, and improving students' concepts in education.

This study indicated that there was no significant difference between male and female students' views towards importance of artificial intelligence literacy in education (Table 2). This study indicated the overall effectiveness of AI in education. effectiveness of artificial intelligence videos in education. In this regard, Nikita (2023) supported the findings of this study that AI is having positive impact on higher education institutions and in the coming three years, this impact will reach about 99.4 percent. LeewayHertz (2023) revealed that AI has helped students to meet their unique study requirements. Now students are more at ease to study by using AI applications and tools. In one more such investigation by eLearning Industry (2023) showed that AI has helped educators to incorporate and integrate AI in curriculum. This gives more personalized learning experience to students.

Significant aspect of findings of this research indicated that there was no statistically significant difference between rural and urban students' views towards the importance of artificial intelligence literacy in education (Table 3). There was no statistically significant difference between employed and unemployed students' views towards importance of artificial intelligence literacy in education (Table 4). The findings of the present study indicated no statistically significant difference between employed and unemployed distance learners' views towards importance of artificial intelligence literacy in education. In one study, by Khedrane (2024) AI is an important factor in success of distance learners. This

association is positively associated with many factors of students in distance education. Students who possess high skills in using AI are more successful than those who have weaker competencies. As a significant discussing point, it indicates that artificial intelligence has shaped the world we are in now more than we were in the past few decades. Now the world has transformed all its institutions by the revolution of AI especially by introducing personalized learning systems for students in all educational setups and scenarios. No there is no alone recipient of learning, all the teaching is diversifying as per students' choices, demands, aspirations, preferences and learning styles. Students are the best deciders of their learning content, and they select the best learning materials for themselves by using AI tools and apps. This resulted in increased students' participation, well written learning content/assignments and overall personal grooming. AI qualified students can do much better performance in their actual job scenarios as well. In addition, teachers also take advantage of time saving rich content access for their better online classes. So, to adopt distance education, AI has played a significantly key role.

Conclusions and Recommendations

Artificial intelligence literacy is important for the promotion of healthy learning environments for distance learners. Since distance education deals with students at mass level, and they come from diversified backgrounds, so in the sample of present study there was quite a diversified sample having multiple demographic characteristics which helped in in depth analysis of data as per their characteristics.

Male and female attach equal importance towards use of artificial intelligence in education. With the advent of technology in education, new artificial intelligence technologies are being introduced around the globe which motivates students and provides them with ease and a preferred learning environment. That's why gender roles are not involved in their learning preferences towards AI use in distance education.

As distance learners come from different psychological and demographic backgrounds, they prefer learning accordingly. AI tools are now in reach to every area in the country with the advancement of internet packages provided by GSM companies. So, it is concluded that students belonging to rural and urban areas equally attribute artificial intelligence important in education to promote literacy and cultivate learning rich environments.

In distance education, students whether employed or unemployed seek equal access to modern teaching and learning packages. Their entitlement puts no effect on their learning preferences towards AI use. So, AI is

positively used by all students. Distance learners belong to different job titles and both who are on the job or unemployed preferred artificial intelligence to be used in education.

Following are the recommendations for future researchers.

1. Future research may focus on specific features and methodologies that contribute to the effectiveness of AI in educational videos, exploring factors such as content delivery, interactivity, and adaptability to diverse learning preferences.
2. Further studies may investigate the nuanced impact of AI on critical thinking, student engagement, and creativity in diverse educational settings, considering variations across subjects, grade levels, and cultural contexts.
3. Researchers may explore the tailored application of AI to address individual learning needs, particularly among students with varying abilities, aiming to optimize AI tools for inclusive education and assessing their correlation with academic achievement.

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