

The Impact of Artificial Intelligence on University Students Learning at Affiliated Graduate Colleges

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Abstract

Artificial intelligence (AI) had emerged as a transformative force in higher education, offering new possibilities for personalized learning, student engagement, and academic support. This study investigates the impact of AI on students' learning at affiliated graduate colleges in Kasur, Pakistan, with particular focus on academic performance, engagement, creativity, critical thinking, and problem-solving skills with AI use. A quantitative, descriptive research design was employed. Data was collected through a structured questionnaire comprising 20 items based on a five-point Likert scale. Using random sampling, responses were obtained from 200 male and female students enrolled in various undergraduate and postgraduate programs at affiliated graduate colleges in Tehsil Pattoki and Chunia. The collected data were analyzed using SPSS version 26, applying descriptive statistics, independent sample t-tests, ANOVA, and Pearson correlation. The findings reveal that most students are familiar with AI. Results indicate that AI positively influences students overall academic outcomes. A significant positive correlation ($r = .612$, $p < .05$) was found between students' perceptions of AI and their learning outcomes. The study concludes that while AI has a significant and positive impact on university students' learning specifically at affiliated graduate colleges, its integration must be balanced with human interaction and guided by ethical considerations. The findings offer future researchers to ensure effective and responsible use of AI in higher education.

Keywords: Artificial Intelligence (AI), Higher Education, Student Learning, Academic Performance, Student Engagement, Critical Thinking, Creativity, Ethical Issues.

Introduction:

Background and Context

AI is increasingly being positioned as strategically important for education. Artificial intelligence has the potential to be an effective teaching aid that gives students interesting learning opportunities while relieving teachers of part of their workload. AI applications in education have a lot of potential, especially when paired with modern educational innovations like gamification, digitalization of course materials, and individualized learning experiences. For example, the

modeling power of AI systems has been meticulously applied to construct reactive and adaptive lessons for the formation of tailored learning environments, to compensate for the lack of teachers using intelligent tutoring systems. (Zhai et al., 2021).

The development of professional and interpersonal skills is aided by artificial intelligence and is necessary for the growth of an organization. This strategy is employed by learning systems to enhance students' productivity and efficiency based on their needs. Online learning has emerged as one of the most significant educational channels for continuing education and skill development in the COVID-19 and post- COVID-19 environments. Students' problem-solving abilities are developed through mental quality enhancement. (Shreevamshi et al., 2022)

Artificial intelligence influences the quality of learning by offering various forms of online courses and online learning techniques. Online learning environments and online teaching courses have grown in popularity in recent years. Students who attend online classes have additional chances since they can learn more about a given topic in more detail. Online learning platforms give students access to a variety of cutting-edge instructional techniques that enhance their comprehension of the subject matter. (Chen et al., 2020)

Artificial intelligence has advanced to the present day thanks to cognitive AI, it is now capable of carrying out a variety of tasks, including decision-making, medical diagnosis, and language translation. Artificial intelligence (AI) uses algorithms, fast internet connections, sophisticated computers, and a tonne of real-time data to execute jobs like interacting, analyzing, inferring, reasoning logically, and reason contextually, tasks that people can perform intuitively. Unlike humans, artificial intelligence (AI) can do both fixed and domain-specific tasks with unmatched learning speed, enormous data volumes, higher efficiency, and infinite processing capacity. Humans, on the other hand, can reason critically, formulate and solve issues creatively, pick up new skills quickly, and create in reaction to circumstances. In facial recognition and factory automation, artificial intelligence (AI) has surpassed average human skill, notwithstanding the reality mentioned above regarding humans, AI, deep learning, and a plethora of data. For instance, it must complete massive tasks comprehensively & quickly (Slimi, 2023).

AI is only one illustration of the numerous ways that technology has transformed education. As previously mentioned, artificial intelligence (AI) is a relatively new area of technological development that is becoming increasingly well-known in academic and instructional circles across the globe. Due to the integration of high-performance computing systems into administrative chores and the increasing public awareness of the benefits of artificial intelligence (AI) in education, the subject is changing quickly. Artificial Intelligence is only one of the numerous ways that technology has altered education. As has been mentioned, artificial intelligence (AI) is a comparatively young area of technical progress that is still growing in popularity among scholars and educators globally. The discipline is evolving rapidly because of the increasing interest in the use of AI in education and the integration of high-performance computing systems into various bureaucracies. It is for this reason that AI is helping in the advancement of the education sector by bridging such loopholes. It has led to an increase in the volume of big data intelligence systems-facilitated online learning solutions (Chen et al., 2020). The growing integration of AI-powered educational technologies with modern teaching approaches has demonstrated the possibility of using AI as a personal assistant to support students. This assistance could take the form of tailored task reminders, real- time automated feedback to enhance writing, or suggestions for what and when to study. The use of AI to provide feedback, however, seems to indicate that students relied more on the technology than they did on it for active learning (Darvishi, 2023) The study's drawbacks include related to data security, ethical considerations, emotional impacts, and unemployment risks (Pisica et al., 2023).

Along with the optimal framework for skill development, technological advancements also raise questions about the social aspect of human nature. The imaginative mind, creative competencies,

cognitive skills, and emotional intelligence are predicted to be the most valuable resources in the digital age. Humans require social connection and a feeling of community, both of which are closely related to the process of learning in a human-populated academic setting. It necessitates face-to-face engagement and communication; emotional and social intelligence cannot be fostered by robots or software. Artificial Intelligence (AI) in education reduces human social experiences. These developments could present further difficulties that could disrupt the labor market. (Xu et al., 2018) Also there has been the argument that AI was still not able to equal human cognitive powers. It is easy to fool machines with their processing power. Human intelligence is a concept that is constantly contested, and modern societies place a high value on sensitivity to others, on the capacity to cooperate with strangers. Computer simulations and information processing techniques are unquestionably effective tools for teaching and learning, but they cannot recognize the entire range of emotions that affect behavior and, ultimately, motivation to accomplish goals. (Pisica et al., 2023)

Statement of the Problem

It was revealed that AI may improve student-centered learning within the scope of education in organizations. AI in education is a relatively new and promising area that might redefine the processes of education and learning of our students (Bates et al., 2020). To the best of the author's knowledge, there is a lack of research on the effects of AI on the creativity, critical thinking, and problem-solving abilities of affiliated graduate college students. The rationale for the present research is to examine the effect of the use of AI applications on learners. While evaluating the positive and negative impacts of AI, consideration is made to the attitudes of higher education students. Problem formulation for a thesis on how artificial intelligence impacts higher learning students' learning. The objective of the present research is to determine the extent to which the use of AI tools affects the learning of university students at affiliated graduate colleges. The problem statement acts as a lens through which to consider the complex interplay of AI, learning, and higher education. It can also guide how research questions, objectives, and approaches are developed.

Significance of the study

AI can be used to enrich collaborative learning environments. Automated agents can assist with organization and guidance in virtual learning environments and intelligent tutoring systems. These AI-powered technologies might foster a stimulating environment for learning that involves participation, critical thinking skills, and problem-solving skills (Kaledio et al., 2024). AI in education to think about solutions and future trends is possible due to the presence of technology in the current educational system. AI tools are important in research and in getting access to the world literature. The positive effects of AI include societal issues like privacy, security, and diversity in nature (Sethi et al., 2020). In today's world, AI has won the battle. The purpose of this research is to analyze the impact of AI on student learning at the higher education university level in affiliated graduate colleges. This research study is conducted to advance the knowledge of the effects that AI is generating in educational sectors. It analyzes how the use of the AI tool affects students and enlightens on its importance. Therefore, this research pursues to contribute to the advancement of knowledge by exploring the influence of AI on university students learning at affiliated graduate colleges.

Objectives

This research aims to bring more clarity on the benefits and drawbacks of using AI in higher education by investigating the opinions of students. The objectives of this research study were as following:

- To investigate the influence of AI learning on students' engagement and academic performance.
- To determine the viewpoint of students on AI tools.
- To explore how the education system is influenced due to AI tools.
- To identify the challenges and limitations of AI faced by university students enrolled at affiliated graduate colleges.

Research questions

This research was carried out to determine:

- What was the impact of AI on students' critical thinking, problem-solving, and creativity skills on students learning at affiliated graduate, university level?
- To what extent does AI enhance student-centered learning and promote personalized education in higher education?
- What were the challenges and limitations of implementing AI in affiliated graduate, university-level education?

Scope and Limitations

The purpose of this study was to assess the effects of artificial intelligence on learning among in affiliated graduate, university level students. This study was conducted on students enrolled at affiliated graduate colleges in Kasur, Pakistan and it was taken as a population. It used quantitative research methods in the collection and analysis of data.

Definition of key Terms:

- **Artificial intelligence (AI):** Artificial intellect, in turn, is the reproduction of human intellect in machines. It allows machines to perform human-like tasks such as learning and understanding, solving problems, reasoning, and perceiving and comprehending language. It is being seen how these AI tools are influencing higher education.
- **Students:** The students at Institute of Education and Research (IER), University of the Punjab are investigating how AI introduction has affected their learning and education.
- **Learning:** Learning is defined as constructive behavioral changes. It is the process of learning new things through practice, study, experience, or attitudes towards knowledge, skills, or behaviors. Students gain creativity, problem-solving abilities, thinking, and comprehension from it.

Methodology

This part aims to discuss the procedure of research study. We discussed the sample, population, tools, instruments and other stages of the study. The purpose of this section was to describe the detailed procedure of method. There was a discussion about tools and instruments being used in research study, data collection and interpretation and location where research was carried out. Following steps were taken to achieve the aims of research:

Nature of the study

This research study was descriptive in nature. A questionnaire was designed to collect data to investigate the impact of AI on university students learning at affiliated graduate colleges. It was determined how AI tools had influenced the educational sector. The questionnaire was administered.

Population of the study

The target population was male and female students of different affiliated graduate colleges in

Tehsil Pattoki & Chunia, Kasur.

Sampling of the study

Random sampling technique was used to collect data for research study. 200 students were selected randomly from different affiliated graduate colleges in Tehsil Pattoki & Chunia, Kasur.

Tool for data collection

A questionnaire comprising of 20 questions was used as a tool.

Research Instrument

Structured questionnaire technique was used. The questions were designed to know the opinions of students about the impact of AI on their learning at affiliated graduate colleges in district Kasur. This research used Five-point Likert scale. The responses of students were measured in the 5 options.

Validation of Instrument

Validation of instrument was done by repeated discussion with the research supervisor & expert of the fields.

Administration of questionnaire

Researchers collected informational data from different affiliated graduate colleges in Tehsil Pattoki & Chunia, Kasur. All concerned students cooperated with the researchers and gave their opinions.

Data collection

The questionnaire was finalized with consultation of the supervisor & experts after validation process. The data collection was completed during the month November- December, 2025

Analysis of data

Quantitative analysis of the collected data was done by using SPSS version 26. The data was initially coded and categorized numerically using the terms 1, 2, 3, 4 and 5. It was then entered into SPSS, or the statistical package for social sciences, and tabulated under the following categories: strongly disagree (1), strongly agree (4), neutral (3), and disagree (2). Descriptive statistics, including the frequency option, percentages, mean, standard deviation, and t-test, were used to analyze the data.

Analysis of Data

This part was concerned with analysis and interpretation of collected data. Researchers collected informational data from different affiliated graduate colleges in Tehsil Pattoki & Chunia, Kasur. The data was quantitative in nature. The Cronbach's alpha statistics (0.86) showed that the reliability value of instrument's data set was good and reliable. The questionnaire in this research study was designed to analysis the Impact of AI on the students' learning at affiliated graduate colleges in district Kasur. The data analysis results were presented in the form of descriptive and inferential statistics. Data were analyzed by the Statistics Package for Social Sciences version 26.

Reliability Statistics:

Cronbach's Alpha	No. of Items
0.86	20

The value (0.86) shows that the data and research instrument were reliable at good level.

Table 1.1: Demographics summary of participants: Distribution of frequency, percentage and mean of responses

Sr	Specification	f	%
Gender	Male	58	29.0%
	Female	142	71.0%
Age	18-20	63	31.5%
	21-5	108	54.0%
	25>	29	14.5%
Program	B. ed	70	35.0%
	BS Urdu	44	22.0%
	BS Islamic Education	17	8.5%
	BS English	12	6.0%
	BS Maths	25	12.5%
	BS Physics	10	5.0%
	MA Urdu	9	4.5%
	MA English	13	6.5%
Total		200	100.0%

Table 1.1 indicates that 29.0% participants were males and 71.0% were females. According to age, 31.5% had age range between 18 to 20 years, 54.0% had 21-25 years and 29% were of age more than 25 years. According to programs, 35.0% had B. ed, 22.0% had BS Urdu, 8.5% had BS Islamic Education, 6.0% had English, 12.5% had Maths, 5.0% had BS Physics, 4.5% had MA Urdu and 6.5% had MA English.

Table 1.2: Independent sample t-test on artificial intelligence scale about gender

Variable	Gender	N	M	S. D	t	df	Sig.(p)
Perceived artificial intelligence	Male	58	3.60	.711	1.011	198	0.313
	Female	142	3.49	.692			

Table 1.2 showed that an independent sample t-test was applied to find the gender based mean score difference. The results revealed that gender did not significantly affect in perspective towards artificial intelligence, as the $t = 1.01$, $p = 0.313$, $> .05$. It was concluded that both females as compared to males' participants, had shown almost similar perspective about artificial intelligence, at affiliated graduate colleges, (university level).

Table 1.3: ANOVA for artificial intelligence scale on the basis programs groups of participants

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.506	7	.644	1.338	.234
Within Groups	92.355	192	.481		
Total	96.862	199			

Table 1.3 Describes that the ANOVA, F -value (1.338) with $p = .234$, obtained for artificial intelligence scale, which was not statistically significant at standard alpha level of significance ($\alpha \leq .05$). There was no significant difference or variation exists among various age groups of

participants on perspective towards artificial intelligence, at affiliated graduate colleges, (university level).

Table 4.4: Pearson product moment correlation coefficient between participant's artificial intelligence and students' learning outcome (n=200)

Variables	'r'	'p'
Artificial intelligence and learning outcome score	.612	.001

Table 1.4 described that there was significant positive impact or relationship between participants' views about artificial intelligence and students' learning outcome score ($r = .612$, $p < .05$). It was concluded that participants' views about artificial intelligence is positively associated with their students' learning outcome, at affiliated graduate colleges, (university level).

Summary, Findings, Conclusion, Discussions, and Recommendations

This portion deals with the summary, research findings, and recommendations of this study. Through data analysis findings are emerged. On the basic of findings conclusions are drawn and in the light of the conclusion of this study recommendations were made.

Summary

The purpose of this study was to investigate the influence of AI learning on students' engagement and academic performance, to determine the viewpoint of students on AI tools, to explore how the education system is influenced due to AI tools and to identify the challenges and limitations of AI faced by university students. In first chapter the introduction, background of study, statement of the problem, objectives, research questions, significance of the study, delimitation of study and key words used in current study are described. In the second chapter the after reviewing the related literature from different sources i.e. journal articles, books, published thesis and dissertations, conference papers and symposium research papers had been written to fulfill the objectives and requirement of this research work. The related works which had been done in past by other people and researchers mentioned algorithm citations. Further introduction to previous works, definitions and terminologies, major characteristics of the current research work is described also. In third chapter the methodology of study was reported in which research design, sample population, sample & sampling technique, instrumentation, data collection procedure and techniques of data analysis and statistical tests are explained. In chapter four the data analyses and interpretations of results were presented. At the end in fifth chapter the findings conclusions and recommendations were written and explained.

Findings of the Study

On the basis of data analysis, the finding of the study were as follows.

- **Statement-1:** Indicates that 29.0% participants were males and 71.0% were females. According to age, 31.5% had age range between 18 to 20 years, 54.0% had 21-25 years and 29% were of age more than 25 years. According to programs, 35.0% had B. ed, 22.0% had BS Urdu, 8.5% had BS Islamic Education, 6.0% had English, 12.5% had Maths, 5.0% had BS Physics, 4.5% had MA Urdu and 6.5% had MA English.
- **Statement-2** showed that an independent sample t-test was applied to find the gender based mean score difference. The results revealed that gender did not significantly affect in perspective towards artificial intelligence, as the $t = 1.01$, $p = 0.313$, $> .05$.
- **Statement-3** describes that the ANOVA, F -value (1.338) with $p = .234$, obtained for artificial intelligence scale, which was not statistically significant at standard alpha level of significance

($\alpha \leq .05$). There was no significant difference or variation exists among various age groups of participants on perspective towards artificial intelligence, at affiliated graduate colleges in Kasur (University level).

- **Statement-4** Described that there was significant positive impact or relationship between participants' views about artificial intelligence and students learning at affiliated graduate colleges in Kasur (University level) outcome score ($r = .612, p < .05$).

Discussions

The research aimed to explore how AI influences various aspects of student learning, including academic performance, engagement, and the learning experience overall. The findings reveal both positive and negative impacts, highlighting the complexity of AI's role in higher education.

- **Academic Performance:** AI technologies, such as adaptive learning systems and intelligent tutoring systems, have been shown to improve academic performance by providing personalized learning experiences. These tools adapt to the individual needs of students, allowing for a more tailored approach to education that can lead to better understanding and retention of material. However, the research also indicates that the effectiveness of AI in improving academic performance was contingent on the quality of the technology and the students' ability to engage with it effectively.
- **Student Engagement:** AI has the potential to significantly enhance student engagement by offering interactive and immersive learning experiences. Virtual reality (VR), AI-driven simulations, and gamified learning platforms are examples of AI applications that have been found to increase student interest and participation in their studies. Despite these benefits, some students may find it challenging to adapt to AI-driven learning environments, particularly those who are less technologically literate or who prefer traditional learning methods.
- **Learning Experience:** The integration of AI in university-level education had transformed the learning experience, making it more flexible and accessible. AI-powered platforms enable students to learn at their own pace, access resources anytime and anywhere, and receive instant feedback. However, there were concerns about the potential for AI to depersonalize the learning experience and reduce the role of human interaction, which was essential for developing critical thinking and interpersonal skills.
- **Challenges and Ethical Considerations:** The use of AI in education raises several challenges and ethical concerns, including issues of data privacy, the digital divide, and the potential for AI to reinforce existing biases. Ensuring that AI technologies were used responsibly and equitably in education was crucial for maximizing their benefits while minimizing potential harms.

Conclusion

It was concluded that both females as compared to males' participants, had shown almost similar perspective about artificial intelligence, at affiliated graduate colleges in Kasur (University level). It was concluded that participants' views about artificial intelligence was positively associated with their students' learning outcome, at university level. The study concludes that AI has a significant impact on students' learning at the university level, offering both opportunities and challenges. While AI can enhance academic performance, student engagement, and the overall learning experience, it was essential to address the challenges and ethical concerns associated with its use. The successful integration of AI in education requires a balanced approach that combines technological innovation with a strong focus on pedagogy and student support.

Recommendations for Future Research

The following recommendations were made based upon the results collected in this research study and reflect the need for future research in the field:

- **Investigate Long-Term Impacts:** Future research should explore the long-term impacts of AI on student learning, including how it affects their academic trajectories, career prospects, and overall development.
- **Examine Student Perspectives:** More research is needed to understand students' perceptions of AI in their learning experience; particularly how different demographic groups interact with AI technologies and the challenges they face.

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