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Effects Of Artificial Intelligence (Ai) On Students' Academic Development And Creative Learning

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ABSTRACT

This study primarily aimed to examine the effects of Artificial Intelligence (AI) on students' academic development and creative learning. The population of this particular research study was comprised of all the registered students of Gomal University, Dera Ismail Khan, Khyber Pakhtunkhwa (KP), Pakistan. Gomal University comprised of more than 10000 students, so it's quite difficult for the researcher to contact the whole population; therefore, to overcome this problem, the researcher selected 344 students as the Sample of the study by using available sampling techniques. For the collection of data, the researcher developed a Likert-type scale, which underwent the process of validity and reliability. The developed questionnaire was personally served by the researcher among the respondents and collected back after being filled out by the respondents. The collected data were processed through the statistical package for social sciences (SPSS, version 26), and thus, appropriate statistical tools were applied. Findings of the study indicate there is a strong positive relationship between AI and academic development ($r = 0.687$, $p < 0.01$) as well as creative learning ($r = 0.607$, $p < 0.01$). Nevertheless, regression analysis still offered a subtler image that AI was a statistically



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significant predictor of academic development ($b = 0.321$, $p < 0.001$), explaining its 57.7 percent variance ($R^2 = 0.577$), and the ANOVA confirming the strength of the model ($F = 231.665$, $p < 0.001$). On the other hand, creative learning did not respond to AI in a significant way ($b = 0.089$, $p = 0.095$). Based on findings, the researcher concluded that AI demonstrates a profound and significant capacity to enhance academic development, functioning as a powerful engine for personalized learning and knowledge acquisition.

Key words: Artificial Intelligence (AI), Students' Academic Development, Creative Learning

INTRODUCTION

One of the 21st century's most revolutionary technologies, artificial intelligence (AI) is radically changing communication, knowledge production, and industry. AI today supports a wide range of applications, from healthcare and education to transportation and creative production, by allowing computers to mimic human vision, reasoning, and decision-making. The limits of automation and human-computer interaction have been pushed by recent developments in machine learning, deep neural networks, and generative AI models like ChatGPT and other massive language systems, creating both new opportunities and moral dilemmas. Researchers stress that although AI fosters creativity, productivity, and customization, it also necessitates strong frameworks for accountability, transparency, and fair access (Shaw, 2024).

Academic development is the ongoing process of improving students' cognitive, intellectual, and metacognitive skills in order to attain success and advancement in their education. It includes developing lifetime learning abilities, critical thinking, problem-solving, and self-control in addition to subject-matter knowledge. A variety of elements, including student involvement, digital literacy, teaching quality, and institutional support systems, all have an impact on academic progress in modern education (Qizi et al., 2025).

The term "creative learning" is an educational approach that fosters students' capacity for original thought, creative problem-solving and imaginative knowledge production. It encourages curiosity, creativity, and adaptability by involving students in experimentation, discovery, and teamwork in addition to rote memorization. The importance of creative learning in modern education is becoming more widely acknowledged as a means of cultivating 21st-century skills including design thinking, digital fluency, and critical thinking (Alizade, 2025).

Students today frequently employ artificial intelligence (AI) for their academic work. AI is having a big impact on education because it may boost productivity and performance through individualized learning, instant feedback, and resource access. Furthermore, if not counterbalanced with conventional approaches, possible hazards include over-reliance, issues with academic integrity, and detrimental impacts on wellbeing, like social isolation and anxiety (Vieriu & Petrea, 2025).

In both general and higher education, artificial intelligence is essential. AI gives students both academic obstacles and learning opportunities (Edtech, 2020). By using AI, students can receive academic support, advice, and feedback tailored to their unique learning styles and skill levels (Hwang et al., 2020).

AI serves as a constant tutor, providing immediate feedback and scaffolding to boost students' self-esteem and sense of academic self-efficacy (Zhang and Aslan, 2021). AI offers resources in the field of creative learning that expand the expressive possibilities and lower entrance barriers. Additionally, generative AI might assist in coming up with



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ideas for stories, music, or visual art, forcing pupils to overcome their creative blockages and try out several mediums (Cetinic and She, 2022).

AI is a novel form of collaboration between human intention and machine-generated creativity that encourages students to be more creative and iterative while redefining creativity as trainable and iterative. Similarly, overuse of AI in writing, research, and problem-solving might impede the development of metacognitive and critical thinking skills. Students lose the ability to develop the critical thinking, reasoning, and persistence abilities necessary to master new material if AI responds to their questions and arguments all the time (Da Silva & Ana, 2024; Szmyd & Mitera, 20).

Students frequently employ artificial intelligence (AI) in their academic pursuits. This facilitates students' academic tasks on the one hand, but appears to have had a negative impact on their innovative learning style on the other. The purpose of the current study was to evaluate how AI affected students' academic performance and innovative learning style.

RESEARCH METHODOLOGY

The current study was associated with AI and students' academic performance and creative learning; therefore the researcher used a quantitative research design. The population of this particular research study was comprised of all the registered students of Gomal University, Dera Ismail Khan, Khyber Pakhtunkhwa (KP), Pakistan. Gomal University comprises more than 10000 students, so it's quite difficult for the researcher to contact the whole population; therefore, to overcome this problem, the researcher selected 361 students as the Sample of the study by using available sampling techniques. For the collection of data, the researcher developed a Likert-type scale, which underwent the process of validity and reliability. Consent was taken from all the respondents, and similarly, all the respondents were informed about the confidentiality of the data. The developed questionnaire was personally served by the researcher among the respondents and collected back after being filled out by the respondents. The collected data were processed through the statistical package for social sciences (SPSS, version 26), and thus, appropriate statistical tools were applied.

PRESENTATION OF DATA

Table no.1 showing the Residence-Based Frequencies of Respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Local Residence	151	43.9	43.9	43.9
	Non-Local Residence	193	56.1	56.1	100.0
	Total	344	100.0	100.0	

This table displays the distribution of the survey participants based on their residence. The data shows that the majority of the respondents (56.1%, n=193) were non-local residents, while 43.9% (n=151) were local residents. The total sample size for this analysis was 344 students.

Table no. 2 Showing the Gender-Based Frequencies of Respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	250	72.7	72.7	72.7



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	Female	94	27.3	27.3	100.0
	Total	344	100.0	100.0	

This table presents the gender distribution of the study's participants. It indicates that male students constituted the majority of the sample (72.7%, n=250), while female students made up 27.3% (n=94) of the total 344 respondents.

Table no 3 Showing the Descriptive Statistics of key study variables: Artificial Intelligence (AI), Students' Academic Development, and Creative Learning

Testing Variables	N	Minimum	Maximum	Mean	Std. Deviation
Artificial Intelligence (AI)	344	1.30	4.80	3.2384	.84807
Students' academic development	344	1.63	4.62	3.3319	.60067
Creative learning	344	1.70	4.70	3.4326	.59383

This table provides descriptive statistics for the key study variables: Artificial Intelligence (AI), Students' Academic Development, and Creative Learning. The results show that, on average, students reported positive levels for all three constructs, with Creative Learning having the highest mean score (M=3.43, SD=0.59), followed by Academic Development (M=3.33, SD=0.60) and AI (M=3.24, SD=0.85).

Table no. 4 showing the relationship between Artificial Intelligence, Academic Development and Creative Learning of Students

		[1]	[2]	[3]
Artificial Intelligence (AI)	Pearson Correlation	1	.687**	.607**
	Sig. (2-tailed)		.000	.000
	N	344	344	344
'Academic Development	Pearson Correlation	.687**	1	.622**
	Sig. (2-tailed)	.000		.000
	N	344	344	344
Creative learning	Pearson Correlation	.607**	.622**	1
	Sig. (2-tailed)	.000	.000	
	N	344	344	344

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

This table presents Pearson correlation coefficients to examine the relationships between the main variables. The analysis reveals statistically significant, strong positive correlations between Artificial Intelligence and Academic Development ($r = 0.687, p < 0.01$) and between Artificial Intelligence and Creative Learning ($r = 0.607, p < 0.01$). This provides initial support for hypothesis H2, indicating that higher levels of AI adoption are associated with better academic development and enhanced creative



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learning.

Table no.5 showing the Impact of Artificial Intelligence on Academic Development and Creative Learning of Students

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	71.289	2	35.644	231.665	.000b
	Residual	52.467	341	.154		
	Total	123.756	343			
a. Dependent Academic development						
b. Predictors: (Constant), Artificial intelligence						

This ANOVA table summarizes the results of a regression model with Academic Development as the dependent variable and AI as the predictor. The highly significant F-statistic (F = 231.665, p < 0.001) indicates that the regression model is a good fit for the data, meaning that AI is a statistically significant predictor of Academic Development.

Table no. 6 Regression Analysis (Coefficient)

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.928	.123		7.535	.000
		.227	.038	.321	6.015	.000
a. Dependent Variable: Academic Development						

This table details the coefficients of the regression model predicting Academic Development. The analysis shows that Artificial Intelligence has a significant positive effect on Academic Development ($\beta = 0.321$, $t = 6.015$, $p < 0.001$). For every one-unit increase in AI, Academic Development is predicted to increase by 0.227 units.

Table no. 7 Regression Analysis (Model Summary)

Model	R	R Square	Adjusted R Square	Std. Error of Estimate
1	.760a	.577	.575	.38716
a. Predictors: (Constant), Artificial Intelligence AI				

This model summary table for the regression analysis indicates that Artificial Intelligence accounts for 57.7% ($R^2 = 0.577$) of the variance in Students' Academic Development. This demonstrates a substantial predictive power of AI on academic outcomes.

Table no.8 Regression Analysis (Coefficient)

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.897	.122		7.380	.000



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Artificial Intelligence AI	.062	.037	.089	1.674	.095
a. Dependent Variable: Creative learning					

This table presents the coefficients for the regression model with Creative Learning as the outcome. Unlike its effect on Academic Development, Artificial Intelligence did not show a statistically significant direct effect on Creative Learning ($\beta = 0.089$, $t = 1.674$, $p = 0.095$).

RESULTS AND DISCUSSION

The main goal of this specific research study was to evaluate how artificial intelligence (AI) affected students' academic growth and creative learning. The study's conclusions show a high favorable correlation between AI and both creative learning ($r = 0.607$, $p < 0.01$) and academic progress ($r = 0.687$, $p < 0.01$). The ANOVA confirmed the model's strength ($F = 231.665$, $p < 0.001$), while regression analysis provided a more nuanced picture of AI as a statistically significant predictor of academic growth ($b = 0.321$, $p < 0.001$), explaining its 57.7 percent variance ($R^2 = 0.577$). On the other hand, creative learning did not respond to AI in a significant way ($b = 0.089$, $p = 0.095$). This finding aligns with studies on Adaptive Learning Platforms that successfully close knowledge gaps (Xia et al., 2023). According to the findings of the study by Hennekeuser et al. (2024), artificial intelligence has a profound and intricate impact on education. Furthermore, the study came to the conclusion that AI makes personalized learning possible by customizing instructional materials to each student's particular requirements. Although AI is not a direct cause of creative development, the current study also found a strong correlation between students' use of AI and creativity. This bolsters the literature's warnings that AI has the potential to homogenize output and impede the creative process (Kafai, 2023). Such new conceptions, as supported by Holmes et al (2019), reveal that AI has greatly transformed the education and academic attitude of the students. The study went on to say that AI alone does not ensure successful educational outcomes. According to this idea, the research conducted by Castaneda & Selwyn (2018) revealed that the integration of AI in educational settings poses important queries about accessibility, equity, and the changing function of conventional teaching techniques.

CONCLUSION

On the basis of findings, the researcher arrived at the conclusion that AI demonstrates a profound and significant capacity to enhance academic development, functioning as a powerful engine for personalized learning and knowledge acquisition. However, its benefits for creative learning are not automatic; the initial promise of AI as a creative catalyst is not directly fulfilled without strategic intervention. The technology, in its current application, appears to be a tool for academic development but not an integral tool of creativity.

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