REVIEW OF CRIME, PEACE AND SOCIETY
ISSN (O): 3079-6105, ISSN (P): 3079-6091
Vol. 3, No. 4, 2026, 313-328

Artificial Intelligence and the Transformation of Teaching Practices in Higher Education: Evidence from Faculty Members at Kohat University of Science and Technology, Pakistan

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Abstract

The use of Artificial Intelligence (AI) in higher education is rapidly changing the way teaching and learning is done, how students are prepared for academic success, how they are assessed, and how learning is managed. The current study is designed to examine the effect of AI on the teaching approach of the faculty members of Kohat University of Science and Technology (KUST), Kohat, Pakistan. The research design used was quantitative cross-sectional with 152 faculty members as subjects who were sampled using a structured questionnaire. Chi-square and Kendall's Tau-c tests were used to analyze the relationship between the use of AI and teaching practices. The results showed that there was a strong positive correlation between the use of AI and the improvement of teaching methods (χ^2=14.32, p=0.001), the efficiency of classroom activities (χ^2=16.85, p<0.001), the preparation and management of lessons (χ^2=15.76, p<0.001), and assessment practices (χ^2=15.41, p=0.001). AI's ability to decrease workload, assist in personalized learning, and enhance academic activities was also acknowledged by faculty members. The study finds that AI has a great potential to improve the effectiveness of teaching and to help transform higher education. However, to ensure responsible use of AI technologies, faculty training, AI literacy, ethical guidelines, and institutional support are crucial for effective implementation.

Article History
Received 15 June 2026
Revised 05 July 2026
Accepted 14 July 2026
Published 08 August 2026

OPEN ACCESS

Corresponding Author *

Keywords
Artificial Intelligence; Higher Education; Teaching Practices; Faculty Adoption; Educational Technology; AI Integration; Pakistan

Introduction

Artificial Intelligence has become a part of our daily life and has been helping in making things more efficient, convenient, and developed in various fields of human activities. Over the past few years, AI has come out of the realm of theory and technology and has become a reality in education, research, healthcare, finance, governance, and administration. AI has a unique significance in the field of higher education, as universities are engaged in knowledge generation, information management, quality of teaching, research innovations, assessment and academic decision making. AI is thus a key area of interest for researchers, teachers, students, administrators, and policymakers (Crompton & Burke, 2023). In this regard, the study by Zawacki-Richter et al. (2019) shows that AI is making a significant impact on higher education by transforming it from a traditional to a modern and technology-based system. It has been widely adopted by teachers, students, and administrators, particularly in education through intelligent tutoring systems, adaptive learning platforms, automated feedback tools, plagiarism detection systems, digital assessment, learning analytics, student performance prediction, academic writing support, administrative automation, and particularly for class preparation (Ateeq et al., 2024).

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As with any socio-economic progress, third world countries like Pakistan are gradually picking up the momentum in the ethical use of AI in their educational system. While AI has the potential to offer numerous benefits, its adoption in Pakistan faces several challenges, including the lack of internet connectivity, technology literacy disparities, inadequate training, and the absence of clear policies and guidelines. Bhatti (2024) found that AI tools like ChatGPT, DeepSeek, Gemini, Perplexity, Twee, Canva, Grammarly, Turnitin, and other data analysis, class preparation, assessment, and grading tools can improve learning and assessment in Pakistan's higher education institutions. But to be effective they must be accompanied by the proper institutional readiness and support. This underscores the need for faculty development, awareness, policy making and responsible utilization of AI in Pakistani universities to ensure proper introduction and utilization of these technologies.

In this regard, a recent study in Pakistan revealed that students are getting exposed to the educational advantages of AI as well as the ethical problems related to its utilization. Ashraf et al. (2025) concluded that ChatGPT and other AI-driven tools can have a positive impact on students' academic outcomes in the higher education classroom in Pakistan. In the same vein, Alghazo et al. (2025) found that ChatGPT was perceived as a valuable learning resource by the students in Pakistani universities, but they also voiced concerns about academic integrity, ethical use, and overreliance on such tools. These findings suggest that AI is already a part of the higher education context in Pakistan. But, if not well directed and controlled, it can lead to issues concerning the quality of teaching, fair assessment and academic honesty. Thus, there is a need for guidelines in the use of AI in Pakistan universities to foster responsible and appropriate use of AI.

Simultaneously, AI can be used responsibly and with proper training, institutional support, ethical considerations, and necessary infrastructure to alleviate academic workload, enhance teaching quality, facilitate research tasks, and reinforce assessment practices. Hence, it is important to understand the attitude of the faculty members towards AI and its future impact on higher education in public sector universities. Considering AI's significance in higher education as a need and a quick way to redefine higher education, the present study has been designed to look at the role of AI in class preparation among the faculty. The study is delimited to the regular faculty members of Kohat University of Science and Technology, Kohat.

Artificial Intelligence and Classroom Activities

Artificial Intelligence (AI) assists teachers in creating presentations by providing outlines, structuring content, summarizing information, suggesting visuals, and creating speaker notes. These features can enhance the structure and flow of lectures, and decrease the time spent on preparation (Baig & Yadegaridehkordi, 2025). AI can also suggest questions for students and teachers to discuss, questions for reflection, and formative assessment activities to engage and involve students. AI can also help in the planning of activities in the classroom, including group discussions, case studies, quizzes, debates, problem-solving exercises, and inquiry-based learning tasks. It can create activities of varying difficulty levels, allowing teachers to cater to the diverse learning needs, and support critical thinking, creativity, and collaboration (Moundridou et al., 2024).

One of the major benefits of AI is its potential to reduce the time spent on routine academic tasks. Teaching, research, supervision, assessment and administration are often combined in faculty members. AI can help by creating initial lesson plans, lecture notes, presentations, quizzes, summaries, and drafts of feedback, thereby freeing up time for teachers to concentrate on more advanced instructional tasks (Baig & Yadegaridehkordi, 2025; Mah & Groß, 2024). However, these benefits come with new challenges, such as ensuring the accuracy of AI-generated content, vigilant oversight of AI usage, and the redesign of assessments to uphold academic integrity. Thus, the impact of AI on academic productivity is contingent upon effective utilization and support, which includes proper training. AI can help faculty plan lessons, create content, prepare presentations, design classroom activities, and manage workloads. Nevertheless, its application needs to be trained, with clear institutional guidelines and professional supervision (Xia et al., 2024). In summary, while AI can be a valuable academic support tool, its effective implementation should be supervised by teachers, guided by their professional judgment, ethical considerations, and institutional support.

Artificial Intelligence and Student Assessment

Assessment is a key element of the measurement of students learning, skills, understanding and progress. Assessment is now increasingly supported by Artificial Intelligence (AI) for test item generation, analysis of test responses, feedback, identification of learning gaps and continuous assessment. AI-powered tools can offer timely feedback, personalized support, and adaptive assessment opportunities that enhance the learning process (Luo et al., 2025; Xia et al., 2024). AI can aid in ongoing learning by generating practice activities, providing instant feedback, highlighting learning gaps, and suggesting learning resources in formative assessment. It can also help with self-assessment and peer assessment, promoting continuous improvement and learner engagement (Xia et al., 2024).

AI can help teachers create a range of questions such as multiple-choice, true/false, short answer, and case-based. It can also create questions of varying difficulty levels, allowing for the evaluation of various learning outcomes and minimizing the time needed to prepare test questions (Mulla & Gharpure, 2023; Zou, 2024). But there can be inaccuracies, ambiguities, or misalignment with course objectives in AI-generated questions. Hence, it is crucial for the teachers to check and improve the assessment items before using them to ensure their quality and relevance (Artsi et al., 2024). But AI-supported assessment should promote critical thinking and reflection, rather than providing immediate answers (Prompiengchai et al., 2025). As beneficial as AI can be, it should be used as a tool to assist teachers, not replace them. Assessment should be meaningful, fair, creative, professionally judged, and with ethical oversight, and it should be meaningful and aligned with educational goals (Alghamdi & Alghizzi, 2025; Bond et al., 2024).

Artificial Intelligence and Students' Grading

AI can analyze a student's academic performance, attendance, and engagement in the classroom, as well as their learning patterns and strengths and weaknesses, to provide insights into their academic progress. Learning analytics can aid this process by tracking students' learning progress and assisting teachers with timely academic support when necessary (Chen

et al., 2023). AI dashboards can also assist educators in visualizing data on student engagement, task completion, and performance, providing a clear overview of the learning process (Paulsen & Lindsay, 2024). AI can also play a role in the feedback process, helping to identify errors, provide explanations, and offer suggestions for improvement. This feedback can be delivered more rapidly, and in a more personalized way, and it can be especially helpful in larger classes where it may be challenging to give individual attention (Lee & Moore, 2024).

AI can also enhance the efficiency, consistency, and personalization of feedback, potentially positively impacting students' learning and engagement (Alghamdi & Alghizzi, 2025). The role of teachers in assessment is however still important, especially in high-stakes exams where accuracy, context, and professional judgement are required (Xia et al., 2024). AI can also be used to assist with the grading process, ensuring that teachers apply grading criteria uniformly and adhere to rubrics, thereby minimizing certain human errors and subjectivity in the grading process. But, if AI is utilized for assessment, it is important to ensure transparency in the process, clear assessment criteria, and trust in the assessment of student work (Chai et al., 2024). Meanwhile, concerns about student data privacy, protection and potential bias exist. If not designed to take account of differences in linguistic, cultural, or digital backgrounds, AI systems can also harm students from those backgrounds. Thus, it is crucial to have ethical protocols, human oversight, and clear evaluation mechanisms to ensure responsible and equitable use of AI in education (Bond et al., 2024; Bergdahl et al., 2024; Miao & Holmes, 2023).

Challenges of AI Usage in Higher Education

While there are numerous benefits to using Artificial Intelligence (AI) in higher education, there are also a number of challenges. These include the limited capabilities of AI, lack of digital infrastructure, over-reliance on AI tools, accuracy and reliability concerns, academic integrity concerns, and resistance to technological change. AI, if not trained, used with policies, and supervised, can result in superficial learning, increased plagiarism, and inequities in learning practices. Hence, it is crucial for universities to consider the ethical and responsible use of technology alongside innovation (Abbas et al., 2024; Bond et al., 2024).

In some instances, AI-generated presentations might also need careful editing, as they may include too much text, subpar examples, or incorrect information. Teachers should make sure that the content of presentations is relevant, accurate and consistent with the course goals (Chan & Tsi, 2024; Moundridou et al., 2024). AI-generated activities may not always align with classroom realities, such as the background of the students, class size, time available, and desired learning outcomes. Teachers need to assess and modify these activities prior to implementation, as reported by Acquah et al., (2024) and Mah & Groß, (2024).

AI literacy among teachers and students is one of the major challenges to the effective implementation of AI. AI literacy involves comprehending the functioning of AI systems, their capabilities and limitations, and the ethical concerns surrounding their application. Many users are using AI tools without realizing their pros, cons, and potential dangers. Therefore, AI can be used to get immediate answers instead of encouraging critical thinking and self-learning (Miao & Cukurova, 2024).

AI literacy is especially crucial for faculty members, who are tasked with teaching, designing assessments, academic integrity, and evaluating AI-assisted work. Lack of

knowledge can result in either the rejection of AI technologies or their misuse in educational environments. The UNESCO AI Competency Framework emphasizes the importance of AI knowledge, ethical awareness, pedagogical integration, and continuous professional development for educators. Thus, AI literacy should be considered as a technical and academic requirement (Miao & Cukurova, 2024).

The World Bank (2023) has stated that unequal access to digital technologies can limit access to technology-based education. Some of the most frequent issues are internet connectivity, computer facilities, electricity, technical assistance and a lack of institutional subscription to AI tools. These restrictions can exacerbate educational disparities by providing an edge to those who have access to more technology and better educational institutions. Consequently, the successful and inclusive integration of AI in higher education requires investments in infrastructure, technical support, and equitable access policies (World Bank, 2023; Bond et al., 2024).

Objective of the Study

The main objective of the study was to test the association of AI application for class preparation, presentation, assessment, and innovation.

Hypotheses of the Study

1. ***H*:** Artificial Intelligence has a significant association with AI use for class preparation, presentation, assessment, and innovation.
2. ***H0*:** Artificial Intelligence has no significant association with AI use for class preparation, presentation, assessment, and innovation.

Research Methodology

Research Design

The study was quantitative and cross sectional. This design enabled the researchers to gather the data from the respondents at one point in time (Creswell & Creswell, 2018) and therefore the application of artificial intelligence in academic practices, in this case, class preparation. The quantitative nature and design were also considered suitable for this study because it also allowed the researchers to collect data from a relatively large number of respondents within a limited time frame and with lesser resources. It is often used in social science studies to search for patterns, to describe what is going on or not, and to explore the relationship between variables without altering the context in which they are studied (Bryman, 2016). Furthermore, this design was suitable to explore the correlation between the use of AI tools and their effect on the transformation of Higher Education. It also helped in the use of statistical techniques to test the hypotheses formulated based on the real-time responses of the faculty members. Overall, the cross sectional research design was a practical and systematic way of attaining the objectives of the study and was able to draw meaningful conclusions from the empirical data collected from the target population (Babbie, 2010).

Population of the Study

All faculty members of Kohat University of Science and Technology were the population. Additionally, the study focused on faculty members from different academic fields, who are directly involved in teaching, assessment, grading, and academic planning, where AI tools and applications may have a potential impact. The population comprised faculty members of Social Sciences, Natural and Physical Sciences, Biological Sciences, Management Sciences, Pharmaceutical Sciences and Allied Health Sciences. The diversity of the participants provided a variety of perspectives on the role and application of AI in the academic setting.

Sampling Procedure

The study population was divided into strata and proportionate stratified random sampling technique was used. In addition, Bowley's formula was used to determine the number of respondents to be selected from each faculty. This resulted in each faculty being sampled in the same proportion as it existed in the total population. Random sampling was done in each faculty to ensure that all faculty members have an equal chance of being selected for the study. This helped to minimize selection bias and enhance the representation and generalizability of the results. The study population was 296 faculty members, the sample size was 152 based on 95 percent level of confidence and 5 percent margin of error from Sekaran's sample size table. Furthermore, the overall sample was allocated to each faculty in proportion to the number of students in each faculty as per the proportional allocation formula as provided by Kothari (2004) and Bowley (1926).

Table 1. Study Populations and Sample size

S. No	Faculty	Total Faculty Members	Sample Size
1	Faculty of Social Sciences	69	36
2	Chemical Sciences & Pharmaceutical Sciences	27	14
3	Physical & Numerical Sciences	59	29
4	Biological Sciences	63	32
5	Management Sciences	42	22
6	Allied Health Sciences	36	19
Total		**296**	**152**

Data Collection Instrument

The study was carried out with a structured questionnaire which targeted the role of artificial intelligence in the transformation of higher education and class preparation among the study population. The questionnaire included all the variables of the study namely, demographic, dependent and independent variables, which were measured on a three level scale of Agree, Disagree and Neutral. The questionnaire was pretested using a pilot study in the study population, prior to the actual administration, in which all ambiguities and uncertainties were identified, edited and corrected.

Validity and Reliability

The reliability was determined by Cronbach's Alpha in SPSS and it was found to be 0.73, which is within the acceptable range of reliability. In this regard, a value of 0.60 and above is considered sufficient for internal consistency and appropriate for indexation, whereas a value of 0.80 is considered highly significant for reliability (Nunnally & Bernstein, 1994). In addition, face validity was performed by reviewing the questionnaire for clarity, relevance, and appropriateness of the items (Taherdoost, 2016). All items in the questionnaire were aligned with the competencies of the new curriculum. To ensure content validity, the study's research objectives and conceptual framework were matched with the items. Construct validity was also ensured by the inclusion of items that were able to accurately measure the variables of interest, which included the use of AI in class preparation and the transformation of higher education.

Data Analysis

The collected data were analyzed by SPSS (20th Version) to explore the correlation between artificial intelligence and the change of higher education. In order to obtain accurate, consistent and meaningful interpretation of the results, the analysis was carried out systematically and step by step according to the research objectives and research hypotheses. Data were analyzed at two levels: Univariate and Bivariate. Descriptive analysis of frequency and percentage distributions were done using univariate statistics. Furthermore, to test the association between the dependent and independent variables, the Chi-square test was used. In addition, the Tau-c test was used to determine the direction of the results and association.

Results

Descriptive analysis of Participants' Responses Regarding AI Application in Class Preparation

The responses of the faculty members about the use of artificial intelligence in class preparation are presented in Table 2. The results show that the majority of respondents have a positive attitude towards the use of artificial intelligence in improving teaching, such as class preparation and assessment. The results show that a large percentage of the subjects think that AI can make teachers better teachers (61%) and make classroom activities more efficient (65%). This suggests that AI is seen as a useful tool to improve teaching and learning as not only improves classroom management but also streamlines the classroom. Similarly, 63% of respondents reported that AI is helpful in saving time on lesson preparation and management, suggesting that AI can save time and boost productivity for faculty. Additionally, over half of the respondents (52%) think that AI could improve the overall quality of education and (55%) that AI could help teachers better understand students' learning needs. This indicates that AI can not only be used for administrative support but also for pedagogical support to enhance teaching methods and learner-centred learning.

Furthermore, 58% of the respondents said that AI enables universities to automate repetitive academic tasks and 63% said that AI has helped to make learning more flexible in terms of browsing and searching relevant teaching materials. The results indicate a clear trend towards the idea that AI is increasingly becoming a more flexible and efficient approach to teaching. But there were mixed results in some regions. For instance, 46% of the respondents agreed that AI improves communication between teachers and students, while 37% did not

agree, indicating that there is a need to understand and integrate AI in the communication process.

In the same vein, 52% agreed that AI has a positive impact on academic performance in universities, while 37% disagreed, suggesting a certain level of caution about the direct impact of AI on the academic institutions. Overall, it can be concluded that the attitude of the faculty members regarding the use of artificial intelligence in preparing lessons at Kohat University of Science and Technology is positive, especially in terms of the use of artificial intelligence to facilitate the process of lesson preparation, to reduce the burden of lesson preparation, and to make lesson preparation more effective.

Table No. 2: Frequency and Percentage Distribution of AI Application in Class Preparation

S#	Statement	Agree	Disagree	Neutral	Total
1	Artificial Intelligence helps teachers to improve teaching methods.	93 (61%)	26 (17%)	33 (22%)	152 (100%)
2	AI tools make classroom activities more efficient.	99 (65%)	29 (19%)	24 (16%)	152 (100%)
3	AI saves time in preparing and managing lessons.	96 (63%)	29 (19%)	27 (18%)	152 (100%)
4	AI technologies improve the overall quality of education.	79 (52%)	43 (28%)	30 (20%)	152 (100%)
5	Teachers can use AI to understand students' learning needs.	84 (55%)	46 (30%)	22 (15%)	152 (100%)
6	AI supports universities in automating routine academic tasks.	88 (58%)	38 (25%)	26 (17%)	152 (100%)
7	AI has made learning more personalized and flexible.	96 (63%)	31 (20%)	25 (17%)	152 (100%)
8	AI tools reduce teachers' workload in higher education.	85 (56%)	34 (22%)	33 (22%)	152 (100%)
9	The use of AI improves communication between teachers and students.	70 (46%)	56 (37%)	26 (17%)	152 (100%)
10	AI helps universities achieve better academic results.	79 (52%)	56 (37%)	17 (11%)	152 (100%)

Source: (Field Survey, 2026)

Association between Artificial Intelligence and Teaching Activities

The field information on the various respondents' statements of independent variables and the dependent variables shows the relationship between the attitude of the respondents and the level of perception of the role of Artificial Intelligence (AI) in teaching activities. Chi-square test and Kendall's Tau-c statistics were used to show the association between the variables. The results show a statistically significant relationship between attitude and all aspects of class preparation with the use of AI. The majority of the respondents agreed with the statement "Artificial Intelligence helps teachers to improve teaching methods" (n=87) while 15

disagreed and 6 were neutral. This relationship was statistically significant (χ^2=14.32, p=0.001), and was moderately positively associated (Tau-c=0.351). This indicates that respondents were more likely to see AI as a means to enhance instructional practices.

Likewise, the majority of respondents at the high level agreed (n=110) that AI tools increase the efficiency of classroom activities, with 7 disagreeing and 8 being neutral. The association was highly significant (χ^2=16.85, p<0.001) and had a moderate positive relationship (Tau-c=0.387). This suggests that positive attitudes towards AI are associated with greater beliefs about AI's potential to improve the efficiency of classrooms. When asked about the statement "AI saves time in preparing and managing lessons", 60 respondents with high-level perceptions agreed, while 7 disagreed. A significant Chi-square value (χ^2=15.76, p<0.001) and a significant Tau-c value (0.372) indicate a positive relationship between positive attitudes toward AI and the time-saving benefits of AI.

There is potential for the use of ICT in teaching activities. The findings also indicate that the majority of the respondents were positively oriented and agreed that "AI technologies have made evaluation and students' grading easier. Of those who responded to the high-level question, 61 agreed and 16 disagreed. The association was statistically significant (χ^2 = 15.41, p = 0.001) and had a moderate positive association (Tau-c = 0.365). This suggests that generally, respondents were confident with the educational benefits of using AI technologies. The same trend was seen regarding the statement: “Teachers can use AI to understand students' learning needs.” The majority (n = 101) agreed with this statement, with 14 disagreeing. The relationship was statistically significant (χ2 = 10.44, p = 0.015) and the Tau-c value was 0.284 which showed positive association. This indicates that, in general, the respondents believed that AI can be a valuable tool to identify and address students' learning needs. The same pattern was found for the statement, “AI helps universities to automate routine academic tasks.” Of those respondents who had a high level perception, 101 agreed with the statement while 13 disagreed. This association was statistically significant (χ^2 = 12.95 and p = 0.004) and had a positive Tau-c value of 0.327. This means that the more positive the attitudes, the more acceptance of the use of AI for routine academic tasks. There was also a statistically significant relationship between the statement “AI has made learning more personalized and flexible” (χ^2 = 11.87, p = 0.008). Of those who had high level perceptions, 96 agreed that this was the case, while 11 disagreed. The Tau-c value (0.301) indicates a moderate positive relationship, indicating that the respondents were aware of the use of AI to facilitate personalized learning experiences.

Similarly, the statement "AI tools reduce the workload for teaching in higher education" (n=97) received a high level of agreement with only 15 disagreeing. The association was statistically significant (χ^2=12.87, p=0.012). While the correlation between Tau-c (0.128) and other statements shows a relatively weaker relationship, the findings suggest that positive attitudes are associated with higher recognition of the role of AI in reducing workload. There was a significant association between the statement "The use of AI improves communication between teachers and students" (χ^2=8.27, p=0.041). Most high-level respondents agreed (n=74) vs. 12 who disagreed. The positive Tau-c value (0.216) suggests that good

The correlation between attitudes towards AI and perceptions of improved teacher-student communication is moderate. Lastly, AI's impact on academic performance was also

recognized by the respondents. Sixty-six high-level respondents agreed with the statement "AI helps universities achieve better academic results", with only 10 disagreeing. This association was statistically significant (χ^2=9.54, p=0.023), and the positive Tau-c value of 0.248 suggested that respondents with more positive attitudes towards AI were more likely to perceive improvements in academic outcomes.

Table 3. Association between Artificial Intelligence and Class Preparation

Statement	Attitude	Use of Artificial Intelligence			Total	Chi square (χ^2) p-value
		High Level	Moderate Level	Low Level		
Artificial Intelligence helps teachers to teaching methods	Agree	87	02	27	114	γ^2= 14.32 (P=0.001) Tau-C 0.351
	Disagree	15	01	9	25	
	Neutral	06	02	8	16	
AI tools make activities more efficient	Agree	110	04	16	120	γ^2=16.85 (P=0.000) Tau-C =0.387
	Disagree	07	05	09	21	
	Neutral	08	04	08	20	
AI saves time in and managing lessons	Agree	60	09	21	90	γ^2=15.76 (P=0.000) Tau-C =0.372
	Disagree	07	12	13	32	
	Neutral	10	11	9	30	
AI technologies The overall quality of education	Agree	61	22	38	111	γ^2=15.41 (P=0.001) Tau-C =0.365
	Disagree	16	08	09	31	
	Neutral	02	02	06	10	
Teachers can use AI understand students' learning needs	Agree	101	04	20	125	γ^2=10.44 (P=0.015) Tau-C=0.284
	Disagree	14	01	01	16	
	Neutral	03	01	02	06	
AI supports Automating routine academic tasks	Agree	101	03	13	117	γ^2=12.95 (P=0.004) Tau-C =0.327
	Disagree	13	03	11	27	
	Neutral	02	03	03	08	
AI has made learning personalized and	Agree	96	2	17	115	γ2=11.87 (P=0.008) Tau-C =0.301
	Disagree	11	1	7	19	
	Neutral	3	3	12	1	
AI tools reduce workload in education	Agree	97	3	20	120	γ^2=12.865 (P=0.012) Tau-C=0.128
	Disagree	15	1	4	20	
	Neutral	05	4	3	12	
The use of AI communication teachers and students	Agree	74	23	27	124	γ^2=8.27 (P=0.041) Tau-C=0.216
	Disagree	12	3	5	20	
	Neutral	3	3	3	8	
AI helps achieve better results	Agree	66	39	10	109	γ^2=9.54 (P=0.023) Tau-C=0.248
	Disagree	10	9	11	30	
	Neutral	3	4	6	13	

Discussion

The results of the current study indicate that Artificial Intelligence (AI) is seen as a valuable Educational Technology (ET) which is positively impacting the teaching and learning practices, classroom preparation, assessment activities and academic management in general by the faculty members of Kohat University of Science and Technology (KUST). The results show that there are statistically significant relationships between the use of AI and various aspects of teaching practices, suggesting that AI is not just perceived as a technological

advancement but is also gaining traction as an academic aid. The findings from the Chi-square test show that there is a significant relationship between the attitudes of faculty members towards AI and their recognition of the role of AI in improving academic practices (χ^2=14.32, p=0.001), efficiency in classroom activities (χ^2=16.85, p<0.001), preparation and management of lessons (χ^2=15.76, p<0.001), and activities related to assessment (χ^2=15.41, p=0.001). The results suggest that the use of AI by university teachers is linked to a shift from traditional teaching methods to more technology-driven and flexible ones.

KUST faculty members' positive attitudes towards AI align with the literature that highlights the increasing integration of AI in education, especially in higher education. Past research has demonstrated that AI technologies have an impact on academic practices, such as lesson planning, content creation, instructional design, assessment preparation, and student support (Zawacki-Richter et al., 2019; Crompton & Burke, 2023). Likewise, a recent systematic review identified the key contributions of AI in higher education as the creation of educational resources, the relief of academic workload, the enhancement of assessment practices, and the facilitation of better teaching practices (Liang et al., 2025). Therefore, the findings in this study indicate that AI should be viewed as an educational partner and not a replacement for teachers but rather as a facilitator to enhance teachers' capabilities.

Most faculty members felt that AI improves the teaching approach and efficiency of the classroom, reflecting the increasing importance of AI-assisted teaching design. In this study, 61% of the participants believed that AI can help teachers improve their teaching methods, while 65% thought that AI tools can improve the efficiency of classroom activities. This positive reaction is due to the AI systems' ability to help teachers develop content for lectures, examples, discussion questions, classroom activities and adapt content to students' needs. Moundridou et al. (2024) found similar results, pointing out that generative AI can support teachers in their lesson planning and improve the organization of instruction when developing educational content. Similarly, Baig and Yadegaridehkordi (2025) found that AI-driven tools can streamline teaching processes, freeing up time for educators to engage in more creative and student-focused activities. The present study extends this by providing empirical evidence from an environment of AI adoption in public-sector university in Pakistan where AI adoption is still at a nascent stage.

Another important result of this study is that there is a strong correlation between the use of AI and the reduction of lesson preparation time. Many of the respondents (63%) agreed that AI assists them in saving time in preparing and managing lessons. Academic staff often have to perform multiple roles as teacher, researcher, supervisor, evaluator and administrator. In such cases, AI can help alleviate the burden of repetitive tasks, such as creating the initial lecture plan, designing learning materials, formulating assessment questions, and organizing the course. Mah and Groß (2024) suggested that generative AI can revolutionize instructional design by helping educators create teaching materials more efficiently. Likewise, recent studies indicate that AI can enhance academic productivity through various phases of the learning process, such as planning, teaching, and assessing. Based on the above findings, it is therefore concluded that AI could be a potential effective mechanism in enhancing faculty productivity at KUST.

The results also show the perception of the role of AI in student-centred learning and personalized learning. More than half of the respondents said AI helps teachers to better understand students' learning needs (55%) and to provide more personalized and flexible learning (63%). The finding indicates that faculty members are aware of the potential of AI and consider it as a tool that can be used to improve pedagogical decision-making. AI-powered learning analytics systems have the ability to analyze the interactions of students, detect learning difficulties, and offer information to guide instructors in formulating suitable teaching strategies (Chen et al., 2023). Similarly, AI-supported feedback systems can provide timely responses and individualized guidance, which are particularly beneficial in large classrooms where providing personalized feedback manually can be challenging (Lee & Moore, 2024). AI-powered personalization and adaptive learning also stand out as one of the most promising use cases for AI in higher education, as highlighted in recent reviews.

The significant association between AI and assessment practices is another important finding of this research. There was confidence in AI-supported evaluation and grading processes, with faculty members reporting that AI technologies facilitate evaluation and grading. AI can assist teachers in creating assessment questions, evaluating student answers, identifying learning gaps, and giving instant feedback. Luo et al. (2025) pointed out that AI-assisted assessment systems can enhance assessment efficiency by facilitating continuous assessment and feedback. When using AI for assessment, however, it is important to exercise caution due to potential inaccuracies or questions that do not align with the learning objectives in automatically generated feedback. Artsi et al. (2024) noted that teachers need to review and validate AI-generated assessment materials prior to implementation. Thus, the current results indicate that while faculty members see the potential for using AI in assessment, they must ensure ongoing faculty engagement and professional judgment for effective implementation.
While the results indicate high levels of AI acceptance, they also highlight the need for responsible and ethical use of AI. A few respondents were still not sure how well AI can enhance communication and academic performance, suggesting that technology use does not necessarily translate to improved learning outcomes. Issues of accuracy, academic integrity, privacy, and overreliance on AI are still significant. Past research has highlighted the potential dangers of superficial learning, plagiarism, and issues of fairness and transparency with the use of AI (Bond et al., 2024; Miao & Holmes, 2023). The importance of AI literacy among faculty members, clear institutional policies, and continuous professional development for the effective use of AI have also been highlighted in recent research. Thus, universities should not just make AI tools available, but also establish ethical guidelines and training programs to ensure their responsible use in education.
The findings are significant for the context of higher education in Pakistan, where the institutions are increasingly shifting towards digitalization, but still grappling with infrastructure, training, and policy-making issues. Overall, the responses from KUST faculty members indicate a positive attitude towards the adoption of AI in academic activities. In Pakistan, the findings indicate that AI technologies like ChatGPT can positively impact students' learning experiences and academic performance when integrated into the educational context (Ashraf et al., 2025). But these benefits can only be realized if institutions invest in digital infrastructure, offer training on AI-related topics and create guidelines on the ethical and responsible use of AI.

In conclusion, the results of this study contribute to the literature on the use of AI in the higher education sector in Pakistan. The findings suggest that AI has the potential to enhance the effectiveness of teaching, alleviate teaching workload, aid in assessment, and facilitate personalized learning. Meanwhile, AI should be used as an aid and not a replacement for the work of teachers. To ensure the future use of AI in higher education, it is essential to strike the right balance between technological progress and human participation. Teachers will remain at the heart of the review process of AI-generated content, upholding academic standards, and ensuring meaningful and educationally sound learning experiences.

Conclusion

The current study reveals that Artificial Intelligence (AI) has a growing impact on the teaching methods of the faculty members of Kohat University of Science and Technology (KUST), Kohat. The results suggest that there is a positive correlation between the use of AI and various aspects of the teaching process, such as lesson planning, classroom management, assessment, workload management, and personalized learning. Overall, faculty members considered AI to be a valuable educational tool that can enhance teaching efficiency, save time, aid in the creation of learning materials, and provide valuable insights into students' learning needs. The positive associations between AI use and academic practices also indicate that AI can have a significant role in the current modernization of higher education.

Meanwhile, the responsible use, proper training, and robust institutional support of AI are essential for its effective integration. While AI can support teachers in enhancing teaching and managing academic tasks, it should be used in conjunction with and not replace the professional knowledge and judgment of teachers. Thus, universities must be more aware of AI literacy among faculty, establish clear ethical guidelines, and ensure equitable access to AI technologies. In conclusion, the study suggests that AI can serve as a tool for enhancing teaching and learning in a more innovative, efficient, and student-centred way if it is properly implemented and used responsibly.

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