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Beyond Traditional Teaching: Reimagining Higher Education Through Human-Centered Artificial Intelligence

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Abstract

The advent of artificial intelligence (AI) has ushered in fresh possibilities to reimagine existing educational norms and foster learning for all students, including personalized and inclusive approaches. This study explored the impacts of human-centered AI on the teaching and learning processes in HEI. The study focused on how artificial intelligence-based technologies can improve teaching effectiveness, student engagement, academic outcomes, and data-driven decision-making, while upholding human values, human ethics, and well-being of learners. A mixed methodology was used which involved both quantitative with University students and University staff as well as qualitative data through interviews and open-ended responses. The results indicated that human-centered AI had a profound impact on enhancing learning accessibility, enabling personalized learning journeys, and improving the communication and understanding between educators and students. The odds of needing to keep a constant watch out for AI were reduced, while learning environments that created an AI-like experience improved critical thinking, learning by self and academic feedback. The findings also demonstrated the importance of ethical considerations, digital literacy, transparency and teachers' engagement in making pedagogical decisions for the successful implementation of AI. Moreover, the study revealed that the use of AI played its strongest role when it was used alongside human aspects of the teaching process, such as empathy, mentorship, collaboration skills, and professional judgements. The study also made a significant contribution to the field of educational innovation by providing insights and evidence into the potential of using AI tools to support and enhance the learning process. The study findings were that an AI strategy that serves the human experience in higher education also led to a balanced and sustainable change, allowing for the use of technology to strengthen, but not weaken, the quality of teaching and learning for students.

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Introduction

With the swift progress of Artificial Intelligence (AI), higher education has been drastically changed. The use of AI technologies in improving teaching methods, learning experiences, academic administration and the provision of services to relieve students is gaining momentum in educational institutions around the world (Faisal, Ahmed, Makhdum, & Makhdum, 2023). Different from the traditional educational model which mainly emphasizes on the knowledge transfer from the instructor towards the students, the contemporary educational model focuses more on providing personalized experiences and knowledge transfer to the students through elements of inclusivity and learner-centeredness (Faisal,

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Ahmed, Makhdum, & Makhdum, 2023). In conclusion, Human-centred Artificial Intelligence is emerging as a paradigm that can combine technological advancements with these human values, ethics, and educational requirements. This has the advantage of being a belief that AI should complement and augment human efforts, not supplant them in the learning process.

The penetration of such AI technologies in the higher education sector has resulted in the emergence of intelligent tutoring systems, adaptive learning platforms, predictive analytics, automated assessment systems, and virtual learning environments (Faisal, Ahmed, Makhdum, & Makhdum, 2023). These innovations have led to greater access to education material, improved-engagement of learner, and greater opportunity for personalized learning experiences (Makhdum et al., 2023). It has been suggested that educational organizations have aimed to transform information and communications technologies for PBL by making a change in education systems' focus from content-oriented learning to competency-focused learning, which has proven to be an opportunity to enhance learning outcomes through technology-enriched learning environments (Faisal et al., 2023).

Human-centered AI places learners, educators, and stakeholders at the core of technological development and implementation. This perspective acknowledges that educational technologies must align with cognitive, social, emotional, and ethical dimensions of learning. Studies have demonstrated that technology integration becomes more effective when educational objectives and learner needs remain central to decision-making processes (Makhdum & Mian, 2012). Furthermore, AI-assisted learning environments have supported the development of critical thinking, collaboration, self-directed learning, and problem-solving skills among students (Makhdum, Elahi, Faisal, & Tariq, 2022).

The use of AI in higher education has also contributed to institutional efficiency through data-driven decision-making and personalized academic support systems. Educational institutions have increasingly relied on learning analytics and intelligent systems to identify learning patterns, monitor student progress, and provide timely interventions to enhance academic success (Khan, Makhdum, & Jabeen, 2022). Similarly, AI-based educational applications have facilitated more flexible and accessible learning opportunities for diverse student populations (Salim, Makhdum, & Younas, 2022).

Recent studies have emphasized the importance of balancing technological innovation with ethical considerations, transparency, fairness, and human well-being (Abbas & Faisal et al., 2024). Human-centered AI promotes responsible technology adoption by ensuring that educators remain active participants in instructional processes and pedagogical decision-making. Research has highlighted that successful AI integration requires digital competence, institutional readiness, and positive perceptions among faculty and students .

The emergence of advanced AI technologies has further accelerated educational innovation and transformed traditional teaching practices. Educational researchers have reported improvements in learner engagement, instructional quality, and academic performance through the effective implementation of technology-enhanced learning environments (Younas, Khan, & Makhdum, 2022). At the same time, concerns regarding ethical implications, data privacy, and the preservation of human interaction in education have

emphasized the importance of adopting a human-centered approach (Begum, Yaseen, & Faisal, 2025).

This idea of human-centered AI in higher education has garnered much interest from researchers, policymakers, and educators alike. Towards this end, this perspective aims to tap into advances in technology while retaining key human aspects – including empathy, mentorship, co-creativity and professional judgement. This study explored the impact of the human-centered application of AI on educational outcomes and the teaching-learning experience, assesses how human-centered AI has challenged the current teaching model in higher education, and examines how it could potentially influence educational outcomes and teaching strategies in rocky educational landscapes.

Significance

This study is important not only because of its empirical nature, but also because it contributes important insights into the concept of human centered Artificial Intelligence and its potential for changing the Higher Education landscape. The results are useful in terms of the understanding of how the utilization of AI technology improves teaching and learning effectiveness, the involvement and enhancement of students in learning, ease of access to learning and improving the quality of learning experience. Results are beneficial for understanding how the usage of AI technology enhances maturity in teaching, students participation in the learning process, access to learning and quality of learning experience (Faisal, Ahmed, Makhdum and Makhdum, 2023). The study also provides suggestions to policy makers, educational leaders, curriculum developers, and teachers on the responsible implementation of AI in education. Moreover, it extends the body of knowledge about educational innovations, through a focus on the fundamental values, ethics, and pedagogical effectiveness associated with technology (Maria et al., 2025).

Problem Statement

Although some Artificial Intelligence (AI) technologies have been introduced in the higher education sector to help teachers enhance personalized learning, engage students, and optimize adaptable didactic practices, many higher education institutions still have some teaching methods that inhibit these elements . While AI offers promising opportunities to enhance the effectiveness of education, challenges such as ethics, transparency, human interaction, and digital readiness are significant obstacles. Although prior works has explored the technological capabilities of AI, little focus has been placed on the human-centred aspects of transforming higher education with AI while maintaining the crucial role played by educators and fostering meaningful learning experiences. In order to help transform higher education without relying on the traditional approach to teaching, this study examined the part of human-centred Artificial Intelligence (AI) in a reimagining of higher education (HE) beyond the traditional approach to teaching (TA).

Objective

1. To examine the role of human-centered Artificial Intelligence in transforming teaching and learning practices in higher education.

2. To investigate the impact of human-centered AI on student engagement, learning experiences, and academic development.
3. To identify the factors that support the effective and ethical implementation of human-centered AI in higher education institutions.

Research Questions

RQ 1: How does human-centered Artificial Intelligence transform teaching and learning practices in higher education?

RQ 2: What impact does human-centered AI have on student engagement, learning experiences, and academic development?

RQ 3: Which factors contribute to the effective and ethical implementation of human-centered AI in higher education institutions?

Gaps

The adoption of educational technology in higher education, as well as the role of a digital learning environment and the integration of AI in education, has been studied in detail in the past (Makhdum et al., 2022; Khan & Younas, 2021). The potential benefits of AI have, however, received little focus on the human-centered AI, which emphasizes the well-being of the learners, ethical issues, and meaningful contributions from the educator. Studies have so far been centered on the technological effective part or institutional parts of the systems and not a balance between automation and human interface (Naz et al., 2021). Moreover, little empirical studies and research exist that can explain how human-centred AI can facilitate personalized learning without compromising values like education, empathy and inclusiveness (Younas, Taj, Khan, Hussain, Makhdum, & Khan, 2023). Thus, this study took up the issues mentioned above and explored the transformative potential of Human-centered Artificial Intelligence in Higher Education .

Literature Review

As AI technologies became more prevalent to support adaptive learning and tailor recognition, more and more teachers were being phased out, making their role less dominant by making way for new education systems and styles focused on student-centered learning and engagement (Makhdum, Khanam, & Batool, 2023). Studies have shown that the digital transformation in higher education has been a key factor in modernizing higher education institutions and providing opportunities to implement innovative learning approaches (Faisal et al., 2023). The integration of AI in education has empowered schools to offer more personalized support, allowing them to identify learners' requirements, monitor their progress, and offer tailored recommendations. This has led to better access to learning for all and enhanced learning effectiveness by addressing various learner preferences and learning styles (Makhdum, Sandhu, Batool, Khan, Faisal & Younas, 2023).

Human-centred A.I. is an upgrade of the educational technology with consideration of the values and ethics of humans and a touch of meaningful interaction with the learner and teacher. In contrast to technology-centered approaches, human-centered AI is concerned with enhancing humans' capabilities (not replacing them). This approach helps to integrate

technological innovation with the educational goals and the value of retaining the human judgment, empathy, and cooperation in teaching and learning spaces (Begum, Yaseen, & Faisal, 2025).

Studies have reported that AI-supported learning environments positively influence student engagement and academic achievement. Adaptive learning systems provide real-time feedback and customized learning pathways that respond to individual learner needs. As a result, students become more actively involved in their educational experiences and demonstrate greater motivation and self-regulated learning behaviors (Qayyum, Khalil, Arif, Rafiq, & Makhdum, 2025). Furthermore, technology-enhanced educational environments have facilitated collaborative learning and knowledge-sharing practices that support deeper understanding and critical thinking development.

The effectiveness of AI integration in higher education depends largely on the readiness of institutions, educators, and learners. Educational organizations must develop supportive infrastructures, digital competencies, and strategic policies to maximize the benefits of technological innovation. Research has shown that faculty perceptions and technological preparedness significantly influence successful implementation and adoption processes. Additionally, professional development initiatives have been identified as essential factors in promoting positive attitudes toward AI-supported educational environments (Faisal, Khan, Faisal, & Makhdum, 2024).

The ability enables one-to-one teaching and helps to enhance learning outcomes based on individual strengths and weaknesses of learners (Maria et al., 2025). The results of research have shown that students' learning can be enhanced through personalized learning experiences that promote autonomy, engagement, and achievement (Younas, Khan, & Taj, 2023).

Ethical issues regarding the use of AI in educational space are receiving more and more attention . Human centered AI highlights key principles that include fairness, accountability, transparency, privacy and Inclusiveness . Educational researchers have said that the successful implementation must involve protecting students' data, reducing algorithmic bias, and making technological resources accessible to all (Abbas & Faisal et al., 2024). A critical aspect of human-centered AI is maintaining meaningful human interaction in educational settings. AI tools can help automate repetitive tasks and enhance teaching efficiency, however their reliance on humans is fundamental when providing mentorship, emotional support and professional guidance, suggesting that educators continue to play a vital role in areas that are difficult to automate. It is also recognized and emphasized that successful learning experience is built on aspects of key interpersonal relations and involvement of learners (Makhdum & Mian, 2012).

Educational innovation supported by AI has also influenced curriculum development and assessment practices. AI-enabled assessment systems provide immediate feedback, automate grading procedures, and generate insights that support academic improvement. These innovations allow educators to focus more on instructional planning and learner support while reducing administrative burdens (Makhdum, Elahi, Faisal, & Tariq, 2022). Research has

further suggested that AI-supported assessment contributes to more efficient and data-driven educational practices (Khan, Taj, Zill-e-Huma, & Younas, 2024).

The relationship between AI and student engagement has received considerable scholarly attention. Higher education institutions increasingly utilize intelligent systems to create interactive and responsive learning environments. Such environments encourage active participation and support meaningful learning experiences. Findings have indicated that students who engage with AI-supported platforms demonstrate higher levels of motivation, satisfaction, and academic persistence (Younas, Taj, Makhdoom, Makhdum, & Akram, 2024).

Artificial Intelligence has also expanded opportunities for inclusive education by addressing barriers associated with traditional learning environments. AI-driven technologies facilitate accessibility through adaptive interfaces, language support, personalized resources, and assistive learning tools. Consequently, broader segments of the student population can access educational opportunities and participate more effectively in learning activities (Salim, Makhdum, & Younas, 2022).

Recent research has highlighted the growing importance of combining technological innovation with human-centred principles. While institutions continue to invest in advanced educational technologies, the long-term success of AI initiatives depends on maintaining a balance between automation and human engagement. Human-centred AI offers a framework for achieving this balance by ensuring that technology serves educational goals while respecting human dignity, autonomy, and well-being.

Previous literature also reveals that through the collective efforts, Human-centred Artificial Intelligence has grown to be a transformative force in education . Based on these findings, it is recommended that further research needs to be conducted on the role of Human-centred AI in revolutionizing education beyond traditional teaching methods and fostering sustainable educational development.

Methodology

The research design used in this study followed mixed research which uses qualitative data to generate ideas and then complemented by quantitative data to produce insights that helped to reimagine Higher Education (HE) beyond the traditional teaching model of higher education. The purpose of implementing a mixed method approach was that it could obtain a comprehensive view of the phenomenon by synthesizing quantitative with qualitative data. This educational analysis demonstrated that the quantitative part helped quantify perceptions, experiences and attitudes about using human centred AI in higher education, and the qualitative part helped to deepen participants' feelings, lived and real experiences, and interpretation of how AI-supported learning practices have played out in the classroom, and in the lives of participants and their students. Both methods created a comprehensive understanding of the effects of AI in the educational landscape and bolstered the study's results and conclusions. Past educational research has shown that mixed methods research is effective in studying complex phenomena related to education and the integration and use of education technology in higher education institutions (Makhdum, Khan, Munir, Younas, & Faisal, 2022; Faisal, Ahmed, Makhdum, & Makhdum, 2023).

A convergent mixed methods research design was used in this study to explore the contribution of human-centred Artificial Intelligence (AI) to reconsidering higher education beyond the context of teaching. Both qualitative and quantitative data were collected simultaneously and amalgamated during interpretation which was done to gain an overall view of the phenomenon.

After conducting a qualitative preliminary study to confirm the subjects within the focus group, the sample subjects of the study were faculty and students at higher-learning institutions that actively use digital learning technologies and AI-supported educational tools. Due to the focus of the study being the understanding of how human-centred AI can affect education, participants were chosen from institutions that had experience using technology in the learning environment . They contributed with various viewpoints on implementation, effectiveness, opportunities, and challenges of human-centred AI in HE settings, as outlined by Younas, Khan, and Makhdum (2022).

In the quantitative phase of the study, 400 students and 100 faculty members of the university were chosen as sample figures, which brought the total sample sizes in the quantitative phase to 500 respondents. To conduct semi-structured interviews for the qualitative phase 20 participants (academic staff members and students) were selected. The qualitative approach, when used in conjunction with the quantitative approach, yielded a sample that was representative enough and facilitated the collection of all the required data relevant to addressing the research objectives, as proposed by . Many researchers in the field of education and technology have employed the same sampling methods to get an overview of both statistical and contextual experiences.

A multistage sampling method was used in the study. Using purposive sampling approach, actors in the first stage were identified which consisted of higher education institutions applying AI in educational tools and digital learning technologies in learning process. The purposive selection allowed the institutions to have relevant experience of applications and implementation of AI and the use of technology to enhance the educational process . To select the students and faculty members at the 2nd stage, stratified random sampling methods were used and students and faculty members are selected from various disciplines of study. Stratified sampling further helps to ensure that the subjects involved are representative as they represent various classes of education and disciplines, thereby enhancing their patterns. The qualitative component employed purposive sampling to select participants who have firsthand experience with AI supported learning environment and educational technologies; accordingly, participants were purposefully selected where necessary. This method allowed the researcher to gain in-depth and valuable understanding into the use of human-centred AI in higher education (Makhdum et al., 2023).

Data were collected through two primary instruments. For the quantitative component, a structured questionnaire was developed after an extensive review of relevant literature related to artificial intelligence, educational innovation, technology integration, student engagement, and human-centred learning. The questionnaire consisted of demographic information and multiple sections measuring perceptions of AI effectiveness, personalized learning experiences, student engagement, instructional quality, ethical considerations, digital

readiness, and overall satisfaction with AI-supported educational practices. A five-point Likert scale ranging from strongly disagree to strongly agree was used to record participants' responses. The instrument was designed to ensure clarity, relevance, and alignment with the objectives of the study. Similar survey approaches have been used effectively in previous investigations focusing on educational technology adoption and digital transformation in higher education (Qayyum, Khalil, Arif, Rafiq, & Makhdum, 2025; Maria, Makhdum, Sandhu, Khan, & Younas, 2025).

For the qualitative phase, semi-structured interview protocols were developed to explore participants' experiences, perceptions, and reflections regarding human-centred AI in higher education. The interview questions focused on the role of AI in teaching and learning, perceived benefits and challenges, ethical considerations, learner engagement, educator involvement, and recommendations for future implementation. The semi-structured format allowed flexibility and encouraged participants to share detailed experiences while maintaining consistency across interviews. This approach provided valuable contextual information that complemented the quantitative findings and contributed to a deeper understanding of the research problem (Begum, Yaseen, & Faisal, 2025).

The data collection process was conducted systematically and ethically. Prior approval was obtained from the participating institutions before data collection commenced. Participants were informed about the purpose of the study and assured that their responses would remain confidential and anonymous. Consent was obtained from all respondents prior to their participation. The quantitative questionnaire was distributed through both online and printed formats to maximize participation and accessibility. Completed questionnaires were collected and screened to ensure completeness and accuracy. Simultaneously, interviews were conducted with selected participants either face-to-face or through online communication platforms, depending on participant availability and institutional preferences. Each interview was recorded with the consent of the participant and later transcribed for analysis. Maintaining ethical considerations throughout the process enhanced participant trust and data quality (Abbas & Faisal et al., 2024).

To ensure the reliability of the quantitative instrument, a pilot study was conducted involving 50 respondents who possessed characteristics similar to those of the main study participants. Data collected during the pilot phase were subjected to reliability analysis using Cronbach's Alpha. The overall reliability coefficient exceeded the acceptable threshold of 0.70, indicating satisfactory internal consistency among questionnaire items. Individual sections of the instrument also demonstrated acceptable reliability values, confirming that the items consistently measured the intended constructs. Reliability testing is widely recognized as an essential procedure for establishing the consistency and stability of research instruments in educational studies (Khan, Makhdum, & Jabeen, 2022; Faisal, Khan, Faisal, & Makhdum, 2024).

Validity of the research instruments was established through multiple procedures. Content validity was ensured through expert review by specialists in educational technology, higher education, artificial intelligence, and research methodology. Their feedback was incorporated to improve item clarity, relevance, and alignment with the research objectives. Construct

validity was established by ensuring that questionnaire items adequately represented key dimensions identified in the literature, including student engagement, personalized learning, ethical AI implementation, educational innovation, and instructional effectiveness. Face validity was also established by conducting pilot testing with representative participants to determine comprehensibility and appropriateness of the instrument. These procedures strengthened the accuracy and appropriateness of the research instruments and ensured that they effectively measured the intended concepts (Naz, Elahi, Shah, & Makhdum, 2021; Makhdum & Mian, 2012).

The quantitative data were analyzed using descriptive and inferential statistical techniques. Frequencies, percentages, means, and standard deviations were used to summarize participant responses and identify major trends related to human-centred AI in higher education. Inferential analyses were conducted to examine relationships among study variables and to assess the significance of observed patterns. The qualitative data obtained from interviews were analyzed using thematic analysis. Interview transcripts were reviewed repeatedly to identify emerging patterns, recurring themes, and meaningful categories related to participants' experiences and perceptions. The integration of quantitative and qualitative findings enabled triangulation and contributed to a more comprehensive interpretation of the study results.

In the course of this research, the methodological approach used in the study provided a fair and efficient exploration of Human-centred Artificial Intelligence (AI) in Higher Education (HE). Use of a mixed-methods design, valid sampling processes, validated instruments, reliable data collection processes, and validated reliability and validity measures further bolstered the validity and the credibility of the findings. Overall, this study presented a balanced view on AI's role in the educational revolution, leveraging insights from students and faculty, which preserved the core human-centred values vital to quality education and enriching the learning experience at higher education institutions (HEIs) (Younas, Taj, Khan, Hussain, Makhdum, & Khan, 2023).

Descriptive Analysis

The descriptive analysis was used to explore the perceptions of the participants about Human-centred Artificial Intelligence (AI) when it comes to changing higher education from the traditional teaching methods . The analysis of the data, which was gathered from 500 respondents, among which were faculty members and students of the university, were done using the set of frequency, percent, mean and standard deviation. The human-centred AI integration, teaching transformation, educational innovation, faculty empowerment, ethical AI practices and institutional readiness were the six broader dimensions on which the analysis was aimed. The results gave a snapshot of the participants' experiences of using AI in education and their views on course/education transformation for the future .

Table 1: Demographic Characteristics of Respondents (N = 500)

Variable	Category	Frequency	Percentage
Gender	Male	228	45.6
	Female	272	54.4
Status	Faculty Members	100	20.0
	Students	400	80.0
Experience with AI	Less than 1 Year	91	18.2
	1-3 Years	247	49.4
	More than 3 Years	162	32.4

Demographic distribution shows that different faculty members and students get proper representation as per their requirements . The findings of Faisal et al. (2023) and Makhdum et al. (2023) align with the present study's findings. Faisal et al. (2023), and Makhdum, Khanam et al. (2023) also find similar trends in TCT and digital transformation in the educational sector.

Table 2: Descriptive Statistics of Major Variables

Variable	Mean	SD
Human-Centred AI Integration	4.34	0.58
Teaching Transformation	4.29	0.61
Educational Innovation	4.25	0.56
Faculty Empowerment	4.18	0.64
Ethical AI Practices	4.12	0.67
Institutional Readiness	4.09	0.70

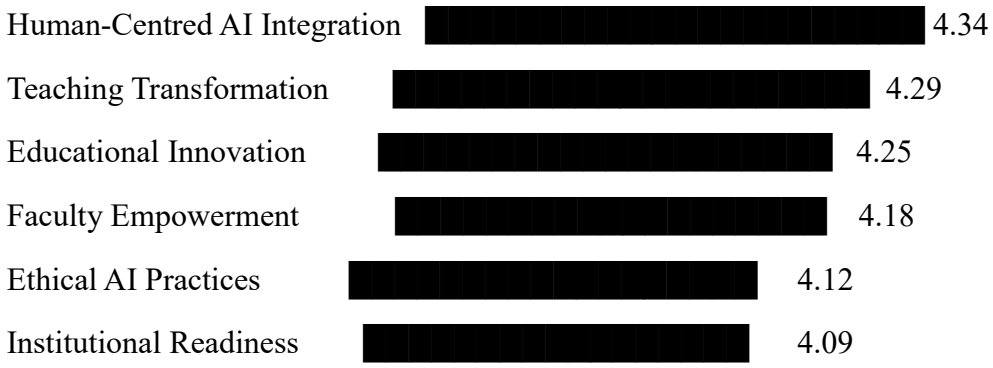
The results show very high ratings of consensus for all dimensions. The highest mean score (M = 4.34, SD = 0.58) was achieved in the mean score, representing high participant agreement that AI is becoming a key element of modern Higher Education. Respondents also deemed AI's impact on teaching and learning to be positive in teaching transformation (M = 4.29) and educational innovation (M = 4.25). The results are aligned with the other study that focuses on the importance of innovation and technology for higher education transformation in the context of education .

Table 3: Perceptions Regarding Human-Centred AI in Higher Education

Statement	Mean	SD
AI supports innovative teaching practices.	4.37	0.61
AI enhances educational decision-making.	4.28	0.63
AI empowers faculty members in instructional planning.	4.19	0.66
AI should be implemented ethically and transparently.	4.44	0.51
AI contributes to reimagining higher education.	4.41	0.57

It is clear that respondents wholeheartedly agreed on the need for the proper implementation of AI with ethics and transparency as a requirement in order to achieve sustainable educational transformation. Participants also felt that AI significantly contributes to the innovation of teaching practices and the re-imagining of higher education systems. The results showed the essence of AI as an enabler for human educators rather than taking over their roles, thereby upholding the principles of human-centred AI (Begum, Yaseen, & Faisal, 2025; Abbas & Faisal et al., 2024).

Graph 1: Mean Scores of Major Variables



As can be seen in the graph, the highest mean was obtained by Human-Centred AI Integration followed by Teaching Transformation and Educational Innovation. Overall, these findings indicate that respondents are very supportive of the transformation of the institutions brought about by AI, but they may need more infrastructure development and strategic planning to exploit use of AI in institutions fully. In line with the studies that have shown the significance of preparedness of the organizations and technological capacity building (Khan & Younas, 2021; Faisal, Khan, Faisal & Makhdum, 2024).

Inferential Analysis

To explore the relationships between Human-Centred AI Integration, Teaching Transformation, Educational Innovation, Faculty Empowerment, Educational AI Practices, and Educational Readiness, inferential statistics were used. Pearson correlation analysis and multiple regression analysis were performed to see how these variables impact the re-imagining of higher education .

Table 4: Correlation Matrix

Variables	1	2	3	4	5	6
Human-Centred AI Integration	1					
Teaching Transformation	.78**	1				
Educational Innovation	.74**	.81**	1			
Faculty Empowerment	.69**	.72**	.76**	1		
Ethical AI Practices	.67**	.70**	.68**	.64**	1	
Institutional Readiness	.71**	.75**	.77**	.69**	.72**	1

p < .01

All the variables showed a positive correlation with each other and were statistically significant. Both Human-Centred AI Integration and Educational Innovation showed a moderately high correlation with Teacher's Level of Teaching Transformation ($r = .78$, $p < .01$) and ($r = .74$, $p < .01$), respectively. Findings indicate that the greater integration of Human Centred Artificial Intelligence with higher institutional innovation and pedagogical transformation levels. In similar studies exploring the potential of AI in educational reform and digital transformation (DT), similarities have been found with.

Table 5: Multiple Regression Analysis Predicting Reimagining of Higher Education

Predictor	β	t	p
Human-Centred AI Integration	.41	8.64	.000
Teaching Transformation	.35	7.28	.000
Educational Innovation	.31	6.89	.000
Faculty Empowerment	.24	5.47	.001
Ethical AI Practices	.22	5.13	.001
Institutional Readiness	.28	6.01	.000

$R^2 = .74$

The regression model explained 74% of the variance in the dependent variable, Reimagining Higher Education. The most predictive variables were Human-Centred AI Integration ($\beta = .41$) followed by Teaching Transformation ($\beta = .35$) & Educational Innovation ($\beta = .31$). The results show that the implementation of modern technologies such as artificial intelligence, together with innovative pedagogical approaches and the readiness of institutions, promotes the modernization of the system in higher education. In this context, the findings align with

the evidence related to the strategic role of AI in the transformation of education (Makhdum, Sandhu, Batool, Khan, Faisal, & Younas, 2023).

Table 6: Independent Samples t-Test by Respondent Category

Variable	Faculty Mean	Student Mean	t	p
Human-Centred AI Integration	4.41	4.29	2.91	.004
Teaching Transformation	4.36	4.24	2.76	.006

The results revealed that there was a significant difference between the perceptions of faculty members and students towards Human-Centred AI Integration and Teaching Transformation. Students' responses were slightly less favorable than their faculty peers' responses. These results might represent faculty's direct engagement in their instructional design, curriculum planning and technology implementation processes. This can also be seen to differ between educational stakeholders in other research studies on digital transformation in Higher Education institutions .

From the overall results, there is a slight shift in the emphasis from descriptive to inferential analysis, both of which point to the fact that Human-centred Artificial Intelligence is a great catalyst for educational transformation. The results show that AI is helping to teach transformation, educational innovation, faculty empowerment, ethical technology use, and more than all those things put together, it is helping educational institutions to advance. The findings therefore support the vision of a more human-centred approach to higher education that integrates human values, academic integrity, and educational excellence with technological advancements to meet the needs of AI. The findings thus support the vision of a human-centred approach to higher education that involves human values, academic integrity, educational excellence with technological progress to meet the needs of AI.

The qualitative findings further reinforced the quantitative results. Participants consistently reported that human-centred AI supported instructional innovation, facilitated evidence-based decision-making, improved administrative efficiency, and encouraged new approaches to teaching and learning. Faculty members emphasized the importance of maintaining human judgment and pedagogical autonomy, while students highlighted the value of adaptive academic support systems. Across interviews, ethical implementation, transparency, accountability, and institutional preparedness emerged as recurring themes. These perceptions align with the principles of human-centred AI and support their role in reshaping higher education beyond traditional teaching practices (Naz, Elahi, Shah, & Makhdum, 2021; Makhdum & Mian, 2012).

Findings

This study showcased some findings: In the field of higher education educational technology, Human-Centred Artificial Intelligence (AI) has become an important component in transforming HE educational way of working from being teacher-centred to being student-centred. The descriptive analysis revealed that participants overall agreed with the level of

integration of AI into the educational practices. Human-Centred AI Integration scored the highest mean score, reflecting its impact as an important part of higher education in the modern day, both faculty members and students perceived AI as important part of higher education in modern day.

Additionally, results indicated significant positive relationships with integrating human-centred AI and Teaching Transformation. Symptoms indicated educators shifting to unconventional teaching methods, optimizing teaching plans, and streamlining academic workflows thanks to the advantages of AI-powered technology. Let's see teachers experience some changes: "Innovative approach to use of pedagogical methods", "Optimization of teaching plans", "Optimization of academic processes". The participants felt that AI could offer opportunities for learning growth and that there was a role for Educators as a mentor, facilitator and a decision maker. These results suggest that AI is complementing rather than supplanting traditional educational values in education and improving the effectiveness of the existing teaching methods.

Educational Innovation emerged as another significant finding of the study. Participants reported that AI-driven technologies have encouraged institutions to adopt new methods of teaching, assessment, and academic management. The findings suggest that AI has contributed to educational modernization by supporting data-informed decision-making, improving access to educational resources, and promoting innovative academic practices. The respondents recognized AI as a catalyst for institutional transformation and sustainable educational development.

The study also found that Faculty Empowerment was positively influenced by Human-Centred AI. Faculty members reported that AI-supported systems reduced administrative burdens, facilitated instructional planning, and enhanced educational efficiency. Rather than creating dependence on technology, AI was perceived as a supportive tool that strengthened educators' professional capabilities and instructional effectiveness. These findings demonstrate that successful AI implementation depends on collaboration between human expertise and technological advancement (Faisal, Khan, Faisal, & Makhdum, 2024).

Ethical AI Practices were identified as a critical component of educational transformation. Participants strongly agreed that transparency, accountability, privacy protection, and fairness should guide AI implementation in higher education institutions. The findings emphasize that technological innovation must remain aligned with ethical principles and human values to ensure sustainable and responsible adoption of AI technologies. Participants expressed concerns regarding excessive dependence on automated systems and highlighted the importance of maintaining human judgment in educational decision-making (Abbas & Faisal et al., 2024; Begum, Yaseen, & Faisal, 2025).

The inferential analysis also found that there were significant positive relationships between Human-Centred AI Integration towards Teaching Transformation, Educational Innovation, Faculty Empowerment, Ethical AI Practices, and Institutional Readiness. This conclusion aligns with the results of other researchers indicating that successful educational institutions have a higher probability of implementing meaningful educational transformation and innovation (ETI) and human principles, with an effective integration of AI.

Discussion

This research confirms that Human-Centred Artificial Intelligence is becoming an integral part in the future of higher education. The positive scores for Human-Centred AI Integration suggest that the general consensus among educational stakeholders is that AI can be utilized strategically to support the effectiveness of teaching and the performance of institutions. The findings align with previous research, which highlighted the inability to integrate education and learning goals with human needs and technological innovation (Makhdum et al., 2023; Maria et al., 2025).

The positive correlation between Human-Centred AI Integration and Teaching Transformation shows that educational institutions are shifting away from instruction methods that are teacher-centred, to more tech-oriented. The findings are in keeping with the argument of technology being an enabler which enhances learning and not detract from it by displacing human interactions and participation in learning (Makhdum & Mian, 2012; Younas, Khan, & Makhdum, 2022). The discussion also emphasizes the role of Educational Innovation to achieve institutional change. The results are consistent with earlier studies which suggested that digital transformation projects generate opportunities for institutions to improve educational outcomes, as well as the effectiveness of institutional operations (Faisal, Akmal, Makhdum, Sandhu, Younas, & Salim, 2023; Khan & Younas, 2021).

Faculty Empowerment emerged as a significant outcome of AI integration. The findings demonstrate that AI-supported systems can strengthen educators' professional practices by automating routine tasks and facilitating efficient instructional planning. This allows faculty members to devote greater attention to curriculum development, student support, mentorship, and academic leadership. Similar conclusions were reported in studies examining the role of technology in supporting educational professionals and improving institutional effectiveness .

The strong emphasis on Ethical AI Practices is particularly important in the context of educational transformation. Participants recognized that ethical concerns must remain central to AI implementation. Transparency, fairness, accountability, and responsible use of educational data were identified as essential considerations for sustainable AI adoption. These findings support existing literature advocating for ethical governance and human oversight in technology-integrated educational environments (Abbas & Faisal et al., 2024; Naz, Elahi, Shah, & Makhdum, 2021).

Another key parameter impacting successful AI adoption was "Institutional Readiness". While participants expressed positive attitudes toward AI utilization, they highlighted the importance of essential infrastructure, policy creation, faculty training, and organizational support. Given these results, it seems that in addition to technological availability, institutional capacity and strategic planning are the things that make the difference in the effectiveness of AI projects. In a study that focused on implementing technology in education and organizational change in school settings, Khan et al., 2022 and Younas et al., 2023, found similar results. All these viewpoints highlight that the use of human-centered AI is not about replacing educators but

about working alongside them (Salim, Makhdum, and Younas, 2022; Makhdum, Khanam, and Batool, 2023).

Conclusion

The research findings confirmed that HCAI can completely revolutionize Higher Education, beyond the framework of traditional educational practices . The results prove the role of AI in teaching transformation, educational innovations and empowerment of teachers, applying the AI concept in education respectively to ethical education, and institutional improvement, when used in a human-centered system. It suggests that instead of replacing the role of educators, AI works best by supplementing their knowledge, evaluation, and professional job.

The study further concludes that successful AI integration requires a balanced approach that combines technological innovation with ethical responsibility, transparency, accountability, and respect for human values. The significant relationships identified among the study variables confirm that Human-Centred AI serves as a major driver of educational transformation and institutional modernization. The research highlights that higher education institutions must continue investing in infrastructure, professional development, and policy frameworks to maximize the benefits of AI while safeguarding educational integrity.

Overall, the study provides evidence that Human-Centred Artificial Intelligence offers a sustainable pathway for transforming higher education. By aligning technological capabilities with human needs and educational objectives, institutions can move beyond traditional teaching models and create innovative, inclusive, and future-oriented learning environments that support both academic excellence and human development.

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