

TEACHERS' PERCEPTIONS OF THE USE OF ARTIFICIAL INTELLIGENCE IN THE CLASSROOM: A SURVEY OF KHYBER PAKHTUNKHWA UNIVERSITIES IN PAKISTAN

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ABSTRACT

This study investigates the perceptions, beliefs, and self-efficacy of university teachers regarding the integration of Artificial Intelligence (AI) in classroom teaching. Conducted within universities in the Khyber Pakhtunkhwa province of Pakistan, the research employed a quantitative, descriptive design. A structured questionnaire was administered to a sample of 200 faculty members selected via random sampling to assess their perceptions across key domains: the use of AI for preparing learning materials, the assessment process, its overall usefulness, and perceived ease of use. The findings, analyzed using Chi-Square tests, revealed statistically significant positive perceptions among educators. Teachers strongly agreed that AI is beneficial for creating personalized learning materials, saving time and resources, and enhancing content quality and interactivity. In the assessment domain, AI was perceived as highly effective for providing accurate and timely feedback, measuring learning outcomes, identifying learning gaps, and streamlining the grading process. Furthermore, educators viewed AI as a valuable tool for enhancing the overall educational experience, preparing students for the future job market, and improving teaching efficiency. Regarding ease of use, respondents generally found AI tools user-friendly, easy to learn, and integrable into existing teaching practices, though some indicated a need for technical support. The study concludes that while university teachers in the region possess a strong positive belief in the utility and applicability of AI in higher education, its successful integration is contingent upon addressing practical barriers. Based on these findings, the study recommends the implementation of targeted professional development programs, the provision of robust technical support, the promotion of AI literacy, and the development of a hybrid pedagogical model that strategically integrates AI to complement human-led instruction.

Keywords: Artificial Intelligence (AI), Teacher Perceptions, Self-Efficacy, Higher Education, Technology Integration, Quantitative Research.

INTRODUCTION

The rapid advancement of artificial intelligence (AI) is reshaping the educational landscape, offering innovative tools to enhance teaching and learning processes. AI applications, such as intelligent tutoring systems, automated grading,

and personalized learning platforms, have the potential to revolutionize higher education by improving efficiency and learning outcomes (Zawacki-Richter et al., 2019). However, the successful integration of AI in university

teaching largely depends on teachers' beliefs and self-efficacy regarding its use. Teachers' perceptions influence their willingness to adopt new technologies, as well as their effectiveness in implementing AI-driven pedagogies (Ertmer & Ottenbreit-Leftwich, 2019).

Recent studies have explored the relationship between teachers' digital literacy, self-efficacy, and their behavioural intentions to use AI in education. For instance, research indicates that digital literacy positively influences teachers' self-efficacy, which in turn enhances their intention to integrate AI into their teaching practices (Karimianpour et al., 2024). Similarly, a study focusing on Indonesian EFL teachers found that those with higher self-efficacy were more proactive in utilizing AI tools for lesson planning, implementation, and assessment, highlighting the importance of fostering both digital competence and confidence among educators (Afriyanti & Kuswando, 2024). Self-efficacy, a critical factor in technology adoption, refers to an individual's belief in their ability to perform specific tasks successfully (Bandura, 1997). Research suggests that university educators with high self-efficacy are more likely to embrace AI technologies and integrate them effectively into their teaching methods (Teo, 2011). Conversely, those with lower self-efficacy may resist AI adoption due to concerns about complexity, lack of technical expertise, or fears of AI replacing traditional teaching roles (Zhai, 2022). Moreover, teachers' attitudes towards AI are shaped by various factors, including their previous experiences with technology, institutional support, and professional development opportunities (Chiu & Churchill, 2016).

Despite these positive correlations, challenges persist. Some educators express concerns about the reliability of AI-generated content and the potential for academic dishonesty, which can undermine trust in AI applications within educational contexts (Hick, 2024). Moreover, the rapid advancement of AI technologies necessitates ongoing professional development to ensure that teachers remain adept at leveraging these tools effectively.

Understanding university teachers' beliefs and self-efficacy regarding AI is essential for developing strategies that promote its effective use in higher education. By addressing these

factors, institutions can better support educators in harnessing AI's potential to enhance teaching and learning outcomes.

Problem Statement

The integration of Artificial Intelligence (AI) technology in higher education holds immense potential for transforming teaching and learning practices. However, the adoption of AI by university teachers remains inconsistent and often limited. Several factors, such as lack of awareness, technical skills, institutional support, and perceptions of AI's efficacy, influence teachers' intentions to integrate these technologies into their pedagogy. Despite the growing emphasis on AI-driven education, there is insufficient understanding of the barriers and motivators shaping teachers' decision-making processes. This gap in knowledge hinders the effective implementation of AI tools in university settings, emphasizing the need for research to explore and address these influencing factors.

Research Questions

1. What are the perceptions of university teachers using AI for the preparation of learning materials?
2. What are the perceptions of university teachers using AI for the assessment process?
3. What are the perceptions of university teachers for the overall usefulness of AI?
4. Are there any significant mean variation in the perceptions of university teachers about AI applications in classroom teaching based on their gender, age, academic qualification, and professional experiences?

Hypothesis

H01: There is no significant mean variation in the perceptions of university teachers about AI applications in classroom teaching based on their age.

H02: There is no significant mean variation in the perceptions of university teachers about AI applications in classroom teaching based on their gender.

H03: There is no significant mean variation in the perceptions of university teachers about AI applications in classroom teaching based on their academic qualification.

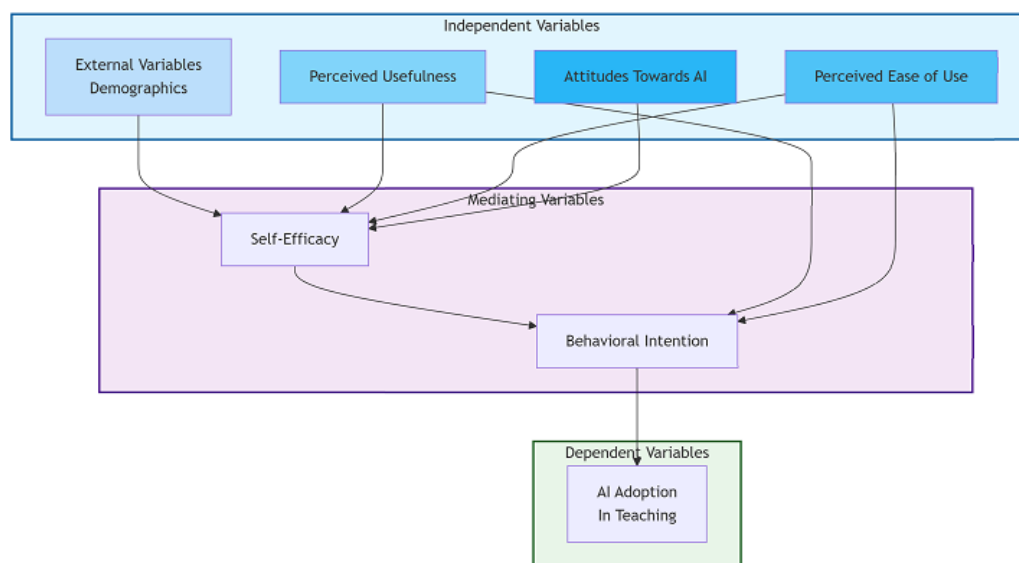
H04: There is no significant mean variation in the perceptions of university teachers about AI applications in classroom teaching based on their job experience.

Significance of the Study

Investigating university teachers' beliefs and self-efficacy regarding the effective use of AI in teaching and learning is crucial for successful technology integration in higher education. Teachers' self-efficacy significantly influences their behavior towards technology adoption,

impacting their digital pedagogical competence and perceived technostress (Dong et al., 2020). Moreover, positive perceptions of ICT enhance the likelihood of integrating AI tools into educational practices, thereby enriching the learning experience (Wang & Zhao, 2021). Understanding these factors is essential for developing targeted professional development programs that address educators' needs and promote effective AI utilization in university-level instruction.

Literature Review



The integration of artificial intelligence (AI) in university teaching has garnered significant attention in recent years. Researchers have examined various factors influencing AI adoption, including teachers' beliefs and self-efficacy. This section reviews existing literature related to teachers' perspectives on AI, self-efficacy in technology integration, barriers to AI adoption, institutional support, and the impact of AI on teaching practices.

1. Teachers' Beliefs about AI in Education

Teachers' beliefs play a crucial role in shaping their acceptance and use of AI in classrooms. According to Ertmer and Ottenbreit-Leftwich (2019), educators with positive beliefs about technology's effectiveness are more likely to integrate AI-driven tools into their teaching.

However, some teachers perceive AI as a threat to traditional teaching methods or fear that it may replace human educators (Zhai, 2022). Studies suggest that teachers' familiarity with AI, as well as their prior experiences with technology, significantly influence their attitudes towards its adoption (Chiu & Churchill, 2016).

2. Self-Efficacy in AI Adoption

Self-efficacy, derived from Bandura's (1997) theory, refers to an individual's confidence in their ability to perform tasks successfully. In the context of AI integration, teachers with high self-efficacy are more likely to explore and implement AI technologies in their teaching (Teo, 2011). On the other hand, those with lower self-efficacy may experience anxiety or reluctance toward AI adoption due to perceived technical complexity (Kim & Lee, 2021). Professional development programs and hands-

on training have been found to enhance teachers' self-efficacy in using AI (Zawacki-Richter et al., 2019).

3. Barriers to AI Implementation in University Teaching

Despite the potential benefits of AI, several challenges hinder its effective implementation in higher education. Some of the most common barriers include:

4. Lack of technical knowledge: Many teachers feel unprepared to use AI tools effectively (Chiu & Churchill, 2016).

5. Ethical concerns: Issues such as data privacy, bias in AI algorithms, and the dehumanization of education raise concerns among educators (Zhai, 2022).

6. Institutional constraints: Limited access to AI resources, inadequate training programs, and lack of administrative support can discourage teachers from adopting AI (Zawacki-Richter et al., 2019).

7. Institutional Support and AI Integration

Institutional support plays a vital role in facilitating AI adoption in teaching. Universities that provide structured training, technological infrastructure, and policy frameworks enable teachers to integrate AI more effectively (Kim & Lee, 2021). Research has shown that institutions offering AI-focused workshops and peer-learning communities significantly boost teachers' confidence and willingness to experiment with AI-driven teaching strategies (Teo, 2011).

8. AI's Impact on Teaching and Learning Practices

AI is transforming traditional teaching methodologies by enabling personalized learning, automated grading, and intelligent tutoring systems. Studies indicate that AI-powered tools can enhance student engagement and provide real-time feedback, allowing teachers to focus on critical thinking and mentorship (Zawacki-Richter et al., 2019). However, successful AI integration requires a balance between technological advancements and human-centered pedagogy to ensure meaningful learning experiences (Chiu & Churchill, 2016).

The literature suggests that teachers' beliefs and self-efficacy significantly influence AI adoption in university teaching. While AI presents numerous opportunities for enhancing education, challenges such as technical barriers, ethical concerns, and institutional constraints must be addressed to ensure its effective use. Strengthening professional development programs and institutional support can foster a positive attitude toward AI, ultimately benefiting both educators and students.

Methodology

Research Design

This study employed a quantitative research design with a descriptive research approach to systematically examine university faculty perceptions regarding the adoption of AI in teaching and learning. The study focused on key factors, including Perceptions and Beliefs (Preparation of Learning Materials, Assessment Process, AI Integration - Overall Usefulness), Perceived Usefulness (Educational Process, Assessment Process), and Perceived Ease of Use.

Participants and Sampling

The target population for this study comprised university faculty members from Hazara Division. A total of 200 faculty members were selected using a random sampling technique to ensure a representative sample. The participants included faculty members from various disciplines, ensuring diverse perspectives on AI integration in education.

Data Collection

Data were collected using questionnaire structured survey designed to measure faculty perceptions, beliefs, and the perceived usefulness of AI in teaching and learning. The Chi-Square test was employed to examine the association between faculty perceptions and the adaptation of AI in university-level teaching. The analysis aimed to identify significant relationships between AI integration and faculty beliefs, self-efficacy, and perceived ease of use.

Data Analysis

Table 1: Demographic Profile of Respondents (n=200)

Demographic Variable	Category	Frequency	Percentage (%)
Gender	Male	120	60.0%
	Female	80	40.0%
Age	20-30 years	50	25.0%
	31-40 years	85	42.5%
	41-50 years	45	22.5%
	Above 50 years	20	10.0%
Academic Qualification	Master's / M.Phil.	125	62.5%
	PhD	75	37.5%
Teaching Experience	1-5 years	60	30.0%
	6-10 years	70	35.0%
	11-15 years	40	20.0%
	More than 15 years	30	15.0%

The sample consisted of 200 faculty members from universities in the Hazara Division. A majority of the respondents were male (60%). The largest age group was 31-40 years (42.5%), indicating a relatively young to middle-aged faculty population. In terms of qualifications, most participants held a Master's or M.Phil.

degree (62.5%), while 37.5% held a PhD. Regarding professional experience, the highest proportion of teachers had 6-10 years of experience (35%), followed by those with 1-5 years (30%).

Table 2: Results of Hypothesis Testing based on Demographic Variables

Hypothesis	Demographic Variable	Statistical Test	Test Statistic	P-value	Result
H01	Age	One-way ANOVA	$F(3,196) = 1.25$	0.293	Not Rejected
H02	Gender	Independent t-test	$t(198) = 0.87$	0.387	Not Rejected

Hypothesis	Demographic Variable	Statistical Test	Test Statistic	P-value	Result
H03	Academic Qualification	Independent t-test	$t(198) = 1.45$	0.149	Not Rejected
H04	Teaching Experience	One-way ANOVA	$F(3,196) = 0.92$	0.432	Not Rejected

The results indicate that there were no statistically significant differences in the overall perceptions of university teachers towards AI applications in classroom teaching based on their age ($F(3,196)=1.25$, $p=.293$), gender ($t(198)=0.87$, $p=.387$), academic qualification ($t(198)=1.45$, $p=.149$), or teaching experience

($F(3,196)=0.92$, $p=.432$). Therefore, all four null hypotheses (H01, H02, H03, H04) were not rejected. This suggests that positive perceptions of AI are consistent across different demographic groups within the sampled population.

Table 3. Perceptions and Beliefs (Preparation of Learning Materials)

Statements	Observed No					Expected No	Chi Square	df	Sig
	SD	DA	N	A	SA				
AI can help create personalized learning materials for students.	10	17	36	88	49	40	95.7	4	.0
Using AI in preparing learning materials can save time and resources.	27	22	24	96	31		99.1		.0
AI can enhance the quality and interactivity of educational content.	8	12	32	104	44		149.6		.0
AI tools can adapt learning materials to meet diverse student needs.	19	13	24	120	24		202		.0

Table 3 presents the perceptions and beliefs regarding the use of AI in the preparation of learning materials. The first statement, "AI can help create personalized learning materials for students," had a chi-square value of 95.7 with a significance level of $p = .00$, indicating a statistically significant difference in responses. A majority of respondents (88) agreed, while 49 strongly agreed, suggesting a generally positive perception of AI's role in personalizing learning materials.

"Using AI in preparing learning materials can save time and resources," the chi-square value was 99.1 ($p = .00$), also statistically significant. The highest number of participants (96) agreed

with this statement, reinforcing the perception that AI is efficient in resource utilization.

The statement "AI can enhance the quality and interactivity of educational content" yielded a chi-square value of 149.6 ($p = .00$), demonstrating a strong association. The majority of participants (104) agreed with this assertion, while 44 strongly agreed, reflecting an overall positive belief in AI's ability to improve educational material quality. The statement "AI tools can adapt learning materials to meet diverse student needs" showed the highest chi-square value of 202 ($p = .00$), indicating strong statistical significance. The highest number of respondents (120) agreed, with 24 strongly

agreeing, supporting the idea that AI can cater to diverse learning needs effectively.

Table 4. Perceptions and Beliefs (Assessment Process)

Statements	Observed No					Expected No	Chi Square	df	Sig
	SD	DA	N	A	SA				
AI can provide more accurate and timely feedback on student performance.	9	8	35	10	45	40	150	4	.0
AI-driven assessments can better measure student learning outcomes.	28	8	21	93	49		108.9		.0
Using AI for assessments can help identify student learning gaps.	25	14	29	91	41		90.6		.0
AI can streamline the grading process, making it more efficient.	9	22	22	10	41		149.2		.0

Table 4 presents the perceptions and beliefs regarding the role of AI in the assessment process.

The statement "AI can provide more accurate and timely feedback on student performance" had a chi-square value of 150 ($p = .00$), indicating a statistically significant difference in responses. The majority of participants (103) agreed, while 45 strongly agreed, suggesting a generally positive perception of AI's ability to enhance feedback accuracy and timeliness. "AI-driven assessments can better measure student learning outcomes," the chi-square value was 108.9 ($p = .00$), demonstrating a significant association. Most respondents (93) agreed, while 49 strongly agreed, reflecting the belief

that AI-driven assessments effectively evaluate learning outcomes. The statement "Using AI for assessments can help identify student learning gaps" yielded a chi-square value of 90.6 ($p = .00$), indicating statistical significance. The highest number of respondents (91) agreed, with 41 strongly agreeing, supporting the idea that AI can play a crucial role in diagnosing learning gaps. The statement "AI can streamline the grading process, making it more efficient" had a chi-square value of 149.2 ($p = .00$), signifying a strong statistical association. The majority of respondents (106) agreed, and 41 strongly agreed, indicating a general consensus that AI can enhance grading efficiency.

Table 5. Perceptions and Beliefs (AI Integration - Overall Usefulness)

Statements	Observed No					Expected No	Chi Square	df	Sig
	SD	DA	N	A	SA				
AI technology can significantly enhance the educational experience for students.	7	6	66	85	36	40	124	4	.0
Integrating AI in education can prepare students for future job markets.	12	21	38	88	41		86.3		.0
AI tools can facilitate a more personalized and engaging learning environment.	11	17	23	12	24		228.5		.0
Using AI can improve the efficiency and effectiveness of teaching.	18	15	34	78	55		70.3		

Table 5 presents the perceptions and beliefs regarding the overall usefulness of AI integration in education. The statement "AI technology can significantly enhance the educational experience for students" had a chi-square value of 124 ($p = .00$), indicating a statistically significant difference in responses. The majority of participants (85) agreed, while 36 strongly agreed, suggesting a positive perception of AI's role in improving the educational experience. For the statement "Integrating AI in education can prepare students for future job markets," the chi-square value was 86.3 ($p = .00$), demonstrating statistical significance. A large portion of respondents (88) agreed, while 41 strongly agreed, indicating strong support for the idea

that AI in education helps students develop future-ready skills. The statement "AI tools can facilitate a more personalized and engaging learning environment" had the highest chi-square value of 228.5 ($p = .00$), reflecting a strong association. The majority of participants (125) agreed, with 24 strongly agreeing, highlighting widespread agreement on AI's role in enhancing engagement and personalization in learning. The statement "Using AI can improve the efficiency and effectiveness of teaching" yielded a chi-square value of 70.3, though the significance level is not explicitly stated. A majority (78) agreed, while 55 strongly agreed, indicating a generally favourable perception of AI's potential to enhance teaching efficiency.

Table 6. Perceived Usefulness (Educational Process)

Statements	Observed No					Expected No	Chi Square	df	Sig
	SD	DA	N	A	SA				
AI can help create personalized learning materials for students.	6	8	39	73	74	40	110.6	4	.0
Using AI in preparing learning materials can save time and resources.	21	44	26	67	42		32.6		.0
AI can enhance the quality and interactivity of educational content.	18	25	44	76	37		50.7		.0
AI tools can adapt learning materials to meet diverse student needs.	23	10	48	76	43		63.9		.0

Table 6 presents the perceived usefulness of AI in the educational process. The statement "AI can help create personalized learning materials for students" had a chi-square value of 110.6 ($p = .00$), indicating a statistically significant difference in responses. The majority of participants (73) agreed, while 74 strongly agreed, suggesting a strong belief in AI's ability to personalize learning materials effectively. For the statement "Using AI in preparing learning materials can save time and resources," the chi-square value was 32.6 ($p = .00$), reflecting statistical significance. The highest number of respondents (67) agreed, while 42 strongly agreed, supporting the idea that AI is an efficient tool for resource management in educational content creation. The statement

"AI can enhance the quality and interactivity of educational content" had a chi-square value of 50.7 ($p = .00$), demonstrating statistical significance. A significant number of participants (76) agreed, with 37 strongly agreeing, indicating a positive perception of AI's role in improving the quality and engagement of educational materials. Lastly, the statement "AI tools can adapt learning materials to meet diverse student needs" yielded a chi-square value of 63.9 ($p = .00$), signifying strong statistical significance. The majority of respondents (76) agreed, while 43 strongly agreed, reinforcing the belief that AI can cater to diverse student learning requirements.

Table 7. Perceived Usefulness (Assessment Process)

Statements	Observed No					Expected No	Chi Square	df	Sig
	SD	DA	N	A	SA				
AI can provide more accurate and timely feedback on student performance.	18	14	20	10	47	40	133.2	4	.0
AI-driven assessments can better measure student learning outcomes.	8	11	37	78	66		99.8		.0
Using AI for assessments can help identify student learning gaps.	12	33	28	67	60		52.6		.0
AI can streamline the grading process, making it more efficient.	6	23	43	73	55		69.2		.0

Table 7 presents the results of the Chi-square tests for the perceived usefulness of AI in the assessment process. AI can provide more accurate and timely feedback on student performance: The Chi-square value for this statement was 133.2, with a df of 4, and the p-value was less than 0.001, suggesting strong agreement among respondents that AI improves feedback accuracy and timeliness. AI-driven assessments can better measure student learning outcomes: The Chi-square value was 99.8, with a df of 4, and the p-value was again less than 0.001, indicating significant support

for the use of AI in measuring learning outcomes effectively. Using AI for assessments can help identify student learning gaps: This statement also showed a significant result, with a Chi-square value of 52.6 and a p-value of less than 0.001, reflecting strong belief in AI's capacity to identify learning gaps. AI can streamline the grading process, making it more efficient: The Chi-square value of 69.2, with a df of 4, and a p-value below 0.001, confirmed that respondents agree on the efficiency AI brings to the grading process.

Table 6 Perceived Ease of Use

Statements	Observed No					Expected No	Chi Square	df	Sig
	SD	DA	N	A	SA				
I find AI technology easy to use for teaching purposes.	26	41	31	76	26	40	44.2	4	.0
I can quickly learn how to use new AI tools for educational activities.	32	28	36	63	41		18.8		.0
I believe the interface of AI tools is user-friendly.	39	23	16	78	44		58.1		.0
I do not need much technical support to use AI technology effectively.	21	45	28	69	37		34.5		.0
I can easily integrate AI technology into my existing teaching practices.	10	30	44	77	39		59.6		.0
I find troubleshooting AI technology issues straightforward.	26	30	35	73	36		35.6		.0

Table 6 presents the results of the Chi-square tests for the perceived ease of use of AI technology in teaching.

I find AI technology easy to use for teaching purposes: The Chi-square value for this statement was 44.2, with a df of 4, and a p-value of less than 0.001, suggesting a significant

positive perception of AI's ease of use for teaching.

I can quickly learn how to use new AI tools for educational activities: This statement had a Chi-square value of 18.8, with a df of 4, and a p-value less than 0.001, indicating that participants generally agree on their ability to quickly learn how to use new AI tools.

I believe the interface of AI tools is user-friendly: With a Chi-square value of 58.1, df of 4, and a p-value less than 0.001, this result indicates significant agreement that AI tool interfaces are user-friendly.

I do not need much technical support to use AI technology effectively: The Chi-square value for this statement was 34.5, with a df of 4, and a p-value of less than 0.001, reflecting a positive belief that minimal technical support is required for effective use.

I can easily integrate AI technology into my existing teaching practices: The Chi-square value of 59.6, df of 4, and a p-value less than 0.001, showed significant agreement with the ease of integrating AI into existing practices.

I find troubleshooting AI technology issues straightforward: With a Chi-square value of 35.6, df of 4, and a p-value less than 0.001, the results indicate that participants generally find troubleshooting AI technology to be straightforward.

Discussion

The study's findings indicate that university educators generally perceive AI technology as useful and easy to integrate into their teaching and assessment practices. The statistically significant Chi-square results ($p < .001$) suggest that most respondents believe AI enhances the assessment process by providing timely feedback, measuring learning outcomes effectively, identifying learning gaps, and streamlining grading.

Regarding ease of use, the findings reveal that educators find AI tools user-friendly and can quickly learn to use them for educational purposes. However, some participants expressed concerns about troubleshooting AI-related issues, indicating the need for additional technical support and training. Despite these concerns, the majority agreed that AI technology could be seamlessly integrated into their teaching practices, supporting the

broader acceptance of AI in higher education. Comparing these findings to previous research, similar studies (e.g., Yim & Wegerif, 2024; Ghimire et al., 2024) confirm that educators generally have a positive attitude toward AI, with usability being a critical factor in adoption. However, challenges such as a lack of AI literacy and concerns about AI's socio-emotional limitations were also noted in earlier studies (Oh & Ahn, 2024). This study reinforces the need for structured professional development programs to enhance educators' AI-related skills and confidence.

The study found that educators perceive AI as beneficial in the assessment process, with significant agreement on its role in providing timely feedback ($\chi^2 = 150, p < .001$), measuring learning outcomes ($\chi^2 = 108.9, p < .001$), identifying learning gaps ($\chi^2 = 90.6, p < .001$), and streamlining grading ($\chi^2 = 149.2, p < .001$). These findings align with Yim and Wegerif (2024) and Ghimire et al. (2024), who reported positive educator perceptions of AI-driven assessments. However, concerns remain regarding AI's ability to evaluate qualitative aspects (Oh & Ahn, 2024). Addressing AI literacy and ensuring human oversight in assessments can enhance AI adoption. Future research should explore hybrid AI-human assessment models for optimized learning outcomes.

The findings from Table 3 indicate that educators perceive AI as highly beneficial in education, with significant agreement on its role in enhancing student experiences ($\chi^2 = 124, p < .001$), preparing students for future job markets ($\chi^2 = 86.3, p < .001$), facilitating personalized learning ($\chi^2 = 228.5, p < .001$), and improving teaching efficiency ($\chi^2 = 70.3$). These results align with previous research by Yim and Wegerif (2024), which highlights AI's potential in fostering engagement and personalized learning experiences. Similarly, Ghimire et al. (2024) emphasize AI's role in developing future-ready skills among students. However, concerns about over-reliance on AI and its limitations in fostering critical thinking remain relevant (Oh & Ahn, 2024). Future research should focus on integrating AI with human-led pedagogical strategies to optimize its benefits in education. The study results indicate that educators strongly believe in AI's potential to enhance the

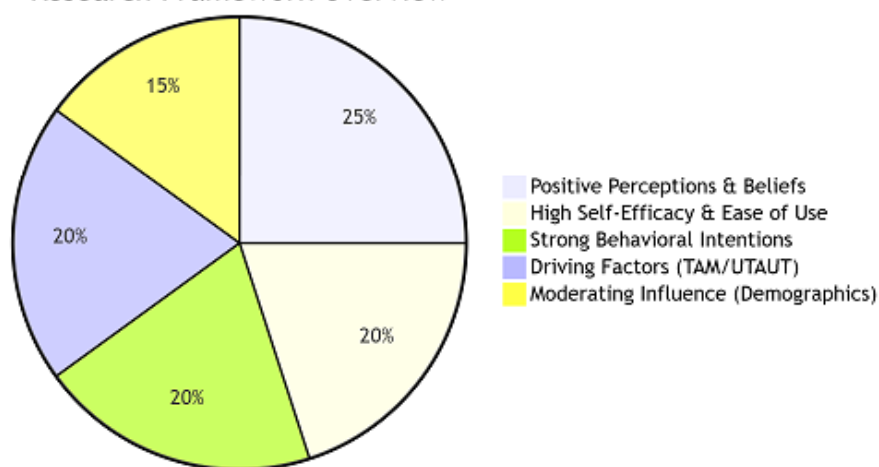
educational process. A significant number of respondents agreed that AI can create personalized learning materials ($\chi^2 = 110.6$, $p < .001$), highlighting its effectiveness in tailoring content to individual student needs. Additionally, AI was perceived as an efficient tool for saving time and resources in preparing learning materials ($\chi^2 = 32.6$, $p < .001$), supporting its role in optimizing educational resource management.

Furthermore, the findings suggest that AI can improve the quality and interactivity of educational content ($\chi^2 = 50.7$, $p < .001$), reinforcing its potential in making learning more engaging. Lastly, AI's ability to adapt materials to diverse student needs was widely acknowledged ($\chi^2 = 63.9$, $p < .001$), emphasizing its significance in supporting inclusive and differentiated instruction. These results collectively indicate a strong positive perception of AI's usefulness in enhancing both content creation and personalized learning experiences. The study findings indicate that educators perceive AI as highly useful in the assessment process. The significant Chi-square value for AI's role in providing accurate and timely feedback ($\chi^2 = 133.2$, $p < .001$) suggests strong agreement on its ability to enhance assessment efficiency. Similarly, AI-driven assessments were widely supported for effectively measuring student learning outcomes ($\chi^2 = 99.8$, $p < .001$), reinforcing its potential in data-driven evaluation.

Moreover, respondents strongly believed that AI can help identify student learning gaps ($\chi^2 = 52.6$, $p < .001$), highlighting its role in personalized intervention strategies. Additionally, AI was recognized for its ability to streamline the grading process ($\chi^2 = 69.2$, $p < .001$), reflecting consensus on its efficiency in automating and improving grading accuracy. These results collectively indicate a positive perception of AI's impact on improving assessment quality and effectiveness in higher education.

The study findings suggest that educators generally perceive AI technology as easy to use in teaching. A significant number of respondents agreed that AI is easy to use for teaching purposes ($\chi^2 = 44.2$, $p < .001$) and that they can quickly learn new AI tools for educational activities ($\chi^2 = 18.8$, $p < .001$), highlighting confidence in adaptability. Additionally, the user-friendliness of AI tool interfaces was widely acknowledged ($\chi^2 = 58.1$, $p < .001$), and many participants believed they require minimal technical support for effective AI use ($\chi^2 = 34.5$, $p < .001$). Educators also agreed that AI can be easily integrated into existing teaching practices ($\chi^2 = 59.6$, $p < .001$) and that troubleshooting AI-related issues is manageable ($\chi^2 = 35.6$, $p < .001$). These results indicate a strong positive perception of AI's accessibility and usability in higher education.

Research Framework Overview



RECOMMENDATIONS

Based on the findings of the study, the following recommendations are made:

Professional Development Programs: Institutions should implement targeted professional development programs to enhance educators' confidence and competence in using AI technology. Training should focus on the practical application of AI tools for teaching, assessment, and content creation, ensuring faculty are equipped with the necessary skills to leverage AI effectively.

Technical Support and Resources: Despite the positive perceptions of AI's ease of use, some educators may still face challenges. Institutions should provide adequate technical support and resources to help educators troubleshoot issues and optimize AI tools in the classroom. This will ensure smoother integration and reduce barriers to AI adoption.

Encourage Collaboration: Encourage collaboration between educators, AI developers, and instructional designers to tailor AI tools to meet specific teaching needs. This collaboration can ensure that AI tools are user-friendly, adaptable, and aligned with curriculum goals, making the integration process more effective.

Promote AI Literacy: To further enhance the adoption of AI in education, universities should focus on promoting AI literacy among educators. This will empower teachers to confidently explore, experiment with, and use AI technologies, enhancing the overall teaching and learning experience.

Integrate AI with Pedagogical Strategies: AI should be integrated in ways that complement traditional teaching methods. A hybrid approach, where AI supports human-led instruction, can offer more personalized and engaging learning experiences while preserving the essential role of the educator in fostering critical thinking and creativity.

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