



Vol. 3 No. 9 (September) (2025)

Gender-Based Perceptions Regarding the Application of Artificial Intelligence in Teaching at University-Level

Mahe Kamel

Mphil Scholar

Dr. Maksal Minaz

Lecturer

Email: maksalminaz@awkum.edu.pk

Dr. Abdul Ghaffar

Associate Professor

Department of Education,

Abdul Wali Khan University Mardan.

Email: abdulghafar@awkum.edu.pk

ABSTRACT

The aim of the gender based perceptions and usage of artificial intelligence in teaching at university level was to explore gender-based differences in awareness, usage and institutional support for AI tools among university faculty members. For this purpose a quantitative, approach was employed with a sample of 120 participants. Data was collected through a self made questionnaire after ethical consideration of validity and reliability with a cronbach Alpha .85. Collected data were analyzed via chi-square tests to examine associations between gender and various AI-related practices and perceptions of University teachers. The findings revealed that there is generally no statistically significant difference between male and female faculty members regarding their awareness of fundamental AI concepts in using AI tools, or their intention to adopt AI in the process of teaching and learning at University level. However, significant associations were found in institutional support ($p = 0.008$) and the enhancement of lesson planning through AI tools ($p = 0.028$), suggesting that faculty perceptions in these areas vary notably by gender. Overall, the study concludes that while gender does not play a significant role in AI awareness and application, institutional support and perceived instructional benefits of AI may influence attitudes differently among male and female faculty. Based on the findings it was recommended that there is dire need need for inclusive AI training programs and institutional policies that support equitable technology adoption in higher education.

Key words: Artificial Intelligence, institutional support, lesson planning etc.

Introduction

According to Siahaan et al. (2020), artificial intelligence is described as intelligence that can replicate human behavior intelligently or intelligently in all contexts in order to do tasks efficiently and practically using this technology. According to Dhawan and Batra (2021), AI-powered systems and technological advancements hold the capacity to profoundly transform the functioning of higher education institutions. Based on the United States Education Sector Report, projections indicate that the application of artificial intelligence within the U.S. education sector is expected to increase by approximately 48% between 2018 and 2022.



Vol. 3 No. 9 (September) (2025)

As stated by Zawacki-Richter et al. (2019), artificial intelligence has benefited higher education by providing a variety of learning platforms for teachers and students, making studying more engaging and entertaining. The AI Learning platform enables learners to practice activities and improve their learning abilities. For instance, personalized learning systems like Knewton & Dreambox are among the most beneficial contributions of AI to education, allowing teachers to monitor students' performance while simultaneously allowing students to study at their own speed and interests. It also allows teachers to teach students based on their specific needs and requests. Despite the opportunities, digital transformation raises worries about job displacement due to automation and the digital divide, which can worsen socioeconomic inequality (Autor, 2015). Privacy concerns and the need for cyber security are also critical issues to address (Twenge, 2023).

Problem Statement

Popularity of Artificial Intelligence (AI) in higher education catches global attention, promising transformative effects on teaching, learning, and institutional efficiency (Dhawan & Batra, 2021; Zawacki-Richter et al., 2019). Despite this, the adoption of AI remains uneven across contexts, influenced by factors such as faculty awareness, comfort, institutional support, and perceptions of its pedagogical value (Baker & Smith, 2019; Salas-Pilco & Yang, 2022). One underexplored area is the role of gender in shaping these perceptions and practices. While prior studies suggest no consistent gender-based differences in technological adoption (Yang & Chen, 2023), gaps remain regarding how male and female faculty perceive institutional support, training needs, and the benefits of AI during instructional practices at University level (Minaz & Idris 2023)..

In contexts where gender dynamics play a significant role in higher education practices, overlooking these differences may hinder equitable adoption. This study addresses gap by examining gender-based perceptions and usage of AI among university faculty members, focusing on awareness, comfort, training, institutional support, and pedagogical applications.

Research Objectives

The present study was focused on following research objectives;

To examine the relationship between the integration of artificial intelligence (AI) in pedagogy and the teaching effectiveness of university faculty

To investigate whether gender differences influence the adoption and utilization of AI tools in teaching and learning practices.

Research Questions

What is the relationship between the integration of AI in pedagogy and the teaching effectiveness of university faculty?

Do gender differences influence the implementation of AI tools in teaching and learning practices?

Significance of the Study

This study contributes to the growing discourse on AI in education by offering a gender-based perspective on its integration in higher education. Its significance lies in several areas:

Conceptual Framework

The conceptual framework is guided by the Technology Acceptance Model (TAM) and prior research on AI in higher education (Zawacki-Richter et al., 2019; Yang & Chen, 2023).

Independent Variable (IV): Gender (Male, Female).



Vol. 3 No. 9 (September) (2025)

Mediating Variables:

Awareness of AI concepts

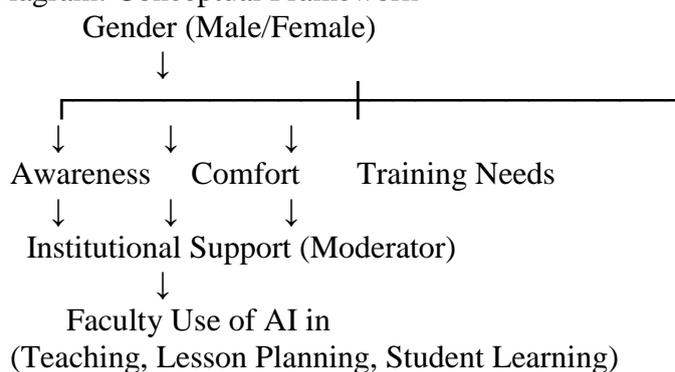
Comfort in using AI tools

Training needs

Perceptions of institutional support.

Dependent Variable (DV): Usage of AI in teaching and learning (e.g., lesson planning, individualized learning, instructional enhancement).

Diagram: Conceptual Framework



Hypothesis Basis:

No significant gender differences expected in AI awareness and comfort (Yang & Chen, 2023).

Potential gender-based variation in perceptions of institutional support and lesson planning effectiveness (findings of this study).

Literature review

According to Ahmad et al. (2021) AI technology has made important advances in the last few years and study of the implications for education and the perceptions of ability concerning AI use as a teaching and learning tool has yet to be totally discovered. According to Bates et al. (2020) the study complete participants in education and especially to university-level education administrators who seek to moderate concerns over developing technology and change guidelines to address these concerns. According to (Highet, Skelly & Tyers, 2017) in modern periods, the disparity in all technology use between genders based has truly diminished; though, women still face persistent drawbacks. For illustration, in today's small and middle-income countries, a gender-based gap of 8 % occurs in terms of phone ownership and rising to 20 % as it comes to smartphones (Shelby-Caffey, 2021) says that the need for university-level education institutes and faculty to add AI into teaching and remaining passive in their method will be open the door to outside international concerns manipulating the individual in the digital age. The discoveries of this study are timely as stress mounts on university-level education organizations to promote digital literacy. As Selwyn (2020) clarified that the background of AI writing tools and skill TAM helps justify how the university level students' perceptions identify their behavior toward assuming these technologies. For example, if a university level student identifies that using AI tools and skills like Grammarly or QuillBot will reduce errors and develop their writing value and quality, they are further more likely to approve these tools. Likewise, uncertainty they discover these tools in-built and user-friendly, they will be more motivated to use them regularly. These perceptions are more manipulated by external elements, such as foregoing



Vol. 3 No. 9 (September) (2025)

technological tools and experience and peer influence. According to Alhwaiti (2023) in the existing study, it was observed faculty approaches relating to gender-based, which are joint variables when trying to understand the aspects contributing to user tolerance and acceptance of developing technology at university level.

Baker and Smith (2019) broadly described artificial intelligence (AI) as machines capable of performing cognitive tasks typically associated with human intelligence, such as learning and problem-solving. In a research study, Salas-Pilco and Yang (2022) identified common applications such as predictive modeling, intelligent analytics, assistive technologies, autonomous content analysis, and image analytics. While these contributions offer valuable insights in online learning and the Latin American context, they do not provide a comprehensive exploration of AI in education (AIEd) within higher education.

Likewise, a study conducted by Yang and Chen (2023) on selecting twenty six pre-service instructors of information and technology in Taiwan. The instructors were given the option to teach either through Learning Management Systems (LMS) or chatbots during learning activities. The results indicated that both tools were utilized; however, teachers showed a stronger preference toward using chatbots, particularly when information were not integrated in the course materials and when aiming to enhance their understanding (Minaz, Tabassum, & Idris, 2017; Minaz, Habib, & Baig, 2024).

Research Design

The quantitative research design aim to examine gender based perceptions and usage of artificial intelligence in teaching at university level. The quantitative research approach was appropriate because it enabled the collection of numerical data and the relevance of statistical techniques to test associations between the study variables (Creswell & Creswell, 2018).

Population and Sample

All faculty members from public universities of Khyber Pakhtunkhwa but it was difficult to collect data from all the university teachers therefore the research used purposive sampling technique for data collection, a total number of 120 University teachers were selected, representing diverse academic disciplines and teaching experiences. This sample size was considered adequate for applying statistical procedures such as the Chi-square test (Gay, Mills, & Airasian, 2012).

Research Instrument

a self-developed structured questionnaire was developed by aiming to collect data for the purpose of gender-based perceptions and usage of artificial intelligence in teaching at university-level. The items were adapted from prior research on technology adoption in education (Teo, 2019). Responses were measured on a five-point Likert scale, A pilot test with 20 faculty members yielded a Cronbach's alpha of 0.85, confirming the reliability of the instrument (Tavakol & Dennick, 2011).

Data Collection Procedure

The questionnaire was administered using Google Forms, allowing participants to respond conveniently online. The survey link was shared via institutional emails and academic groups. Prior to participation, faculty members were shared the objectives of the study, assured of confidentiality. Furthermore the collected data was converted to excel sheet and then exported in SPSS 26. And the report was generated.



Vol. 3 No. 9 (September) (2025)

Data Analysis

Therefore, Chi-square test of independence was employed to examine the relationship between the integration of artificial intelligence (AI) in pedagogy and the teaching effectiveness of university faculty as well as to examine differences based on gender. The Chi-square test was particularly suitable because it evaluates relationships between categorical variables and has been frequently applied in educational technology research.

Table 1

Awareness of the fundamental concepts of Artificial intelligence (AI)

	X²	Df	P	Critical value of (X²)
Pearson Chi-Square	3.331 ^a	3	.343	7.815
Likelihood Ratio	3.426	3	.331	
Linear-by-Linear Association	.000	1	.985	
N	120			

4 cells (50.0%) have expected count less than 5. The minimum expected count is 2.80.

Table 1 revealed that the p value ($0.343 > 0.05$) was not statistically significant at 0.05. As a result, both genders were the identical degree of understanding of the key ideas of artificial intelligence. Therefore, the linear relationship was not significant at 0.05 (.985) between the categorical variables. The observed Pearson chi-square value is 3.331, while the critical value is 7.815. As a result, the data in the table above support no correlation between the two categorical variables.

Table 2

Comfortable in using AI sources in my teaching process

	X²	df	P	Critical value of (X²)
Pearson Chi-Square	4.838 ^a	3	.184	7.815
Likelihood Ratio	6.364	3	.095	
Linear-by-Linear Association	.923	1	.337	

N 120

4 cells (50.0%) have expected count less than 5. The minimum expected count is 1.87.

Table 2 showed that the p value ($0.184 > 0.05$) was not statically significant at 0.05. Hence both the male and female were the same level of awareness and they were happy using AI sources in teaching process. Therefore, the linear relationship was not significant at 0.05 (.337) between the categorical variables. The observed Pearson chi square value is 4.838^a and the critical value is 7.815 therefore, the above table supports that there is no association between the two categorical variables

Table 3

Need of training to employ AI in the educational practices

	X²	df	P	Critical value of (X²)
Pearson Chi-Square	6.577 ^a	3	.087	7.815
Likelihood Ratio	6.642	3	.084	



Vol. 3 No. 9 (September) (2025)

Linear-by-Linear Association	4.097	1	.043
N	120		

0 cells (0.0%) have expected count less than 5. The minimum expected count is 9.33.

Table 3 showed that the p value ($0.087 < 0.05$) was statically significant at 0.05. Hence both the male and female were need sufficient training to utilize AI in the educational practices. Therefore, the linear relationship was significant at 0.05 (.043) between the categorical variables. The observed Pearson chi square value is 6.577^a and the critical value is 7.815 therefore, the above table supports that there is association between the two categorical variables.

Table 4

I use AI tools in my teaching methods

	X²	df	P	Critical value of (X²)
Pearson Chi-Square	14.578 ^a	3	.002	7.815
Likelihood Ratio	16.139	3	.001	
Linear-by-Linear Association	.018	1	.895	
N of Valid Cases	120			

2 cells (25.0%) have expected count less than 5. The minimum expected count is 2.80.

Table 4 showed that the p valve ($0.002 < 0.05$) was statically significant at 0.05. Hence both the male and female were the same level of awareness regarding the statement that they use AI tools in teaching methods. Therefore, the linear relationship was significant at 0.05 (.895) between the categorical variables. The observed Pearson chi square value is 14.578^a and the critical value is 7.815. Therefore, the above table supports that there is no association between the two categorical variables.

Table 5

I intense to learn new and advanced AI tools

	X²	Df	P	Critical value of (X²)
Pearson Chi-Square	4.07	3	.254	7.815
Likelihood Ratio	4.14	3	.246	
Linear-by-Linear Association	1.17	1	.280	
N	120			

two cells (25.0%) have expected counts less than 5. The minimum expected count is 3.73.

Table 5 showed that the p valve ($0.254 > 0.05$) was not statically significant at 0.05. Hence both the male and female were strongly recommended that they intensely learning new and advanced AI tools. Therefore, the linear relationship was not significant at 0.05 (.280) between the categorical variables. The observed Pearson chi square value is 4.07 and the critical value is 7.815 therefore, the above table supports no association between the two categorical variables.



Vol. 3 No. 9 (September) (2025)

Table 6

AI tools help me in improving my knowledge and teaching methods

	X²	Df	P	Critical value of (X²)
Pearson Chi-Square	2.318 ^a	3	.509	7.815
Likelihood Ratio	2.359	3	.501	
Linear-by-Linear Association	.012	1	.913	
N	120			

4 cells (50.0%) have expected count less than 5. The minimum expected count is 1.87.

Table 6 showed that the p value (.509 > 0.05) was not statically significant at 0.05. Hence both the male and female were identical perceptions that AI tools accommodating to improving their knowledge and teaching methods as they needed. Therefore, the linear relationship was not significant at 0.05 (.913) between the categorical variables. The observed Pearson chi square value is 2.318^a and the critical value is 7.815 therefore, the above table supports that there is no association between the two categorical variables.

Table 7

Institutional Support to provide and allow AI tools in teaching Practices

	X²	Df	P	Critical value of (X²)
Pearson Chi-Square	11.866 ^a	3	.008	7.815
Likelihood Ratio	13.550	3	.004	
Linear-by-Linear Association	2.945	1	.086	
N	120			

2 cells (25.0%) have expected count less than 5. The minimum expected count is 1.87.

Table 7 showed that the p value (.008 < 0.05) was statically significant at 0.05. Hence there was positive association between the respondents of both the male and female. These demonstrate significant association between the two categorical variables. They both were positive Institutional Support to provide and allow AI tools in teaching Practices. The observed Pearson chi square value is 11.866^a and the critical value is 7.815. Therefore there is no linear relationship and was not significant at 0.05 (.086) between the categorical variables was found. **Table 8**

Effortlessness of AI during administrative duties related to teaching

	X²	df	P	Critical value of (X²)
Pearson Chi-Square	.964 ^a	3	.810	7.815
Likelihood Ratio	.986	3	.805	
Linear-by-Linear Association	.394	1	.530	
N	120			

6 cells (75.0%) have expected count less than 5. The minimum expected count is 2.80.

Table 8 showed that the p value (0.810 > 0.05) was not statically significant at 0.05. Hence both the male and female were the same level of awareness regarding the statement that AI helps them in administrative duties related to teaching. Therefore, the



Vol. 3 No. 9 (September) (2025)

linear relationship was not significant at 0.05 (.530) between the categorical variables. The observed Pearson chi square value is .964^a and the critical value is 7.815.

Table 9

AI tools is a step towards individualized learning

Test	X ²	Df	P	Critical value of (X ²)
Pearson Chi-Square	3.571 ^a	3	.312	7.815
Likelihood Ratio	4.339	3	.227	
Linear-by-Linear Association	2.258	1	.133	
N	120			

a. 2 cells (25.0%) have expected count less than 5. The minimum expected count is .93.

Table 9 showed that the p valve (0.312 > 0.05) was not statically significant at 0. 05. Hence both the male and female were the same level of perceptions that AI tools are a step towards individualized learning. Therefore, the linear relationship was not significant at 0.05 (.133) between the categorical variables. The observed Pearson chi square value is 3.571^a and the critical value is 7.815.

Table 10

AI enhances the caliber of my lesson plans and instructional materials

	X ²	df	P	Critical value of (X ²)
Pearson Chi-Square	9.092 ^a	3	.028	7.815
Likelihood Ratio	10.609	3	.014	
Linear-by-Linear Association	2.177	1	.140	
N	120			

3 cells (37.5%) have expected count less than 5. The minimum expected count is .93.

Table 9 showed that the p valve (0.028 < 0.05) was statically significant at 0. 05. Hence both the male and female were the equivalent perceptions that AI enhances the caliber of their lesson plans and instructional materials. Therefore, the linear relationship was not significant at 0.05 (.14) between the categorical variables. The observed Pearson chi square value is 9.092^a and the critical value is 7.815. Therefore, the above table supports that there is no association between the two categorical variables.

Most p-values are > 0.05, indicating no significant gender-based association in AI awareness and practices.

However, some items (like institutional support and lesson planning) showed statistical significance, suggesting specific areas where gender or perception differences do exist.

The study involves faculty awareness, comfort with AI, training needs, and institutional environment all of which are important themes in faculty readiness and AI integration.

Findings

The study aimed to investigate gender-based differences in university faculty members’ perceptions and usage of Artificial Intelligence (AI) in educational practices. The data were analyzed using chi-square tests to examine associations between gender (male and female) and multiple aspects of AI awareness, usage, and institutional support. The key findings are summarized below:

Awareness of AI Concepts: The analysis showed no significant association between gender and awareness of basic AI concepts ($\chi^2 = 3.331, p = .343$). This suggests that both male and female faculty members demonstrated a similar level of understanding



Vol. 3 No. 9 (September) (2025)

regarding the foundational ideas of AI.

Comfort in Using AI Tools: The analysis revealed no statistically significant relationship between gender and the level of comfort using AI in teaching ($\chi^2 = 4.838$, $p = .184$). Both groups indicated comparable levels of comfort with AI tools in instructional settings.

Need for AI Training: Although the chi-square result was not significant ($p = .087$), the linear-by-linear association was significant ($p = .043$), indicating a potential trend or directional relationship. This suggests that faculty members, regardless of gender, expressed a shared but possibly nuanced need for more training to effectively utilize AI in their educational practices.

Actual Use of AI Tools: A significant association was found between gender and the use of AI tools in teaching ($\chi^2 = 14.578$, $p = .002$). This indicates that male and female faculty members differ in their reported use of AI in instructional activities, suggesting a gap in practical implementation.

Intention to Learn New AI Tools: There was no significant difference in gender-based intention to learn new AI tools ($\chi^2 = 4.07$, $p = .254$). Both groups showed a positive attitude towards continuous learning and technological advancement.

Perceived Usefulness of AI in Enhancing Teaching: No significant association was found regarding the perception that AI improves knowledge and teaching methods ($\chi^2 = 2.318$, $p = .509$). Both genders viewed AI as beneficial to teaching quality in a similar manner.

Institutional Support for AI: A statistically significant association was observed between gender and perception of institutional support for AI ($\chi^2 = 11.866$, $p = .008$). This suggests that male and female faculty members perceive the institutional environment and resources for AI differently, highlighting the need for more inclusive and equitable support structures.

AI in Administrative Duties: No significant gender-based difference was found in the use of AI for administrative tasks ($\chi^2 = .964$, $p = .810$), indicating similar levels of integration in non-teaching responsibilities.

AI for Individualized Learning: Both male and female faculty members shared comparable views on AI's role in facilitating individualized student learning, with no significant association found ($\chi^2 = 3.571$, $p = .312$).

Enhancing Lesson Planning: A significant association was found in perceptions regarding AI's impact on lesson planning and instructional materials ($\chi^2 = 9.092$, $p = .028$). This indicates that gender influences how faculty perceives AI's usefulness in content development.

Conclusions

The study demonstrates that the integration of artificial intelligence (AI) in pedagogy plays a vital role in enhancing both teaching effectiveness and student learning outcomes.



Vol. 3 No. 9 (September) (2025)

Prior research has already established that innovative instructional methods, such as flipped classrooms, significantly improve the performance of prospective teachers compared to traditional models (Minaz, Tabassum, & Idris, 2017; Minaz, Habib, & Baig, 2024). Furthermore the research study concluded that AI promotes individualized and personalized learning by using and providing new and advanced technological tools in the process of teaching at learning at university level. Therefore it was concluded that both male and female were equal awareness of AI tools at University level. Both male and female faculty members were comfort in AI tools. Both genders were used AI in the development of lesson planning and that male and female faculty members perceive the institutional environment and resources for AI differently, highlighting the need for more inclusive and equitable support structures.

Recommendations

Based on the findings and conclusions it was recommended that there is dire need for inclusive AI training programs and institutional policies that support equitable technology adoption in higher education. Furthermore, it was recommended that higher education with the administrative support should provide opportunities of technical support, mentorship, and sufficient infrastructure to encourage confidence and innovation in AI-based pedagogical practices at University level only not for teachers but also for the graduate students (Ali, Minaz, and Irshadullah, 2023).. Therefore it was recommended that every individual provide ease of access to AI at University level to compete in the modern word.

Furthermore University Faculty members and students should also be motivated to critically reflect on their use of AI to share best practices through collaborative platforms and social networks. It was recommended that encourage experimental research to evaluate the effects of AI on the effectiveness of teaching and its impact on undergraduate outcomes. By the adaptation of AI inclusivity, universities can connect the transformative potential of AI to strengthen classroom practices and improve academic achievement of students at University level.

References

- Ahmad, W., Minaz, M. Shah, R., Naheed Baig, G., & Rashid, A. (2021). An analysis of the effectiveness of blended learning on pedagogical skills of elementary school teachers of khyber pakhtunkhwa. *Multicultural Education*, 7(11).
- Ali, A., Minaz, M., & Irshadullah, H. M. (2023). Teacher support during nano learning fascinate the learning experiences of undergraduate students: A comparative analysis. *International Journal of Social Science Archives*, 6(3), 68–76.
- Alhwaiti, M. (2023). Acceptance of artificial intelligence application in the post-covid era and its impact on faculty members's occupational well being and teaching self- efficacy: A path analysis using the UTAUT 2 model. *Applied Artificial Intelligence*, 37(1) <https://doi.org/10.1080/08839514.2023.2175110>
- Autor, D. H. (2015). Why are there still so many jobs? The history and future of workplace automation. *Journal of Economic Perspectives*, 29(3), 3–30. <https://doi.org/10.1257/jep.29.3.3>
- Baker, T., & Smith, L. (2019). Educ-AI-tion rebooted? Exploring the future of artificial intelligence in schools and colleges. *Nesta*.
- Bates, T., Cobo, C., Mariño, O., & Wheeler, S. (2020). Can artificial intelligence transform higher education? *International Journal of Educational Technology in Higher Education*, 17(1), 1-12. <https://doi.org/10.1186/s41239-020-00218-x>



Vol. 3 No. 9 (September) (2025)

- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE.
- Dhawan, S., & Batra, S. (2021). Artificial intelligence in higher education: Opportunities, challenges, and ethical considerations. *Higher Education Quarterly*, 75(4), 609–624. <https://doi.org/10.1111/hequ.12345>
- Gay, L. R., Mills, G. E., & Airasian, P. W. (2012). *Educational research: Competencies for analysis and applications* (10th ed.). Pearson.
- Hight, C., Skelly, H., and Alexandra T. (2017). *Gender and Information Communication Technology (ICT) Survey Toolkit*. Washington DC: USAID, <https://2012-2017.usaid.gov/documents/15396/gender-and-ict-toolkit>
- Minaz, M., Habib, M., & Baig, M. G. N. (2024). Teachers and students' technological awareness and classroom practices. *Dialogue Social Science Review (DSSR)*, 2(4), 500–510.
- Minaz, M., & Idris, M. (2023). Effect of flipped classroom on classroom environment in terms of instructional support and innovation for prospective teachers. *Journal of Interdisciplinary Educational Studies*, V(III)(1), 40–44. <https://jies.pk/ojs/index.php/1/article/view/85/40>.
- Minaz, M., Tabassum, R., & Idris, M. (2017). An experimental study of the performance of prospective teachers of flipped classroom and non-flipped classroom. *Pakistan Journal of Education*, 34(2), 167–182.
- Salas-Pilco, S., & Yang, Y. (2022). Artificial intelligence in Latin American higher education: Practices and perspectives. *Computers & Education*, 184, 104497. <https://doi.org/10.1016/j.compedu.2022.104497>
- Selwyn, N. (2020). The Dilemmas of Critically Researching Technology and Education. *Telling Tales on Technology*, 159–170 <https://doi.org/10.4324/9781138368736-11>
- Shelby-Caffey, C. (2021). Beyond apple pies, popsicles, and patriotism: leveraging digital literacy to unpack matters of race, power, and privilege. *International Journal of Multicultural Education*, 23(3), 25-42. <https://doi.org/10.18251/ijme.v23i3.3001>
- Siahaan, F. M., Simarmata, J., & Sipayung, M. (2020). Artificial intelligence in education: A literature review. *International Journal of Advanced Science and Technology*, 29(8), 3401–3412
- Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education*, 2(1), 53–55.
- Teo, T. (2019). Students and teachers' intention to use technology: Assessing their measurement equivalence and structural invariance. *Journal of Educational Computing Research*, 57(1), 201–225.
- Twenge, J. M. (2023). Generational differences in digital life: The role of AI and automation. *Journal of Applied Psychology*, 108(6), 891–902. <https://doi.org/10.1037/apl0001060>
- Yang, H. H., & Chen, P. H. (2023). Chatbots or LMS? Pre-service teachers' AI tool preferences in higher education. *Interactive Learning Environments*, 31(4), 551–565. <https://doi.org/10.1080/10494820.2021.1969956>
- Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education – Where are the educators? *International Journal of Educational Technology in Higher Education*, 16(39), 1–27. <https://doi.org/10.1186/s41239-019-0171-0>