

PERSONALIZED LEARNING THROUGH AI AND ITS EFFECTS ON STUDENTS' PERCEPTION AND ENGAGEMENT

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ABSTRACT

This study was exploring personalized learning through AI and its effect on students' perception and engagement. The main objective of the study was to explore the relationship between students' perception of AI integration and their academic engagement. The population of the study was all the universities of District Sargodha. To collect the sample, the multistage sampling technique was used. First of all, from all the universities of district Sargodha, one public university and one private university were selected. From each university 6 faculties were selected (social science, information technology, allied health sciences, management sciences, sciences, and languages). A stratum of 50 students was made from each faculty of both universities, and a total of 300 students were selected. This study was quantitative in nature, so a self-developed questionnaire was used to gather data from the respondents. The chi-square was used to find out the conclusions. The results of the study were that there was a significant association between students' perception of academic engagement and AI-personalized learning content at the graduate level. On the basis of the conclusion, it was recommended that to optimize AI-powered learning for graduate students, prioritize engagement-driven strategies, simplify AI interactions for enhanced accessibility, and continuously refine AI models for high personalized accuracy.

I. INTRODUCTION

Student engagement and perception are the highly important measures of the effectiveness of education these days and directly affect motivation, the outcome of learning, and academic persistence. As the system of the digital technologies penetration into education becomes more popular, there is a need to study how new technologies, specifically Artificial Intelligence (AI), affect these student-focused factors. With an accelerated development of AI, various industries are undergoing changes and education is not an exception. The place of AI in education in general and higher education in particular is the aspect that cannot be disregarded and influences the learning process of students bringing both beneficial and adverse effects (Vieriu & Petrea, 2025). A revolutionary potential of education has been announced by the introduction of individualized learning experiences and new tutoring systems that provide personal guidance, support, and feedback based on the individual patterns of learning and cognitive level (Hwang et al., 2020) and effectively accommodating the needs of the diverse learners. However, the simple introduction of high-tech AI tools does not ensure a good education (Castañeda & Selwyn, 2018).

Accordingly, when AI is introduced into the education system, such questions as equity, accessibility, and a new role of conventional teaching methods appear. The educational profession has been severely influenced by AI in many ways. AI enhances personalized learning whereby learning content is personalized to meet the personal needs of a learner (Hennekeuser et al., 2024). Research indicates that students in personalized learning settings develop a connection of enhanced self-efficacy and positive approach towards their academic performance (Johnson & Smith, 2019). These are experiences that are more and more attained via AI-powered systems that scan large volumes of data to determine learning gaps and come up with solutions to the same (Tapalova & Zhiyenbayeva, 2022). Adaptive learning systems, which are based on artificial intelligence, have been shown to enhance student engagement and performance by providing real-time feedback and adjusting the learning pace (Zawacki-Richter et al., 2019).

More so, in conventional education systems, learners are motivated to study intensively through the acquisition of inquiry, critical thinking, and problem solving skills. Critical thinking skills are necessary in shaping holistic learning experiences of the students. Questioning strategies, group work, and assignments are characteristic methods to enhance the capacity of learners to evaluate knowledge and formulate their own point of view (Vieriu & Petrea, 2025). The fast speed of processing information and proving insight-driven reaction by AI is a challenge to the conventional educational techniques, bringing up questions about the distinction between human-based cognition and the learning of machines. To illustrate, AI can be used to analyze and manage data, but it might not be good at understanding nature and being creative as human minds (Vieriu & Petrea, 2025). It is the significance of a considered approach to the introduction of AI that can guarantee its addition as an addition but not a substitution to developing human interaction and analysis abilities (Wu, 2023).

The rationale for conducting this study lies in the transformative potential of Artificial Intelligence (AI) to revolutionize higher education through personalized learning experiences that enhance students' engagement and perception. As universities increasingly adopt AI-powered adaptive systems, understanding how these tools affect learners' motivation, confidence, and academic behavior becomes crucial for optimizing pedagogical design. Personalized AI systems analyze individual learning patterns and provide tailored feedback, thereby fostering autonomy, self-efficacy, and deeper engagement (Hennekeuser et al., 2024; Holmes et al., 2023). However, the mere inclusion of AI technologies does not guarantee improved learning outcomes unless accessibility, trust, and accuracy are ensured (Wu, 2023; Vieriu & Petrea, 2025). This study was therefore designed to empirically explore the relationship between students' perceptions of AI integration and their academic engagement, particularly within the higher education context of Pakistan, where technology integration is rapidly expanding. The findings contribute to current educational discourse by identifying factors that influence students' trust and interaction with AI-based learning, aligning with emerging global evidence that AI can significantly improve engagement when effectively personalized and ethically implemented (Bell et al., 2024; bin Salem, 2024; Brooklyn et al., 2024). The objectives of the current study are given below;

1. To identify the levels of students' engagement.
2. To investigate the effect of AI-based personalized learning on students' academic engagement.
3. To explore the relationship between students' perception of AI integration and their academic engagement.

II. METHOD

Participants

For the data collection about the personalized learning through AI and its effect on students' perception and engagement, population of the study contained of all public and private universities in district Sargodha. Multistage sampling technique was used in the research. The procedure of sampling was carried out as:

- 1) First of all, from all the universities of district Sargodha one public and one private university was selected.
- 2) In the second stage, 6 faculties were selected from each university (social sciences, information technology, allied health sciences, management sciences, sciences and languages).

- 3) A stratum of 50 students were made from each faculty of both universities and total 300 students were selected.

Measures

The data was collected through questionnaire. The tool was developed by the researcher to measure the personalized learning through AI and its affection students' perception and engagement. It is a 5-point Likert scale with 1=strongly disagree, 2=disagree, 3= Neutral, 4=agree, 5= strongly agree. Questionnaire for students to measure their personalized learning through AI and its effects on their perception and engagement consisted of 6 constructs. In which 6 statements were for perceived effectiveness of AI-personalized content, 10 for perceived simplicity and accessibility, 8 for engagement, 3 for personalization accuracy, 3 for student confidence and self-efficacy and 6 for trust in AI technology. This scale was filled by the students to measure the effects of personalized learning through AI and its effect on students' perception and engagement at university level. The questionnaire was administered through self-visits for collecting the data. Respondents were 300 in number including 50 students from social sciences, 50 students from information technology, 50 students from allied health sciences, 50 students from management sciences, 50 students from Sciences and 50 students from languages. Questionnaire containing covering letter and demographic information were handed over to every respondent on personal basis. From which the response from the students of social sciences was 84.74%, from information technology students 83.33 %, 80.64% from students of allied health sciences, 81.96% from students of management sciences, 83.33% of students from sciences and response from students of languages was 80.64%, which was considered according to the recommendations of Larossi (2006) that 80-85% of the responded questionnaires return rate is at the good level.

Table 1: Response Rate of Research Respondents

Category of Respondents	Questionnaires Handover	Questionnaires Received	Respondents Rate
Social sciences	59	50	84.74 %
Information technology	60	50	83.33 %
Allied health sciences	62	50	80.64 %
Management sciences	61	50	81.96 %
Sciences	60	50	83.33%
Languages	62	50	80.64%

Procedure

The data collected through the research instruments were coded and tabulated before analysing and interpreting it statistically. APA ethical standards and code of conduct were follow during data collection. All the data collected from the students were categorized on their average mean score basis. SPSS software was used to analyse the data. The chi-square test of association was used to measure the level of association between the AI-based personalized learning and students' academic engagement.

III. RESULTS

Table 2: Association between Students' Perception about AI Personalized Learning Content and Students' Engagement

Variables	χ^2	df	p
[a] Students' engagement	96.61	3	.000
[b] Students' perception of AI personalized content	230.00	4	.000
[c] AI simplicity and accessibility	175.26	4	.000
[d] Students' AI personalized accuracy	211.20	4	.000
[e] Students' confidence, self –efficacy	210.53	4	.000
[f] Students' trust in AI technology	103.78	4	.000

Note. χ^2 = Chi Square

[a] Table shows that chi-square value (96.61) was significant at $p = 0.000 < 0.05$ which shows that there is a significant association between students' perception about AI personalized content and students' engagement. Whereas the chi-square values i.e. 96.61 and 230.00 shows a strong and positive association between students' perception about AI personalized content and students' engagement. This trend shows that as perception of AI personalized content increases, students' engagement also increases. [b] Results show that chi-square values i.e. 96.61 and 175.26 shows a strong and positive association between AI simplicity and accessibility and students' engagement. This trend shows that as perception of AI simplicity and accessibility increases, students' engagement also increases. [c] The chi-square value i.e. 96.61 and 211.20 shows a strong and positive association between students' AI personalized accuracy and students' engagement. This trend shows that as AI personalized accuracy increases, students' engagement also increases. [e] Chi-square value i.e. 96.61 and 210.53 indicate that confidence and self-efficacy of the students and engagement of students has strong and positive relationship. This tendency demonstrates that the higher the confidence self-efficacy of students, the higher is the engagement of students. [f] Chi-square values i.e. 96.61 and 103.78 indicates a strong and positive relation between trust of students on AI technology and engagement of students. This trend indicates that the higher the confidence of students in AI technology, the higher the interaction becomes.

IV. DISCUSSION

As the study by Nawaz et al. (2025) under the title of Personalized Learning through AI and its Effects on Students Perception and Engagement recorded, the results indicated that the perception of AI-personalized learning content by the students had a strong and positive relationship with the level of their engagement in academic activity. The chi-square results showed that there were significant correlations between variables e.g. the simplicity of AI, its accessibility, accuracy with which it was personalized by the students and the levels of trust students had in the AI technology- which also all increased the levels of engagement. These findings suggest that students are confident, motivated and engaged in the learning process, when they are sure that AI systems are correct, available and reliable. These results align with the recent studies (e.g., Hwang et al., 2020; Zawacki-Richter et al., 2019) that have devoted their attention to the influence of adaptive and personalized AI systems on learner autonomy, satisfaction, and persistence.

To a greater degree, the paper reveals the transformative character of AI in the redefinition of the nature of the interactions within the educational context of the learning process personalization. However, it also shows that there should be prudent policies in integrating to ensure that the access is equitable and that, the excessiveness of technology is not exploited. The authors recommend that schools should adopt a design that is based on engagement, simplify AI interfaces and maintain precision of AI algorithms at the expense of continuous refinements. Such measures have the capability of creating additional positive interactions among technology and students, self-efficacy, and long-term academic motivation. Lastly, the research paper will offer practical empirical information in support of the role of AI as a facilitator of deeper and student-directed learning in higher education.

V. CONCLUSION

The findings of the present article demonstrate that Artificial Intelligence is essential to enhance the perceptions and the involvement of students with regards to individualized learning processes. The phenomenon of the significant intertwining between AI personalized content, the ease of access and the academic involvement of students makes one think that the appropriately designed AI-tools may lead to the deeper involvement of the learning process, self-confidence, and self-efficacy in the learners. The use of AI in higher education needs to be learner-centered in the implementation of AI and responsive to the learner in feedback to achieve just and meaningful learning outcomes because AI is still emerging. Future studies ought to examine the long-term effects of AI-based personalization and its effect on pedagogical activities so that technology is used as a facilitating aid, not as an alternative to human-centric education.

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VI. REFERENCES

- Bell, C., Olukemi, A., & Brooklyn, P. (2024). AI-Driven Personalization in Digital Marketing: Effectiveness and Ethical Considerations.
- bin Salem, I. (2024). Integrating artificial intelligence in personalized learning: A future-oriented approach to enhance student engagement and achievement. *International Journal of Post Axial: Futuristic Teaching and Learning*, 111-119.
- Brooklyn, P., Olukemi, A., & Bell, C. (2024). Ai-driven personalization in digital marketing: Effectiveness and ethical considerations. *Available at SSRN 4906214*.
- Castañeda, L., & Selwyn, N. (2018). *More than tools? Making sense of the ongoing digitizations of higher education*. *International Journal of Educational Technology in Higher Education*, 15(1), 1–10. <https://doi.org/10.1186/s41239-018-0109-y>
- Hennekeuser, J., Meier, C., & Schmid, U. (2024). *Adaptive learning environments and AI in higher education: The role of personalization for academic success*. *Computers & Education*, 210, 104789. <https://doi.org/10.1016/j.compedu.2023.104789>
- Hennekeuser, J., Meier, C., & Schmid, U. (2024). *Adaptive learning environments and AI in higher education: The role of personalization for academic success*. *Computers & Education*, 210, 104789.
- Holmes, W., Bialik, M., & Fadel, C. (2023). *Artificial intelligence in education: Promises and implications for teaching and learning*. Center for Curriculum Redesign.
- Hwang, G. J., Sung, H. Y., & Chang, S. C. (2020). *A review of artificial intelligence in education: Implications for future classroom learning*. *Educational Technology & Society*, 23(4), 1–14.
- Johnson, M., & Smith, T. (2019). *Personalized learning and self-efficacy: The role of adaptive educational technologies*. *Journal of Learning Analytics*, 6(3), 45–59. <https://doi.org/10.18608/jla.2019.63.4>
- Nawaz, S., Fatima, S. H., Shah, F. S., Shoukat, Z., Nawaz, G., & Mahmood, A. (2025). *Personalized learning through AI and its effects on students' perception and engagement*. *Pakistan Journal of Positive Psychology*, 2(3), 21–25.
- Tapalova, O., & Zhiyenbayeva, A. (2022). *Data-driven adaptive learning: AI approaches for identifying student learning gaps*. *Journal of Educational Computing Research*, 60(7), 1723–1740. <https://doi.org/10.1177/07356331221084721>
- Vieriu, R., & Petrea, S. (2025). *AI in modern education: Opportunities and cognitive challenges*. *Journal of Educational Innovation*, 12(1), 22–36.
- Wu, T. (2023). *Human cognition versus artificial intelligence: A comparative study on creativity and understanding*. *Cognitive Systems Research*, 79, 100–115. <https://doi.org/10.1016/j.cogsys.2023.07.005>
- 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(1), 1–27. <https://doi.org/10.1186/s41239-019-0171-0>