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**AI-Enabled Personalized Learning to Enhance Teaching–Learning
Outcomes in Higher Education: A Strategic Pathway toward Viksit
Bharat @2047**

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Abstract

The utilization of artificial intelligence technology within the educational realm has been steadily growing, as it allows for individualized learning according to learners' requirements, inclinations, and achievements. This study seeks to evaluate the effects of AI-enhanced personalized learning technologies on multiple dimensions of the educational process, particularly engagement, learning satisfaction, and academic performance. Furthermore, the impact of teachers' digital competencies and their perceptions about AI technologies will be determined. The theoretical frameworks include Self Determination Theory, Technology Acceptance Model, and Adaptive Learning System.

This research adopted a quantitative approach. There were 250 respondents from different programs in higher education institutes selected for the research. In terms of the data collection, structured questionnaires with questions in Likert Scale were used. Descriptive statistics, Pearson correlation, ANOVA, and multiple regression techniques were employed to assess the acquired data. As a result of the conducted research, it can be claimed that there is a positive correlation between the high usage of the artificial intelligence tools and the student engagement as well as their academic performance. The teacher readiness, which is represented by the digital literacy and the positive attitude towards the AI technologies, the significant determinant of the intention to employ artificial intelligence techniques. Furthermore, the perceived utility of the AI tools by the students is crucial, whereas the simplicity of use is comparatively less relevant. Thus, the research proves that the usage of the personalized learning provided by the artificial intelligence tools is critical for the improvement of the educational process if it is done right. Considering the pedagogical and technological aspects of the issue, the following recommendations are provided.

Keywords: AI-enabled personalized learning, higher education, student engagement, learning satisfaction, academic performance, teachers' digital competence, Technology Acceptance Model.

1 Introduction

Within the last decade, AI has brought a complete revolution in many industries, higher education being one of the major ones [1]. Personalized learning simply means the process of giving personalized content and methods that match the requirements of the learner. Personalized learning has gained popularity owing to the possibility of big data and the way it can be personalized [2]. This is because the dynamic learning environment created by AI depends upon the performance of the learner, and there is a strong relationship between both of them. This is because the tutor that is built using AI technology will be able to understand the gaps in learning and provide relevant materials to fill those gaps [3] [4].

Personalized learning offers much flexibility since, for instance, learners like adults have the freedom to learn at their own pace and convenience [5]. The combination of adaptability and AI will assist the educators in making learning fun, efficient, and productive. Nonetheless, there are numerous issues which must be considered prior to applying the technologies to learning process. Among the issues related to ethical considerations, the issue of students' privacy, accessibility to the technology, and training of the faculty are among the major issues which must be addressed prior to implementation of AI. It is crucial to possess governance, infrastructure, and evaluation to use AI in the education process [6].

1.1 Theoretical Framework

The research that will be carried out in this particular project will incorporate Personalized Learning Models, Learning Analytics Frameworks, and AI-Driven Adaptive Learning Systems that are aimed at personalizing the whole process and content of learning [7]. Another theoretical framework that was used is Learning Analytics Frameworks, which focuses on the importance of the use of data-driven insight in learning. It has been seen that prediction and dashboards of analytics play a role in identifying gaps in learning and decision making [8]. As revealed by the findings from the scoping studies carried out, there is an actual but situational impact on learning engagement and performance since, although there is a definite relationship between adaptive and personalized systems and learning engagement and performance, there are certain factors that affect their influence on learning [9].

A critical moderating layer present in all reviews emphasizes the need for ethical governance, digital infrastructure, faculty preparedness, and assessment in order to enable fair AI adoption [10]. This approach also has its basis in the theory of adaptive systems, mainly ITS and AHS that use domain model, pedagogical model, user model, and communication model for personalized tutoring [11]. Moreover, the SDT also demonstrates how the use of AI promotes the components of autonomy, competence, and relatedness to foster intrinsic motivation. The TAM framework highlights the significance of perceived utility and user-friendliness in the adoption of technology

by learners [12].

1.2 Scope of the Proposed Research

The current research examines the novel application of Personalized Learning via Artificial Intelligence inside Indian Higher Education Institutions, specifically on its impact on student engagement, their satisfaction with learning process and their performance, as well as digital competence of teachers and their attitude towards it. This study comprises all types of undergraduate, postgraduate, diploma and certificate programs and research programs and different learning scenarios. Taking into account technological, pedagogical, and institutional aspects in terms of the adoption and readiness for AI in future learner-centric Higher Education system of Viksit Bharat@2047.

2 Review of Literature

The integration of artificial intelligence within the educational sector has acquired substantial relevance, especially the way in which it would transform the education in the field of management. The benefits of AI are personalization, customization, and analysis for the purpose of learning. Research done by [13] demonstrated that management undergraduates and postgraduates recognize the significance of AI within business operations and the significance of utilizing skills related to data analysis and strategic decision making in their careers. Similarly, [14] demonstrated how the use of AI could help in improving academic performance as well as ease the burden on teachers, but highlighted the need for human teachers to develop critical thinking and emotional intelligence skills. [15] Differences in generations with regard to attitudes towards the application of AI should also be noted because Generation Z students make use of AI technology like ChatGPT more often than the older generation teachers who are wary of certain limitations of the technology. [16] The impact of the usage of AI on personalized learning was examined; it can positively affect management education because it motivates students, engages them and improves their academic performance. It was shown with the help of the tools of AI and self-determination theory that the levels of autonomy, competence, and relatedness of the learner increase if he/she receives personalized education. In this paper, there are recommendations for using AI.

The development of online education is taking place extremely quickly and new solutions should be found. [17] This paper has brought to the fore the application of artificial intelligence technology in transforming online learning with regard to personalization of learning, assessment and support for learning. Through the use of intelligent tutoring systems, adaptive learning and predictive analytics technology, artificial intelligence can achieve customization of the learning experience, provision of feedback and learner engagement. This document has concentrated on some critical concerns pertaining to the utilization of artificial intelligence in digital education. [18] investigated the use of AI in the formulation of individualized learning experiences at universities. According to the search results in the database (17,899 citations), 45 articles were selected for analysis following the PRISMA approach and bias risk assessment. We believe that the application of AI technology may help develop adaptive learning, as well as enhance the

engagement of the learners and the efficiency of educational management by personalizing both content and feedback. However, there are many other issues that should be considered, such as ethical issues, privacy, and teachers' preparation. The review [19] The findings from 142 research studies clearly indicate that the application of AI enhances engagement and customizes information, the issues of privacy and scalability still remain relevant. Future research should focus on ethical and explainable AI. [20] AI and machine learning-driven adaptive learning has made huge changes in the e-learning process for each learner. [21] The investigation has been executed based on the analytical results and the viewpoints of both students and teachers concerning the effect of such technologies on the learning process. The research showed that the use of artificial intelligence for personal learning increases engagement and memorization, as well as the detection of gaps through adaptive testing. [12] Used the Self-Determination Theory and Technology Acceptance Model in combination with a mixed methods approach (questionnaire, learning analytics, and performance grades). Results proved the effectiveness of the tool but noted the dependence of results on the level of digital literacy and experience with adaptive technologies among the participants. It was confirmed that artificial intelligence is capable of closing the gaps and making inclusive education feasible.

3 Research Gap

Despite the promising nature of the AI technologies usage in higher education institutions in improving personalized learning, motivation, and academic achievement, there exist some challenges in this area. First of all, most of the literature reviewed is confined to the specific context of the study, therefore, the findings cannot be generalized. The lack of research on the long-term effect of personalized learning by means of AI technologies can be pointed out as well because there are only few studies involving longitudinal design or sample size. Moreover, the questions of faculty readiness, ethical management, technological infrastructure, and equity for underprivileged countries have not been studied sufficiently. Finally, there are no studies on the application of the combination of psychological and technology acceptance theories in order to assess students' performance in the AI environment.

3.1 Objectives of the Proposed Research

1. To assess the level of awareness, access and current use of AI-enabled personalized learning tools among students and teachers in selected higher education institutions.
2. To examine the relationship between the use of AI-enabled personalized learning tools and key teaching–learning outcomes such as student engagement, satisfaction and academic performance.
3. To analyze teachers' and students' readiness for AI-integrated pedagogy in terms of digital competence, attitude towards technology and perceived usefulness of AI tools.
4. To identify the major institutional, technological and pedagogical challenges constraining effective integration of AI-enabled personalized learning in higher education.
5. To provide evidence-based recommendations for strengthening AI-enabled teaching–learning practices in higher education as a means to support the national vision of Viksit Bharat @2047.

3.2 Hypothesis

H1: There is a positive and significant relationship between the extent of use of AI-enabled personalized learning tools and student engagement in higher education.

H2: There is a positive and significant relationship between the extent of use of AI-enabled personalized learning tools and students' academic performance.

H3: Students who frequently use AI-enabled personalized learning tools will report higher levels of learning satisfaction than students who use such tools rarely or not at all.

H4: Teachers' digital competence and attitude towards AI-enabled teaching learning has a positive and significant effect on their intention to integrate AI tools in classroom teaching.

H5: Perceived usefulness and ease of use of AI-enabled personalized learning tools have a positive and significant effect on students' intention to continue using such tools as part of their learning process.

4 Methodology

4.1 Research Design

Concerning this research, the choice of the quantitative approach to data analysis was determined by the statistical empirical analysis of the effects of using personalized learning technologies based on AI on the level of engagement, academic achievements, The degree of student satisfaction with their learning experience and the determinants impacting the readiness of students as well as faculty to adopt AI in the teaching framework of higher education. As far as the data collection method is concerned, it was based on the distribution of questionnaires among a representative sample of 250 students and teachers, in which the questions about the use of AI, usefulness and convenience of its implementation, the engagement, academic success and satisfaction of students and digital literacy and attitudes of teachers to AI-based teaching were posed. For the purpose of conducting the online survey, we used online forms that were created using such online tools as Google forms. Also, the offline survey was applied in case of poor internet connection. The following types of data analysis were performed in SPSS: descriptive statistics, Pearson correlation, ANOVA, and multiple regressions.

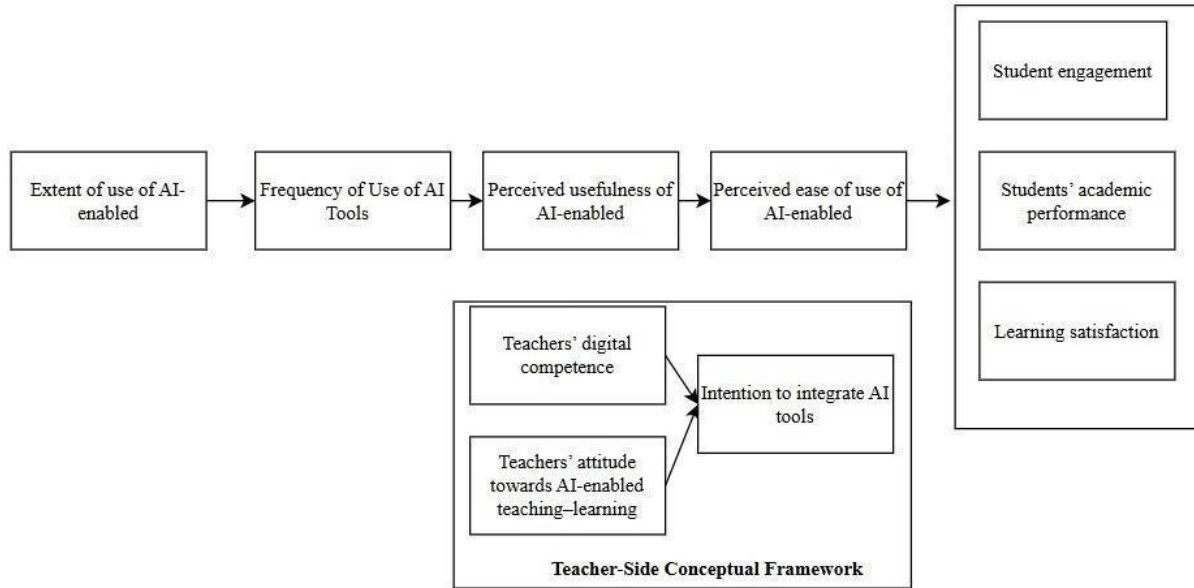


Figure 1 Conceptual Framework

4.2 Research site and Justification

These data were obtained from various institutes providing education at the levels of undergraduate, postgraduate, diploma, certificate, and research studies. These institutes were selected since they were capable of representing the varied nature of the Indian education system with the aim of developing AI-enabled institutes based on Viksit Bharat @2047. The institutes that were using AI for personalized learning toolkits were preferred.

4.3 Data Collection

The methods used in the research included the usage of quantitative data collection technique through the use of structured survey questionnaire that aimed to establish the relationship between personalized learning using AI technology, engagement, learning satisfaction, academic performance, digital competence, and intention to adopt AI among teachers. Most of the data was gathered with the help of Likert Scale questions through the online medium such as Google forms, LMS, and emails. Nonetheless, the offline data collection process was also done in order to gather data from students without access to the internet.

4.4 Data Analysis

The analysis of data used descriptive statistics to elucidate the characteristics of the study participants and AI. Secondly, correlations of the variables such as AI usage, engagement, satisfaction, and performance were tested by the use of Pearson correlation coefficients. One-way ANOVA was used to determine the difference between the groups of AI users (low, medium, and high) with regards to learning satisfaction while the difference in mean values was obtained from Tukey's test. The intention to adopt and use AI was predicted through regression analysis.

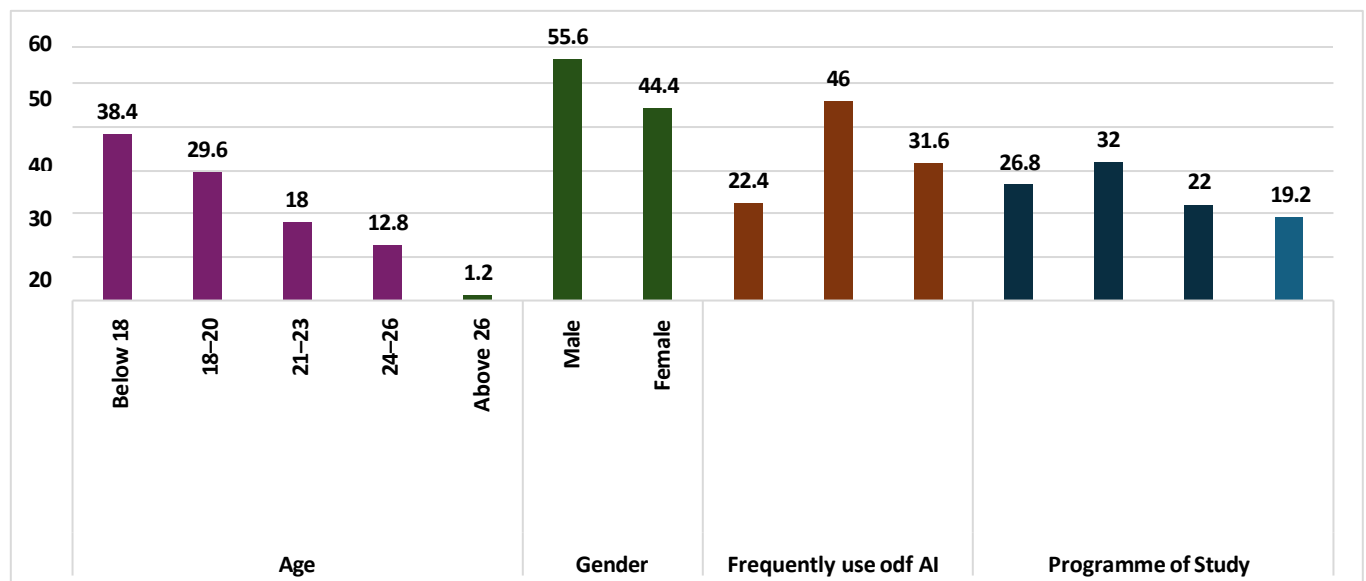
5 Results

This section will deliver the findings from the study on the effects of AI-enhanced personalized learning within higher education. This will include descriptive analysis, correlation testing, ANOVA, and regression analysis, this will be utilized to determine the correlation between the application of AI technology and student involvement, satisfaction with learning, academic performance, and digital competence of teachers. In this chapter, results on the trends in the adoption of AI, differences in terms of the use of AI between different groups, and factors that influence the decision to adopt AI will be presented.

Table 1 Demographic variables

Variables	Groups	Frequency	Percent
Age	Below 18	96	38.4
	18–20	74	29.6
	21–23	45	18.0
	24–26	32	12.8
	Above 26	3	1.2
	Total	250	100.0
Gender	Male	139	55.6
	Female	111	44.4
	Total	250	100.0
Frequently use of AI	Less Usage	56	22.4
	Medium Usage	115	46.0
	High Usage	79	31.6

	Total	250	100.0
Programme of Study	Undergraduate	67	26.8
	Postgraduate	80	32.0
	Diploma / Certificate Programme	55	22.0
	Research Scholar	48	19.2
	Total	250	100.0



As for the demographics of the respondents (N = 250), The sample predominantly comprises young individuals, with 38.4% of respondents under 18, 29.6% aged 18-20, 18.0% between 21-23, 12.8% in the 24-26 age range, and merely 1.2% over 26 years old. Therefore, the research sample is quite representative in terms of the opinions of adolescents and young people. With respect to the gender of the respondents, it should be said that 55.6% of them are males while the remaining 44.4% of the respondents are females, which indicates the nearly equal participation of the respondents with the prevalence of men over women. As for the frequency of using AI-enabled personalized learning tools, 46.0% of the respondents are medium users, 31.6% of them are heavy users, and 22.4% of the respondents are light users, which means that the learners utilize AI tools in academic activities. With respect to the program of study of the respondents, 32.0% of them are postgraduate students.

Proposed Hypothesis

H1: There is a positive and significant relationship between the extent of use of AI-enabled personalized learning tools and student engagement in higher education.

Table 2 Correlations

				Extent of Use of AI Enabled Personalized Learning Tools	Student Engagement
Extent of Use of AI Enabled Personalized Learning Tools	Mean	Std. Deviation	Pearson Correlation	1	.539**
	3.7490	.63629	Sig. (2-tailed)		.000
			N	250	250
Student Engagement	3.9112	.58765	Pearson Correlation	.539**	1
			Sig. (2-tailed)	.000	
N	250	250		250	250
**. Correlation is significant at the 0.01 level (2-tailed).					

The descriptive statistics presented reveal a pronounced usage of AI-based personalized learning tools by students (Mean = 3.7490, SD = 0.63629), as well as a high degree of student engagement (Mean = 3.9112, SD = 0.58765) measured on a five-point Likert Scale. The main aim of this investigation is to evaluate the potential association between the employment of AI-based personalized learning tools and student engagement, thus the Pearson correlation test was executed (Table 2). The analysis reveals a noteworthy association between the application of AI tools and student engagement ($r=.539$, $p < .001$), implying that students utilizing AI-enhanced tailored learning resources frequently demonstrate heightened interest in their learning experiences. This results from the extensive sample size utilized in this investigation ($N = 250$) and the achievement of a significant level.

5.1 Sampling Technique and Sample Size

A stratified random selection technique was utilized to include a range of academic levels and to ensure proper representation of learners as well as educators involved with AI tools. The final sample consisted of 250 student respondents, representing various age groups, genders, and program categories. This dual-group sampling strengthened the alignment between student and

teacher perspectives.

H2: There is a positive and significant relationship between the extent of use of AI-enabled personalized learning tools and students' academic performance.

Table 3 Correlations

				Extent of Use of AI Enabled Personalized Learning Tools	Academic Performance
Extent of Use of AI Enabled Personalized Learning Tools	Mean	Std. Deviation	Pearson Correlation	1	.529**
	3.7490	.63629	Sig. (2-tailed)		.000
			N	250	250
Academic Performance	3.8184	.66355	Pearson Correlation	.529**	1
			Sig. (2-tailed)	.000	
N	250	250	N	250	250
				**. Correlation is significant at the 0.01 level (2-tailed).	

As evidenced by the findings from the descriptive statistics, the degree of adoption of AI-enabled personalized learning tools (Mean = 3.7490, SD = 0.63629) and the level of academic performance (Mean = 3.8184, SD = 0.66355) are relatively high amongst the respondents. In order to test the hypothesis stating that the degree of adoption of the tools has a positive association with the level of academic performance of the students, Pearson correlation coefficient was utilized (Table 4 below). As evidenced by the findings, the positive correlation between the degree of adoption of the AI-enabled personalized learning tools and the academic performance of the students is relatively high and statistically significant ($r = .529$, $p < .001$). That is, the greater the degree of adoption of the AI-enabled personalized learning tools, the greater the academic performance of the students. Given the relatively large sample size ($N = 250$) and significance level ($p < .01$), it is evident that H2 is relatively valid.

H3: Students who frequently use AI-enabled personalized learning tools will report higher levels of learning satisfaction than students who use such tools rarely or not at all.

Table 4 Descriptive

Learning satisfaction				
	N	Mean	Std. Deviation	Std. Error
Less Usage	56	4.0223	.60730	.08115
Medium Usage	115	3.6565	.62868	.05862
High Usage	79	3.8608	.74973	.08435
Total	250	3.8030	.67844	.04291

Table 5 Comparisons

Dependent Variable: Learning satisfaction						
Tukey HSD						
(I) Frequently use	(J) Frequently use	Mean Difference (I-J)	Std. Error	Sig.	F	Sig.
Less Usage	Medium Usage	.36580*	.10834	.002	6.136	.003
	High Usage	.16156	.11614	.347		
Medium Usage	Less Usage	-.36580*	.10834	.002		
	High Usage	-.20424	.09716	.091		
High Usage	Less Usage	-.16156	.11614	.347		
	Medium Usage	.20424	.09716	.091		
*. The mean difference is significant at the 0.05 level.						

The descriptive results show that students with **less usage** of AI-enabled personalized learning tools report the **highest mean level of learning satisfaction** (M = 4.0223, SD = 0.6073), followed by those with **high usage** (M = 3.8608, SD =

0.7497), while the **medium usage** group reports the lowest satisfaction ($M = 3.6565$, $SD = 0.6287$).

A one-way ANOVA indicates that the differences in learning satisfaction across the three usage groups are **statistically significant** $F(2,247) = 6.136$, $p = .003$. $F(2,247) = 6.136$, $p = .003$. Post-hoc Tukey HSD comparisons (Table 7) reveal that students with **less usage** report significantly higher learning satisfaction than those with **medium usage** (Mean Difference = 0.366, $p = .002$), whereas the differences between **less vs high usage** and **medium vs high usage** are not statistically significant. These results indicate that the utilization frequency of AI tools correlates with educational contentment, the pattern is **not strictly linear** in favour of higher usage; instead, students with very low and very high usage show comparable levels of satisfaction, with the **medium-usage group reporting relatively lower satisfaction**. In this connection, **Hypothesis 3** is confirmed to a certain extent because the greater use of AI does not necessarily mean greater satisfaction with studying compared with all other groups of students.

H4: Teachers' digital competence and attitude towards AI-enabled teaching learning has a positive and significant effect on their intention to integrate AI tools in classroom teaching.

Table 6 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.815 ^a	.664	.661	.33545
a. Predictors: (Constant), Teachers' Attitude Toward AI-Enabled Teaching–Learning, Teachers Digital Competence				

Table 7 Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	F	t	Sig.
		B	Std. Error	Beta			
1	(Constant)	.439	.156		243.621	2.817	.005
	Teachers Digital Competence	.380	.049	.384		7.819	.000

Teachers Attitude Toward AI Enabled Teaching Learning	.478	.046	.509		10.361	.000
a. Dependent Variable: Intention to Integrate AI Tools in Classroom Teaching						

The findings from the multiple regression analysis offer substantial backing for H4. Table 8 illustrates that educators' digital proficiency and their disposition towards AI-facilitated teaching significantly account for a considerable portion of the variance in their intention to incorporate AI tools in classroom instruction, with a $R = .815$ and $R^2 = .664$, indicating that roughly 66.4% of the variation in intention is accounted for by these two elements. The Overall Regression Model Is Statistically Significant (2,247) =243.621, $p < .001$, confirming that the set of predictors reliably predicts teachers' intention to use AI tools.

The coefficient estimates in Table 10 further show that both teachers' digital competence ($B = 0.380$, $\beta = 0.384$, $t = 7.819$, $p < .001$) and teachers' attitude toward AI-enabled teaching–learning

($B = 0.478$, $\beta = 0.509$, $t = 10.361$, $p < .001$) have positive and statistically significant effects on intention to integrate AI in classroom teaching. The standardized beta values indicate that attitude toward AI-enabled teaching–learning exerts a comparatively stronger influence than digital competence. Overall, these findings fully support H4, confirming that higher levels of digital competence and more favorable attitudes towards AI-enabled teaching–learning are strongly associated with a greater intention among teachers to integrate AI tools in their classroom practice.

H5: Perceived usefulness and ease of use of AI-enabled personalized learning tools have a positive and significant effect on students' intention to continue using such tools as part of their learning process.

Table 8 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.456 ^a	.208	.202	.62298
a. Predictors: (Constant), Perceived Ease of Use of AI Tools, Perceived Usefulness of AI Tools				

Table 9 Coefficients

		Unstandardized Coefficients		Standardized Coefficients	F	t	Sig.
		B	Std. Error	Beta			
1	(Constant)	1.756	.258		32.444	6.796	.000
	Perceived Usefulness of AI Tools	.449	.073	.408		6.131	.000
	Perceived Ease of Use of AI Tools	.086	.071	.081		1.213	.226
		a. Dependent Variable: Intention to Continue Using AI Tools					

The multiple regression analysis yields partial corroboration for H5. The perceived effectiveness and perceived user-friendliness of AI-enhanced personalized learning resources jointly elucidate 20.8% of the discrepancy in students' willingness to continue employing such tools ($R = .456$, $R^2 = .208$, Adjusted $R^2 = .202$). This signifies a moderate level of explanatory capability of the model. The comprehensive regression model demonstrates statistical significance $F(2,247) = 32.444$, $p < .001$, confirming that the combination of these two predictors reliably predicts students' intention to continue using AI tools.

However, the findings illustrated in Table 13 demonstrate that solely perceived utility has a significant beneficial effect on intention ($B = 0.449$, $\beta = 0.408$, $t = 6.131$, $p < .001$). Conversely, the perceived simplicity of usage has a beneficial albeit statistically negligible effect ($B = 0.086$, $\beta = 0.081$, $t = 1.213$, $p = .226$). This suggests that the propensity to utilize AI technology is contingent upon its utility rather than the simplicity of its application. Hence, Hypothesis H5 could be regarded as being partly validated due to the fact that usefulness is very influential when it comes to the willingness to continue using the AI applications while easiness is not.

5.2 Discussion

Regarding the results received for testing all five hypotheses, It is essential to acknowledge that AI personalization technologies play a significant role in the student learning experience and the educational objectives of the instructor. At the same time, the importance of using such technologies for the student does not lie in the mechanical aspect and not in their frequency of use. In particular, the first and second hypotheses demonstrate that the frequent use of technologies has a positive impact on the engagement and effectiveness of the student. In this way, the claim about AI being a supportive technology becomes true. The third

hypothesis shows the correlation between using technologies and the satisfaction from the learning process, but it does not relate to the frequent use which may lead to cognitive overload. To begin with, from the perspective of teachers, one can say that the purpose of the fourth hypothesis is to prove that digital competence and positive attitude towards the application of AI technologies to the process of teaching-learning process are among the most important predictors of intention to adopt these technologies. The reason is that it can be considered as the fact that implementation of the mentioned technology into the teaching process is possible only in case if teachers believe in their competence in the sphere of digital and see the benefit of these technologies for the process. In terms of intention of students to adopt AI technologies, it is worth noting that the purpose of the fifth hypothesis is to prove that the usefulness of these technologies has more impact on adoption of them than the easiness. It means that students are ready to make some effort in adopting these technologies because of the benefits that they bring. Therefore, taking into consideration all hypotheses mentioned above, it can be said that AI-enabled personalized learning can bring success to Viksit Bharat @2047 program only if higher education institutions do not restrict themselves by only implementing the technology.

6 Conclusion

Each of the hypotheses was analyzed based on which experiment was conducted, and numerical data confirm the findings of the research. Regarding Hypothesis **H1**, it can be deemed accurate, given the discovery of a positive association between the utilization of AI tools and student involvement levels ($r = .539$, $p < .001$, $N = 250$). Furthermore, the correlation between the utilization of AI tools and students' academic achievement proved to be favorable; therefore, it is possible to state that Hypothesis **H2** is also correct ($r = .529$, $p < .001$). Nevertheless, speaking about Hypothesis **H3**, the ANOVA test has found significant differences among the groups of learning satisfaction ($F(2, 247) = 6.136$, $p = .003$), and the average levels of satisfaction for low, medium, and high users have been 4.02, 3.66, and 3.86 respectively. However, the post hoc test has shown the presence of statistically significant difference only between low and medium users (mean difference = 0.366, $p = .002$). On the teachers' side, **H4** was strongly supported: digital competence and attitude toward AI-enabled teaching-learning jointly explained 66.4% of the variance in intention to integrate AI tools ($R = .815$, $R^2 = .664$, $F(2, 247) = 243.621$, $p < .001$). It can be deemed accurate, given the discovery of a positive association between the utilization of AI tools and student involvement levels ($r = .539$, $p < .001$, $N = 250$). Finally, **H5** received partial support: perceived usefulness and ease of use together accounted for 20.8% of the variance in intention to continue using AI tools ($R = .456$, $R^2 = .208$, $F(2, 247) = 32.444$, $p < .001$), but only perceived usefulness showed a significant effect ($\beta = .408$, $p < .001$). Although the reported simplicity of utilization did not ($\beta = .081$, $p = .226$). Overall, the numerical evidence demonstrates that AI-enabled tools meaningfully enhance engagement and performance, and that teachers'

competence and attitudes and students perceived usefulness are critical levers for sustaining AI adoption in line with the broader vision of future-ready higher education.

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