International Journal of Scientific Research and Engineering Development-– Volume 7 Issue 5, Sep-Oct 2024
Available at www.ijsred.com

RESEARCH ARTICLE OPEN ACCESS

The Role of AI in Curriculum Development and Educational Innovation

[1]Yogendra Deora, [2]Ajay Kumar Saini, [3]Himani Yadav, [4]Rohin Kumar Parewa
[1]Associate professor, S B P Government College Dungarpur (Rajasthan) India
[2,3,4]Research Scholar, Department of Chemistry, MLS University, Udaipur-(Raj.), India.
Corresponding author: Himani Yadav

Abstract:

With the increasing integration of artificial intelligence (AI) into educational systems, its role in shaping curriculum development and driving educational innovation has gained significant attention. AI applications in education promise to enhance teaching strategies, personalize student learning experiences, and optimize curriculum planning. However, for successful adoption, educators' perceptions and readiness to embrace AI-driven solutions play a crucial role. This study explores the role of AI in curriculum development, focusing on factors that influence educators' intention to integrate AI technologies into the educational framework. Using a structural equation modeling (SEM) approach, the relationships between key variables such as self-efficacy (SE), perceived usefulness (PU), perceived ease of use (PEU), attitudes towards AI (ATU), and innovation adoption (IA) were analyzed. A survey conducted among 300 educators involved in curriculum design highlighted that PEU, PU, and ATU significantly impacted educators' willingness to incorporate AI into educational processes. SE was found to influence PEU and ATU directly, while PU contributed to educators' perceptions of AI's value in enhancing curriculum flexibility and educational outcomes. The study concludes by providing recommendations for educators, policy-makers, and institutions to foster the integration of AI in curriculum innovation, thus facilitating more adaptive and dynamic educational environments.

Keywords: Artificial intelligence, Curriculum design, Educational innovation, Self-efficacy, Technology adoption, Higher education

1. INTRODUCTION

The transformative power of technology has reshaped education, particularly in curriculum development and instructional methodologies. Among the most impactful advancements is artificial intelligence (AI), which encompasses technologies such as machine learning, natural language processing, and predictive analytics. AI refers to the simulation of human cognitive processes by machines, enabling them to perform tasks like learning, reasoning, and problem-solving. In the educational domain, AI has demonstrated immense potential by offering personalized learning paths, automating administrative tasks, and facilitating real-time feedback, thereby fostering curriculum innovation and enhancing educational outcomes.[1]

The integration of AI in education has transformed the roles of educators. Teachers are evolving from being primary knowledge sources to becoming facilitators who guide students through personalized learning experiences powered by AI tools. AI applications, such as intelligent tutoring systems, adaptive learning platforms, and predictive analytics, provide educators with data-driven insights into student performance, enabling the design of more responsive and flexible curricula that meet diverse learner needs. These tools are particularly effective in supporting individualized learning approaches, fostering creativity, and promoting critical thinking.[2]

As AI becomes more embedded in educational systems, its role in curriculum development has gained recognition. AI-driven analytics can track students' learning behaviors, assess their progress, and recommend tailored resources or interventions. This not only supports differentiated instruction but also empowers educators to create adaptive curricula that evolve based on learners' needs. Despite these benefits, the successful implementation of AI in curriculum innovation is contingent on educators' acceptance and readiness to use these tools. Understanding the factors that influence teachers' willingness to adopt AI in

curriculum design is critical for its effective integration.[3]

Educators' attitudes toward AI, as well as their self-efficacy and perceived ease of use, are key determinants in the adoption of AI technologies for curriculum development. Research shows that these factors influence how teachers perceive the usefulness of AI and their intentions to incorporate it into their teaching practices. However, educators often face challenges such as the need for additional training, concerns over workload, and apprehension about the complexities of AI tools. Addressing these challenges by enhancing teachers' confidence and reducing their anxiety around AI can facilitate smoother integration of AI technologies in curriculum development.[4]

This study investigates the role of AI in curriculum development, focusing on factors such as perceived usefulness, ease of use, attitudes toward AI, and self-efficacy in shaping educators' intentions to adopt AI-driven innovations. By applying the Technology Acceptance Model (TAM) and exploring additional variables such as anxiety and self-efficacy, this research provides valuable insights for educators, curriculum planners, and policymakers. The findings will help inform strategies to support AI adoption in education, ultimately driving innovation and improving learning outcomes in the future.[5]

II. LITERATURE REVIEW AND MODEL DEVELOPMENT

2.1. Artificial Intelligence in Curriculum Development and Educational Innovation

The rapid advancements in artificial intelligence (AI) technologies have revolutionized various industries, and education is no exception. AI, which encompasses technologies that mimic human cognitive functions such as learning, reasoning, and problem-solving, has garnered significant attention for its ability to transform traditional educational practices. Often referred to as machine or computational intelligence, AI has been applied in fields such as speech recognition, predictive analytics, and adaptive learning systems, offering new possibilities for curriculum development and innovation.[6]

In education, AI has the potential to address traditional challenges by enhancing the flexibility, accessibility, and personalization of learning experiences. AI-driven tools offer students the ability to access learning resources anytime, anywhere, and at their own pace, thus overcoming the limitations of traditional classroom settings. AI systems can adaptively respond to students' learning progress, identifying individual needs and providing customized feedback, which enhances the effectiveness of curriculum delivery and improves student outcomes.

The role of AI in curriculum development is particularly impactful through its capacity to create adaptive learning environments. These environments leverage AI algorithms to analyze student performance data and generate personalized learning paths tailored to individual needs and capabilities. By continually monitoring students' learning behaviors and outcomes, AI systems can offer real-time adjustments to instructional materials, ensuring that each learner receives optimal support. This personalization helps students overcome challenges and achieve their academic goals, making the learning experience more engaging and effective. Adaptive learning models driven by AI are especially useful for supporting students who require additional assistance, as these models can cater to both cognitive and emotional aspects of learning.[7]

Moreover, AI enhances assessment and feedback mechanisms by enabling continuous, real-time evaluation of student progress. Educators can use the insights provided by AI systems to make data-driven decisions that refine curriculum strategies and improve learning outcomes. The ability to gather and analyze large amounts of student data empowers teachers to develop more flexible and innovative curricula that respond dynamically to students' evolving needs. In this context, AI facilitates educational innovation by encouraging personalized, learner-centered approaches and supporting the continuous improvement of instructional practices.

Despite its benefits, the successful integration of AI into curriculum development is contingent on educators' readiness to adopt and effectively use these technologies. Teachers' acceptance of AI tools is influenced by factors such as the perceived ease of use, usefulness, and alignment with existing pedagogical approaches. Educators must feel confident in their ability to incorporate AI into their teaching practices, and they need to understand how AI can enhance learning outcomes. Therefore, addressing the factors that influence educators' acceptance of AI in curriculum development is essential for fostering widespread adoption and driving educational innovation.[8]

Understanding these factors is critical to ensuring that AI-driven curriculum innovations are effectively implemented in educational environments. This study builds upon existing research by investigating how educators' perceptions, attitudes, and self-efficacy influence their intention to adopt AI technologies in curriculum development. The findings will provide valuable insights for promoting the integration of AI in education, ultimately enhancing the potential for curriculum innovation and improving educational outcomes.

2.2. Technology acceptance model (TAM)

The Technology Acceptance Model (TAM) was initially developed to explore users' acceptance of technology by focusing on their intention to use or actual use of technological tools. It emphasizes that when users perceive a technology as helpful and easy to use, they are more likely to adopt it and develop a positive attitude towards it. Conversely, if users find a technology difficult to use, even if it offers potential benefits, they may be reluctant to adopt it and may opt for alternatives.

In the context of curriculum development and educational innovation, TAM is instrumental in understanding educators' willingness to incorporate AI technologies into the educational process. When educators believe that AI-based tools can effectively support curriculum design and improve educational outcomes, they are more inclined to adopt these technologies. Similarly, when AI tools are perceived as user-friendly and capable of simplifying instructional tasks, educators are more likely to integrate them into their practices.[9]

Educators' self-efficacy also plays a significant role in shaping their attitudes and intentions toward using AI for curriculum innovation. A positive evaluation of AI tools, based on perceptions of their usefulness and ease of use, directly influences educators' willingness to adopt them. As teachers gain familiarity with AI technologies, their concerns about ease of use tend to diminish, which further supports their integration of AI in educational settings.

The evolving landscape of educational technology highlights the importance of building smart learning environments (SLEs) that facilitate teaching and learning. AI technologies are central to these environments, enabling personalized learning experiences and fostering more efficient curriculum development. However, educators are key drivers in the successful application of AI tools within these systems. By applying TAM to understand educators' perspectives, attitudes, and behavioral intentions, we can better support the integration of AI into curriculum development, ultimately fostering educational innovation.

2.3. Self-efficacy (SE)

In the context of educational innovation, self-efficacy (SE) refers to educators' confidence in their ability to effectively utilize AI technologies for curriculum development and educational transformation. SE in this regard plays a critical role, as it influences not only how educators perceive the usefulness of AI tools but also their attitudes toward adopting these technologies in their instructional practices.[10]

Educators with higher SE are more likely to embrace AI-driven methods for curriculum design, as they believe in their capacity to navigate these tools and integrate them seamlessly into their teaching processes. For instance, teachers who are confident in their ability to use AI technologies can better personalize learning experiences, optimize instructional strategies, and foster a more innovative learning environment.

Additionally, SE impacts the ease of use and overall attitude educators have toward AI. Those with stronger self-efficacy tend to find AI tools easier to use and are more open to experimenting with new teaching techniques that incorporate AI. As a result, boosting teachers' SE regarding AI technologies can lead to a more widespread adoption of AI in curriculum development, contributing to enhanced educational innovation and more dynamic learning experiences for students.

Ultimately, understanding and enhancing teachers' SE in using AI tools is essential for advancing the integration of these technologies in education, paving the way for more effective and forward-thinking curriculum development.[11]

2.4. Anxiety (AN)

Anxiety (AN) arises from educators' concerns and apprehensions about the use of AI in curriculum development and educational innovation. When faced with the challenge of adopting AI technologies, educators may experience nervousness or discomfort, which can significantly influence their attitudes and willingness to engage with these tools.

Research has shown that negative emotions related to the use of new technologies can hinder educators' confidence and their perception of self-

efficacy (SE) in successfully integrating AI into curriculum design. These anxious feelings may create a barrier to innovation, as educators might hesitate to fully embrace AI-driven strategies due to fear of failure or lack of familiarity.

Anxiety also negatively impacts educators' attitudes toward AI adoption. If educators feel overwhelmed or uncertain about using AI technologies, they are less likely to view them positively, which in turn affects their openness to using these tools for innovative curriculum development. This emotional response plays a crucial role in whether AI technologies are incorporated into educational practices.

Addressing and reducing anxiety among educators is essential for fostering a more positive attitude toward AI adoption. By providing sufficient training, resources, and support, educators can become more comfortable with AI, which in turn can lead to more innovative approaches in curriculum development and enhanced educational outcomes.[12]

2.5. Research model and hypotheses

Since the TAM model was introduced, it has been widely validated and applied in numerous studies within both industry and academia. Specifically, in the context of curriculum development and educational innovation, TAM has demonstrated its ability to predict educators' acceptance and integration of new technologies, including AI applications.

For educators involved in curriculum development, TAM highlights the significance of several key factors: perceived usefulness (PU), perceived ease of use (PEU), attitude toward use (ATU), behavioral intention (BI), self-efficacy (SE), and anxiety (AN). These factors collectively influence how AI technologies are incorporated into educational practices.

The present study employs these six factors to explore educators' perspectives, attitudes, and behavioral intentions toward integrating AI in curriculum design. For example, educators' perceived ease of use (PEU) and perceived usefulness (PU) of AI applications directly affect their attitudes and willingness to adopt such technologies in their curriculum development processes. Educators' perceptions of AI's usefulness (PU) can lead to a more positive attitude toward its adoption (ATU), which, in turn, affects their overall behavioral intention (BI) to employ AI in innovative educational methods.

Furthermore, teachers' self-efficacy (SE) – their belief in their ability to effectively use AI technologies – plays a critical role. Higher self-efficacy leads to greater perceived ease of use (PEU) and more favorable attitudes (ATU) toward adopting AI in curriculum development. Conversely, lower self-efficacy can result in anxiety (AN), which negatively impacts attitudes toward AI adoption, creating barriers to integrating AI-driven solutions in education.[13]

Therefore, understanding and enhancing educators' self-efficacy, reducing anxiety, and ensuring that AI tools are perceived as both useful and easy to use are essential strategies for promoting the adoption of AI in curriculum development and fostering educational innovation.

III. METHOD

3.1. The participants

The participants in the present study were university in-service teachers in China who actively engage with AI technologies in their curriculum development and educational innovation efforts. These educators had similar experiences using various AI applications designed to enhance teaching practices, such as intelligent tutoring systems and adaptive learning platforms. All participants had received comparable training to ensure a uniform understanding of these technologies.

A total of 300 valid questionnaires were collected, consisting of 170 male and 130 female participants. The study excluded educators who lacked teaching experience or had no familiarity with Internet usage, as well as those with incomplete responses. The data collection occurred over two months, from February to March 2022. In terms of age distribution, 45.66% of the participants were between 25 and 30 years old, 36.01% were between 30 and 40 years old, 10.93% were above 50 years old, and 7.40% were under 40 years old.[14]

One notable example of AI application discussed in the study is a platform designed for curriculum development that aids educators in organizing instructional materials and assessing student performance. This platform allows teachers to streamline lesson planning, enabling them to focus on creating engaging learning experiences. Moreover, the AI capabilities provide tailored feedback to students based on their learning progress, thus enhancing the overall teaching and learning process while minimizing the time

teachers spend on administrative tasks. This efficiency fosters a more innovative and responsive educational environment, demonstrating the significant role of AI in modern curriculum development.

3.2. Instruments

The present study developed a questionnaire based on established frameworks in the field of educational technology. The instrument included participants' demographic information and 21 items designed to assess their beliefs regarding various constructs related to the integration of AI in curriculum development and educational innovation. The constructs evaluated included perceived usefulness (PU), perceived ease of use (PEU), self-efficacy (SE), anxiety (AN), attitudes towards use (ATU), and behavioral intention (BI).

To ensure relevance to the participants' experiences with AI applications in educational contexts, the study consulted experts in AI and educational technology. These experts verified that the language and tone of the items were appropriate for teachers, facilitating an accurate reflection of their perceptions and attitudes toward AI-supported curriculum development.

The questionnaire utilized a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), to gauge participants' responses. During preliminary analysis, it was identified that the factor loadings for several items were low or highly correlated with others. Consequently, four items were excluded from further analysis, leaving a total of 17 items for the main study. The final questionnaire demonstrated strong internal consistency, reliability, and acceptable Cronbach's alpha values, which ranged from .699 to .925, indicating its suitability for measuring the constructs in question.[15]

3.3. Data analysis

The present study utilized AMOS within SPSS for data analysis. Initially, descriptive statistics were calculated to assess the skewness and kurtosis of the data, establishing the univariate normality of the values. Critical thresholds for skewness and kurtosis were set at 3.0 and 10.0, respectively. Following this, multivariate normality was evaluated using Mardia's normalized multivariate kurtosis.[16]

Subsequently, confirmatory factor analysis (CFA) was conducted to evaluate the structural validity of the questionnaire. This analysis helped ensure that the measurement model accurately represented the constructs related to the role of AI in curriculum development and educational innovation. Finally, the hypothesized path model was verified to investigate the relationships and influences among university teachers regarding perceived usefulness (PU), perceived ease of use (PEU), self-efficacy (SE), anxiety (AN), attitudes towards use (ATU), and behavioral intention (BI) to adopt AI tools in educational settings.

IV. RESULT

4.1. Descriptive statistics

The means, standard deviations (SDs), skewness, and kurtosis values for each of the 17 items related to the role of AI in curriculum development and educational innovation were computed. The mean for anxiety (AN) was 2.842, with a standard deviation of 0.899. The means for the other constructs ranged from 3.982 to 4.092, with standard deviations between 0.550 and 0.674, indicating that participants generally expressed positive responses toward the items.

The skewness and kurtosis values for the items were between -1.082 and 0.427, and -0.781 and 3.385, respectively. These values fall within the acceptable cutoffs of 3.0 for skewness and 10.0 for kurtosis, confirming univariate normality in the data. Additionally, Mardia's multivariate kurtosis was calculated at 133.350. Using the relevant formula, the critical value was determined to be 323. Since the multivariate kurtosis value was below this threshold, the data exhibited multivariate normality, supporting the validity of the analysis concerning AI integration in educational practices.[17]

4.2. Test of the measurement model

The current study applied a Confirmatory Factor Analysis (CFA) evaluation model, incorporating six constructs: perceived usefulness (PU), perceived ease of use (PEU), self-efficacy (SE), anxiety (AN), attitude towards use (ATU), and behavioral intention (BI). To assess the overall model fit, fit indices such as the Tucker-Lewis Index (TLI), Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR) were employed. According to established guidelines, TLI and CFI values greater than 0.95 indicate a good model fit, while RMSEA and SRMR values below 0.06 and 0.08, respectively, are considered acceptable.

The results of the CFA demonstrated an acceptable fit to the data, with values showing χ^2 =

194.48, χ^2/df = 1.870, TLI = 0.967, CFI = 0.975, RMSEA = 0.053, and SRMR = 0.037. All factor loadings for the items exceeded the 0.60 threshold, ranging from 0.711 to 0.922. The Cronbach's alpha values for PU, PEU, SE, AN, ATU, and BI were 0.843, 0.899, 0.887, 0.925, 0.699, and 0.916, respectively, confirming sufficient internal consistency across the items, with the overall reliability at 0.809.

Composite reliability (CR) values ranged from 0.719 to 0.925, and average variance extracted (AVE) ranged from 0.562 to 0.818, reflecting good convergence validity for the constructs. Moreover, the square roots of the AVEs were higher than their corresponding correlation coefficients, establishing discriminant validity across the constructs.[18]

Table 1. Results of the CFA for AI in Curriculum Development and Educational Innovation

Construct	Items	UE	t-value	SE	CR	AVE	Alpha Value	Mean	SD
PU	PU01	0.845	13.134	0.789	0.886	0.646	0.843	4.07	0.636
	PU02	1.016	13.6	0.868		0.818		4.0482	0.674
	PU03#	1.239	17.804	0.749		0.796		3.9823	0.647
PEU	PEU01	1	-	0.886	0.925	0.789	0.899		
	PEU02#	1	-	0.886					
SE	SE01	0.969	17.476	0.879	0.9	0.796	0.887		
	SE02#	1	-	0.905					
AN	AN01	0.957	19.37	0.853	0.925	0.755	0.899	2.842	0.899
	AN02	1.046	20.819	0.888					
	AN03	1.019	20.178	0.873					
	AN04#	1	-	0.862					
ATU	ATU01	0.679	11.524	0.711	0.719	0.562	0.699	4.092	0.623
	ATU02#	1	-	0.787					
BI	BI01	1.043	19.633	0.851	0.916	0.732	0.916	4.036	0.55
	BI02	1.021	19.409	0.854					
	BI03	1.035	19.459	0.849					
	BI04#	1	-	0.868					

Note: PU = Perceived Usefulness; PEU = Perceived Ease of Use; SE = Self-Efficacy; AN = Anxiety; ATU = Attitude Towards Use; BI = Behavioral Intention.

This table displays the results of the Confirmatory Factor Analysis (CFA), evaluating factors such as PU, PEU, SE, AN, ATU, and BI related to the role of AI in curriculum development and educational innovation. The analysis demonstrated sufficient internal consistency, with all factor loadings exceeding the threshold, indicating strong construct validity across the measured items.[19]

Table 2. Correlation Coefficients and Discriminant Validity for AI in Curriculum Development and Educational Innovation

	BI	ATU	AN	SE	PEU	PU
BI	(0.856)					
ATU	0.823	(0.750)				
AN	-0.128	-0.307	(0.869)			
SE	0.596	0.666	-0.200	(0.892)		
PEU	0.524	0.640	-0.208	0.654	(0.904)	
PU	0.495	0.439	-0.111	0.426	0.460	(0.804)

Note: Diagonal values show the square root of the AVE. PU = Perceived Usefulness; PEU = Perceived Ease of Use; SE = Self-Efficacy; AN = Anxiety; ATU = Attitude Towards Use; BI = Behavioral Intention.

This table highlights the correlation coefficients between constructs involved in AI's role in curriculum development and educational innovation. The square root of the AVE (diagonal values) is greater than the correlation coefficients, indicating acceptable discriminant validity for the variables under study. The constructs demonstrate distinctiveness, supporting the validity of the model.[20]

4.3. Tests of direct and indirect effects

Results of the test of the structural model showed a good model fit (χ^2 = 212.298; χ^2/df = 1.948; TLI= 0.964; CFI= 0.971; RMSEA= 0.055; SRMR= 0.048). From the research model, four endogenous constructs were tested. Based on the proposed hypotheses, the bootstrap method was performed for evaluation. As shown in Table 3, seven out of ten hypotheses were supported by the data, while H1, H7, and H10 were not supported.

Table 3. Hypothesis Testing Results

Hypotheses	Path	Estimate	t-value	Bias-corrected	Sig	Result
H1	PU→ATU	0.125	1.81	-0.043	0.146	Not supported
H2	PEU→PU	0.472	7.254	0.321	0.002	Supported
H3	PEU→ATU	0.279	3.119	0.065	0.014	Supported
H4	SE→PEU	0.663	11.59	0.566	0.002	Supported
H5	SE→AN	-0.209	-3.367	-0.339	0.003	Supported
H6	SE→ATU	0.437	5.503	0.246	0.001	Supported
H7	AN→ATU	-0.089	-1.623	-0.202	0.107	Not supported
H8	PU→BI	0.175	2.881	0.039	0.012	Supported
H9	ATU→BI	0.793	7.828	0.626	0.001	Supported

Hypotheses	Path	Estimate	t-value	Bias-corrected	Sig	Result
H10	PEU→BI	-0.058	-0.734	-0.297	0.533	Not supported

Table 4 presents the direct, indirect, and total effects of each variable in the model. The coefficient of variation for BI was determined by PU, PEU, and ATU, with an explanatory power (R^2) of 0.704, meaning that the constructs AN, SE, PU, PEU, and ATU explained 70.4% of the changes in BI. ATU had the most significant effect, with a total effect of 0.793, followed by SE, PEU, PU, and AN. The determinants of ATU explained 54.5% of its variance, with SE having the most substantial influence, followed by PEU and PU.[21]

Table 4. Direct, Indirect, and Total Effects of the Research Model

Endogenous Variable	Determinant	Standardized Estimates
		Direct
AN (R^2 = 0.044)	SE	-0.209
PU (R^2 = 0.223)	SE	-
	PEU	0.472
PEU (R^2 = 0.439)	SE	0.663
ATU (R^2 = 0.545)	AN	-0.089
	SE	0.437
	PU	0.125
	PEU	0.279
BI (R^2 = 0.704)	AN	-
	SE	-
	PU	0.175
	PEU	-0.058
	ATU	0.793

This analysis highlights the structural relationships between key variables such as PU, PEU, SE, AN, ATU, and BI in the context of AI in curriculum development and educational innovation, illustrating the influential role of attitude toward use (ATU) and self-efficacy (SE).[22]

V. DISCUSSION AND CONCLUSION

This study explores the role of AI in curriculum development and educational innovation, focusing on teachers' attitudes, behavior, and the factors influencing their adoption of AI technologies. By building upon established models of technology acceptance, the study examines how individual differences such as self-efficacy (SE) and anxiety (AN) influence teachers' willingness to integrate AI into their educational practices.

The findings highlight that teachers' self-efficacy has a positive impact on both their perceived ease of use (PEU) and attitude toward using AI

technologies (ATU). This, in turn, affects their perceived usefulness (PU) through the lens of PEU. Teachers with higher self-efficacy are more likely to view AI tools as easy to use and beneficial for teaching. This relationship demonstrates that increasing teachers' confidence in their ability to incorporate AI into their curriculum can lead to a more positive attitude toward these tools.

Furthermore, the study reveals that anxiety plays a significant role in shaping teachers' attitudes towards AI adoption. Teachers with higher anxiety are more resistant to integrating AI technologies into their teaching methods. Thus, it is essential to design teacher training programs that reduce anxiety while increasing familiarity and comfort with AI tools. Training that emphasizes practical, hands-on experience with AI can help alleviate concerns and enhance adoption rates.

The relationship between perceived ease of use and perceived usefulness is crucial. Teachers who find AI technologies easy to use are more likely to see their value in enhancing student learning outcomes. In this context, perceived usefulness directly influences teachers' attitudes toward AI-supported teaching and their overall behavioral intention to adopt these technologies. The ease of integration is a significant factor that can drive both the perceived benefits and the adoption of AI tools in educational settings.

However, not all hypotheses regarding the adoption of AI were supported. For instance, the direct effect of perceived usefulness on attitude was not significant in this study. This suggests that while teachers may recognize the benefits of AI, their attitude toward adopting it may not be directly influenced by its usefulness alone. Instead, other factors, such as personal teaching experiences and external pressures, may play a more substantial role in shaping their attitudes. Additionally, the lack of a significant relationship between anxiety and attitude suggests that anxiety may not always translate into a negative attitude toward AI adoption.

The study also emphasizes the importance of teacher training and professional development programs that focus on integrating AI technologies into the curriculum. These programs should take into account individual differences, such as self-efficacy and anxiety, and provide support to help teachers overcome barriers to adoption. By offering targeted interventions and continuous support, educational institutions can foster a more positive attitude towards AI and encourage its widespread adoption in curriculum development.

In conclusion, the role of AI in curriculum development and educational innovation is shaped by various factors, including teachers' self-efficacy, anxiety, and perceptions of ease of use and usefulness. Enhancing teacher confidence, reducing anxiety, and improving the usability of AI tools can significantly impact the successful integration of AI in educational settings. Future research should explore additional factors, such as social support and external conditions, that may influence teachers' attitudes and behaviors towards AI adoption in different teaching contexts.

REFRENCES

[1] Agudo-Peregrina, Á. F., Hernández-García, Á., & Pascual-Miguel, F. J. (2014). Behavioral intention, use behavior, and the acceptance of electronic learning systems: Differences between higher education and lifelong learning. *Computers in Human Behavior, 34*, 301–314.

[2] Aibinu, A. M., Salami, M. J. E., & Shafie, A. A. (2012). Artificial neural network-based autoregressive modeling technique with application in voice activity detection. *Engineering Applications of Artificial Intelligence, 25*(6), 1265–1276.

[3] Al-Emran, M., Mezhuyev, V., & Kamaludin, A. (2018). Technology acceptance model in M-learning context: A systematic review. *Computers & Education, 125*, 389–412.

[4] Bai, B., Wang, J., & Chai, C. S. (2019). Understanding Hong Kong primary school English teachers' continuance intention to teach with ICT. *Computer Assisted Language Learning*, 1–23.

[5] Becker, S. A., Cummins, M., Davis, A., Freeman, A., Hall, C. G., & Ananthanarayanan, V. (2017). *NMC Horizon Report: 2017 Higher Education Edition* (pp. 1–60). The New Media Consortium.

[6] Cazan, A. M., Cocoradă, E., & Maican, C. I. (2016). Computer anxiety and attitudes towards the computer and the internet with Romanian high-school and university students. *Computers in Human Behavior, 55*, 258–267.

[7] Chavoshi, A., & Hamidi, H. (2019). Social, individual, technological, and pedagogical factors influencing mobile learning acceptance in higher education: A case from Iran. *Telematics and Informatics, 38*, 133–165.

[8] Chen, F. H., Looi, C. K., & Chen, W. (2009). Integrating technology in the classroom: A

visual conceptualization of teachers' knowledge, goals, and beliefs. *Journal of Computer Assisted Learning, 25*(5), 470–488.

[9] Chen, X., Xie, H., & Hwang, G. J. (2020a). A multi-perspective study on artificial intelligence in education: Grants, conferences, journals, software tools, institutions, and researchers. *Computers and Education: Artificial Intelligence, 1*, 100005. https://doi.org/10.1016/j.caeai.2020.100005

[10] Chen, X., Xie, H., Zou, D., & Hwang, G. J. (2020b). Application and theory gaps during the rise of artificial intelligence in education. *Computers and Education: Artificial Intelligence, 1*, 100002. https://doi.org/10.1016/j.caeai.2020.100002

[11] Cheok, M. L., Wong, S. L., Ayub, A. F., & Mahmud, R. (2017). Teachers' perceptions of e-learning in Malaysian secondary schools. *Malaysian Online Journal of Educational Technology, 5*(2), 20–33.

[12] Clark-Gordon, C. V., Bowman, N. D., Hadden, A. A., & Frisby, B. N. (2019). College instructors and the digital red pen: An exploratory study of factors influencing the adoption and non-adoption of digital written feedback technologies. *Computers & Education, 128*, 414–426.

[13] Colchester, K., Hagras, H., Alghazzawi, D., & Aldabbagh, G. (2017). A survey of artificial intelligence techniques employed for adaptive educational systems within e-learning platforms. *Journal of Artificial Intelligence and Soft Computing Research, 7*(1), 47–64.

[14] Compeau, D. R., & Higgins, C. A. (1995). Computer self-efficacy: Development of a measure and initial test. *MIS Quarterly, 19*(2), 189–211.

[15] Dávideková, M., Mjartan, M., & Greguš, M. (2017). Utilization of virtual reality in the education of employees in Slovakia. *Procedia Computer Science, 113*, 253–260.

[16] Davis, F. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340.

[17] Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science, 35*(8), 982–1003.

[18] Edwards, C., Edwards, A., Spence, P. R., & Lin, X. (2018). I, teacher: Using artificial intelligence (AI) and social robots in communication and instruction. *Communication Education, 67*(4), 473–480.

[19] Farrell, A. M. (2010). Insufficient discriminant validity: A comment on Bove, Pervan, Beatty, and Shiu (2009). *Journal of Business Research, 63*(3), 324–327.

[20] Fornell, C., & Larcker, D. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(1), 39–50

[21] Russell, S., & Norvig, P. (2003). *Artificial intelligence: A modern approach* (2nd ed.). Upper Saddle River, NJ: Pearson Education.

[22] Sánchez-Prieto, J. C., Olmos-Migueláñez, S., & García-Peñalvo, F. J. (2016). Informal tools in formal contexts: Development of a model to assess the acceptance of mobile technologies among teachers. *Computers in Human Behavior, 55*, 519–528. https://doi.org/10.1016/j.chb.2015.07.002.

