Examining the Role of GenAI Enablement in Curriculum Reform: Evidence from Higher Vocational Education

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Abstract. With the rapid advancement of generative artificial intelligence (GenAI), educational institutions are increasingly exploring its potential to support curriculum reform. However, empirical evidence on how GenAI enablement relates to curriculum reform outcomes in practice-oriented educational contexts remains limited. Focusing on higher vocational education, this study examines the association between teachers' perceived GenAI enablement and curriculum reform outcomes, and explores the mediating role of teachers' perceived value as well as the moderating role of AI literacy. Data were collected through a questionnaire survey of 571 teachers from higher vocational colleges in China. Structural equation modeling and bootstrapped regression analyses were employed to test the proposed relationships. The results indicate that perceived GenAI enablement is positively associated with curriculum reform outcomes, and that this relationship is primarily transmitted through teachers' perceived value. Furthermore, teachers' AI literacy strengthens the positive association between GenAI enablement and perceived value, resulting in a significant conditional indirect effect. These findings provide empirical evidence that GenAI contributes to curriculum reform not merely through technological availability, but through teachers' value perceptions and capability preparedness. The study offers practical insights for managing GenAI integration in vocational education and other practice-oriented educational settings.

Keywords: Generative artificial intelligence, curriculum reform, perceived value, AI literacy, vocational education, digital education management

1 Introduction

The rapid advancement of large language models has brought generative artificial intelligence (GenAI) to the forefront of digital transformation in education (Samala et al., 2025[14]). Tools such as ChatGPT and other generative systems are increasingly adopted to support content generation, instructional design, feedback provision, and learning analytics. As a result, GenAI is no longer viewed merely as an auxiliary instructional technology, but as a potentially transformative resource for curriculum development and reform, particularly in technology-intensive and practice-oriented educational contexts.

I. A. Khan et al. (eds.), *Proceedings of the 2026 5th International Conference on Educational Innovation and Multimedia Technology (EIMT 2026)*, Atlantis Highlights in Social Sciences, Education and Humanities 51,
https://doi.org/10.2991/978-94-6239-691-3_23

In recent years, a growing body of research has examined the application of GenAI in higher education, focusing on instructional affordances, pedagogical integration strategies, implementation challenges, and ethical considerations (Batista et al., 2024[1]; Belkina et al.,2025[2];Pinho et al., 2025[12]; Qian, 2025[13]; Wang et al., 2025[21]). Existing studies have documented the potential of GenAI to enhance teaching efficiency, support personalized learning, and facilitate innovative instructional practices. At the curriculum level, emerging discussions emphasize the need to align curriculum structures with AI-related competencies, industry demands, and evolving forms of human–AI collaboration (Shimizu et al., 2023[16]; Sims, 2024[17]). Despite the growing literature on generative AI in education, several important gaps remain. First, most existing studies focus primarily on the pedagogical applications of GenAI at the instructional or learning level, such as content generation, feedback support, and personalized learning. Relatively little empirical research has examined how GenAI contributes to curriculum-level change, particularly in terms of curriculum reform outcomes. Second, prior research often implicitly assumes that the availability or adoption of GenAI tools will automatically lead to educational improvement. However, curriculum reform is a complex process involving sustained adjustments in curriculum design, instructional strategies, assessment approaches, and alignment with professional standards. Such changes depend not only on technological conditions but also on how educators interpret, appropriate, and integrate new technologies into their daily teaching practices. As a result, similar levels of technological deployment may lead to very different curriculum reform outcomes across institutions and teaching contexts. Third, although teacher AI literacy has been widely discussed as an important competency in AI-enhanced education, limited empirical research has examined how teachers' AI literacy shapes the process through which technological enablement is translated into curriculum reform outcomes. To address these gaps, this study proposes a moderated mediation framework linking perceived GenAI enablement, teachers' perceived value, AI literacy, and curriculum reform outcomes.

Higher vocational education provides a particularly relevant context for examining this issue. Compared with general academic education, higher vocational education places stronger emphasis on the close integration of curriculum and industry practice. Curricula are expected to respond rapidly to changes in occupational standards, technological innovation, and labor market demand. Teachers in vocational colleges therefore face continuous pressure to update instructional content, redesign learning activities, and adjust assessment methods. In this context, GenAI offers promising support for curriculum reform by enabling rapid content generation, adaptive instructional design, and data-informed decision making. At the same time, the effective use of GenAI places higher demands on teachers' professional judgment and digital capabilities.

From a technology management perspective, the contribution of GenAI to curriculum reform is likely to depend on teachers' perceptions of how the technology supports their instructional tasks. When teachers perceive GenAI as providing concrete and task-relevant support—such as improving teaching efficiency, enhancing instructional quality, or enabling innovative teaching approaches—they may be more willing to experiment with new curriculum designs and teaching practices. Conversely, if GenAI is perceived as difficult to use, unreliable, or misaligned with instructional needs, its impact on curriculum reform may remain limited, regardless of its technical sophistication.

In addition, teachers' capabilities in understanding and using AI technologies may shape how GenAI enablement is translated into perceived instructional value. AI literacy, broadly defined as the ability to understand basic AI concepts, apply AI tools appropriately, and critically evaluate AI-generated outputs, has been increasingly recognized as an important competence for educators in AI-enhanced learning environments (Long & Magerko, 2020[9]; UNESCO, 2023[19]). Teachers with higher levels of AI literacy may be better equipped to recognize the pedagogical potential of GenAI, integrate it meaningfully into curriculum design, and avoid superficial or inappropriate use. As a result, AI literacy may condition the extent to which GenAI enablement contributes to positive curriculum reform outcomes.

Against this background, this study investigates the role of GenAI enablement in curriculum reform within higher vocational education. Specifically, it examines the association between teachers' perceived GenAI enablement and curriculum reform outcomes, explores whether teachers' perceived value mediates this relationship, and assesses whether teachers' AI literacy moderates the value realization process. Drawing on survey data collected from teachers in Chinese higher vocational colleges and employing structural equation modeling and regression-based analyses, this study provides empirical evidence on how GenAI is related to curriculum reform in practice-oriented educational settings.

By focusing on teachers' perceptions and capabilities, this study contributes to ongoing discussions on digital education management and technology-supported curriculum reform. Rather than treating GenAI as a purely technical solution, the findings highlight the importance of aligning technological enablement with educators' value perceptions and professional readiness. The results offer practical insights for educational institutions seeking to manage GenAI integration in ways that support sustainable curriculum reform in vocational and applied education contexts.

2 Theoretical Framework and Hypotheses

Although technology adoption models such as the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) have been widely used to explain educators' adoption of digital technologies, these frameworks primarily focus on individuals' technology usage intentions and behaviors. As a result, they provide limited explanatory power for understanding curriculum-level change, which involves broader processes such as pedagogical redesign, instructional innovation, and institutional curriculum alignment. Curriculum reform in technology-enhanced educational environments is shaped not only by technological availability but also by how educators interpret and integrate these tools into their instructional practices. In the context of generative artificial intelligence (GenAI), the presence of advanced technological capabilities does not automatically lead to curriculum reform;

rather, its influence depends on teachers' perceptions of how effectively the technology supports their instructional work. Accordingly, this study emphasizes teachers' perceived value as a key mechanism through which GenAI enablement may translate into curriculum reform outcomes.

This perspective can be further understood through the lens of human–AI collaboration theory, which conceptualizes artificial intelligence as a cognitive support tool that augments rather than replaces human expertise. The effectiveness of AI-supported work depends on the complementary interaction between human capabilities and intelligent systems. In educational contexts, teachers remain the primary agents responsible for instructional judgment, curriculum design, and pedagogical decision-making, while AI technologies function as enabling resources that support tasks such as content development, feedback provision, and learning analytics. From this perspective, the impact of GenAI on curriculum reform depends on how teachers interpret AI-generated outputs, integrate them into instructional design, and align them with curriculum goals. Building on these arguments, this study develops a conceptual model examining the relationship between teachers' perceived GenAI enablement and curriculum reform outcomes, with teachers' perceived value and AI literacy serving as key explanatory mechanisms.

2.1 GenAI Enablement and Curriculum Reform Outcomes

In higher vocational education, teaching tasks are characterized by strong practice orientation, frequent curriculum updating, and close alignment with industry standards. Teachers are required to continuously adapt curriculum content, instructional methods, and assessment approaches to reflect changes in professional practice. GenAI offers a range of instructional functionalities—such as automated content generation, adaptive learning support, interactive feedback, and data-informed decision making—that are closely aligned with these task demands.

When teachers perceive GenAI as providing effective and task-relevant support, they may be more willing to experiment with new instructional approaches and reconsider existing curriculum structures. Prior research on educational technology adoption suggests that perceived technological support is positively associated with changes in teaching practices and instructional innovation (Venkatesh et al., 2012 [20]). Extending this logic to the curriculum level, GenAI enablement may facilitate curriculum reform by supporting instructional design, enhancing flexibility, and improving alignment between curriculum content and practical skill requirements.

Accordingly, this study proposes that teachers who perceive higher levels of GenAI enablement are more likely to report positive curriculum reform outcomes, reflected in improved curriculum relevance, instructional adaptability, and alignment with professional practice.

H1. Teachers' perceived GenAI enablement is positively associated with curriculum reform outcomes.

2.2 Teachers' Perceived Value as a Mediating Factor

Although GenAI provides various instructional affordances, its contribution to curriculum reform is unlikely to be realized without teachers' recognition of its pedagogical value. Research on technology use in education consistently highlights perceived value—often reflected in perceived usefulness or instructional benefit—as a key factor shaping educators' engagement with new technologies. In instructional settings, teachers' value perceptions typically develop through practical experiences in which a technology demonstrably improves teaching efficiency, instructional quality, or pedagogical innovation.

In the context of GenAI-supported teaching, perceived value refers to teachers' subjective evaluation of the instructional benefits generated through GenAI use. When teachers perceive GenAI as valuable—for example, by reducing preparation time, supporting differentiated instruction, or enabling innovative learning activities—they may be more inclined to integrate it into curriculum-related decision making. These value perceptions can motivate teachers to redesign learning objectives, adjust instructional strategies, and align assessment methods with emerging curriculum reform goals.

From this perspective, perceived value serves as an important link between technological conditions and curriculum-level outcomes. Rather than directly transforming curriculum structures, GenAI enablement may first shape teachers' perceptions of instructional value, which in turn influence their engagement in curriculum reform activities. Based on this reasoning, the following hypotheses are proposed:

H2. Teachers' perceived GenAI enablement is positively associated with teachers' perceived value.

H3. Teachers' perceived value is positively associated with curriculum reform outcomes.

Taken together, these hypotheses suggest that teachers' perceived value mediates the relationship between GenAI enablement and curriculum reform outcomes.

H4. Teachers' perceived value mediates the relationship between GenAI enablement and curriculum reform outcomes.

2.3 The Moderating Role of Teacher AI Literacy

From a human–AI collaboration perspective, AI literacy represents an important capability that shapes how effectively teachers interact with and utilize AI systems in instructional contexts. Teachers' ability to recognize and realize the instructional value of GenAI may vary depending on their level of AI literacy. In AI-enhanced educational environments, such differences may help explain why similar levels of technological enablement result in divergent instructional and curriculum outcomes. Teachers with higher AI literacy are likely to be better equipped to interpret GenAI outputs, adapt them to specific instructional contexts, and integrate them meaningfully into curriculum design, thereby facilitating the translation of perceived GenAI enablement into concrete instructional value. In contrast, teachers with lower AI literacy may experience greater uncertainty or difficulty when engaging with GenAI, which can constrain the extent to which perceived enablement is transformed into perceived value (Kasneci et al., 2023[6]). Accordingly, AI literacy is expected to strengthen the positive relationship between perceived GenAI enablement and teachers' perceived value.

H5. Teacher AI literacy moderates the relationship between GenAI enablement and teachers' perceived value, such that the relationship is stronger for teachers with higher levels of AI literacy.

Because teachers' perceived value is conceptualized as the pathway through which GenAI enablement influences curriculum reform outcomes, variation in AI literacy may further condition this indirect relationship. Specifically, higher levels of AI literacy may amplify the extent to which GenAI enablement contributes to curriculum reform through enhanced value perceptions. Taken together, these arguments suggest that AI literacy may influence not only the direct relationship between GenAI enablement and perceived value but also the indirect pathway linking GenAI enablement to curriculum reform outcomes.

H6. Teacher AI literacy moderates the indirect relationship between GenAI enablement and curriculum reform outcomes via teachers' perceived value, such that the indirect effect is stronger at higher levels of AI literacy.

Figure 1 presents the conceptual model examined in this study.

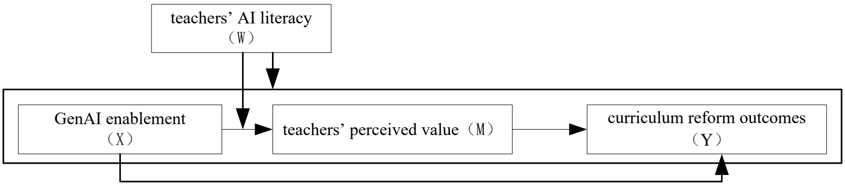

Fig. 1. Conceptual Research Model

3 Method

3.1 Sample and Data Collection

This study employed a questionnaire-based survey to collect data from teachers working in higher vocational colleges in China. Higher vocational education represents a practice-oriented educational context in which teachers play a central role in curriculum design, implementation, and reform. Teachers are therefore well positioned to provide meaningful evaluations of GenAI-supported teaching practices and curriculum reform outcomes.

Data collection was conducted between September and December 2025 using online distribution channels, including professional teacher development platforms and institutional teaching and research networks. Participation was voluntary and anonymous. On the first page of the questionnaire, respondents were informed of the research purpose, the academic use of the data, and their right to withdraw at any time. Screening items were included to ensure that respondents had direct teaching responsibilities and had participated in curriculum-related activities.

After data cleaning procedures—excluding questionnaires with incomplete responses, excessively short completion times, or patterned answering—a total of 571 valid questionnaires were retained for analysis, corresponding to an effective response rate of 80.16%. The sample included teachers from a wide range of disciplinary fields, such as manufacturing, information technology, business, transportation, and health-related programs. Overall, the demographic distribution suggests that the sample captures diverse teaching backgrounds within higher vocational education (see Table 1).

Table 1. Demographic Characteristics of the Sample

Variable	Category	Percentage (%)
Gender	Male	46.9
	Female	53.1
Age	29 years or younger	19.3
	30–39 years	36.6
	40–49 years	27.8
	50 years or older	16.3
Teaching Experience	3 years or less	18.4
	4–10 years	38.4
	11–20 years	29.2
	21 years or more	13.8
Disciplinary Field	Equipment Manufacturing	13.9
	Electronics & Information	10.5
	Finance & Commerce	13.6
	Civil Engineering & Construction	10.8
	Health & Medicine	13.3
	Education & Sports	16.7
	Transportation	11.7
	Other	9.5

3.2 Measures

All constructs were measured using five-point Likert-type scales ranging from 1 (“strongly disagree”) to 5 (“strongly agree”).

(1) GenAI enablement. As measurement tools powered by generative AI have yet to establish unified standards, this study independently developed a measurement scale based on the core application scenarios of generative AI (GenAI) in curriculum reform. The scale encompasses four dimensions: content generation support, personalised teaching support, interactive feedback support, and data-driven decision support. Each dimension consisted of two items. The scale comprises eight items, including the following: "Generative AI assists me in developing course-aligned teaching resources (such as project case studies, practical assignments, and learning mate-

rials)". The scale assesses teachers' perceptions of the extent to which generative AI empowers key tasks in curriculum reform. The Cronbach's α values for the four dimensions ranged from 0.639 to 0.688. Although slightly below the conventional threshold of 0.70, these values are considered acceptable for exploratory constructs with two-item dimensions. The overall scale demonstrated strong internal consistency (Cronbach's α = 0.893), indicating satisfactory reliability of the GenAI enablement construct.

(2) Teachers' perceived value. The Teachers' Perceived Value Scale was adapted from established measures by Davis (1989)[4], Kim et al. (2007)[8] and Teo (2011)[18], and revised to align with the specific context of generative AI supporting vocational curriculum reform. The 7-item scale assesses teachers' perceptions of the comprehensive value of GenAI in curriculum reform, encompassing efficiency gains, quality improvements, and the promotion of innovation. In this study, the scale demonstrated high internal consistency reliability (Cronbach's α = 0.890).

(3) Curriculum reform outcomes. The outcomes of curriculum reform serve as the dependent variable in this study. Its measurement tool was developed by revising scales referenced from studies by Kayir & Toraman (2021)[7], Karacaoglu (2023)[5], and Mehmeti et al. (2024)[10]. This 7-item scale assesses teachers' perceptions of positive changes brought by curriculum reform in areas such as industry alignment, instructional design, assessment methods, and learning outcomes, comprehensively measuring teachers' evaluations of curriculum reform effectiveness. In this study, the scale demonstrated good reliability (Cronbach's α = 0.891).

(4) Teacher AI literacy. The Teacher AI Literacy Scale comprises 6 items and was developed by drawing upon validated instruments from the research of Ning et al. (2025)[11], Shi (2025)[15], and Chiu et al. (2025)[3]. The scale assesses teachers' self-reported competencies across four dimensions: understanding the fundamentals of generative AI, applying AI tools in teaching and professional practice, critically evaluating AI-generated content, and addressing ethical issues in AI usage. In this study, the scale demonstrated good reliability (Cronbach's α = 0.863).

In addition, several background variables—including gender, age, teaching experience, disciplinary field, prior AI-related training, and prior involvement in curriculum reform—were included as control variables to account for potential confounding effects.

3.3 Analytical Strategy

A two-stage analytical strategy was adopted to test the proposed conceptual model.

First, structural equation modeling (SEM) was employed to examine the measurement model and the hypothesized relationships among the key constructs. To ensure the validity of the measurement model, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were conducted. EFA was performed using SPSS to examine the underlying factor structure of the measurement items. Subsequently, CFA was conducted to assess the reliability and validity of the measurement model, followed by estimation of the structural paths linking GenAI enablement, teachers' perceived value, and curriculum reform outcomes.

Second, regression-based mediation and moderation analyses were conducted using the PROCESS macro in SPSS. Bootstrapping procedures with 5,000 resamples were applied to test the significance of indirect effects. Mediation analysis examined whether teachers' perceived value mediates the relationship between GenAI enablement and curriculum reform outcomes, while moderation analysis assessed whether teacher AI literacy moderates the relationship between GenAI enablement and perceived value. Finally, a moderated mediation model was estimated to determine whether the indirect effect of GenAI enablement on curriculum reform outcomes via perceived value varies across levels of AI literacy.

This combined SEM–PROCESS approach enables a robust examination of both structural relationships and conditional indirect effects, while remaining appropriate for the sample size and the research focus of this study.

4 Results

4.1 Common Method Bias

As the data were collected via a single-source self-report questionnaire, common method bias (CMB) was assessed. In order to ascertain the potential for CMB, the study was conducted on a voluntary and anonymous basis. The items were presented in a random order, and reverse-coded and attention-check items were included. Statistically, Harman's single-factor test demonstrated that the first factor accounted for 33.23% of the total variance (below the 40% threshold). Furthermore, a single-factor confirmatory factor analysis (CFA) indicated an inadequate model fit (χ^2/df = 9.549, TLI = 0.571, CFI = 0.603, RMSEA = 0.122), suggesting that a single latent factor cannot account for the covariance among the constructs. In general, the probability of CMB exerting a substantial influence on the outcomes is considered to be low.

4.2 Measurement Model and Correlation Analysis

Prior to confirmatory factor analysis, exploratory factor analysis (EFA) was conducted to examine the underlying factor structure of the measurement items. The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was 0.946, and Bartlett's test of sphericity was significant (χ^2 = 7775.26, $p < 0.001$), indicating that the data were suitable for factor analysis. Principal component analysis with varimax rotation was employed. The results revealed four distinct factors corresponding to the theoretical constructs, and all item loadings exceeded 0.60 with no significant cross-loadings, suggesting a clear factor structure.

The CFA results indicated that the measurement model demonstrated a good fit to the data (χ^2/df = 1.183, CFI = 0.992, TLI = 0.991, RMSEA = 0.018). All standardized factor loadings were above 0.60 and statistically significant ($p < 0.001$), providing evidence of good convergent validity.

Before conducting hypothesis testing, this study first assessed the reliability and validity of the measurement model. As shown in Table 2, the composite reliability (CR) for each construct exceeded 0.80, and the average variance extracted (AVE) exceeded 0.50 for all constructs, indicating strong convergent validity. Additionally, the square root of the AVE for each construct was greater than its correlation coefficient with other constructs, supporting good discriminant validity. Correlation analysis revealed significant positive correlations among all variables, providing preliminary evidence for subsequent tests of inter-variable relationships.

Table 2. Results of Confirmatory Factor Analysis and Inter-Construct Correlations

Variable	AVE	CR	X	M	Y	W
X	0.514	0.894	(0.717)			
M	0.536	0.890	.566**	(0.732)		
Y	0.541	0.892	.387**	.544**	(0.736)	
W	0.513	0.863	.307**	.290**	.200**	(0.716)

Note. * indicates $p < 0.05$, ** indicates $p < 0.01$, *** indicates $p < 0.001$; the same applies below. Diagonal elements are the square root of AVE.

4.3 Structural Model and Direct Effects

Structural equation modeling was employed to examine the hypothesized relationships among the key constructs. The baseline structural model demonstrated an acceptable fit to the data ($\chi^2/df = 1.046$, TLI = 0.996, CFI = 0.997, RMSEA = 0.016). As hypothesized, teachers' perceived GenAI enablement was positively associated with curriculum reform outcomes ($\beta = 0.439$, $p < 0.001$), supporting H1 (see Table 3).

When teachers' perceived value was incorporated into the structural model, GenAI enablement showed a strong positive association with perceived value ($\beta = 0.634$, $p < 0.001$), supporting H2. In turn, teachers' perceived value was positively associated with curriculum reform outcomes ($\beta = 0.555$, $p < 0.001$), supporting H3. After including perceived value in the model, the direct path from GenAI enablement to curriculum reform outcomes was substantially reduced and became non-significant, indicating a mediation effect (see Table 3).

Table 3. Structural Model Path Coefficients (SEM Results)

Path	Baseline Structural Model		Mediating Structural Model	
	Path Coefficient	Test Result	Path Coefficient	Test Result
X→Y	0.439***	Supported	0.083	Not Supported
X→M			0.634***	Supported
M→Y			0.555***	Supported

4.4 Mediation and Moderation Effects

Bootstrapping analysis was conducted to further examine the mediating role of teachers' perceived value. The indirect effect of GenAI enablement on curriculum reform outcomes via perceived value was statistically significant (indirect effect = 0.286, 95% CI [0.219, 0.326]), with the confidence interval not including zero. These results indicate that teachers' perceived value mediates the relationship between GenAI enablement and curriculum reform outcomes, providing support for H4.

To test the moderating role of teacher AI literacy, regression-based moderation analysis was performed. The interaction between GenAI enablement and teacher AI literacy was statistically significant ($\beta = 0.209$, $p < 0.001$, see Table 4), indicating that AI literacy strengthens the positive association between GenAI enablement and teachers' perceived value. Simple slope analysis showed that the relationship between GenAI enablement and perceived value was stronger among teachers with higher levels of AI literacy (see Figure 2), supporting H5. In addition, Johnson–Neyman analysis showed that the conditional effect of GenAI enablement on perceived value was statistically significant across nearly the entire observed range of AI literacy, except for a very small portion at the lower end of the AI literacy distribution (approximately 2.1% of the sample).These results suggest that AI literacy strengthens the value-generation process associated with GenAI enablement.

Building on these results, moderated mediation analysis further indicated that the indirect effect of GenAI enablement on curriculum reform outcomes via perceived value varied across levels of AI literacy (index = 0.103, 95% CI [0.067, 0.138]). As shown in Table 5, the conditional indirect effect increased from 0.167 at low levels of AI literacy (−1 SD) to 0.366 at high levels of AI literacy (+1 SD), supporting H6.

Table 4. Moderating Effect of Teachers' AI Literacy

Variable	β	S.E.	t	p	95% Confidence Interval	
					Lower Bound	Upper Bound
Control Variables						
Gender	-0.0748	0.0659	-1.1348	0.2569	-0.2042	0.0546
Age	-0.0206	0.0336	-0.6123	0.5406	-0.0866	0.0455
Teaching Experience	-0.0321	0.0347	-0.9244	0.3557	-0.1004	0.0361
Disciplinary Field	0.0192	0.0146	1.3110	0.1904	-0.0095	0.0478
AI Training Experience	-0.0077	0.0426	-0.1814	0.8561	-0.0913	0.0759
Curriculum Reform Experience	-0.0366	0.0504	-0.7279	0.4670	-0.1355	0.0623
Independent Variable						
X	0.5405	0.037	14.6115	0	0.4679	0.6132
Moderating Variable						
W	0.1381	0.0367	3.7659	0.0002	0.0661	0.2102
Interaction Term						
X × W	0.2085	0.0362	5.7523	0	0.1373	0.2797
R2	0.3754					
F	37.46***					

Overall, the results provide consistent empirical support for the proposed conceptual model. Teachers' perceived GenAI enablement was positively associated with curriculum reform outcomes, and this association was primarily transmitted through teachers' perceived value. Moreover, teacher AI literacy strengthened the value realization process by amplifying the indirect effect of GenAI enablement on curriculum reform outcomes. These findings suggest that GenAI contributes to curriculum reform not simply through technological availability, but through teachers' perceptions of instructional value and their ability to effectively engage with AI tools.

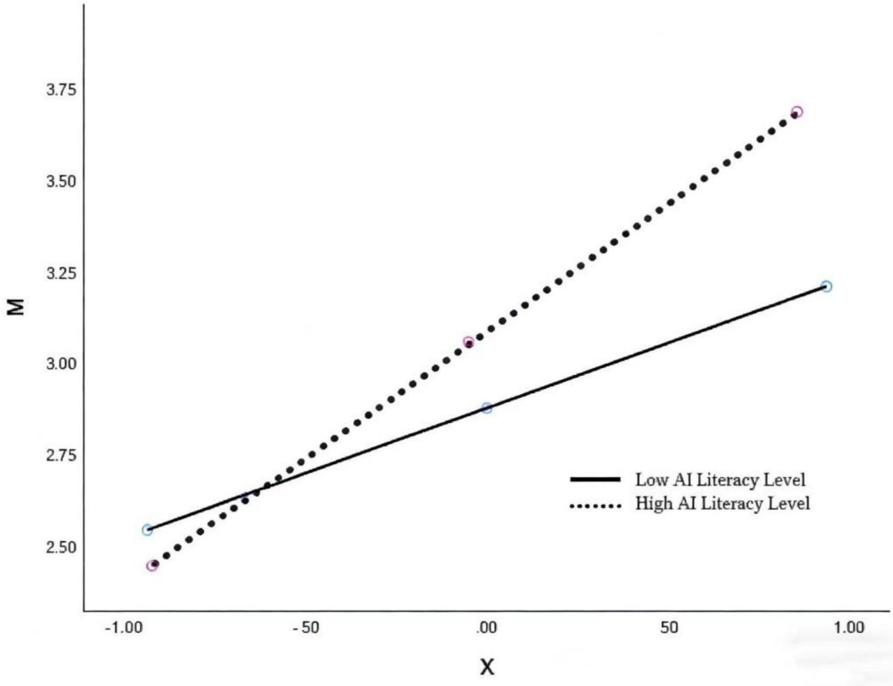

Fig. 2. Moderating effect of teacher AI literacy on the relationship between GenAI enablement and perceived value.

Table 5. Conditional Indirect Effects Analysis

Teachers' AI Literacy Level	Indirect Effect	S.E.	95% Confidence Interval	
			Lower Bound	Upper Bound
Low(M-1SD)	0.1665	0.0270	0.1165	0.2224
Average(M)	0.2662	0.0274	0.2137	0.3202
High(M+1SD)	0.3660	0.0372	0.2919	0.4380

Note: M = Mean of the sample; SD = Standard deviation; Values in the table are based on bootstrap estimation (N = 5000)

5 Discussion and Implications

This study examined how GenAI enablement is associated with curriculum reform outcomes in higher vocational education. By focusing on teachers' perceptions and capabilities, the findings provide empirical evidence on the conditions under which

GenAI contributes to curriculum-related change in practice-oriented educational settings.

5.1 Discussion of Key Findings

The results indicate that teachers' perceived GenAI enablement is positively associated with curriculum reform outcomes. However, this association is not primarily driven by direct technological effects. Instead, the influence of GenAI on curriculum reform operates largely through teachers' perceived instructional value. When teachers perceive GenAI as beneficial for improving teaching efficiency, instructional quality, or pedagogical innovation, they are more likely to engage in curriculum redesign and instructional adjustment. This finding suggests that the contribution of GenAI to curriculum reform depends on how teachers interpret its usefulness in everyday teaching practice, rather than on the mere presence of advanced technologies.

In addition, the findings highlight the conditioning role of teacher AI literacy. Teachers with higher levels of AI literacy were better able to translate GenAI enablement into perceived instructional value, thereby strengthening the indirect association between GenAI enablement and curriculum reform outcomes. This result helps explain why similar levels of technological support may lead to different curriculum reform outcomes across teachers and institutions. GenAI appears to be most effective when educators possess sufficient understanding and skills to engage with AI tools critically and purposefully.

Taken together, these findings portray GenAI-enabled curriculum reform as a value-driven and capability-dependent process. Rather than functioning as an automatic driver of change, GenAI supports curriculum reform when it aligns with teachers' instructional needs and when teachers are equipped to recognize and apply its potential. This perspective is particularly relevant for higher vocational education, where curriculum relevance, instructional flexibility, and responsiveness to industry practice are central concerns.

5.2 Practical Implications for Digital Education Management

The findings of this study offer several practical implications for institutions seeking to integrate GenAI into curriculum reform initiatives. First, educational managers should adopt a value-oriented approach to GenAI implementation. Instead of evaluating success primarily in terms of tool adoption or usage frequency, institutions should focus on whether GenAI generates tangible instructional value for teachers. Providing concrete teaching scenarios, exemplars, and application cases may help teachers better recognize how GenAI can support curriculum-related tasks.

Second, professional development initiatives should place greater emphasis on enhancing teachers' AI literacy. Training programs should go beyond basic tool operation and address teachers' understanding of AI principles, instructional integration strategies, and critical evaluation of AI-generated outputs. Strengthening these capabilities can improve teachers' confidence and agency in using GenAI, thereby increasing the likelihood that technological enablement leads to meaningful curriculum reform.

Third, differentiated support strategies are needed to address variations in teachers' AI literacy. Teachers with lower levels of AI literacy may require additional scaffolding, mentoring, or guided practice to avoid superficial or ineffective use of GenAI. By providing inclusive and adaptive support mechanisms, institutions can reduce capability-based disparities and promote more equitable participation in GenAI-enabled curriculum reform.

Finally, the results suggest that GenAI integration should be aligned with the specific characteristics of vocational education. Given the close connection between vocational curricula and industry practice, GenAI-supported curriculum reform should prioritize practical relevance, instructional adaptability, and alignment with occupational standards. Viewing GenAI as a supportive resource for teachers—rather than a replacement for professional judgment—may contribute to more sustainable and context-sensitive curriculum reform outcomes.

6 Conclusion

This study examined how GenAI enablement is associated with curriculum reform outcomes in higher vocational education. Using survey data from vocational college teachers, the results provide empirical evidence that GenAI contributes to curriculum reform primarily through teachers' perceived instructional value, rather than through direct technological effects. When teachers perceive GenAI as useful for supporting teaching tasks, curriculum design, and instructional innovation, they are more likely to engage in curriculum reform activities.

The findings further indicate that teacher AI literacy plays an important conditioning role in this process. Teachers with higher levels of AI literacy are better able to translate GenAI enablement into perceived instructional value, thereby strengthening the indirect relationship between GenAI enablement and curriculum reform outcomes. These results suggest that differences in teachers' capabilities help explain why similar levels of technological support may lead to different curriculum reform outcomes across educational contexts.

From a practical perspective, this study highlights that effective GenAI-enabled curriculum reform requires not only access to advanced technologies, but also sustained support for teachers' value recognition and capability development. By emphasizing teachers' perceptions and readiness, the findings offer useful insights for managing GenAI integration in vocational education and other practice-oriented educational settings. Future research may extend this work by employing longitudinal designs or exploring additional contextual factors that shape GenAI-supported curriculum reform.

Acknowledgment

This work was supported by the Guangxi Vocational Education Teaching Reform Research Project [Grant NO. GXGZJG2025B070].

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