

AI Literacy and Trust in AI-Generated Content Among College Students: The Mediating Roles of Learning Motivation and Self-Efficacy

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Abstract

With the rapid development of generative artificial intelligence (AI), AI tools are increasingly used in college students' learning and daily lives. This study examines the relationships among college students' AI literacy, trust in AI-generated content, learning motivation, and self-efficacy. Questionnaire data were analyzed using independent-samples t tests, one-way ANOVA, regression analysis, and Bootstrap mediation analysis. The results show that (1) trust in AI-generated content did not differ significantly by gender, grade level, or major; (2) AI literacy positively predicted trust in AI-generated content; (3) learning motivation did not significantly mediate this relationship, whereas self-efficacy played a significant mediating role; and (4) the effect of AI literacy on trust was primarily mediated through self-efficacy. These findings suggest that enhancing college students' AI literacy may strengthen their self-efficacy and promote more appropriate trust in AI-generated content. Accordingly, recommendations are proposed for universities, students, and society to improve AI literacy and support the effective integration of generative AI into higher education.

Keywords: Artificial Intelligence; AI literacy; Trust in AI-generated Content; Learning Motivation; Self-efficacy

1. Introduction

1.1. Research Background

With the rapid development of generative artificial intelligence (AI) technologies represented by ChatGPT, DeepSeek, Doubao, and Qianwen, higher education is undergoing a major paradigm shift. As “digital natives,” college students have a natural advantage in terms of technology access. Surveys show that more than 80% of college students have experience using AI tools, and 32.1% report “frequent, multi-scenario reliance on AI tools to complete learning tasks.” This indicates that AI is no longer merely a concept of “new technology,” but has genuinely entered college students' learning contexts. Although AI-generated content is convenient, it is not always accurate, and college students differ in their degree of trust toward it. Trust is a core element in human–machine interaction and directly affects the intensity and sustainability of human–machine interaction. In the field of AI-generated text, trust can directly influence whether users are willing to rely on and adopt the information it provides. Therefore, examining the factors that influence trust in AI-generated content can help college students develop more rational and moderate attitudes of trust, thereby improving their ability to discern and use AI-generated content and better realizing the auxiliary value of AI tools in learning.

Existing studies have shown that individuals' level of AI literacy affects their trust in AI-generated content. Mei et al. (2025) proposed this term in their study, arguing that AI literacy refers to an individual's ability to recognize which tasks can be applied to AI, use AI technologies efficiently to process standardized or big-data tasks, and evaluate the potential and limitations of AI applications. Based on the “technology–cognition–ethics” model, Wang et al. (2023) constructed a core AI literacy framework from four dimensions: awareness, use, evaluation, and ethics [6]. This suggests that individuals with higher AI literacy are usually better able to judge the reliability of AI-generated content, understand the characteristics of AI technology as well as its strengths and limitations, and thus form relatively stable and rational trust attitudes during use.

Building on previous research, this study further examines the influence of college students' AI literacy on their trust in AI-generated content and the underlying mechanisms, with the aim of providing references for AI literacy education in universities and for fostering college students' reasonable trust in AI-generated content.

1.2. Research Objectives

This study aims to achieve the following objectives: first, to determine whether college students' trust in AI-generated content differs across demographic characteristics, thereby providing a basis for subsequent analyses; second, to analyze the influence of college students' AI literacy on their trust in AI-generated content; third, to further examine the possible mechanisms through which learning motivation and self-efficacy operate between AI literacy and trust in AI-generated content; and fourth, to propose recommendations, based on the findings, from the perspectives of universities, college students, and society for improving college students' AI literacy and promoting the formation of rational trust in AI-generated content.

1.3. Research Significance

By analyzing college students' AI literacy, trust in AI-generated content, learning motivation, and self-efficacy, this study can, to some extent, enrich research on AI literacy, trust in AI-generated content, and learning psychology. Although discussions of trust in AI-generated content have begun to accumulate, much of the existing literature remains at the level of technology use or general trust; relatively limited research has examined, from the perspective of the college-student population, the formation process of trust in AI-generated content and its influencing factors. Incorporating learning motivation and self-efficacy into the discussion can broaden the research perspective on the mechanisms underlying college students' trust in AI-generated content and help further explore the mediating roles of learning motivation and self-efficacy, thereby providing a reference for future related research.

This study also has practical significance for universities, college students themselves, and society. For universities, the findings can provide references for implementing AI literacy education and help schools make more targeted adjustments to curriculum design and teaching arrangements, enabling students to gradually develop relatively rational attitudes toward trusting AI-generated content during learning. For college students themselves, this study helps them better understand the characteristics of AI-generated content, recognize that AI tools can improve learning efficiency but should not be relied upon completely to replace their own thinking; while improving their AI literacy, college students can gradually develop more stable learning psychology, reasonably trust AI-generated content, and thereby better use AI tools to improve learning efficiency and quality. For society, this study can provide an empirical basis for the application of generative AI in education, help more people attach importance to the cultivation of AI literacy, and enable AI technologies to play a better role in university teaching.

2. Literature Review

2.1. The Relationship Between AI Literacy and Trust in AI-Generated Content

Users' familiarity with AI technology plays a key moderating role in the formation mechanism of trust, profoundly shaping the pathways through which trust is formed. Long and Magerko (2020) define AI literacy as a set of competencies that enable individuals to critically evaluate AI technologies and communicate and collaborate effectively with AI. This suggests that individuals' level of AI literacy influences their trust in AI-generated content. Individuals with higher AI literacy are usually better able to judge the reliability of AI-generated content, understand the characteristics of AI technology and the strengths and limitations of AI-generated content, and thus form relatively stable and rational trust attitudes during use. Based on this, the present study proposes:

H1: College students' AI literacy significantly positively predicts their trust in AI-generated content.

2.2. The Mediating Role of Learning Motivation

Learning motivation is a psychological tendency that initiates and sustains individuals' learning behavior to meet learning needs. According to its type and nature, student motivation can be divided into intrinsic and extrinsic learning motivation (Rapp, 1999). Intrinsic learning motivation refers to the drive to learn arising from internal needs, interests, or the desire for self-actualization. Long and Magerko (2020) note that the public's understanding of AI technologies is often limited, and related misconceptions restrict people's effective use of AI, collaborative use of AI, and critical judgment of AI as informed users. When college students lack understanding of AI, it is often more difficult for them to form active learning intentions; however, once they have a clearer understanding of AI, they are more likely to be motivated to learn and explore further.

Furthermore, college students with higher AI literacy usually have a clearer understanding of AI technologies and are more likely to develop interest and desire for active learning and exploration when using AI, thereby enhancing their learning motivation. Once learning motivation is strengthened, college students become more proactive in engaging with AI-related knowledge and tools and are more likely to develop sustained attention to and understanding of AI-generated content. Based on this, the present study proposes:

H2: Learning motivation may independently mediate the relationship between college students' AI literacy and trust in AI-generated content.

2.3. The Mediating Role of Self-Efficacy

Bandura (1997) defined self-efficacy as an individual's belief in his or her capability to plan for or carry out a course of action to achieve a specific outcome. Getenet et al. (2024) found that positive digital literacy has a significant positive effect on self-efficacy; in AI application contexts in particular, individuals with higher AI literacy may have stronger self-efficacy. These studies provide theoretical support for the relationship between AI literacy and self-efficacy.

Related research suggests that individuals' trust in artificial intelligence is affected by their own competence and technology familiarity, and that highly familiar users are more likely to evaluate content quality based on their own experience and mental models. In AI learning and use contexts, students with higher self-efficacy often show a stronger willingness to try, are willing to actively use AI tools, and continuously accumulate successful operational experiences through repeated practice, thereby forming positive evaluations of their own abilities. When facing AI-generated content, such students are also more likely to adopt an attitude of active judgment and rational analysis rather than simply accepting or directly rejecting it. Based on this, the present study proposes:

H3: Self-efficacy may mediate the relationship between college students' AI literacy and trust in AI-generated content.

2.4. Research Model

To further test the above hypotheses, this study will analyze the sample data to examine the relationships among AI literacy, trust in AI-generated content, learning motivation, and self-efficacy, as well as the possible underlying mechanisms. The model is shown in Figure 1.

3. Research Design

3.1. Participants

This study employed convenience sampling to recruit undergraduate students from multiple universities through an online survey platform and social media. A total of 52 questionnaires were collected, of which two

invalid responses were excluded due to incomplete answers, internal inconsistencies, or careless responding. The final sample comprised 50 valid responses, yielding a valid response rate of 96.15%.

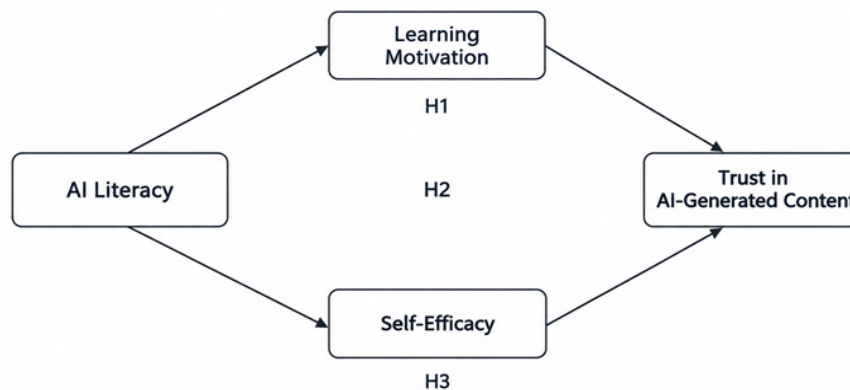


Figure 1. Hypothesized Research Model

Regarding gender, 10 respondents were male (20%) and 40 were female (80%). In terms of grade level, 2 respondents were first-year students (4%), 8 were second-year students (16%), 5 were third-year students (10%), and 35 were fourth-year students (70%). Regarding academic discipline, 33 respondents were from the humanities and social sciences (66%), 16 were from science and engineering (32%), and one was from the arts (2%). Overall, the sample included students from different academic disciplines and grade levels, although female students and fourth-year students were disproportionately represented. Given the use of convenience sampling and the relatively small sample size, the findings should be interpreted with caution when generalizing to the broader undergraduate population.

3.2. Measures

This study collected data through a questionnaire survey. To ensure the reliability and validity of the measurement, relatively mature scales were selected whenever possible and were appropriately adjusted according to the research topic and the actual context of college students' use of generative AI. All scales used a five-point Likert scale ranging from "1 = strongly disagree" to "5 = strongly agree," with higher scores indicating higher levels of the corresponding variables. The questionnaire was completed anonymously to improve response authenticity.

3.2.1. AI Literacy Scale

The AI Literacy Scale (AILS) was adopted from Wang et al. (2023). The scale contains 12 items across four dimensions: AI awareness, AI usage, AI evaluation, and AI ethics. It was scored on a five-point Likert scale, ranging from 1 ("strongly disagree") to 5 ("strongly agree"). Item 2 was reverse-scored, and higher scores indicated greater AI literacy among college students. In this study, the scale had a Cronbach's α coefficient of 0.696, indicating a borderline acceptable level of internal consistency.

3.2.2. Trust in AI-Generated Content Scale

Drawing on the initial trust scale proposed by Kim and Tadisina (2003), the Trust in AI-Generated Content Scale was adapted to the research context. The scale contains 11 items and measures college students' trust in AI-generated content across two dimensions: competence and benevolence. It used a five-point Likert scale, ranging from 1 ("strongly disagree") to 5 ("strongly agree"). Item 5 was reverse-scored, and higher scores indicated greater trust in AI-generated content. In this study, the scale had a Cronbach's α coefficient of 0.742, indicating acceptable internal consistency.

3.2.3. Learning Motivation Scale

The Academic Motivation Scale (AMS), developed by Vallerand et al. (1992), distinguishes among intrinsic motivation, extrinsic motivation, and amotivation. In the present study, only the intrinsic motivation subscale was administered, comprising four items. Responses were measured on a five-point Likert scale, ranging from 1 (“strongly disagree”) to 5 (“strongly agree”), with higher scores indicating stronger learning motivation. The subscale had a Cronbach’s α coefficient of 0.822 in this study, indicating good internal consistency.

3.2.4. AI Self-Efficacy Scale

The AI Self-Efficacy Scale (AISE) was adopted from Wang and Chuang (2024). The original scale contains 22 items covering four core dimensions: assistance, anthropomorphic interaction, comfort with AI, and technological skills. Considering the research context, 21 items were retained. Responses were measured on a five-point Likert scale, ranging from 1 (“strongly disagree”) to 5 (“strongly agree”), with higher scores indicating greater AI self-efficacy. In this study, the scale had a Cronbach’s α coefficient of 0.886, indicating good internal consistency.

4. Results

4.1. Demographic Differences in Trust in AI-Generated Content

Independent-samples t-tests and one-way analysis of variance (ANOVA) were conducted to examine differences in trust in AI-generated content across demographic characteristics, including gender, grade level, and major. The results are shown in Table 1.

For gender differences, the independent-samples t-test showed that the difference in trust in AI-generated content between male students ($M = 3.71$, $SD = 0.39$) and female students ($M = 3.44$, $SD = 0.41$) was not statistically significant ($p > .05$), indicating no significant gender difference in trust in AI-generated content.

For grade-level differences, the one-way ANOVA showed that the differences in trust in AI-generated content across grade levels were not significant ($F = 0.597$, $p = .620$). Further post hoc comparisons using the Scheffé test showed that none of the pairwise comparisons among grade levels reached significance ($p > .05$), suggesting that grade level had a relatively limited influence on trust in AI-generated content.

For major differences, the one-way ANOVA showed that the differences in trust in AI-generated content across majors were likewise not significant ($F = 0.930$, $p = .402$), indicating that disciplinary background did not significantly affect trust in AI-generated content.

In summary, the differences associated with gender, grade level, and major did not reach statistical significance, suggesting that trust in AI-generated content was relatively stable across groups.

Table 1 Differences in Trust in AI-Generated Content by Demographic Characteristics

Variable	Statistic	p
Gender	$t \approx 1.99$	0.05
Grade level	$F = 0.597$	0.620
Major	$F = 0.930$	0.402

4.2. Regression Analysis of AI Literacy, Learning Motivation, and Self-Efficacy on Trust in AI-Generated Content

Multiple regression analysis was used to examine the effects of AI literacy, learning motivation, and self-

efficacy on trust in AI-generated content. Trust in AI-generated content was entered as the dependent variable, while AI literacy, learning motivation, and self-efficacy were entered as independent variables to test the relationships among the variables.

4.2.1. Effect of AI Literacy on Trust in AI-Generated Content

Regression analysis was conducted to examine the effect of AI literacy on trust in AI-generated content. The results are shown in Table 2. The regression model was significant overall ($F = 11.068$, $p = .002$), indicating acceptable explanatory power. The results showed that AI literacy significantly and positively predicted trust in AI-generated content ($\beta = 0.426$, $t = 3.327$, $p = .002$). Specifically, the higher the level of AI literacy, the higher the individual's trust in AI-generated content. In addition, the explanatory power of the model was $R^2 = 0.181$, with adjusted $R^2 = 0.165$, indicating that AI literacy explained approximately 18.1% of the variance in trust in AI-generated content, which can be considered a moderate level of explanatory power in behavioral research.

Table 2 Regression Analysis of AI Literacy Predicting Trust in AI-Generated Content

Variable	B	SE	β	t
Constant	1.797	0.511	—	3.517**
Literacy	0.454	0.136	0.426	3.327**
R^2	0.181			
F	11.068**			

4.2.2. Effect of Learning Motivation on Trust in AI-Generated Content

Regression analysis was conducted to test the effect of learning motivation on trust in AI-generated content. The results are shown in Table 3. The regression model was not significant overall ($F = 0.812$, $p = .372$), indicating that learning motivation had weak explanatory power for trust in AI-generated content. Specifically, learning motivation did not significantly predict trust in AI-generated content ($\beta = 0.126$, $t = 0.901$, $p = .372$), suggesting that learning motivation did not significantly affect individuals' trust in AI-generated content. In addition, the explanatory power of the model was low ($R^2 = 0.016$, adjusted $R^2 = -0.004$), indicating that learning motivation explained only about 1.6% of the variance in trust and had relatively weak overall explanatory power.

Table 3 Regression Analysis of Learning Motivation Predicting Trust in AI-Generated Content

Variable	B	SE	β	t
Constant	3.092	0.444	—	6.966**
Motivation	0.100	0.111	0.126	0.901
R^2	0.016			
F	0.812			

4.2.3. Effect of Self-Efficacy on Trust in AI-Generated Content

Regression analysis was conducted to examine the effect of self-efficacy on trust in AI-generated content. The results are shown in Table 4. The regression model was significant overall ($F = 21.078$, $p < .001$), indicating good explanatory power. Specifically, self-efficacy significantly and positively predicted trust in AI-generated content ($\beta = 0.545$, $t = 4.591$, $p < .001$), indicating that the higher an individual's AI self-efficacy, the higher their trust in AI-generated content. In addition, the explanatory power of the model was $R^2 = 0.297$, with adjusted $R^2 = 0.282$, indicating that self-efficacy explained approximately 29.7% of the variance in trust in AI-generated content and had relatively strong explanatory power.

Table 4 Regression Analysis of Self-Efficacy Predicting Trust in AI-Generated Content

Variable	B	SE	β	t
Constant	1.554	0.424	—	3.663**
Self-efficacy	0.519	0.113	0.545	4.591**
R ²	0.297			
F	21.078**			

4.3. Mediation Analysis

Regression analysis was conducted, and the PROCESS macro (Model 4) was used to test the mediating role of self-efficacy in the relationship between AI literacy and trust in AI-generated content. The results are shown in Table 5. The bootstrap method with 5,000 resamples was used to estimate the significance of the indirect effect. First, in the mediation model, AI literacy significantly and positively predicted self-efficacy ($\beta = 0.585$, $t = 4.337$, $p < .001$), indicating that higher AI literacy was associated with stronger self-efficacy. Second, in the regression model with trust in AI-generated content as the dependent variable, self-efficacy had a significant positive effect on trust ($\beta = 0.423$, $t = 3.216$, $p = .002$), whereas the direct effect of AI literacy was not significant ($\beta = 0.207$, $t = 1.408$, $p = .165$). Further bootstrap tests showed that the indirect effect of AI literacy on trust in AI-generated content through self-efficacy was 0.247, with a 95% confidence interval of [0.073, 0.543], which did not include zero, indicating that the mediating effect was significant. Taken together, the influence of AI literacy on trust in AI-generated content was mainly realized through the mediator of self-efficacy, showing a pattern of full mediation.

Table 5 Bootstrapping Results for the Mediating Effect of Self-Efficacy

Path	Effect	Boot SE	95% CI
Literacy $\rightarrow$ efficacy $\rightarrow$ trust	0.247	0.117	[0.073, 0.543]

Note. ** $p < .01$. “Literacy” refers to AI literacy, “efficacy” refers to AI self-efficacy, and “trust” refers to trust in AI-generated content.

5. Discussion and Conclusion

5.1. Discussion

5.1.1. The Effect of AI Literacy on Trust in AI-Generated Content

This study found that college students’ AI literacy significantly and positively predicted their trust in AI-generated content, supporting Hypothesis 1. This is consistent with the Technology Acceptance Model (TAM) and perspectives from digital literacy theory and, to a certain extent, indicates that the higher college students’ AI literacy, the more rational and cautious their trust judgments toward AI-generated content become. As AI literacy increases, people understand AI technology more thoroughly, which leads them to move beyond the extreme attitude of either fully believing or completely disbelieving AI-generated content when evaluating it. Instead, they tend to think in a more objective and rational way and form reasonable trust based on understanding.

These findings are consistent with current research on the relationship between AI literacy and trust. Related studies have shown that low-familiarity users, lacking intrinsic experience and frameworks for evaluating the quality of AI-generated content, are more inclined to rely on the “peripheral route.” By contrast, the trust formation of high-familiarity users shows different characteristics: through long-term practice, this group has formed its own “mental models” and can more confidently evaluate the core quality of the content itself. Thus, college students with higher AI literacy are often not merely passive recipients of information when facing AI-

generated content; rather, they combine their own experience, existing knowledge, and judgment criteria to further analyze and verify the content. This not only helps individuals better adapt to the development trend of AI technology but also helps them form a scientific and rational set of values, thereby contributing to the construction of long-term trust relationships. From the perspective of self-regulated learning, college students with higher AI literacy usually possess stronger information-processing and judgment abilities when facing AI-generated content. They can proactively check and compare content and determine which information can be accepted and which content requires further verification. Such ability gives individuals more confidence when using AI and makes them less likely to become overly dependent on AI content. By contrast, college students with lower AI literacy are more likely to regard AI-generated content as an authoritative source of information, thereby showing stronger dependence in trust. Therefore, for college students, higher AI literacy is more conducive to promoting reasonable trust in AI-generated content.

5.1.2. Possible Reasons for the Non-Significant Role of Learning Motivation

The results showed that the direct effect of learning motivation on trust in AI-generated content was not significant, and its mediating effect between AI literacy and trust in AI-generated content also did not reach significance; therefore, Hypothesis 2 was not supported. This suggests that although learning motivation is related to college students' learning engagement, learning interest, and initiative, its explanatory role in trust in AI-generated content is not evident.

A possible reason is that learning motivation mainly reflects students' degree of engagement and internal willingness when facing learning tasks, whereas trust in AI-generated content depends more on individuals' judgments about content reliability, their understanding of AI technology, and their ability to recognize information risks. In other words, learning motivation may affect whether college students are willing to learn and explore, but it may not directly determine whether they trust AI-generated content. Even if a student has strong learning motivation, if they lack understanding of AI technology itself or have not formed stable information-judgment habits, their attitude toward AI-generated content may remain cautious, and they may not necessarily show higher trust simply because of stronger motivation. In actual use, college students facing AI-generated content often do not make judgments solely on the basis of learning enthusiasm such as whether they "want to learn" or "want to use" AI; instead, they comprehensively evaluate the situation based on their understanding of AI technology and their confidence in using AI tools to solve problems. That is, learning motivation by itself cannot directly determine whether college students trust AI-generated content; its role may need to be further expressed through other psychological variables.

Therefore, this study suggests that learning motivation did not play a significant mediating role in the process through which AI literacy affects trust in AI-generated content, but its role in the psychological mechanism remains worthy of further exploration. Future research may incorporate more complex mediation models to further examine the relationships between learning motivation and other variables, so as to more comprehensively reveal the internal mechanisms through which college students' AI literacy influences trust in AI-generated content.

5.1.3. The Mediating Role of Self-Efficacy

The mediation analysis showed that self-efficacy played a significant mediating role between college students' AI literacy and trust in AI-generated content, supporting Hypothesis 3. This indicates that in the process by which AI literacy influences college students' trust in AI-generated content, self-efficacy is also an important factor, and the effect is not limited to AI literacy alone.

Generally speaking, students with higher AI literacy have a clearer understanding of the functions, characteristics, and limitations of AI tools and are more likely to gain successful experiences in actual use. As such experiences accumulate, individuals' confidence in their own ability to understand and judge AI content also increases, and self-efficacy is thereby enhanced. Once self-efficacy is strengthened, students facing AI-generated

content become more willing to rely on their own judgment to analyze whether the content is reliable rather than depending entirely on the results produced by AI itself.

This pattern was evident in the present study. Students with high self-efficacy usually hold more positive evaluations of their own abilities and are more willing to face uncertain information environments. When encountering AI-generated content, they are more inclined to actively discern and verify information rather than accept it directly. Under such conditions, the trust formed is not blind but is reasonable trust grounded in competence judgment. Therefore, the results indicate that the influence of AI literacy on trust in AI-generated content can also be realized by enhancing individuals' self-efficacy.

5.2. Educational Recommendations

Based on the findings, several recommendations are proposed for universities, students, and society.

First, universities should integrate AI literacy education into curricula to help students understand the capabilities and limitations of AI-generated content. AI-assisted learning activities should encourage students to verify information, reflect critically, and develop confidence in using AI tools. Appropriate technical guidance and personalized learning support can further strengthen students' self-efficacy and promote effective AI-assisted learning. Second, students should actively improve their AI literacy and use AI tools responsibly. Rather than relying blindly on AI-generated content, they should critically evaluate its accuracy, recognize its limitations, and maintain independent thinking. Developing critical-thinking and problem-solving skills can help students establish appropriate trust in AI-generated content and use AI effectively to support learning. Third, governments, universities, and society should collaborate to promote the responsible integration of AI into higher education. Policy support, resource sharing, and public awareness initiatives can facilitate AI literacy development and encourage the responsible use of AI-generated content. These efforts can help prepare students for the challenges and opportunities of the intelligent era.

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Acknowledgements

This study was supported by the 2024 Key University Level Research Project of Hanshan Normal University, entitled “Exploring Pathways to Enhancing Pre-service Teachers’ Digital Teaching Competence through AIGC” (Project No. XZW202401).