Evaluating the Effectiveness of a Digital and Generative AI-Supported New Media Marketing Module on Learning Engagement and Satisfaction Among Vocational College Students: A Mixed-Methods Study

Ting Cui [1,*]

1 School of Economics and Management, Shandong Vocational College of Science and Technology, Weifang, Shandong, China

* Correspondence: Ting Cui, School of Economics and Management, Shandong Vocational College of Science and Technology, Weifang, Shandong, China

Abstract: Against the backdrop of digital transformation and the rapid development of generative artificial intelligence (AI), higher vocational education faces new opportunities and challenges in cultivating applied marketing talent. To address this need, this study constructed and implemented a new media marketing module that integrates digital learning resources and generative AI tools, and systematically evaluated its effectiveness in improving student learning engagement and satisfaction. The study employed a mixed research design: The quantitative component measured student engagement and satisfaction at different stages of the module through four questionnaires (N=80) and conducted descriptive statistical analysis to examine trends over time. The qualitative component, through semi-structured interviews with 6 students, explored their experiences and perceptions of AI-assisted learning. The results showed that student engagement and satisfaction showed an overall upward trend throughout the module's implementation. Generative AI played a positive role in personalized feedback, creative support, and practical value, but also faced certain technical dependencies and adaptability challenges. This study provides empirical evidence for the application of generative AI in higher vocational education and offers a reference for pedagogical reform and innovative practice in new media marketing courses.

Keywords: higher vocational education; new media marketing; generative artificial intelligence; learning engagement; learning satisfaction; mixed methods

1. Introduction

In the digital economy and intelligent era, new media marketing has gradually become a crucial avenue for corporate market expansion and brand communication. With the rapid development of new marketing models such as short video platforms, social media, and e-commerce live streaming, the demand for talent with new media operations and digital marketing capabilities is increasingly urgent [1]. As a key platform for cultivating applied talent, higher vocational colleges urgently need to keep their teaching content and methods synchronized with industry developments to enhance students' practical skills and employment competitiveness. However, most new media marketing courses at higher vocational colleges currently remain stuck in traditional teaching methods, lacking effective integration of the latest digital tools and artificial intelligence technologies, making it difficult to fully stimulate students' enthusiasm and initiative [2].

Meanwhile, the rapid advancement of generative AI (Generative AI) offers new possibilities for educational innovation [3]. Generative AI offers unique advantages in text creation, image generation, data analysis, and learning feedback. It can not only provide

students with personalized learning resources and immediate feedback, but also support them in content creation and practical tasks [4]. Existing research has demonstrated the positive effects of AI-assisted learning in enhancing student motivation, promoting deep learning, and improving the learning experience [5]. However, this research has primarily focused on higher education and graduate education, with relatively limited attention paid to higher vocational education. In particular, in the field of new media marketing, which emphasizes both practicality and innovation, empirical research is lacking on how generative AI can be effectively integrated into course modules and its impact on student engagement and satisfaction.

Based on this, this study designed and implemented a new media marketing module that integrates digital learning resources with generative AI tools. This module, centered around the principle of "theory-practice-innovative application," incorporates a variety of generative AI application tools, including text generation, image design, and data analysis. Through contextualized tasks and group collaboration, the module aims to enhance student motivation and satisfaction in the learning process. This study contributes primarily in three areas: First, it addresses the current demand for curriculum innovation in higher vocational education amidst the digital transformation and AI-enabled learning, expanding research on the application of AI in vocational education. Second, through the application of mixed methods, it provides empirical evidence for understanding the mechanisms by which generative AI can enhance learning engagement and satisfaction. Third, at the practical level, it offers actionable case studies and insights for the design and implementation of new media marketing courses in higher vocational colleges. Consequently, this study not only enriches the academic discussion on the integration of AI and educational technology but also provides valuable insights for curriculum reform and talent development innovation in vocational education.

2. Methodology

2.1. Study Design

This study employed a mixed-methods research design, specifically a convergent parallel design combining quantitative and qualitative methods. The study aimed to capture data on student engagement and satisfaction at different stages of learning through quantitative surveys, while also incorporating qualitative interviews to further interpret and deepen the quantitative findings, thereby forming a comprehensive understanding of the module's effectiveness. This design not only revealed overall trends but also delved deeper into students' subjective experiences and potential challenges, thereby enhancing the credibility and explanatory power of the research conclusions.

2.2. Teaching Module Design and Implementation

2.2.1. Course Background

The research subjects were second-year students majoring in New Media Marketing at a vocational college. This module, a core unit within the New Media Marketing major, lasted eight weeks (two hours per week, for a total of 16 hours). The module, with its core focus on "digitalization + generative AI assistance," combined traditional classroom instruction with practical application using AI tools, emphasizing the simultaneous improvement of theoretical knowledge, practical application, and innovative capabilities.

2.2.2. Teaching Objectives

The overall goal of the module is to improve students' motivation and satisfaction in learning new media marketing by integrating digital learning platforms with generative artificial intelligence tools. Specific goals include:

a: Knowledge level: Master the core theories and tool applications of new media marketing;

b: Skill level: Ability to use AI tools such as ChatGPT for marketing copywriting, creative generation and user review analysis, and image generation tools (such as Midjourney) for visual design;

c: Literacy level: Cultivate communication, innovation and problem-solving skills in teamwork and project practice;

d: Emotional level: Enhance students' positive feelings about course content, learning methods and teaching experience, and improve overall learning satisfaction.

2.2.3. Module Content and Structure

Phase 1: Digital Learning (Weeks 1-2).

Students access course handouts, industry cases, and extension videos through the online learning platform, and conduct independent pre-study and group discussions.

Teachers assign test questions and small tasks through the platform to examine students' understanding of the basic concepts of new media marketing.

Phase 2: Generative AI-Assisted Practice (Weeks 3-6).

Text generation task: Students use ChatGPT to write advertising copy and market analysis reports.

Image generation task: Team members use AI drawing tools to design product posters and brand visuals.

Data Analysis Task: Use AI tools to conduct sentiment analysis on fictitious social media comments to help students understand user feedback patterns.

At this stage, teachers mainly play the role of guidance and feedback, emphasizing that students should flexibly use AI tools in practice to complete marketing plans.

Phase 3: Comprehensive Application and Results Display (Weeks 7-8)

Based on previous learning and practice, each group integrated digitalization and AI generation results to complete a new media marketing plan.

Students present and defend their results in groups. Teachers and their peers give scores together and use questionnaires to survey students' satisfaction with the entire learning process.

2.3. Quantitative Research

2.3.1. Research Subjects and Samples

A total of 80 students participated in the study, drawn from two classes majoring in new media marketing at a vocational college. To ensure the research's scientific integrity, all students followed a standardized teaching schedule. The sample consisted of approximately 43% male and 57% female, with the majority aged between 18 and 20. All students signed an informed consent form before the course began, pledging that the research data would be used solely for academic purposes.

2.3.2. Data Collection

The questionnaire survey was conducted at four time points:

T1 (week 1): baseline data before the course started;

T2 (week 3): the first measurement after the end of digital learning;

T3 (week 6): the second measurement after the AI practice phase;

T4 (Week 8): Final measurement after all modules are completed.

2.3.3. Measuring Tools

The learning engagement scale was adapted from the three-dimensional framework of Gunuc and Kuzu, encompassing behavioral engagement, affective engagement, and cognitive engagement [6]. The learning satisfaction scale was adapted from Topala and Tomozii, encompassing satisfaction with teaching content, teaching methods, and overall learning experience [7]. Both scales use a 5-point Likert scale (1 = completely disagree, 5 = completely agree). Quantitative data were processed using SPSS 26.0, mainly including:

descriptive statistics: mean, standard deviation and change trend; reliability test: Cronbach's α coefficient to ensure the internal consistency of the scale (α was 0.834 and 0.898, respectively).

2.4. Qualitative Research

2.4.1. Interviewees

To further explain the quantitative results, after the course ended, this study interviewed 6 students, four from each of the three stratified groups: high, medium, and low. This stratified sampling method helped capture diverse perspectives and avoid biased results.

2.4.2. Interview Process

The interviews were semi-structured and lasted approximately 30-40 minutes for each student. The questions focused on the following aspects:
1) Feelings about the overall course experience;
2) The impact of digital learning on one's own learning behavior;
3) Changes in learning engagement and satisfaction;

The interviews were conducted in a quiet environment and recorded and then transcribed.

2.4.3. Data Analysis

Qualitative data were analyzed thematically using Nvivo 12 software, following Castleberry and Nolen [8].

Step 1: Open Coding, marking key concepts sentence by sentence;

Step 2: Axial Coding: integrating preliminary codes into categories;

Step 3: Selective Coding: Extract 3-4 core themes.

3. Results

3.1. Quantitative Results

As shown in Figure 1, in terms of learning engagement, the average score at T1 (before the course started) was 3.12, which was at a medium level; as the course progressed, the average score at T2 rose to 3.48 (SD=0.51), indicating that students' classroom engagement and learning interest increased in the process of adapting to digital learning resources; the average score at T3 further increased to 3.67 (SD=0.47), indicating that with the support of AI tools, students' learning enthusiasm and task engagement were significantly improved; by T4, the average score reached 4.05, which was at a high level, indicating that students gradually formed a continuous and stable state of learning engagement throughout the learning process.
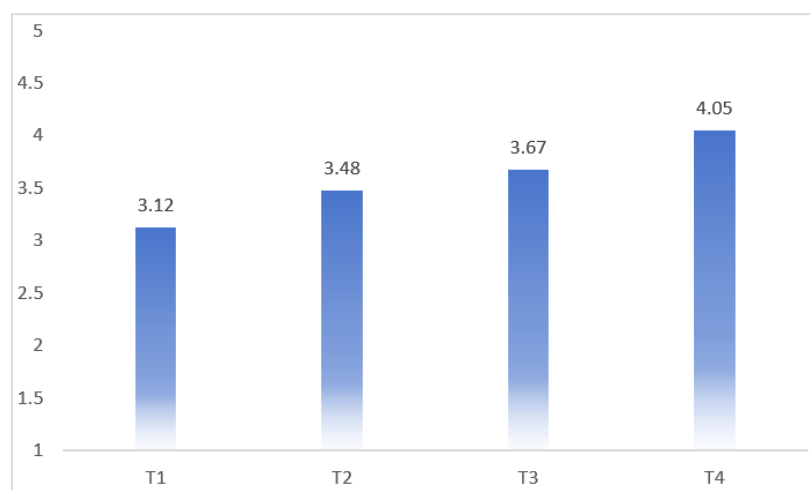
Figure 1. Changes in learning engagement over time.

As shown in Figure 2, in terms of learning satisfaction, the average score was 3.25 at T1, rising to 3.56 at T2, 3.92 at T3, and finally reaching 4.20 at T4. The data shows that student satisfaction with the course content, teaching methods, and overall learning experience has steadily increased, with the increase being particularly significant after the AI implementation phase. This suggests that the introduction of generative AI has not only increased student acceptance of the course but has also, to a certain extent, enhanced the enjoyment and value of learning.
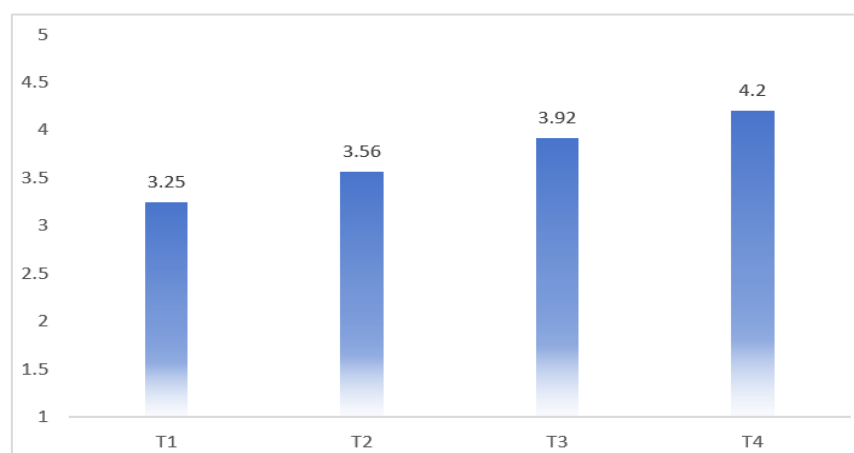

Figure 2. Changes in learning satisfaction over time.

Overall, students' learning engagement and learning satisfaction showed a continuous growth trend throughout the implementation of this module, reflecting that the digital and generative AI-assisted new media marketing module has a positive role in stimulating students' learning enthusiasm and improving their learning experience.

3.2. Qualitative Results

To further explain the quantitative results, this study conducted semi-structured interviews with six students. Through thematic analysis using Nvivo software, three core themes were ultimately extracted, providing deeper insights into the mechanisms behind learning engagement and satisfaction in AI-assisted instruction.

a. Improvement of Personalized Learning Experience

Most students reported that generative AI could provide immediate, task-specific feedback and personalized suggestions tailored to individual learning needs. For instance,

in the advertising copywriting task, AI tools not only generated draft text but also suggested multiple alternative phrasings, structural improvements, and stylistic adjustments. This allowed students to iteratively refine their work, improving both efficiency and quality. Such personalized support was particularly beneficial for students who initially struggled with idea generation, as it enhanced their motivation, encouraged active participation, and enabled them to engage more confidently and autonomously in class activities.

b. Stimulation of Learning Interest and Creativity

Students generally indicated that AI tools significantly stimulated their interest in learning tasks, such as graphic design and data analysis. One student commented, "I used to think marketing planning was boring, but after using AI to generate images and interactive drafts, I realized I could experiment creatively and visualize my ideas instantly." These experiences encouraged students to explore alternative solutions, test different approaches, and integrate AI-generated suggestions with their own reasoning. The increased engagement fostered both enjoyment and satisfaction with the course, while promoting experimentation, iterative learning, and creative problem-solving.

c. Challenges and Reflections during the Adaptation Process

Despite the positive experiences, some students reported initial discomfort and anxiety. Several found it challenging to assess the accuracy, relevance, and applicability of AI-generated content when first using tools such as ChatGPT. Others expressed concern that over-reliance on AI might weaken independent analytical and critical thinking skills. To address these challenges, teachers provided targeted guidance, modeling strategies for critically evaluating AI outputs and integrating them with students' own insights. These reflections highlight the importance of scaffolding student adaptation, establishing balanced usage norms, and cultivating critical thinking alongside AI-assisted instruction.

Combining quantitative and qualitative findings, it is evident that student engagement and satisfaction improved throughout the instructional module, with AI tools playing a significant facilitating role. Quantitative data showed a gradual increase in both engagement and satisfaction from moderate to high levels, while qualitative results elucidated the underlying mechanisms: personalized feedback, creative stimulation, and heightened learning interest. Additionally, students' reflections on adaptation challenges offer valuable guidance for optimizing future course design and ensuring effective integration of AI technologies in educational practice.

4. Discussion

This study, using a mixed-method approach, empirically examined the effectiveness of a new media marketing module assisted by digital and generative artificial intelligence in higher vocational education. The results showed that student engagement and satisfaction continued to improve throughout the course. This finding not only aligns with existing research but also expands the application scenarios of artificial intelligence in vocational education.

First, the gradual increase in learning engagement demonstrates the significant role of digital learning resources and generative AI tools in stimulating student learning motivation. Previous research has shown that digital teaching platforms can enhance student engagement through diverse resources and interactive tasks [9]. The results of this study further demonstrate that when generative AI is incorporated into the practical aspects of the course, students' in-class focus and task completion are enhanced. This trend is particularly pronounced in the AI practical phase (T3), demonstrating that AI's unique capabilities in content generation and immediate feedback contribute to enhancing student motivation and sustained engagement.

Second, the significant increase in learning satisfaction reflects students' high approval of the course content and teaching methods. Previous literature emphasizes that student satisfaction is influenced by both the rationality of the instructional design and the enjoyment of the learning experience [10]. This study found that AI-assisted learning

not only allows students to gain a more personalized learning experience but also derives a sense of accomplishment from creative design and data analysis tasks, significantly improving their learning satisfaction. This finding is consistent with some higher education research, but this study is the first to validate it in a new media marketing course at a higher vocational college, providing new evidence for curriculum reform in vocational education.

Qualitative results also revealed, alongside the positive effects, the challenges students face in adapting to generative AI learning. On the one hand, some students expressed uncertainty and anxiety when first using AI tools, concerned about the reliability of the generated content. On the other hand, some students suggested that excessive reliance on AI tools could undermine their independent thinking and self-directed learning abilities. These findings suggest that educators should strike a balance between AI support and student agency in curriculum design, leveraging AI's complementary advantages while also preventing students from developing a tendency toward dependency during learning [11,12].

5. Conclusion and Implications

This study, focusing on a new media marketing course at a higher vocational college, evaluated the impact of a digital and generative artificial intelligence-assisted module on student learning engagement and satisfaction. The results showed that both student engagement and satisfaction exhibited a sustained upward trend throughout the course. While generative artificial intelligence has played a positive role in providing personalized feedback, supporting creativity, and stimulating learning interest, it also presents challenges related to technology adaptation, digital literacy, and potential dependency.

On a theoretical level, this study enriches the research on the application of artificial intelligence in vocational education, validating its positive impact on students' learning processes, experiences, and skill development. On a practical level, this study has implications for curriculum reform in higher vocational colleges: first, integrating digital resources with generative artificial intelligence tools can help enhance the appeal of courses, improve teaching effectiveness, and foster a more interactive learning environment; second, teachers should strengthen their guidance of students during the teaching process, helping them use AI tools appropriately, critically evaluate generated content, and avoid over-reliance; and third, curriculum design should balance AI empowerment with student autonomy, encouraging students to maintain critical thinking, problem-solving skills, and innovative abilities with the support of technology, while ensuring learning remains engaging, meaningful, and outcome-oriented.

References

1. Y. Yang, D. Yu, and Y. Gao, "Research on the implementation path of ideological and political theory infiltrating the science and technology course teaching," in Proc. 5th Int. Conf. Distance Educ. Learn., May 2020, pp. 117–121, doi: 10.1145/3402569.3402591.
2. Y. Zheng, "The integration of new media technology into the teaching of ideological and political courses in universities in the new era," *Int. J. Educ. Teach. Res.*, vol. 1, no. 1, 2024, doi: 10.70767/ijetr.v1i1.26.
3. M. Liu, Y. Ren, L. M. Nyagoga, F. Stonier, Z. Wu, and L. Yu, "Future of education in the era of generative artificial intelligence: Consensus among Chinese scholars on applications of ChatGPT in schools," *Future in Educational Research*, vol. 1, no. 1, pp. 72-101, 2023, doi: 10.1002/fer3.10.
4. A. Bandi, P. V. S. R. Adapa, and Y. E. V. P. K. Kuchi, "The power of generative ai: A review of requirements, models, input-output formats, evaluation metrics, and challenges," *Future Internet*, vol. 15, no. 8, p. 260, 2023, doi: 10.3390/fi15080260.
5. M. Huang, "Student engagement and speaking performance in AI-assisted learning environments: A mixed-methods study from Chinese middle schools," *Education and Information Technologies*, vol. 30, no. 6, pp. 7143-7165, 2025, doi: 10.1007/s10639-024-12989-1.
6. S. Gunuc and A. Kuzu, "Student engagement scale: development, reliability and validity," *Assess. Eval. High. Educ.*, vol. 40, no. 4, pp. 587–610, 2015, doi: 10.1080/02602938.2014.938019

7. I. Topala and S. Tomozii, "Learning satisfaction: validity and reliability testing for students' learning satisfaction questionnaire (SLSQ)," *Procedia - Soc. Behav. Sci.*, vol. 128, pp. 380–386, 2014, doi: 10.1016/j.sbspro.2014.03.175.

8. A. Castleberry, and A. Nolen, "Thematic analysis of qualitative research data: Is it as easy as it sounds?," *Currents in pharmacy teaching and learning*, vol. 10, no. 6, pp. 807-815, 2018, doi: 10.1016/j.cptl.2018.03.019.

9. A. Das, and S. Malaviya, "Digital Platforms and Leveraging Technologies to Enhance Learner Engagement," *Cyber-Physical Systems for Innovating and Transforming Society 5.0*, pp. 211-231, 2025, doi: 10.1002/9781394197750.ch10.

10. A. Dean, and P. Gibbs, "Student satisfaction or happiness? A preliminary rethink of what is important in the student experience," *Quality Assurance in Education*, vol. 23, no. 1, pp. 5-19, 2015, doi: 10.1108/qae-10-2013-0044.

11. X. Hou, "Research on the Innovation Path of Ideological and Political Education for College Students Based on the New Media Era," *International Journal of New Developments in Education, [S. l.]*, vol. 6, no. 2, pp. 45-50, 2024, doi: 10.25236/IJNDE.2024.060208.

12. H. Shi, L. Li, and L. Zhu, "Exploration and Practice of Digital Empowerment in Ideological and Political Education of The Marketing Course," In *2025 7th International Conference on Computer Science and Technologies in Education (CSTE)*, April, 2025, pp. 498-502, doi: 10.1109/CSTE64638.2025.11092039.