Received: 12 Apr. 2025 | Revised: 25 Apr. 2025 | Accepted: 03 May. 2025 | Published online: 26 May. 2025

RESEARCH ARTICLE

Contemporary Education and Teaching Research
2025, Vol. 6 (5)178-183
DOI: 10.61360/BoniCETR252018280505

Exploring Innovative Pathways for Cultivating Brand Marketing Talent through Virtual Digital Humans

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Abstract: The deep integration of AI technology with the virtual digital human industry is driving a transformative shift in brand marketing from "digitalization" to "intelligentization". Based on emotional practice theory, the industry-education integration model, and AI technology applications, this paper explores the integration mechanism of virtual digital human technology in the educational ecosystem and its innovative value in cultivating brand marketing talents. Through a comprehensive education platform that integrates government, industry, academia, research, and application, and serves as a talent cultivation entity combining talent development, scientific research, technological innovation, enterprise services, and student entrepreneurship, the study analyzes the characteristics of virtual digital human technology, industry demands, and educational practices. A "theory-technology-scenario-competency" four-dimensional cultivation framework is proposed, constructing a virtual-real integrated brand marketing talent cultivation system. This approach incorporates the new requirements for high-quality talents in local development and industrial upgrading into the entire talent cultivation process, enhances the alignment between talent development and socio-economic progress, and fosters innovation in brand marketing.

Keywords: virtual digital humans, brand market, talent cultivation, innovative pathway

I. Introduction

According to the Virtual Digital Human Industry In-Depth Report, the domestic market size for virtual digital humans in China is projected to reach 270 billion yuan by 2030. However, there is a significant shortage of interdisciplinary talent, particularly in the intersection of "technology, marketing, and creativity". Brand marketing, as a core component of corporate strategy, not only influences sales and profits but also determines the long-term survival and development of enterprises in a rapidly evolving market environment.

Virtual digital humans refer to entities existing in non-physical worlds, created and utilized through computer graphics, rendering, motion capture, deep learning, and speech synthesis. They possess multiple human-like characteristics, such as appearance, performance capabilities, and interactive abilities, and are also referred to as virtual avatars, virtual humans, or digital humans (Huang, 2022). AI serves as the "brain" of digital humans, enabling their core functions of interaction, reasoning, and learning. AI technologies allow digital humans to understand user inputs, generate realistic speech and images, and improve through user feedback. Meanwhile, digital humans act as the "shell" of AI, representing their external appearance. They can exist in 2D or 3D forms, resembling real humans or entirely virtual creations, with designs tailored to user aesthetic preferences and application scenarios.

From functional digital humans, such as customer service agents and livestream hosts, to identity-based digital humans, like virtual idols and brand ambassadors, the "virtual digital human + brand" marketing model has permeated industries such as automotive, e-commerce, fast-moving consumer goods (FMCG), and cosmetics (Dong & Wang, 2024). The application of virtual digital humans in brand marketing not only enhances brand image and user experience but also opens new markets and user segments, establishing them as a vital medium for brand communication and a

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mainstream force in new media marketing. Consequently, cultivating application-oriented talent in virtual digital human brand marketing holds significant importance for corporate brand building, market competitiveness, sales growth, and national economic development.

To construct a talent cultivation system that aligns with the digital transformation of brand marketing, it is essential to deeply integrate virtual digital humans into the educational ecosystem. This system should aim to develop professionals who not only master the theory and practice of brand marketing but also possess a profound understanding and proficient application of digital tools and technologies. Key competencies include digital human IP operation, multimodal content production, user emotion analysis, data-driven decision-making, social media marketing, search engine optimization, and content marketing. These skills enable professionals to accurately interpret consumer needs, achieve precise market positioning, and formulate effective strategies, thereby better adapting to market demands and driving innovative development in brand marketing (Guo, 2022).

This paper proposes a four-dimensional innovation model— "Theoretical Systematization, Technological Empowerment, Scenario Reconstruction, and Capability Evolution"—to establish a virtual-real integrated talent cultivation system for brand marketing. This model integrates the new requirements for high-quality talent arising from regional development and industrial upgrading into the entire talent cultivation process, enhancing the alignment between talent development and socio-economic growth.

2. Existing Challenges in Cultivating Brand Marketing Talent through Virtual Digital Humans

2.1 Insufficient technological maturity and high costs

Virtual digital humans are evolving from auxiliary tools to core participants in the educational ecosystem. Their applications in teaching and learning include interactive instruction, remote education, personalized learning, virtual experiments, language education, STEM education, cultural and historical education, art education, and emotional interaction (Li & Liu, 2025). These applications rely on foundational technologies such as generative AI, speech synthesis, computer vision, natural language processing, knowledge bases, and dialogue management. Despite their widespread use, technological maturity remains insufficient. For instance, the precision of physical simulations in virtual experiments needs improvement, and certain scenarios still depend on human intervention for emotional recognition and complex reasoning.

Additionally, the production of hyper-realistic virtual humans involves significant computational demands. For example, rendering each strand of hair to appear as lifelike as possible requires extensive calculations for light and motion trajectories. Core technologies such as 3D modeling and intelligent speech understanding also entail high costs, posing barriers to broader adoption.

2.2 Imperfect talent cultivation system

Firstly, the curriculum system is inadequate. Cultivating talent in virtual digital human brand marketing requires universities to adapt their course offerings. To nurture innovative and practical professionals, the curriculum must be further optimized, with an increased emphasis on practical courses.

Secondly, interdisciplinary integration is insufficient, leading to challenges such as a shortage of high-quality resources, low relevance of available resources, and limited rates outcome transformation (Wu, 2024). These issues hinder students' ability to synthesize multidisciplinary knowledge to solve real-world problems.

Finally, the evaluation system needs improvement. The current talent assessment framework tends to overemphasize academic achievements and theoretical knowledge, neglecting practical skills and innovative capabilities essential for brand marketing in the digital era.

3.3 Insufficient faculty expertise

As virtual digital human brand marketing is an emerging field, the number and scale of qualified instructors remain limited. Many educators struggle to master AIGC tools and virtual human development platforms, making it difficult to meet the growing demand for talent cultivation. Additionally, some teachers exhibit low acceptance of new technologies, necessitating systematic training programs. Enhancing faculty digital literacy and skills is a critical step in advancing the digital transformation of educational institutions.

3. Innovative Pathways for AI Virtual Digital Human-Driven Brand Marketing Talent Cultivation

3.1 Curriculum system: the three-dimensional and four-linkage model

3.1.1 Cultivation philosophy dimension

In the current landscape, traditional methods of brand communication and marketing, which focus on creating visibility, awareness, and reputation among the public, are increasingly ineffective (Guo & Lei, 2024). To align with industry development trends and genuinely support industrial growth, the cultivation of brand communication and marketing talent must undergo updates and upgrades. Guided by the principle of "application-oriented education," the focus should be on enhancing students' ability to solve practical problems, thereby improving their

future market competitiveness.

In the teaching process, educators should adopt a student-centered approach, integrating the OBE (Outcome-Based Education) philosophy with new teaching concepts. This involves innovating the cultivation philosophy from four dimensions: interdisciplinary integration, local relevance, cultural activation, and technological incorporation (Guo & Lei, 2024). Such an approach promotes classroom innovation, facilitates diversified and creative teaching activities, and enriches students' learning experiences, sparking their interest, enthusiasm, initiative, and exploratory spirit. This ensures that the cultivation model, content, and methods for digital virtual human brand marketing talent are seamlessly aligned with real-world demands, fostering the development of application-oriented professionals.

3.1.2 Cultivation content dimension

Through interdisciplinary integration, students can acquire not only specialized skills within a single field but also the ability to collaborate across domains and drive integrated innovation. The cultivation of digital virtual human brand marketing talent requires the deep and organic integration of knowledge and skills from multiple fields, including marketing, brand management, digital media, and artificial intelligence (computer science). This creates a unique and comprehensive cultivation system that spans the entire student lifecycle, from admission to graduation and alumni engagement, closely aligning with enterprise needs through customized, tailored training programs.

Based on key competency indicators for job roles, a systematic talent cultivation approach involves two key strategies: first, academic institutions and enterprises collaborate to invest in funds, equipment, and teaching resources, creating an integrated platform that combines teaching, training, research, and production; second, a three-tiered cultivation framework is designed, including beginner-level courses for foundational competencies, intermediate-level courses integrated into specialized programs for skill refinement, and advanced digital courses and workshops to support professionals in upgrading their skills and obtaining vocational certifications (Guo & Lei, 2024). By collecting job-related data through literature review, benchmarking interviews, and behavioral event analysis, a talent competency model is constructed, detailing the core abilities required for digital virtual human brand marketing roles (Lei et al., 2023), such as market development (e.g., information analysis, channel building), management (e.g., strategic decision-making, team leadership), and financial management (e.g., budgeting, accounting).

Guided by this framework, the curriculum system is enriched with cutting-edge courses related to digital virtual human technology, such as virtual reality, motion capture, and speech synthesis (see Figure 1). Teachers are encouraged to incorporate scientific achievements into classroom teaching and case studies, helping students understand the knowledge and skills needed to address real-world challenges.

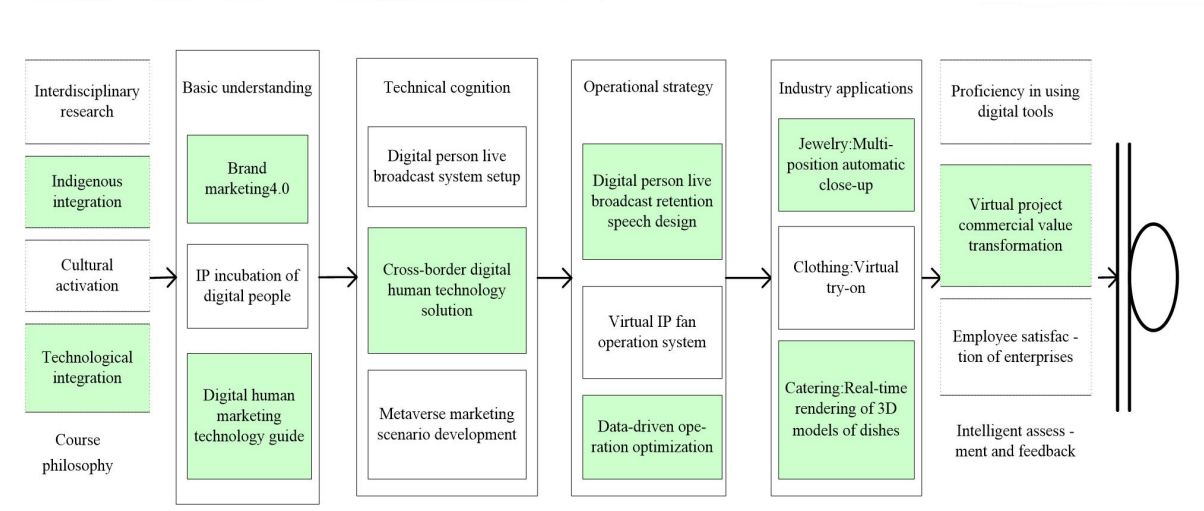

Figure 1 The "Theory-Technology-Scenario-Competency" Four-Linkage Model for Teaching Philosophy and Content.

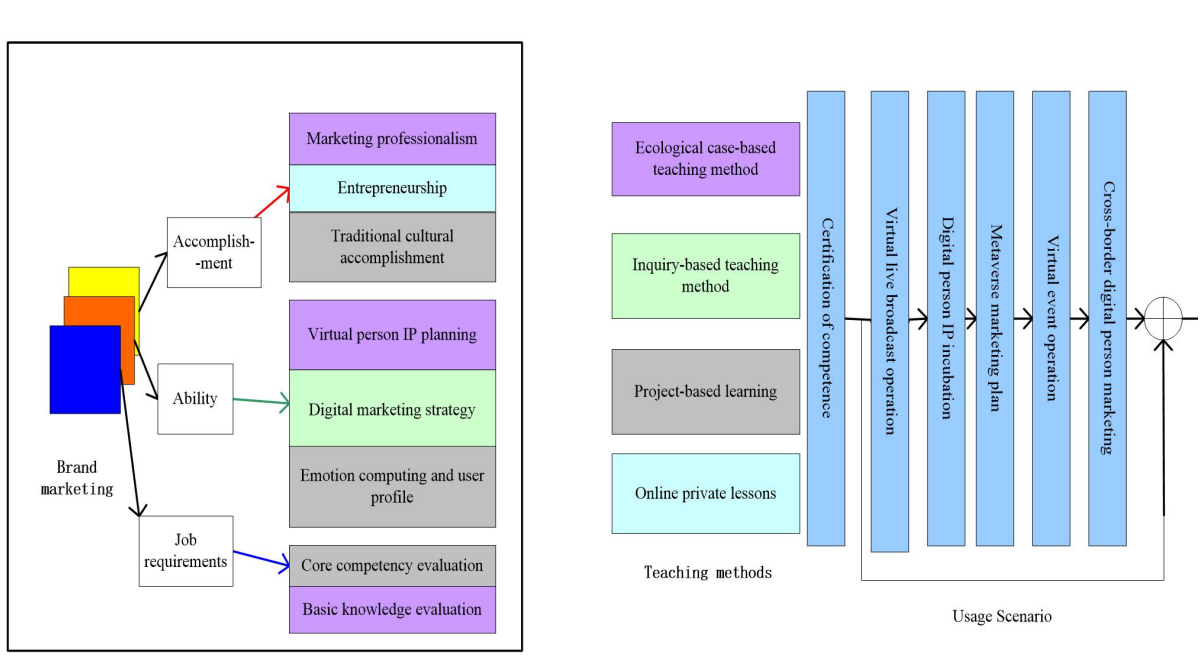

Figure 2 The "Theory-Technology-Scenario-Competency" Four-Linkage Model for Teaching Objective and Method.

3.1.3 Cultivation method dimension

First, the overall teaching objectives must be defined, clarifying the knowledge and skill levels students need to achieve (including theoretical knowledge, case analysis capabilities, and problem-solving skills). Based on this, teaching activities and evaluation methods are designed to align with the demands of digital virtual human brand marketing roles.

Second, phased learning goals are established. Leveraging big data technology, student learning profiles and competency levels are analyzed to set personalized, achievable learning objectives. Tailored teaching content and methods guide students in self-directed learning and exploration. Achieving these phased goals fosters a sense of accomplishment and confidence in students (Wu, 2023).

Additionally, practical objectives are set, involving students in case studies, scenario simulations, and hands-on practice. At different stages, discipline-specific simulations are integrated into the teaching process.

To support these goals, the curriculum system and teaching resources are developed. A forward-looking yet practical curriculum is designed, incorporating not only traditional brand marketing theories but also cutting-edge digital virtual human technologies such as AI, deep learning, motion capture, and real-time rendering. This ensures the curriculum remains relevant to technological and market trends, cultivating versatile professionals skilled in both technology and marketing.

Teaching resources are enriched through industry-academia collaboration, providing students with access to real-world challenges via enterprise projects, authentic competitions, or even brand creation initiatives (Guo & Lei, 2024). Market research and analysis are encouraged, fostering a deep connection between brand marketing and local markets. Such practical exposure ignites students' passion for professional learning.

Furthermore, innovative teaching methods are employed to fully leverage the advantages of the internet and artificial intelligence technologies, adopting a blended online and offline teaching model. Building on the established curriculum, diverse teaching scenarios are created to enhance students' understanding of knowledge, enrich their knowledge reserves, and improve the approachability of digital virtual human brand marketing talent cultivation. In a relatively relaxed learning environment, students can more quickly grasp and comprehend key and challenging aspects of their studies, continuously boosting their academic confidence. Ecological case-based teaching and project-based teaching are utilized, incorporating typical domestic and international cases of virtual digital human brand marketing (ecological big data: selecting region-specific enterprise cases based on local enterprise development, industrial growth, and economic progress, allowing students to directly engage with real-world work patterns and gain comprehensive exposure to market and ecological dynamics) (Xu, 2023). Significant emphasis is placed

on introducing authentic and successful industry cases, collaborating with leading enterprises to jointly develop teaching resources, such as instructional videos, practical manuals, and online courses. These resources provide students with diverse learning experiences, stimulate their interest and creativity, and increase their engagement in the learning process. Through analysis and discussion of these cases, students can better understand the application of theoretical knowledge in practice, sparking their interest and motivation, thereby enhancing teaching effectiveness. By dissecting the successes and failures in these cases, students learn how to craft effective marketing strategies in various contexts, leveraging digital virtual human technology to enhance brand image, improve user interaction, and optimize marketing strategies, while cultivating critical thinking and problem-solving skills. Project-based and task-based teaching methods are introduced, enabling students to deepen their understanding of theoretical applications in practice by solving real-world problems, while honing their innovative thinking and problem-solving abilities. Classroom discussions, case analyses, and role-playing activities are organized to foster teamwork and communication skills. A range of novel teaching methods is employed, offering abundant learning resources and personalized learning paths to encourage students to engage in self-directed learning based on their interests and needs, continuously improving their professional skills and overall competence. This approach achieves the fundamental goal of education by accumulating theoretical knowledge, mastering practical skills, expanding thinking, and building professional confidence. Modern technologies are used to explore teaching methods and strategies tailored to individual students, understanding their unique characteristics and needs to provide targeted, personalized education (Zhang et al., 2025). Customized online "small classes" are designed based on learning objectives, serving as either pre-class preparation or post-class review for in-person sessions, with teachers adjusting the duration and completion schedule of these sessions according to students' proficiency levels (Wu, 2023).

Finally, the innovation of the evaluation system is essential. The transformation of talent cultivation pathways is not an overnight process but a dynamic and continuously improving development journey. Leveraging cutting-edge technologies such as artificial intelligence and big data, a comprehensive, multi-dimensional, and scientific student evaluation system is constructed, centered around practical usage scenarios and utilizing competency certification as a key implementation tool. This system aims to thoroughly and accurately assess students' learning outcomes and innovative capabilities. By analyzing multiple dimensions—such as classroom participation, activity levels on online learning platforms, performance in project practices, and contributions to teamwork—students' learning progress and competency levels are holistically evaluated.

Industry experts, AI engineers, virtual human designers, and brand strategists are invited to collaborate with academic instructors in reviewing students' practical works, enhancing the quality of practical teaching (Guo & Lei, 2024). Intelligent teaching monitoring systems are employed to track students' learning progress in real time, including their learning pace, difficulties, and interests, enabling timely identification of issues and adjustments to teaching content and methods. Additionally, students are encouraged to actively participate in and drive the improvement of teaching quality. Through regular student forums, surveys, and other feedback mechanisms, their learning needs and expectations are deeply understood, allowing for timely adjustments to teaching strategies and course content to ensure that talent cultivation remains aligned with market demands and industry trends.

Evaluative teaching not only helps instructors identify areas for improvement in their teaching methods but also deepens students' self-awareness, enabling them to leverage their strengths and address weaknesses. This approach supports the sustainable development of innovative pathways for cultivating application-oriented talent in digital virtual human brand marketing.

3.2 Upgrading faculty and resources

Digital technology has become a crucial tool for educators to harness digital capabilities and cultivate students' higher-order skills and values. Teachers should enhance their digital awareness and strengthen their knowledge and skills in digital technologies. By integrating digital human applications and project-based practices into their teaching, educators can pursue digital coach certifications to promote the integration of teaching, research, and training through digital means. Simultaneously, attention must be paid to cultivating ethical literacy, particularly in areas such as the authenticity of virtual human identities, data security, and the boundaries of human-machine collaboration.

On the other hand, digital human technology, teaching resources, and their ecosystems must continuously evolve and expand to better align with the demands of the times and educational needs. This includes developing advanced digital tools, updating curricula with cutting-edge content, and fostering collaborations between academia and industry to ensure that educational resources remain relevant, innovative, and effective in preparing students for the rapidly changing digital landscape.

4. Future Prospects

The initiative focuses on cultivating next-generation talent through synergistic university-industry collaboration, establishing strategic alliances with sector leaders to immerse students in virtual digital human brand marketing operations. This hands-on engagement across complete project cycles—from conceptual planning to execution and performance evaluation—enhances practical application of academic knowledge while developing industry-ready competencies. By implementing an integrated credentialing ecosystem that combines stackable micro-credentials with traditional degrees and professional certifications, we empower continuous upskilling to meet evolving technological demands. Cross-institutional collaboration is further strengthened through discipline-specific forums and interdisciplinary teaching symposia, fostering pedagogical innovation and elite faculty development. Central to this transformation is nurturing creative-production talents—digitally fluent professionals who synthesize operational expertise with creative execution capabilities. These innovators demonstrate entrepreneurial acumen in developing technology-driven solutions while maintaining strong market awareness through embedded industry projects and internships. The program establishes dynamic education-industry bridges enabling real-time curriculum updates, resource sharing, and technology transfer, ultimately producing T-shaped professionals who combine specialized technical mastery with cross-functional operational intelligence. This talent development paradigm positions graduates as value creators capable of leading digital transformation, optimizing virtual workflow architectures, and driving sustainable industry evolution through integrated theory-practice application.

Conflict of Interest

The authors declare that they have no conflicts of interest to this work.

Acknowledgment

This research was funded by:

The Research Funds on Innovative Research on Application-Oriented Brand Marketing Talent training path of Digital Virtual Person for Industry-University Cooperative Education project of Ministry of Education with grant No. of 241203242052641.

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How to Cite: Yang, F., Chen, J., Ge, X. & Jiang, S. (2025). Exploring Innovative Pathways for Cultivating Brand Marketing Talent through Virtual Digital Humans. *Contemporary Education and Teaching Research, 06*(5), 178-183. https://doi.org/10.61360/BoniCETR252018280505