Construction of a "Six-Dimensional Intelligent" Teaching System for Marketing Driven by Multimodal Digital Intelligence

Yi Zhang*

Xinyu University, Xinyu, 338004, China
**Corresponding author: zhyzhy8618@126.com*

Abstract: *Multimodal digital intelligence-driven technologies are reshaping the teaching form of marketing. This study constructs a "Six-Dimensional Intelligent" teaching system, which takes the multimodal large model as the core and integrates multi-source data such as text and images to realize the visual representation and interactive transmission of marketing knowledge. At the theoretical level, it proposes the multimodal representation logic, the six-dimensional framework structural correlations, and the technology-capability-value triple-cycle mechanism; at the design level, it forms the dual-track support of multi-platform and content restructuring, the collaborative operation of multi-scenario and multi-evaluation, and the dynamic integration of technical tools and value guidance; at the operational level, it establishes data-driven feedback regulation, transdisciplinary content updating, and system self-regulation methods. By leveraging generative AI, virtual simulation, and an AI dynamic evaluation system, this system lowers the threshold for conceptual understanding, shortens the time lag between curriculum and market technology, and provides personalized paths for capability growth.*

Keywords: *Multimodal Digital Intelligence-Driven; Marketing Teaching; Six-Dimensional Intelligent Framework; Technology-Capability-Value Triple Cycle; Transdisciplinary Content Restructuring*

Introduction

Traditional marketing teaching has long faced structural problems such as linear knowledge transmission, disconnection between technical tools and teaching content, and unitary learner capability assessment. With the maturity of multimodal large models, generative AI, virtual simulation, and other technologies, teaching scenarios have acquired the technical conditions for integrating multi-source data and building immersive interactive environments, which offers new possibilities for overcoming the above dilemmas. However, existing reforms mostly remain at the level of single-point technical applications and lack systematic integration of elements such as technology, content, scenario, evaluation, and value guidance. Therefore, constructing a teaching system that can coordinate multimodal technology empowerment, transdisciplinary content restructuring, progressive scenario-based training, and dynamic evaluation feedback has become a critical pathway for improving the quality of marketing talent cultivation. This study, based on the technological context of multimodal digital intelligence-driven approaches, proposes the "Six-Dimensional Intelligent" teaching system and systematically elaborates on its theoretical foundations, module design, and operational mechanisms, in order to provide an actionable framework reference for the teaching reform of marketing majors.

1. Theoretical Foundations of the Multimodal Digital Intelligence-Driven Teaching System

1.1 Representation Logic of Marketing Knowledge under Multimodal Data Fusion

Multimodal data fusion provides a new technical pathway for the pedagogical expression of marketing knowledge. Multi-source data, including text, images, audio, and video, achieve joint representation within a single framework, enabling abstract theoretical content such as consumer behavior models and brand positioning strategies to be presented to learners in the form of visualization graphs, dynamic simulations, or interactive scenarios. This representational approach breaks away from the linear and static knowledge transmission mode found in traditional textbooks and instead constructs a multi-dimensional and operable cognitive structure. When learners engage with virtual brand endorsers and real-time market cases generated by generative AI, they can more easily establish the

mapping relationship between theory and reality.

From the perspective of cognitive load, multimodal representation effectively lowers the threshold for understanding abstract concepts. For example, by employing 3D dynamic knowledge graphs to display market competition landscapes, learners can intuitively grasp the correlations and evolutionary trends among brands without relying on lengthy textual descriptions. Virtual simulation systems that model the process of live-streaming e-commerce allow terms such as marketing funnel and conversion rate to be naturally internalized through hands-on operation. The core of this representational logic lies in transforming marketing knowledge from being "told" to being "seen and operated," thereby enhancing learners' cognitive efficiency and knowledge transfer ability.

1.2 Core Elements and Structural Correlations of the Six-Dimensional Intelligent Framework

The Six-Dimensional Intelligent Framework consists of six modules: technology empowerment, platform construction, content restructuring, scenario creation, project evaluation, and value guidance. These modules are not simply superimposed but form a networked support relationship with one another. The technology empowerment module provides an underlying tool matrix, covering generative AI, virtual simulation, AR/VR, and the like; the platform construction module builds online and offline teaching spaces to achieve resource integration and data circulation. The content restructuring module decomposes the three core marketing capabilities into big topics, major issues, and special themes, breaking down the traditional disciplinary barriers of the curriculum. The scenario creation module, relying on the progressive model of the "Eight Steps of Marketing," designs a four-tier capability training system ranging from virtual stores to enterprise practice[1].

The structural correlations among the modules manifest as bidirectional drive and feedback loops. Technology empowerment drives the real-time updating of content restructuring; for example, AI-generated case data can be directly embedded into the special themes of the curriculum. Learning behavior data collected in scenario creation, in turn, form individualized diagnoses through the project evaluation module, which then optimizes the configuration of technical tools in a reverse direction. The value guidance module does not exist independently but is embedded into every technical tool and every scenario-based task; for instance, Chinese-style digital avatars are used to narrate brand stories, allowing cultural identity to emerge naturally within professional operations. This structural correlation ensures the holistic synergy of the six-dimensional elements, rather than fragmented accumulation.

1.3 Interactive Mechanism of the Technology-Capability-Value Triple Cycle

The triple-cycle model starts with technology but goes beyond mere tool application. The first cycle is technology-driven capability: the multimodal technology matrix (e.g., GPT for text generation, Midjourney for image design, VR for scenario construction) directly empowers learners' three core marketing capabilities, namely data analysis and judgment, strategic innovation, and execution optimization. In the process of operating AI tools to complete real marketing tasks, learners gradually develop sensitivity to and mastery of new technologies. The second cycle is capability feeding back into technology: when learners discover that existing technical tools cannot solve a particular marketing problem, they, in turn, push the teaching team to introduce or develop new technical modules, thereby generating the driving force for technological iteration.

The third cycle takes value guidance as the regulating variable that runs through the entire process. The application of technology embeds ethical review and brand value scrutiny; for example, the AI-generated creative proposal stage simultaneously evaluates the commercial compliance and social responsibility of the plan. In capability training, China-chic brand cases and local enterprise practice projects are used to help learners develop a deep understanding of local market culture. These three cycles do not proceed linearly but occur simultaneously in every teaching activity: a virtual simulation crisis public relations task not only employs AR/VR technology but also exercises strategic expression capability while conveying responsible business ethics. This interactive mechanism enables technology, capability, and value to reinforce each other, thus avoiding the superficial predicament of "using technology for technology's sake."

2. Module Design of the Intelligent Teaching System for Marketing

2.1 Dual-Track Support Approach of Multi-Platform Environment and Content Restructuring

The construction of a multi-platform environment provides an integrated online-and-offline spatial carrier for teaching operations. The online part relies on cloud-based collaboration platforms, enterprise data interfaces, and learning management systems to integrate real enterprise marketing databases, dynamic case libraries, and personalized learning resources; the offline part, through school-enterprise co-built training spaces, virtual simulation laboratories, and physical project connections, forms a closed-loop chain of "data circulation, task assignment, result submission, and feedback diagnosis." This dual-track structure enables learners to complete market research simulations in a virtual environment while simultaneously obtaining real consumer behavior data through the Enterprise WeChat API interface, thus achieving two-way verification between theory and practice within the same teaching cycle[2].

On this basis, content restructuring forms a dynamic knowledge organization method. Centered around three core capabilities — data-driven market analysis and judgment, strategic innovation and creative expression, and technology-empowered execution optimization — the scattered knowledge points in traditional curricula are reorganized into a modular structure of big topics, major issues, and special themes. Python web scraping and Tableau visualization techniques are embedded into consumer profiling tasks, generative AI is used for rapid iteration of creative proposals, and the concept of blockchain traceability is integrated into ethical discussions on brand communication. This restructuring is not a simple addition or deletion of chapters but uses real marketing tasks as anchors, packaging technical tools, industry cases, and analytical methods into callable knowledge units. Approximately 30% of the content is updated each semester in response to changes in industry demands, ensuring that the knowledge system remains synchronized with the evolution of market technologies.

2.2 Collaborative Operation of Multi-Scenario Drive and Multi-Project Evaluation

Multi-scenario drive adopts the progressive model of the "Eight Steps of Marketing," ranging from on-site demonstrations and simulated practice to real project introduction, forming four capability training levels: virtual store drills, crisis public relations simulation, cross-border marketing decision-making, and enterprise practice assessment. Each level corresponds to different technical support and cognitive requirements; for example, Level 1 uses interactive whiteboards and AI intelligent assistants to complete preliminary strategy design, while Level 3 employs metaverse virtual KOL collaboration simulations and AR real-scene store layout tools. This stepped scenario design allows learners to repeatedly experiment and make mistakes in a low-risk environment, gradually accumulating experience in handling complex marketing problems, thus avoiding costly errors when directly entering the real market.

The multi-project evaluation system synchronously collects process data from each scenario-based task. Voice sentiment analysis of live-streaming scripts, records of image generation for advertising creativity, and GMV and conversion rate indicators from simulated business data are all incorporated into the AI dynamic evaluation model. The evaluation subjects are decomposed into the AI system (accounting for 40%), enterprise mentors (30%), course instructors (20%), and peer learners (10%); the scores from these four dimensions are automatically weighted to generate personalized improvement plans. The key to collaborative operation lies in data interoperability: behavior logs from the L1 virtual store can be directly used for the preliminary analysis of the L2 crisis public relations simulation, while the decision results from L3 serve as the reference baseline for the L4 enterprise practice assessment. This design ensures that evaluation is no longer a single score at the end of a task but rather formative feedback that runs through the entire scenario chain.

2.3 Dynamic Integration of Technical Tool Embedding and Value Guidance

Technical tools are not externally attached in module design but are embedded within the operational process of every marketing task. Generative AI is invoked as an auxiliary engine for market analysis: learners input product features into ChatGPT or ERNIE Bot, which automatically generate a competitive analysis framework, which they then revise based on real-time data obtained through Python web scraping. Digital human technology is used for brand personification design tasks, where learners adjust the image, speech scripts, and interaction logic of virtual spokespersons, and the system

immediately provides feedback on brand consistency scores. AR/VR tools offer immersive adjustment interfaces for product packaging and store layout optimization tasks, where each drag-and-drop operation corresponds to a real-time mapping of shelf display theory. This embedding approach enables technology learning and professional knowledge acquisition to occur simultaneously, eliminating the need for a separate course on "AI Tool Applications"[3].

Value guidance is embedded into technical operation links in an implicit manner. When Chinese-style digital avatars narrate the rise of China-chic brands, learners naturally encounter the logic of extracting and transforming local cultural symbols in the process of designing virtual spokesperson images. The task of AI-generated scripts for live-streaming to assist farmers in rural revitalization is accompanied by a business ethics self-checklist, requiring learners to evaluate the long-term impact of the proposed plan on local supply chains. Each invocation of technical tools is accompanied by a convenient value-judgment micro-step; for example, after the AI generates a creative proposal, the system pops up an ethical risk alert box to guide learners to examine whether issues such as data bias or cultural appropriation exist. This dynamic integration avoids the separation of value guidance from professional teaching, making dimensions such as business ethics and cultural identity intrinsic components of technical operations rather than external preaching.

3. Operational Logic and Iterative Path of the Teaching System

3.1 Multi-Source Data-Driven Teaching Feedback and Regulation Process

The multi-source data generated during teaching operations constitute the foundational material for feedback regulation. Learners' operation tracks when using the Boardmix collaborative whiteboard, node click frequencies in the NRD Studio knowledge graph, decision path choices within the virtual simulation system, and speech sentiment curves recorded by the AI assessment system are all examples of heterogeneous data that are uniformly collected and integrated into the teaching data platform. The teaching data platform cleans and aligns the raw logs, extracting feature variables related to the three core marketing capabilities, such as the completion time and error types of consumer profiling tasks, and the response speed and number of strategy adjustments in crisis public relations simulations. Each type of feature variable corresponds to preset capability observation indicators, forming a quantifiable snapshot of the teaching status.

The regulation process adopts closed-loop control logic. When the system detects that the average score of a class in the "strategic innovation and creative expression" dimension falls below the threshold, it automatically triggers the content push module to supplement that class with an AI-generated case library of China-chic cross-border marketing and AR omnichannel touchpoint optimization exercise tasks. The teacher's interface simultaneously receives a visual diagnostic report, highlighting that the frequent errors are concentrated in the low brand consistency scores in brand personification design. The regulation instructions are issued in two ways: first, the system automatically adjusts the difficulty coefficient of the next-stage scenario tasks; second, it recommends specific classroom intervention actions to the teacher, such as adding an operational demonstration of the digital human IP incubation experiment. This data-driven feedback mechanism shifts teaching regulation from experience-based judgment to evidence-based support, and the regulation cycle can be compressed to within 24 hours after a single class session[4].

3.2 Knowledge Updating Strategy for Transdisciplinary Content Restructuring

The core of transdisciplinary content restructuring lies in breaking away from the chapter structure of traditional marketing courses divided by functional modules. Using real marketing tasks as organizational units, this approach extracts and reassembles knowledge from multiple disciplines—including consumer behavior, data analysis, brand management, communication studies, and information technology—according to task requirements. For example, a task titled "Designing Social Media Viral Communication for a China-Chic Brand" simultaneously draws on user-generated content incentive mechanisms from communication studies, public opinion sentiment analysis from data analytics, local cultural symbol extraction methods from brand management, and metaverse virtual KOL interaction logic from information technology. This restructuring method arranges knowledge not by disciplinary affiliation but by the sequence in which it is called upon during problem-solving, thereby reducing learners' cognitive costs when switching between different knowledge domains[5].

The knowledge updating strategy introduces an industry-demand-driven dynamic refresh

mechanism. Through enterprise data interfaces, the system periodically captures technical keywords from marketing job postings on mainstream recruitment platforms, and combines them with changes in category hot terms provided by the Tmall Consumer Insight API, thereby generating weight adjustment signals for nodes in the knowledge graph. When industry mention frequencies of terms such as "private domain traffic operation," "AI creative generation," and "short-video conversion attribution" rise, the system automatically increases the recommendation priority of the corresponding knowledge modules, and injects the latest enterprise practice cases (e.g., the full process of a brand's Enterprise WeChat API data integration) into the teaching resource library. Each semester, approximately 30% of the teaching cases are replaced or updated; the new content must undergo a three-in-one adaptability verification involving the technical toolkit (Python/Tableau), the industry case library (China-chic cross-border/virtual KOL), and the ethical deliberation zone (AI ethics review). This strategy ensures that the time lag between course content and market technology evolution is kept within three months, whereas the update cycle for traditional textbooks typically takes 12 to 18 months.

3.3 System Self-Regulation Method for Marketing Capability Progression

The system's self-regulation method is built upon continuous tracking of capability growth trajectories. Each learner completes an initial capability assessment upon enrollment, covering three dimensions: proficiency in operating data tools, mastery of marketing theories, and the balance between creative divergence and logical convergence. After each scenario task is completed, the AI dynamic evaluation system outputs a capability increment report, displaying the slope changes of three growth curves—namely "data-driven market analysis and judgment capability," "strategic innovation and creative expression capability," and "technology-empowered execution optimization capability"—in the form of line charts. When a plateau appears twice consecutively on a particular curve, the system determines that the current training intensity or content type does not match the learner's capability level, thereby triggering the regulation mechanism[6].

The specific operations of self-regulation include adaptive adjustment of task difficulty and redirection of resource recommendation paths. For learners who perform excellently at Level 3 of "Cross-Border Marketing Decision-Making," the system automatically unlocks early access permission to the Level 4 enterprise practice assessment and compresses the number of repeated training sessions for lower-level tasks. For learners who repeatedly exhibit sentiment analysis deviations in the "Brand Asset Evaluation" task, the system breaks down the sentiment annotation dimensions of AI public opinion data into more fine-grained practice modules, such as emotion polarity recognition, intensity grading, and sarcastic tone filtering, with each sub-module corresponding to 3 to 5 micro-training cases. Teachers can view the overall capability distribution heat map and identify skill nodes that are commonly weak at the class level; for example, "user segmentation strategy in private domain traffic operation" may be a bottleneck for most learners, at which point the system will push supplementary hands-on tasks involving Enterprise WeChat API data to the entire class. The entire self-regulation process does not rely on frequent manual intervention but is automatically executed through preset rule engines and lightweight machine learning models, enabling the teaching system to continuously optimize its own parameter configuration in response to the collective performance of learners.

Conclusion

This study has constructed a "Six-Dimensional Intelligent" teaching system for marketing driven by multimodal digital intelligence. At the theoretical level, it has clarified the representation logic of multimodal data fusion, the structural correlations among the six-dimensional elements, and the interactive mechanism of technology, capability, and value. At the design level, it has accomplished the dual-track support of multi-platform and content restructuring, the collaborative operation of multi-scenario and multi-evaluation, and the dynamic integration of technical tools and value guidance. At the operational level, it has established data-driven feedback regulation, transdisciplinary content knowledge updating, and system self-regulation methods. By embedding technologies such as generative AI, virtual simulation, and AR/VR into every link of marketing tasks, and by combining progressive scenario-based training with a multi-subject evaluation model, this system achieves closed-loop optimization of knowledge presentation modes, learning pathways, and capability feedback. Two directions can be further explored in the future: first, the alignment method between the capability observation indicators in the teaching system and industry talent standards, so as to enhance the external validity of learners' capability profiles; second, the automatic extraction and modeling of implicit features in multimodal teaching data (such as collaborative behavior patterns and creative

divergence strategies), in order to increase the precision of personalized regulation. In addition, the cross-institutional and cross-disciplinary transfer and adaptation mechanisms also deserve continued attention.

Fund Projects

2025 Jiangxi Province Higher Education Teaching Reform Research Project: Research on the "Six-Dimensional Intelligent" Teaching Reform of Marketing Driven by Multimodal Digital Intelligence (Project No.: BKJG-2026-20-15)

References

[1] Peng, L., & Yu, R. Q. (2026). Reconstruction and practice of the capstone course teaching mode for marketing majors empowered by AI. Public Relations World, (8), 266-268.
[2] Li, J. L. (2026). Research on teaching design of marketing courses under the background of AIGC. Economist, (3), 194-195, 200.
[3] Li, Y. Y. (2025). Research on the innovation of the "Three-Level and Four-Innovation" teaching mode for marketing courses empowered by AI and big data. Science, Technology, Economy and Market, (11), 149-151.
[4] Zhang, Y. N., & Xu, H. J. (2025). Exploration of teaching reform of marketing courses under the demand for digital and intelligent innovative talents. Foreign Trade and Economy, (9), 128-131.
[5] Zheng, J. Y., Ju, J. P., & Yu, C. H. (2023). Exploration of teaching reform of marketing major courses from the perspective of digital intelligence: Taking the course of Consumer Behavior as an example. Modern Business Trade Industry, 44(4), 237-239.
[6] Liang, Y. (2023). Reform and practice of blended teaching of Marketing. Journal of Shanxi University of Finance and Economics, 45(S2), 273-275.