Research on the Scenario-based Construction of the Virtual-Real Integration Teaching Environment in the Intelligent Question Bank Design Unit of "AI+ Education Application Development

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Abstract

This study focuses on the scenario-based construction of the virtual-real integrated teaching environment in the intelligent question bank design unit of "AI+ Education Application Development". Based on constructivism and situational cognition theory, a scenario-based teaching system for knowledge imparting and ability cultivation is constructed, and teaching experiments are carried out in colleges and universities. The three-dimensional assessment shows that scenario-based teaching has increased students' accuracy in knowledge acquisition by 25% and raised the average score of project works by 14.2 points. The scenario-based construction of virtual-real integration can effectively promote the achievement of teaching goals and provide practical references for the curriculum reform of intelligent education.

Key words

Virtual-Real integration teaching Intelligent question bank design Scene-based construction AI+ Educational Applications Teaching reform

1.Introduction

With the deep integration of artificial intelligence and education, the intelligent question bank design unit in the "AI+ Education Application Development" course has become an important field for cultivating compound talents and an important part of China's education informatization construction. The intelligent question bank is an important carrier for achieving precise teaching and personalized learning. Its design and development involve the dual demands of applying artificial intelligence technology and matching educational scenarios. However, the current teaching models mainly focus on theoretical explanations and code demonstrations, making it difficult for students to systematically understand the application logic of intelligent question banks and thus unable to effectively meet complex teaching demands. Research results show that with the help of virtual reality, augmented reality and other technologies, the virtual-real integrated teaching environment can achieve a deep integration of physical teaching space and digital virtual space, which is an effective way to break through the above-mentioned teaching predicament[1]. However, existing research has not yet formed a complete "contextualized" construction system. There is still room for improvement in aspects such as the matching of teaching objectives with situational functions and the deep integration of technology with the teaching process. Therefore, this paper takes "contextualized construction" as the entry point to explore the deep-level joint path of intelligent question bank teaching in the "virtual-real integration" environment, providing theoretical and practical support for talent cultivation, as follows.

2.Correlation Analysis of the Virtual-Real Integration Teaching Environment and the Intelligent Question Bank Design Unit

2.1 The connotation and characteristics of the virtual-real integrated teaching environment

The construction of immersive scenarios relies on a 3D modeling engine to create an interactive question bank development scene. Students can enter the virtual space with the help of immersive terminal devices to observe the technical architecture and operation mechanism of the intelligent question bank. In the teaching of intelligent annotation of test questions, virtual scenes can dynamically present the process of natural language processing models parsing the semantic meaning of the question stem, convert the logic of knowledge point extraction into a visual interactive flow, and deconstruct abstract technical principles from the visual context[2] .

Personalized learning adaptation utilizes learning analysis technology to collect real-time data on multiple dimensions of students' code writing time, debugging frequency, and completion quality in virtual scenarios. The data is then processed by machine learning models to generate personalized ability evaluation maps. The system dynamically adjusts the difficulty of the scenarios based on the evaluation results. For students with a weak foundation, step-by-step operation guidance is provided. Teachers push cutting-edge technologies and application cases to high-level learners, achieving the fundamental goal of precisely matching teaching content with learning needs .

The 3D interactive experience supports multiple interaction methods. Students can write code using traditional input devices or interact with virtual teaching assistants in real time through gesture recognition and voice commands. In the scenario of collaborative development, students who are not on campus can synchronously debug the test paper generation algorithm through a "digital avatar" in a virtual collaborative space, achieving real-time cross-regional collaborative work and building a learning environment that combines technical practicality and social interactivity .

2.2Teaching Requirements for the intelligent question Bank design unit of "AI+ Education Application Development"

The teaching of intelligent question banks needs to cover the entire process from demand analysis to test optimization, and train students from multiple dimensions such as technology, education and engineering practice. In terms of technology, students should master tools such as Python and SQL, and understand the intelligent test paper generation algorithm and the IRT principle. Teachers need to master the norms of each educational stage and apply educational measurement and Bloom's theory to design test question banks. In engineering practice, one needs to possess capabilities in document writing, system development, and other aspects. In traditional teaching, due to the separation of technology and educational theory, it is difficult for students to connect technology with demand, and there is a lack of intelligent test paper generation algorithms for scenario demonstrations. It is necessary to integrate the virtual and the real, and promote cross-domain knowledge integration through scenario design.

2.3 Collaborative mechanism for interdisciplinary knowledge integration

The intelligent question bank design unit has the dual attributes of technology development and educational application. The virtual-real integrated teaching environment provides a structured carrier for the organic integration of interdisciplinary knowledge. In the virtual scene, the technical module and the educational theory module form a dynamic association: When students design test question recommendation algorithms, the system will simultaneously activate the item Response Theory (IRT) parameter model in educational measurement, and display the mapping relationship between algorithm parameters (such as discrimination and difficulty) and the student ability distribution curve through a three-dimensional visualization interface, ensuring that the adjustment of technical parameters is always anchored to the educational evaluation goal.

Meanwhile, the virtual environment builds a two-way verification mechanism of "technical verification - educational adaptation". For instance, in the teaching of applying natural language processing technology to the automatic generation of test questions, students need to first verify the grammatical correctness of the test questions generated by the algorithm through virtual experiments. Then, based on Bloom's Taxonomy of Educational Objectives, they test the coverage of the test questions for different cognitive levels in a virtual classroom scene. Through the feedback of the educational scene, the technical solution is iterated. Realize the deep coupling of computer science and educational knowledge.

2.4 Interwoven paths of dynamic teaching evaluation

The evaluation system of the virtual-real integration environment and the intelligent question bank design unit has the characteristic of deep interembedding. The virtual environment captures students' behavioral data during the development of the question bank (such as algorithm debugging trajectories and question classification logic), and builds multi-dimensional process evaluation indicators. These indicators are directly connected to the evaluation module of the intelligent question bank and become the dynamic basis for the calibration of question difficulty and the distribution of knowledge point weights.

Conversely, the usage effect data of the intelligent question bank (such as the correct answer rate of students and the distribution of error types) will optimize the evaluation dimensions of the virtual teaching scenarios in reverse. For instance, when the question bank data indicates that the test questions generated by a certain type of algorithm have insufficient discrimination in actual teaching, the virtual environment will automatically adjust the training intensity of the teaching scenario for this algorithm, add boundary condition testing tasks, guide students to optimize the technical solution based on the feedback from educational practice, and form a closed-loop evaluation system of "teaching behavior data - question bank performance indicators - virtual scenario iteration". Ensure that the evaluation criteria for technological learning and educational application remain consistent at all times.

3.Theoretical Basis for the Scenario-based Construction of Intelligent Question Bank Design Units in the Virtual-Real Integration Teaching Environment

3.1 The guiding role of constructivist learning theory

Constructivism holds that knowledge acquisition stems from the interaction between learners and their environment as well as the construction of meaning. The intelligent question bank teaching environment integrates virtual and real elements, mainly supporting knowledge construction through multi-dimensional scenarios: By using virtual engineering, design principles are transformed into tasks , which can promote students' mastery of core elements. Cognitive conflict scenarios guide the debugging of comparative theoretical model algorithms, and understand the boundaries of applications; Cooperative construction of situational simulation involves multi-school collaboration, and students work across roles to build an engineering cognitive system.

3.2 The practical value of situational cognition theory

The theory of situational cognition emphasizes the deep coupling between knowledge and application scenarios, and stresses that learning should take place in real-life situations to achieve effective knowledge transfer. In a virtual reality environment, core scenarios are developed by simulating an intelligent test question bank, providing students with practical places to apply knowledge and cultivate abilities .

In the scenario simulation of educational institutions, it establishes a virtual development environment covering K-12 schools, vocational colleges and online education platforms; In response to the practical teaching needs of higher vocational colleges, students need to design a rich media test question storage framework that supports video operation demonstrations, 3D model disassembly, etc. At the same time, the weight of practical operation test questions should be adjusted to master differentiated design strategies for different teaching scenarios[3].

In the application scenarios of technology, the KDDCup educational data is mainly used as the carrier to conduct preprocessing such as text cleaning, feature extraction, and data augmentation. The impact of different processing strategies on the performance of test paper generation and the accuracy of test question classification is monitored in real time, and the correlation cognition between data features and technology selection is established.

In user interaction scenarios, through various perception technologies such as eye movement and expression recognition, behavioral data of students and simulated users when answering questions can be obtained. By analyzing the behavioral characteristics of users during interface navigation and interaction, it can guide students to optimize the layout and presentation of the question bank interface, achieving usability testing throughout the entire development process and actively promoting the transformation of theoretical knowledge into engineering applications.

3.3 Collaborative Mechanism of Technical Tools from the Perspective of Distributed Cognition

Distributed cognitive theory reveals the dynamic distribution patterns of cognitive activities among individuals, tools and the environment, providing a new explanation for the cognitive process of intelligent question bank design in a virtual-real fusion environment. Virtual tools, as carriers of cognitive extension, form a collaborative cognitive system with students and physical devices: In the design of the test question bank architecture, 3D modeling tools externalize students' abstract understanding of the architecture into visual models, and gesture interaction devices transform spatial operation intentions into the combinatorial logic of virtual modules, enabling the cognitive process to break through the limitations of individual thinking and achieve "human-machine" collaborative construction.

This mechanism is manifested in the teaching of technical principles as the optimal distribution of cognitive load. For instance, when explaining intelligent recommendation algorithms, the virtual system takes on the tasks of data processing and result visualization. Students focus on the analysis of the adaptation of algorithm logic to educational scenarios. Through the reasonable division of cognitive tasks, cognitive overload in the learning of complex technologies is reduced, enabling students to simultaneously handle the correlation analysis between algorithm parameter adjustment and the accuracy of test question recommendation, thereby strengthening their in-depth understanding of technology application.

3.4The mapping path of teaching objectives under the framework of activity theory

Activity theory regards teaching as a systematic process of interaction among "subject - object - tool - rule - community", and the virtual-real integration environment provides a hierarchical mapping carrier for the teaching objectives of the intelligent question bank design unit. When the subject (students) acts on the object (question bank development tasks) through virtual tools (code editors, educational scene simulators), the rule system (development norms, educational standards) constrains behavior in real time through virtual prompts, and the community (teachers, virtual classmates) realizes knowledge sharing through the collaborative space.

In target mapping, the virtual environment constructs a concrete path of "task decomposition - element association". For instance, the goal of "cultivating system development capabilities" is broken down into sub-tasks such as ER diagram design, interface development, and stress testing in virtual scenarios. Each sub-task is embedded with corresponding rule prompts (such as database paradigms, educational data security standards), and the quality of task completion is fed back through community interaction (virtual review meetings) Transform abstract goals into actionable and verifiable sequences of specific activities to ensure the precise alignment of teaching objectives with scenario-based practices.

4.Scenario-based Construction Strategies of the Virtual-Real Integration Teaching Environment in the Intelligent Question Bank Design Unit

4.1Scenario-based construction based on teaching objectives

In the scenario of architecture analysis, digital twin technology is utilized to construct a three-dimensional architecture model of the intelligent question bank, presenting the operational mechanisms of the three levels of data, computing, and application in a hierarchical manner. Through interactive operations, students can delve deeply into the underlying logic of each module. Click on the intelligent search function, and the system will display the entire process of search engines based on inverted indexing in a dynamic and visual way. On this basis, mark the impact of word segmentation algorithms such as jieba and THULAC on search accuracy, achieving the transformation of abstract search technology principles into concrete visualization[4].

In the technical comparison scenario, relying on the virtual experiment platform of

"Algorithm sandbox", students can freely choose different test paper generation strategies (greedy algorithm, simulated annealing algorithm), and under the condition of input unified parameters (with a test difficulty coefficient of 0.6 and a knowledge point coverage rate of 80%), conduct simulated experiments. This system can generate real-time data curves such as the running time of algorithms and the target completion rate, demonstrating the differences among various algorithms in terms of test paper generation efficiency and the quality of test paper generation results. This comparison mechanism helps students gain a deeper understanding of the characteristics of algorithms, clarify the applicable scope of algorithms in different educational scenarios, and fundamentally achieve an effective transformation from theoretical cognition to technical application.

Taking "Smart Campus Question Bank Construction" as the core, a virtual practice system covering the entire development process was established. After communication with the virtual principal, students determined the service positioning and functional boundaries of the question bank. Use the ER chart tool to conduct structured design of the test question attribute table and standardize the metadata standards such as knowledge points and difficulty coefficients. The construction of the user interface prototype is achieved by using the drag-and-drop components of the low-code platform. The parameter adjustment and performance test of the intelligent recommendation model were completed on the virtual console. System deployment and stress testing are carried out in the cloud server simulation environment. Quantitative evaluation indicators have been set for each stage to ensure the gradual improvement of the project's practical ability .

The innovative design scenario is presented in the form of a "Future Question Bank Creative Challenge", providing students with cutting-edge technology module libraries such as brain-computer interface interaction, blockchain evidence storage, and emotion computing, to promote students' technological integration and innovation. Students can freely combine various technical components based on the needs of their educational application scenarios to design forward-looking question bank plans. Teachers can dynamically adjust the difficulty of the test questions to adapt to the system according to students' emotional states. Through virtual review, students' interdisciplinary innovative thinking and technology transformation ability can be cultivated.

4.2Scenario-based construction based on the teaching process

The demand research simulation scenario relies on a virtual education platform to construct three types of virtual user roles: teachers, students, and educational administrators. Students conduct multiple rounds of demand interviews as question bank designers. By discussing the intelligent test paper generation strategy with virtual teachers, understanding the functional requirements for error analysis from virtual students, and communicating with virtual managers about the permission Settings for question bank management[5], the system collects user feedback data, guiding students to use the demand analysis methodology to sort out the functional list and form a structured demand analysis report. This report, as a prerequisite material for classroom discussions, effectively activates teaching interaction.

An interactive learning environment was established in the virtual laboratory, and a series of practical operation tasks for core development tools such as Python,MySQL, and PyTorch were designed. Through specific operations such as "cleaning and preprocessing of test question data with Pandas" and "building a question bank API interface based on the Django framework"[6], students have gained a deeper understanding of the logic of tool usage. The system tracks the homework trajectory in real time, conducts intelligent analysis of weak links, and automatically generates personalized preview reports. It includes detailed annotations of technical difficulties and advanced learning suggestions, laying a technical foundation for the internalization of classroom knowledge, etc. Through the above methods, students have transformed from passive previewing to active exploration.

Case analysis scenarios introduce the "panoramic virtual backend" based on virtual reality technology. Students "shuttle" between the data monitoring large screen, the algorithm scheduling center and the user behavior analysis interface, and can directly observe the real-time flow of tens of millions of test questions and the operation of intelligent algorithms[7]. Taking teachers as the research object and regarding them as the core, the real-time calculation of users' answering trajectories is carried out to optimize the design of teachers' answering trajectories. From multiple aspects such as technical architecture, data processing process, and user experience, the essence of case design is analyzed, and the scalability and optimization paths of each functional module are explored[8].

In the fault diagnosis scenario, by presetting typical engineering problems such as test paper generation timeout and excessive repetition rate, students are encouraged to form cross-role problem-solving teams. Students need to collaboratively review the abnormal stack information in the system logs. In the virtual debugging environment, they should search for logical vulnerabilities in the volume generation algorithm code line by line and analyze the bottleneck of query efficiency in combination with the database index structure. During the process of fault location and repair[9], it is necessary to deeply understand the collaborative working mechanism of the data layer, algorithm layer and application layer of the intelligent question bank, master the systematic solution method from phenomenon analysis to root cause location, and improve the ability of fault diagnosis and repair in engineering practice.

The error attribution scenario is based on an intelligent assessment system. Once the trainees complete the self-test in the virtual question bank, a three-dimensional ability evaluation radar will be immediately generated, covering the degree of knowledge mastery, skill proficiency, and practical application ability. In response to the common problems existing in the test question bank, such as deviations in the parameter Settings of the intelligent test paper generation algorithm and insufficiently optimized test question difficulty prediction models[10], the system will automatically provide personalized review paths for students. Students can utilize interactive animations, disassemble algorithm principles, set parameters and optimize code logic in a virtual debugging environment, and verify the learning effect through phased ability tests, ultimately forming a closed-loop improvement of "diagnosis - learning -

consolidation"[11] .

In the industrial connection scenario, an immersive virtual exhibition hall is set up to comprehensively showcase the innovative achievements of industry leading enterprises such as iFLYTEK and Zuoyebang in intelligent question banks. Students can freely browse cutting-edge products such as the big data-based test question generation system and the AI-driven personalized homework recommendation platform, and have natural language communication with virtual product managers. Understand the development trends of industrial technology and market demand trends. From the design norms of lightweight question banks under the background of the "double Reduction" policy to the application of AIGC technology in the field of test question generation, students grasp the pulse of the industry in virtual dialogues[12], accumulate creative inspiration for graduation project topics, and at the same time build their own market awareness and forward-looking technical vision needed for career development.

4.3Scenario-based Cultivation Embedded in Ethical norms

The design of intelligent question banks involves ethical issues such as user data privacy protection and algorithm fairness. The virtual-real integration environment provides a scene carrier for the concrete teaching of ethical norms. The virtual system builds a dual-track scenario of "technical development - ethical verification" : In the teaching of the test question data collection module, students need to first complete the code implementation of the user authorization agreement through the virtual terminal, and then enter the simulated scenario - the system will generate a virtual public opinion event of "privacy leakage caused by unauthorized collection of students' answer records", demonstrating the ethical boundaries of algorithm application.

Meanwhile, the algorithm bias correction task is set up in the virtual environment. When students design test question recommendation algorithms based on machine learning, the system will import virtual datasets containing sensitive features such as gender and region, and present the deviation of the algorithm's recommendation results in different groups through a three-dimensional comparison interface. It guides students to embed fairness constraint functions at the code level, ensuring that the technical solution simultaneously meets performance indicators and educational ethics requirements. Realize the coordinated cultivation of technical capabilities and ethical qualities.

4.4Dynamic Scene Adaptation driven by Multimodal data

The virtual-real fusion environment relies on multimodal data collection and analysis technology to build a closed-loop mechanism for scene adjustment. The system synchronously captures students' physiological signals (eye movement trajectories, micro-expression changes) and behavioral data (code writing rhythm, module call frequency), and after fusion analysis, generates scene adaptation parameters: When the eye movement data shows that students' attention to the visual interface of a certain type of algorithm model is continuously below the threshold, the virtual scene will automatically switch to a presentation form combining flowcharts and pseudo-code. When the behavioral data indicates that students repeatedly make mistakes in the test difficulty calibration stage, the scene will immediately insert an interactive demonstration module of "the correlation between difficulty coefficients and students' ability distribution".

This adjustment mechanism ensures that teaching scenarios are always dynamically matched with students' cognitive states. For instance, in the optimization teaching of intelligent test paper generation algorithms, the peak cognitive load reflected by electroencephalogram (EEG) data triggers scenario splitting - breaking down complex multi-objective optimization problems into sub-scenarios such as "single-objective function construction" and "constraint condition setting", lowering the cognitive threshold while maintaining the integrity of technical logic.

4.5Scaffolding Construction for Cross-scenario knowledge transfer

The virtual-real fusion environment builds a bridge for knowledge transfer from virtual learning to practical application through stepped scene design. Primary scenarios focus on isolated training of technical principles, such as separately practicing the semantic parsing of test questions by natural language processing models in a virtual sandbox; The intermediate scenario construction combines the task of "technology + simplified educational scenarios", requiring students to apply semantic parsing technology to the automatic classification of test questions in a simulated junior high school classroom scenario, while also taking into account the coverage requirements of knowledge points in classroom teaching. The advanced scene interface simplifies the real educational scene data. Students need to optimize the question bank system designed in the virtual environment based on the real answering data of the mid-term exam of a certain middle school, and compare the performance differences between the virtual and real scenes.

Each transition node is equipped with a "migration prompt" tool: when switching from an intermediate scenario to an advanced one, the virtual assistant will generate a "Real Data Noise Handling Guide", marking the logic for handling outliers not covered in the virtual scenario, helping students identify the core differences between the two types of scenarios and effectively transfer knowledge from virtual training to actual development.

4.6Scenario-based Training of Multi-user Role Empathy

The virtual-real integration environment cultivates students' ability to design intelligent question banks from the perspectives of multiple subjects by constructing multi-dimensional user role simulation scenarios. The virtual system generates digital twins of typical users such as teachers, students, and educational administrators. Each role carries specific demand labels: the teacher role focuses on the efficiency of test paper generation and the coverage of knowledge points; the student role pays attention to the friendliness of the answer interface and the clarity of error analysis; and the administrator role emphasizes data statistics functions and permission management logic.

During the teaching process, students need to alternately enter virtual scenes of different roles to complete development tasks: when logging in as a teacher, functional modules that support one-click test paper generation and dynamic difficulty adjustment need to be designed in the virtual lesson preparation scene. After switching to the student role, it is necessary to test the smoothness of the interaction of the question bank in the simulated answering scenario and experience the optimization of the interface layout from the first-person perspective. When entering the role of a manager, it is necessary to build a statistical report module in the virtual background system that complies with the norms of educational data management.

This role-switching mechanism prompts students to embed user empathy thinking in technical development. For instance, when designing the test question push function, it is necessary to not only achieve precise coverage of knowledge points through algorithms (meeting the needs of teachers), but also ensure that the push frequency complies with the requirements of the "double reduction" policy (conforming to the standards of managers) At the same time, the push timing is optimized through the feedback on the answering behavior of virtual students (adapting to the student experience), making the design of the intelligent question bank both technologically advanced and user adaptable.

5.Practice and Effect Evaluation of Scenario-based Construction of Intelligent Question Bank Design Units in the Virtual-Real Integration Teaching Environment

5.1 Practical Case - Empirical Evidence of Curriculum Reform in a Certain University

In the spring semester of 2024, a university conducted a "virtual-real integration" scenario teaching experiment on 60 students majoring in educational technology[13]. The experiment was mainly based on the teaching platform built with Unity and was divided into three functional modules: The basic technology module integrated 12 technical micro-scenarios and supported practical operations such as BERT test question classification model training; In the field of educational applications, a question bank development plan covering three types from primary school to high school[14], higher education, and enterprise training was created, embedding nine typical demand cases within it. The collaborative development zone has achieved six-person online collaborative development, and is equipped with version control and project management functions.

In teaching practice, taking "The Development of a review question bank for the High School Entrance Examination in a certain middle School" as the core task point, students complete the entire process of development. The experimental results show that contextualized teaching can significantly improve the practical effect. The average time for students to debug code is reduced by 30%, the standardization degree of requirement documents is increased by 40%, and 85% of the final projects apply innovative technologies. The specific comparison is shown in Table 1:

Table 1. *Comparison of the Effects of Virtual-Real Integration scenario-based Teaching and Traditional Teaching*

Evaluation Dimension	**Experimental Group (Scenario - based Teaching)**	**Control Group (Traditional Teaching)**	**Improvement Degree**
Code Debugging Time (h)	4.2 hours	6.0 hours	30%
Requirement Document Score (points)	86.5 points	61.8 points	40%
Innovation Technology Utilization Rate (%)	85%	32%	166%

5.2 Effect Evaluation Indicators and Methods

To accurately measure the effectiveness of scenario-based teaching, a three-dimensional evaluation system covering knowledge, ability and experience is constructed. In terms of knowledge mastery, by means of standardized tests (accounting for 40%), focusing on the technical principles of intelligent question banks and knowledge of educational measurement, after the experiment[15], students' accuracy rate in complex knowledge assessments such as "intelligent question bank architecture design" increased by 25%.

The degree of capability achievement is evaluated based on project works (accounting for 50%), and is quantitatively scored from eight dimensions including the rationality of requirement analysis, the innovativeness of technical solutions, and the stability of system operation. The results show that the average score of the works in the experimental group reached 86.5 points, significantly higher than that of the control group at 72.3 points. For details, please refer to Table 2.

The learning experience was collected through a questionnaire survey (accounting for 10%). 92% of the students recognized that virtual and real scenarios enhance the sense of learning immersion, 88% believed that scenario-based tasks exercise problem-solving abilities, but 65% of the students suggested increasing the access to real educational data to improve the authenticity of the scenarios.

Table 2. *Comparison of Project Work Scores between the Experimental Group and the Control Group*

Group	**Average Score**	**Score for Rationality of Requirement Analysis**	**Score for Innovation of Technical Solution**	**Score for Stability of System Operation**
Experimental Group	86.5	17.3	18.5	18.2
Control Group	72.3	13.1	14.2	13.8

6.Conclusion

In conclusion, the construction of the intelligent test question bank design unit in the virtual reality teaching environment deeply integrates technological empowerment with educational demands. Practice has proved that this teaching mode has a significant promoting effect on students' knowledge acquisition and practical application ability. In the future, the integration of technology and teaching needs to be further deepened. The realism and interactivity of scene design should be further optimized. We should also explore the application of emerging technologies such as generative artificial intelligence in the dynamic construction of scenes, continuously improve teaching models, and lay a solid foundation for cultivating compound talents in the era of intelligent education.

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