# Talent training mode of new energy automobile technology specialty based on mixed reality technology

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**Keywords:** mixed reality technology; New energy, talent training; Cloud platform

**Abstract:** The mixed reality technology has a very broad application prospect in all aspects, and it will surely become the mainstream trend in the future study and life. With the development of China's new energy automobile industry, the demand for new energy automobile technology professionals is increasing, so it is necessary to establish a suitable talent training system. Informatization is an important design concept of professional curriculum development in higher vocational colleges. Using modern information technology to assist the teaching process is helpful to improve students' learning enthusiasm and cultivate students' professional core competence. Reconstruct the teaching process based on learning community, build holographic teaching environment, create teaching resources and optimize teaching methods by using mixed reality technology, build online learning hybrid teaching platform based on cloud classroom, evaluate teaching quality by big data analysis technology, and establish a scientific, timely and visual classroom teaching evaluation system to improve classroom teaching quality and better cultivate students' professional core competence. In recent years, with the continuous development of China's social economy, more and more people own private cars. However, with the continuous transformation of China's market economic system, the pressure of market competition in the automobile industry is increasing, which puts forward higher requirements for automobile technicians. At the same time, the demand for new energy automobile technicians is increasing.

## 1. Introduction

The abbreviation of mixed reality technology, AR, is developed on the basis of virtual reality technology.The real environment and virtual objects are superimposed on the same picture or space in real time and exist at the same time. Users use display devices (such as helmet displays). The definition of mixed reality makes it easy for people to confuse the concept of AR. The purpose of mixed reality is not to replace the real world with the virtual world, but to use additional information to enhance users' observation and perception of the real world. Virtual reality, augmented reality and mixed reality are all based on the prosperity of computer simulation technology. There are differences and connections between them. It should be said that mixed reality is developed from virtual reality and augmented reality, and their technological development influences each other, interweaves with each other and develops together. The mixed reality technology belongs to high-tech technology, which has great development potential and space in China. Generally speaking, augmented reality is in its infancy in China, and many enterprises that have paid attention to virtual reality technology gradually transition to the development and application of "mixed reality".

The demand for new energy vehicle professionals in the market is gradually increasing. However, after all, there is a big gap between new energy vehicles and traditional vehicles, so there is a high demand for professionals of new energy vehicles. As the transformation and upgrading of the automobile industry and the energy strategy, the new energy automobile industry's diversity in talent demand and knowledge demand determine that the new energy automobile technology major in higher vocational education must have a brand-new talent training mode to meet the talent demand of the new energy automobile industry, so as to ensure that the talent training of the new energy automobile major is in harmony with the development of the new energy automobile industry.

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Construct a reasonable professional curriculum system and highlight the training goal of practical skills, so as to cultivate more outstanding talents for the society.

## 2. Method

### 2.1 Research Status and Development Trend of Hybrid Reality Technology

The basic characteristics of mixed reality technology: authenticity; Interact with in real time; Imagination. As the mixed reality is developed on the basis of virtual reality, it has certain inheritance and consistency with the hardware of virtual reality system in hardware structure. In a certain sense, mixed reality is the further development of augmented reality and interactive media. A typical mixed reality system consists of a virtual scene generator, a helmet display, a head posture tracking device for tracking the user's sight, a positioning device and an interactive device for aligning the virtual scene with the real scene. The virtual scene generator is responsible for the modeling, management, drawing of virtual scenes and the management of other peripherals. The head tracking device tracks the change of the user's line of sight, and realizes the matching between the user's observation coordinate system and the virtual scene coordinate system.The functions and requirements of the above parts are the same as those of the corresponding units in the virtual reality system, as shown in Figure 1.

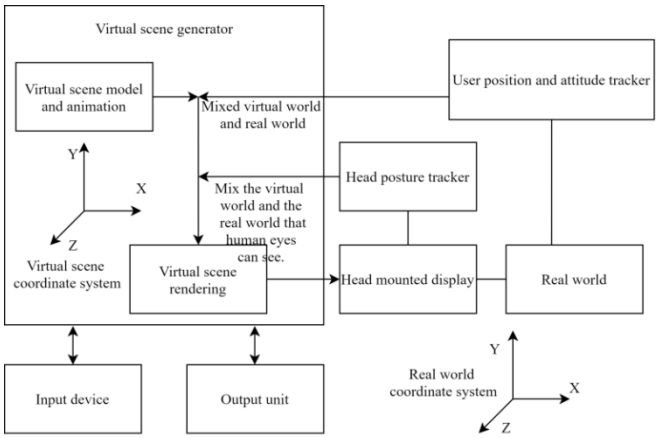


Figure 1 Structure diagram of typical mixed reality system

Because the mixed reality technology is a composite application of real reality, augmented reality, virtual reality and other technologies, its technology can expand in a very broad space, and a variety of technologies in real or virtual environments can be used in an overlapping way. The diversified and multi-dimensional development space provides infinite possibilities for the display technology of mixed reality. The application fields of mixed reality technology are extremely wide, including education, medical treatment, sports, military affairs, art, culture, entertainment and other fields. When virtual and virtual spaces are merged, it is necessary to meet the laws of this physical space.The interaction effect between virtual and virtual spaces is generated by finite reconstruction of the real scene. Including occlusion processing, lighting processing, real-time rendering,dynamic object movement and interactive effects, consumers can freely shuttle between virtual and real, breaking the rigidity of traditional static display and one-way information transmission, and interacting and communicating between people and things in real time. The space for application and development of this technology is also very broad. With the continuous development of science and technology, multimedia technology and computer technology, the types of mixed reality display technologies will be constantly expanded. The mixed reality system also includes human-computer interaction devices, such as data gloves, 6D mouse, tracker, force feedback device, speech recognition and synthesis system, etc. Each device has various varieties and different performances. The topology diagram of the system structure (including hardware structure and software structure) of the project is shown in Figure 2.

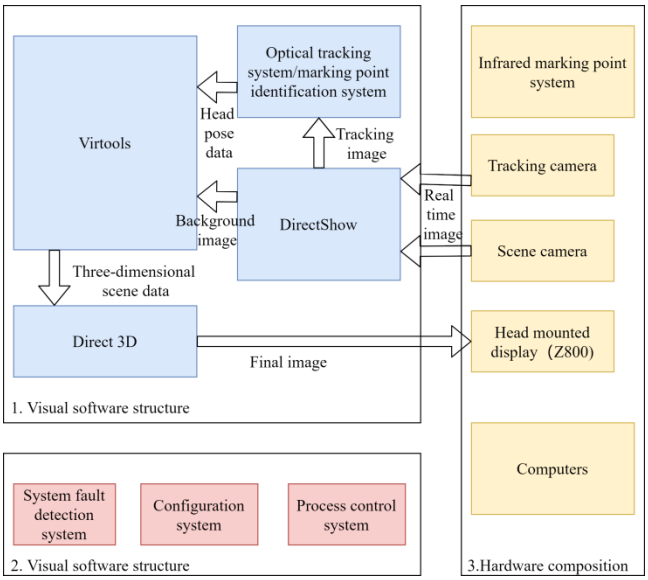


Figure 2 Topology diagram of system structure

In the mixed reality system, the HMD should not only have the ordinary 3D image display function, but also be able to track the position and posture of the user's head in real time, that is, track the direction of the line of sight, and feed back the line of sight information to the image generation software in time, so as to realize the synchronous refreshing display of the visual image and the enhanced information, so that the user can swim in the enhanced environment by observing the surrounding things in the real world. So as to enhance the user's integration environment. In the mixed reality system, the HMD should not only have the ordinary three-dimensional image display function, but also need to be able to track the position and posture of the user's head in real time, that is, track the direction of the line of sight, and feed back the line of sight information to the image generation software in time, so as to realize the synchronous refreshing display of the visual image and the enhanced information, so that the user can swim in the enhanced environment by observing the surrounding things in the real world, thus enhancing the user's integration. Virtual crowd or traffic simulation has made great progress in recent years. However, general simulations are carried out in virtual reality environment. In mixed reality, when virtual crowd is embedded in the real world, its dynamic behavior will interact with the real scene, but in mixed reality environment, the real scene is generally difficult to change. Therefore, the behavior of virtual crowd needs to consider the conflict and coordination with the real world and adapt to the objects, scenes or plots in the virtual environment. Its movement needs to meet the basic physical laws and self-consistency, which leads to the perception of the real world environment, and the perception of the real world state will be quite different due to different conditions. Higher-level conflicts in mixed reality come from the behavioral interaction between human behaviors in virtual and real space. When virtual characters move in real space, they not only need to meet the requirements of virtual and real integration in visual space and the constraints of video scene environment, but also need to make their behaviors conform to social norms and meet the psychological paradigm of human behavior. The following formula will be used:

$$-\frac{h^2}{2\mu}\cdot\frac{\partial^2\psi(x,t)}{\partial X^2}+U(x,t)=ih\frac{\partial\psi}{\partial t}(1)$$

And this formula:

$$-\frac{h^2}{2\mu}\Delta^2\psi+U\psi=E\lambda(2)$$

To minimize the accuracy function of the network, it is necessary to train the radial basis function neural network. The error between the expected output and the actual output of the network

determines the accuracy, so the fitness function is established as follows:

$$F = \frac{1}{\sum_{i=1}^{N}\sum_{j=1}^{k}\left[Y_j(i) - \overline{Y}(i)\right]^2} \quad (3)$$

Their gestures and behaviors must adapt to the constraints of video scene environment. At present, most of the relevant personnel who are committed to product display design have graduated from art majors or commercial marketing majors, and they have a lot of knowledge about aesthetic feeling, commodity marketing strategies, etc., but they are relatively short of the design ideas and forward-looking vision of developing with new technology.

## 2.2 Construction of New Energy Technology Talents Training Scheme

Through various forms of investigation, such as interviews and questionnaires, the demand for new energy talents in car beauty is investigated, including new energy vehicle inspection and maintenance, new energy vehicle maintenance, new energy vehicle sales and after-sales service, workshop supervisor, technical director and other positions. The results of the investigation have the following characteristics: 1. New energy talents in car beauty are urgently needed; 2. High-skilled service-oriented talents of new energy vehicles are urgently needed. The talent training goal of new energy application technology specialty is to cultivate and master certain professional basic theoretical knowledge, with strong practical skills, good professional ethics and innovative spirit; Technical and skilled professionals who have strong practical working ability, can meet the front-line needs of new energy automobile enterprises and have sustainable development ability. The specific ideas are as follows: 1. Mutual benefit and win-win, perfect the mode of "school-enterprise cooperation, industry-university connection"; 2. Break down technical barriers and build a "order-oriented" talent training model; 3. Take new energy vehicles as the main line, and build a curriculum system of "class-post docking, progressive ability"; 4. Establish a "double-qualified" teaching team, guided by famous teachers and supported by projects. School-enterprise collaborative innovation, driven by project tasks, guides students to form a learning community, to accomplish common learning goals and collaborative learning, and to complete common project tasks as a carrier to establish a learning circle, as shown in Figure 3.

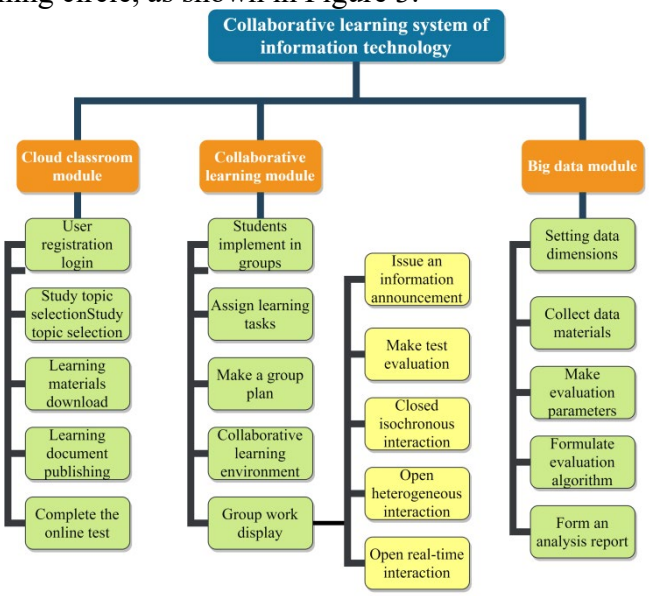


Figure 3 Information-based teaching platform framework

Before positioning the new energy automobile specialty, we should make an overall survey of the market to see what kind of new energy automobile technical professionals are needed in the market, and carry out directional training for students according to the current industry development route and industrial structure, determine the talent training objectives, build a talent training system, and

constantly improve the comprehensive quality of students, so as to improve the employment rate of higher vocational colleges. In order to ensure that the expected goal is achieved, the teaching evaluation of the teaching implementation process of professional courses is carried out, as shown in Figure 4.

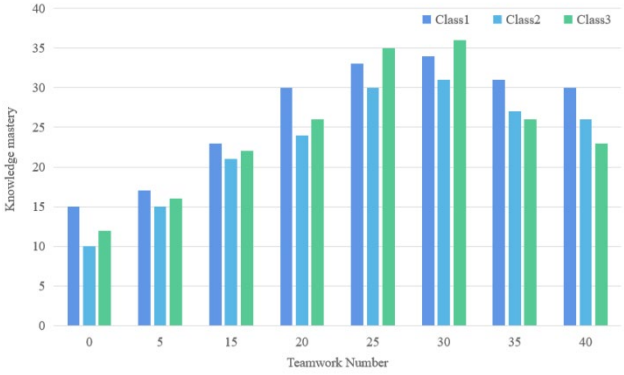


Figure 4 Curriculum framework

Only by constructing a scientific and reasonable professional curriculum system can we continuously improve the efficiency and quality of professional curriculum teaching. When constructing the professional curriculum system, we should take employment as the guide, choose reasonable teaching contents according to the work requirements of enterprises, build a curriculum system of "combination of work and study, progressive ability", train talents with the work task as the center, and make clear the training ideas of talents with modular and modular teaching schemes, so as to make sufficient preparations for training talents suitable for the development of enterprises. Constantly improve students' professional quality; Secondly, it is necessary to cultivate students' core professional ability and cultivate students' psychology of loving their jobs and dedication; Finally, higher vocational colleges should also cultivate students' working ability so that students can adapt to social work in advance. Through enterprise investigation and professional construction discussion, the typical post tasks are defined, the learning field and action field are summarized, the learning situation is designed, the teaching content is selected, and the course content is divided into three teaching modules, with a total of nine learning items. Based on the above-mentioned course content reconstruction, the docking of production process and teaching content can be realized, and the teaching atmosphere can simulate the enterprise environment as much as possible, as shown in Figure 5.

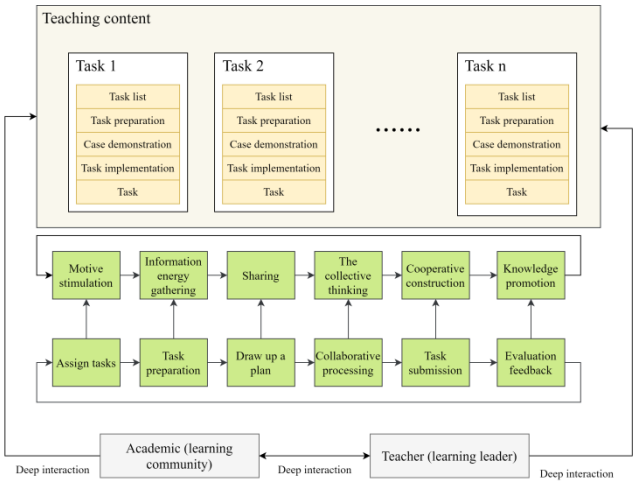


Figure 5 Learning Community

Before, during and after class are organically integrated, and the teaching process is systematically designed to encourage students to "learn by doing, learn by doing". The classroom content is released in the form of tasks, and the teaching quality is guaranteed through the early

theoretical explanation and answering questions, the on-site guidance of teachers, and the post-training evaluation. Before, during and after class are organically integrated, and the teaching process is systematically designed to encourage students to "learn by doing, learn by doing". The classroom content is released in the form of tasks, and the teaching quality is guaranteed through the early theoretical explanation and answering questions, the on-site guidance of teachers, and the post-training evaluation. Take the theory-practice integrated training room jointly built by school and enterprise as the teaching place, and apply the information-based teaching resources of virtual simulation platform to the teaching process; The online open course website of this course's excellent resources has been established, and abundant high-quality teaching resources can meet the students' lifelong learning needs.

## 3. Analysis of results

Based on the cloud platform of vocational education, online learning space is set up, and on-site teaching is carried out by using the offline theory-practice integrated training room, and a hybrid teaching mode combining online and offline is constructed. The implementation of the course is divided into three stages: pre-class exploration, in-class guidance and after-class expansion. After teaching, examine the achievement of learning effect. In this paper, the deep integration teaching mode of information technology and collaborative learning is put into practice for students majoring in automobile inspection and maintenance technology in Grade 2021. Through the analysis of students' course test scores and enterprise research, and comparing the learning situation of students in Grade 2020 and Grade 2021, it can be seen that students' execution ability, teamwork, labor quality, practical ability and skill level, and knowledge mastery have been comprehensively improved (Table 1 shows the statistical results).

Table 1 Comparative statistical chart of learning effect

| Grade/Dimension | Implementation capacity | Labor accomplishment | Practical ability, Skill level | Teamwork | Knowledge mastery |
|---|---|---|---|---|---|
| **Class 2021** | 9.6 | 9.5 | 9.7 | 9.8 | 9.4 |
| **Class 2020** | 6.9 | 6.2 | 7.1 | 7.3 | 6.3 |

Ideal mixed reality technology is a visually indistinguishable mixed environment, which provides a mixed environment from static scene to dynamic scene, from rigid body motion to flexible object motion, from non-intelligent object to intelligent object, covering virtual and real as well as virtual and real robots.as shown in Figure 6.

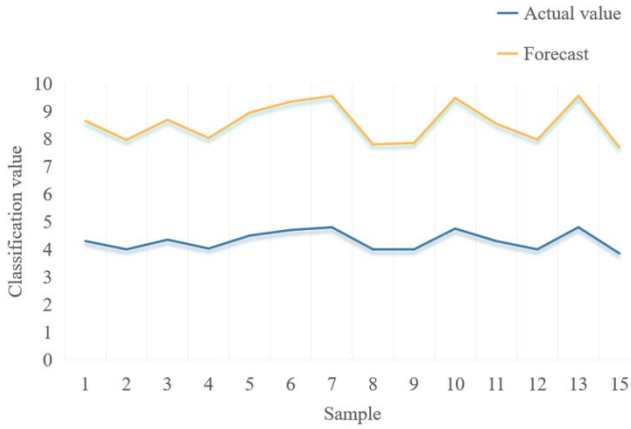


Figure 6 Analysis Table of Curriculum and Professional Ability of New Energy Automobile Technology Specialty

Users can be real human beings or robots. Interaction can be between users and virtual objects, virtual objects, or virtual objects and real objects. In the mixed reality environment, computer analysis is driven interactively, and feedback is presented to users through visualization, thus

forming a deep integration between human and machine intelligence, and providing a platform for deep integration of human and machine intelligence.

## 4. Conclusion

As the technical difficulty of the mixed reality display technology includes both hardware and software, the research and development process of a product display equipment from the conception to the trial production of finished products requires not only the innovative trial production of hardware equipment, but also the innovative development of software programs, which requires repeated technical demonstrations. Combine a series of comprehensive technologies such as information communication, computer graphics, multimedia audio-visual technology, microelectronics technology, artificial intelligence technology, network technology, sensing and measurement technology, etc. to develop and design the equipment and software, and then carry out repeated experimental demonstration, repeated debugging and other processes. After the internal structure of the equipment is basically determined, it will be determined from the perspective of equipment function, consumer demand, interactive characteristics, etc., combined with ergonomics, materials science, design aesthetics, design psychology and other aspects.

While attaching importance to skill training, we pay special attention to strengthening quality education. Quality education runs through the whole teaching process, from the beginning of students' entering the campus to graduation, and students are encouraged to carry out self-education and self-management in various ways. Teachers' teaching tasks in each class cover the content of quality education, and make full use of the implementation of process courses to form the characteristics of education. At the same time, we should enrich educational means, expand educational space, actively build a platform for students to show their individuality and talents, advocate the educational concept of "people-oriented", and carry forward the essence of humanized education. In the process of constructing the training program of new energy vehicle technology professionals, it is an important part to change the teaching methods. Whether the teaching method is scientific and reasonable will have an important impact on the training of professional and technical talents in higher vocational colleges. In the process of training new energy vehicle technology major, scientific teaching methods will improve teaching quality and efficiency more effectively. When setting professional courses, it is necessary to consider the recruitment requirements of enterprises, take the recruitment requirements of enterprises as the teaching goal, set professional courses according to the recruitment requirements of enterprises, and regard job requirements as the core content of professional courses teaching, so that the development of students can better meet the requirements of enterprise talents. It is necessary not only to cultivate students' professional skills, but also to cultivate students' professional quality and improve their adaptability, so that students can adjust their working mentality as quickly as possible after they graduate to work in enterprises.

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