Research on the Integration Reform Design of Accessibility Design Course and Virtual Simulation Technology

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Abstract

In today's society, with the normal introduction of information technology and digital literacy, China's education and teaching reform has also entered a stage of rapid development, and the teaching mode of digital informatization has also begun to receive derivative development. Therefore, based on this background, the overall reform design of the course is based on the "Accessibility Design" course and combined with modern virtual simulation technology, aiming to make the course more in line with modern education models, It also provides a strong foundation for future curriculum construction and student development, promoting the modernization of teaching modes.

Keywords

Accessibility design; Curriculum reform; Virtual simulation technology; Information modernization.

1. Introduction

Virtual simulation technology is an emerging technological means in modern society. By simulating the real environment, virtual models are constructed, providing strong theoretical and technical support for solving urban construction, architectural design, and other aspects. Virtual simulation technology is a new type of technology that integrates multiple disciplines. The characteristics of this technology are reflected in its immersion, simulation, and realism, and it is often used in international industrial design, industrial design, and other aspects.

In the development of virtual simulation technology both domestically and internationally, virtual simulation technology is in full swing. Foreign technologies have developed earlier and are mostly used in national defense technology and engineering construction. The technology is relatively mature and many universities have already introduced design components for teaching in the classroom. In China, the development is relatively late. For example, Li Dapeng used OTA technology to establish a teaching experimental platform for upgrading and maintaining remote control equipment Dong Shuhui analyzed the necessity and feasibility of applying virtual simulation technology to course teaching. These are all previous studies that have provided a lot of theoretical basis for the development of virtual simulation technology in China, and have provided a continuous source of power for the development of new technologies and formats in China.

2. Course Design Analysis

The course "Accessibility Design" is a compulsory course for environmental art and design majors. This course is based on urban construction and public service facility construction in the context of aging society development. Most of the courses use theory, graphic design, and model construction methods to enable students to learn how to construct accessible space design for indoor and outdoor environments in building spaces in an aging society, The steps from thinking to graphic design constitute the basic teaching outline of this course. In the construction of the course, it was found that the integration of model construction and virtual simulation technology can effectively enable students to experience the rationality of their work design through virtual simulation technology, clarify the problems in their design from the experience, and increase the experiential nature of the classroom, thereby creating a fun classroom design atmosphere.

3. Reform methods and content

3.1. Curriculum design composition

In the design of the "Accessibility Design" course, through the early analysis and understanding of this course, in the overall construction and design, the original teaching methods and content methods are mostly based on theory and drawing practice. Therefore, in the later reform, we will increase post training and integrate virtual simulation technology to make the overall course more scientific and verifiable. Increase the teaching hours of the course and adjust the virtual simulation experiments of the practical training courses in the plan, thereby making the design of the entire course more participatory and experimental.

3.2. Reform Methods for Curriculum Design

The primary way of reform is to construct experiential courses, partially reform and adjust the curriculum standards and overall design of teaching, including partial division of theoretical and practical training hours, and adding practical training hours for virtual simulation experiments, transforming the overall course from the original theory and drawing to the current theory and drawing and practice.

Then, we keep the original nature of the course unchanged. The construction of this course mainly focuses on learning the theoretical elements of accessibility, accessibility awareness, and accessibility design scale. By influencing students' accessibility thinking, we consolidate the significance of the construction of this course and make students understand the importance and necessity of learning this course. After theoretical learning, students will improve their course assignments through practical projects, mainly through pre drawing in Auto CAD, and overall design from the perspective of plane layout, which includes unobstructed elements of indoor and outdoor spaces in buildings. They will integrate them in terms of height, ramps, and accessibility (Figure 1), and then establish a three-dimensional model space through sketch up and 3D Max software, Design the plan of the flat space in the form of a three-dimensional model, and students improve the space in the later stage by establishing and observing the model space.





Finally, experimental verification is carried out through virtual simulation technology training courses. In traditional teaching, we mostly evaluate the final course assignments by students submitting plan drawings and rendering design schemes. This method tests students' drawing ability and drawing standards. Teachers can only view students' assignments and give corresponding evaluations through intuitive means, Although such an evaluation is a

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verification of the rigor of student mapping, it can also have a certain degree of subjectivity. Therefore, in the practical training course of virtual simulation experiments, we can import the obstacle free space model established by students into the virtual simulation platform in the later stage, and then combine VR technology in the later stage to let students feel the spatial sense of the model from the first perspective (Figure 2). In the spatial experience, students can quickly understand where the unreasonable parts of their designed model appear, such as high slopes, Insufficient size and space have caused inconvenience in passage. The virtual simulation technology platform will collect problems generated during roaming, and finally provide corresponding suggestions to students through automatically packaging model space problems. Students can observe the problems in their self-designed accessible space through the packaged files and make later work modifications. This approach not only allows students to participate in spatial models from a first perspective, enhancing their course experience, but also enables them to discover their own problems and learn from practice and experience.



Figure 2. Virtual simulation experience of accessible design course

This is a new type of experiential curriculum teaching model. It can greatly enhance the enthusiasm of students and accurately point out their problems.

4. Conclusion

The development of modern society is diverse, and the development of new technologies, materials, and formats is a necessary path for modern society. This article studies and explores the course of Accessible Design, and integrates virtual simulation technology into the practical training of the course, promoting the overall optimization and structural optimization of the course, making it more scientific and diverse.

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