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The Design and Realization of Virtual Experimental Teaching Simulation Platform for the Field Reporting of Disaster Events

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***Abstract*—"Disaster Event Sites" is difficult to restore and it is dangerous to report it on the spot, so "on-the-spot disaster coverage" teaching is always in the state of "To teach but not to practice." By analyzing the current situation and existing problems of news experiment teaching, this paper discusses the design and implementation of virtual experiment teaching simulation platform for disaster event on-site reporting and its application in specific news experiment teaching. The characteristic of "combination of reality and reality" is conducive to promoting the training of news application talents, realizing the diversification of teaching resources and teaching scenarios.**

Keywords—disaster event site; virtual simulation experiment platform; multimedia technology; combination of virtual and reality

Since disaster events have a great impact on people's production and life, the media has always attached great importance to the reporting of disaster events. According to the present situation of on-the-spot reporting of disaster events, this paper analyzes the application of virtual reality technology in the field of on-the-spot reporting of disaster events, and puts forward a method of applying virtual reality technology in the simulation platform of virtual teaching of on-the-spot reporting of disaster events.

I. THE STRUCTURE DESIGN OF NEWS REPORT VIRTUAL SIMULATION PLATFORM

Disaster events are unexpected events that occur suddenly in the process of people's production and life, violate people's will, force activities to stop temporarily or permanently and cause a large number of casualties, economic losses or environmental pollution. The media has always attached great importance to the reporting of disaster events because they will have a significant impact on people's production and life. Virtual reality technology is applied in more and more fields. The virtual simulation platform of disaster event reporting is a combination of virtual reality technology and multimedia technology. It aims to organize the learner to complete the full-process reporting training including planning, interviewing, writing, and on-the-spot reporting by providing a sensitive "disaster event site" driven by reporting tasks.

A. The Overall Solution of Virtual Simulation Platform

Virtual simulation platform realizes visual, auditory and tactile similar scenes in a certain range by using simulation technology, establishes real-time and dynamic three-dimensional images by computer graphics, realizes the situation which can't be achieved in reality, and breaks through the obstacle between reality and virtual [1]. The learners use the mobile terminal to log in to the experimental teaching platform, wear VR glasses and enter the virtual simulation disaster event scene to carry on the observation experience interview. After the interview, the learner uses the virtual simulation experiment system to complete the disaster event scene report recording. After the experiment, the report video, the experiment report will be released to the system platform through the mobile phone terminal; the learners can carry on the mutual evaluation. In the process of experiment, the learner takes the real task to study in the exploration, the thirst for knowledge is stimulated, and the sense of achievement is satisfied.

B. Modular Design of Virtual Simulation Platform

To solve the problem of the traditional experiment way limited by space, time and equipment, and improve the teaching quality of the sensor technology experiment [2]. The virtual simulation experiment platform for on-the-spot reporting of disaster events is the product of the organic integration of information technology and news experiment teaching, which fully expands the practical resources and space of the students' on-the-spot reporting of disaster events, and opens up a new model of news reporting. Virtual simulation platform includes five modules as publishing report task, receiving report task, watching VR disaster scene, choosing reporting position to record video, submitting video. The learner will participate in each link of news production, from receiving report task to collecting and writing, and then to the news release.

The virtual simulation experiment platform is preset with three disaster scenes of earthquake, tornado and fire; the material quality requirement is high-definition panoramic video. Earthquakes and tornadoes are natural disasters while selected fires are man-made disasters. During the experiment, students need to choose disaster scenes according to specific training

objectives. Before the experiment, teachers need to preset the students participating in the experiment. Teachers select corresponding class members to join the "course" in the background of the system. The experiment should have a relatively complete process. For example, in addition to the burning situation, the fire scene should also reflect some firefighting and rescue situations.

C. Innovative Features of Virtual Simulation Platform

1) Combining virtual simulation technology with video synthesis technology

At present, the running news virtual simulation experiment platform all uses the first person angle of view to experience the scene. The learner, as the reporter, can't see their own in the disaster event on-the-spot reporting effect. The virtual simulation experiment platform of disaster event scene report enables the learner not only to get the material through the "disaster event site", observation experience, but also to select the reporting place to complete the on-the-spot report. At the same time, we can review the report effect and analyze the problems in the report. The learners are trained to master the relevant knowledge of “on-the-spot disaster coverage” and acquire relevant skills, such as sensitive news, writing ability and performance before the camera.

2) Using the new media gathering and broadcasting platform which is connected with the industry

As a training ground for training all-around newsmakers, the virtual simulation experiment platform for disaster events provides support for learners to master the ability and skills of broadcasting, enhance the ability of TV program production and scheduling, and improve the artistic and creative skills of TV program production. In this kind of environment, how to deal with camera equipment, scene layout and safety station, how to report the actual situation of the scene and mine favorable information are studied. Compared with the training of local knowledge points provided by traditional teaching, the virtual simulation platform is similar to the working situation of actual production, which makes the experiment effect close to the real report training effect.

3) The Investigation of Reporting “timeliness” by Multimedia Technology

The reporting work in any real situation is “time-limited work” or even “rush work”, and the on-the-spot reporting of disaster events is more time-consuming, so it should also be required for the “report completion time” of learners. Unlike the traditional teaching mode, the task of the virtual simulation experiment platform of disaster event reporting is completed online. The system platform can accurately record the time from the task of receiving reports to the final submission of works, and can provide accurate and effective data. The on-the-spot reporting of disaster events under event pressure helps learners better adapt to the working intensity of real media.

The problem that teachers are difficult to train students in time-limited reporting in traditional teaching is solved. Improving the speed of students' reporting is one of the goals of journalism practice teaching, but due to technical limitations, it is difficult for teachers to require students' reporting time in traditional teaching activities. In this experimental project, a timing system is designed in the teaching software. The time when students finish reporting is accurately recorded and the teaching goal of time-limited reporting training for students is realized.

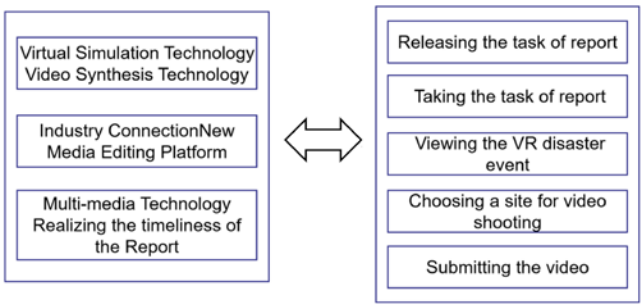

Fig. 1. Structure Design of News Report Virtual Simulation Platform

II. THE KEY TECHNOLOGY OF THE VIRTUAL SIMULATION EXPERIMENT

On the basis of computer simulation technology, multimedia technology and network technology, the experimental platform of virtual simulation of disaster events adopts the platform of developing software architecture, innovating design and teaching management for learners, which has good autonomy, interactivity and extensibility.

A. Technology Architecture of Virtual Simulation Experiment Platform

The renewal of media enhances the sense of immersion from the point of view of technology. This kind of enhanced immersion is embodied in the sense level, i. e. the basic sense of vision, hearing and so on [3]. The full-media virtual news fusion platform includes visual management, fusion production, content library, internet cue convergence and backstage and external auxiliary business system. Virtual simulation experiment platform continues the original system of collection and compilation, VR viewing system, the learner, by receiving the task, carries on the virtual scene report. After the report, the learner carries on the synthesis editing, submits the work to the teacher management platform to carry on the mutual evaluation and the grade, and then carries on the external publication. As far as possible, the platform technology framework helps learners to realize their own experiments, strengthen their own open service capability, and thus enhancing the effect of open service. The live broadcast platform supports the access of various live broadcast streams and equipment, provides a cloud guide station for on-site production, and supports the addition of subtitle switching effects and so on. The platform provides CDN acceleration services across the network which can make viewing smoother.

B. Instrumentation Support for Virtual Simulation Experiment Platform

Virtual simulation platform provides video editing APP and B/ S non-editing, can complete the simple video editing and production, and through the back-pass system, it will transmit the completed video back to the platform content library, forming unified management. Using virtual scene synthesis

reporting equipment, learners can take pictures, record video, and audio. After receiving the task, they could watch the VR disaster site to confirm the reporting location and news leads, hence completing the production of new media content and other content production. Visual management equipment provides workload data statistics, scheduling management and data visualization functions. The live broadcast platform supports all kinds of direct broadcast flow and the access of the equipment, provides the cloud guide station to carry on the field production, and supports the addition of the caption switch special effect and so on. The platform provides the whole network CDN acceleration service, which can realize the more fluent viewing effects.

C. Software Design of Virtual Simulation Experiment Platform

The application of virtual simulation experiment platform has changed the traditional teaching method fundamentally, reduce the cost of laboratory construction and management, which has important reference value to realize the remote experiment teaching [4]. Because the experimental results of TV news acquisition and writing course are usually videos with large files, which are difficult to store and distribute, in traditional teaching, students seldom evaluate each other's works, and students' learning is not easy to carry out. This experimental project uses cloud storage technology, so that all students' works can be shared on the system platform, and realizes the mutual evaluation and sharing of works among students.

The live broadcast platform also has a live broadcast task audit mechanism and the live broadcast stream background monitoring function. While monitoring, the broadcast administrator can add watermark, logo and so on. If the report site needs to be live broadcast support, start live broadcast task, the system platform can also ensure the safety of content dissemination. Operation module provides data statistics and analysis, advertising system, C-side user management, interactive components and other sub-modules. Virtual simulation platform provides two versions of iOS and Android APP. At the same time, learners need to prepare special hardware requirements for computers. Mobile phones are compatible with mainstream Android and IOS devices with integrated head-mounted VR virtual reality glasses.

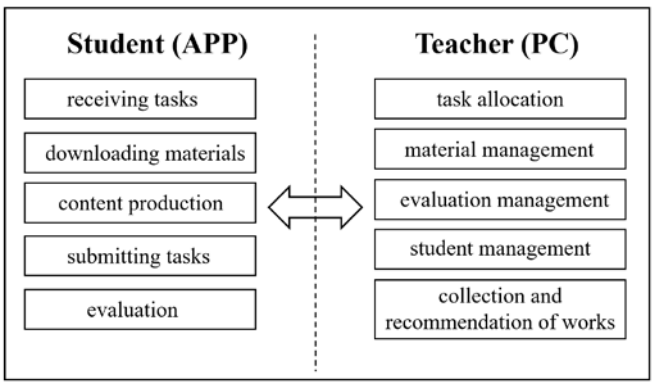

Fig. 2. Functional Sketch of Experimental Software

Micro-site releases using H5 technology to release mobile microsite pages, which are compatible with the mainstream mobile phone browser, and adapt to mainstream models screen, but also can bind micro-site page with WeChat public menu for publication. Multi-platform publishing is a release container, which can share and distribute content resources by providing the unified integration and management of the third-party publishing platform. The operation module provides sub-modules such as data statistics and analysis, advertising system, C-end user management, interactive components and so on. The system will be extended with the deepening and promotion of education and teaching.

III. THE EVALUATION INDEX SYSTEM OF VIRTUAL SIMULATION EXPERIMENT TEACHING

According to the evaluation standard of radio and television news program, setting up the multi-dimension and multi-link evaluation mechanism in the project management module of virtual simulation experiment teaching on the spot report of disaster events, which supports teacher evaluation, student evaluation, audience evaluation, media evaluation and comprehensive consideration of students' ability.

A. Construction of Evaluation Index System

Mutual evaluation of works and sharing of experiences are very good ways to complete learning among students. However, due to time and technology constraints, it is difficult to organize the mutual evaluation and sharing of experiences in traditional teaching. Based on drawing "flipped classroom" experience of practitioners domestic and foreign, together with the full use of modern information tools [5]. The virtual simulation experiment has constructed the "Teacher's evaluation + self-evaluation + student's evaluation + audience's evaluation + media's evaluation's" multiple evaluation system, including the content of each link before, during and after class. The learner's operation information is accurately recorded by chart, and the corresponding system intelligence score is formed. The resulting team learning training report is integrated into the results of member mutual evaluation, displays the team learning situation, and develops the learner's team consciousness and leadership ability. There are intelligent error correction tips in the operation process. After the training is completed, the result can be automatically generated to achieve the effect of real-time interactive feedback, and the whole process evaluation mechanism can be realized. It has changed the single evaluation method of teacher evaluation. It encouraged the self-reflection with self-evaluation, and promoted mutual learning by scoring comments for other learners.

B. The Teaching Method of Virtual Simulation Experiment

The application of "task driven" experiment teaching mode transforms the teaching with imparting knowledge in the past into multi-dimensional interactive teaching with solving problems and accomplishing tasks, transforms the reproducible teaching into inquiry learning. In this way, the students are always in a positive learning state, and their ability to solve practical problems is improved. It is found that by considering the characteristics of the disaster, economic and technical factors, and the initial level of coverage, disaster managers can

predict newsworthiness, the points of maximum demand for information, and the most stressful time in terms of media attention [6]. The teacher explained to the students the purpose, principle, content, steps and requirements of the experiment. Instruct students to download the software needed for the experiment and introduce the main function modules of the software to students. Introduce the use of experimental hardware (VR glasses, green box).The virtual simulation platform attaches great importance to the goal of "task" and the creation of teaching situation. It can make students feel the impact, pre-camera pressure and time pressure of reported events in the process of experiment by restoring disaster scene and timing report.

Students can't only choose the role of reporter, but also choose other roles. Students can switch different identities to obtain different experiences and try the novelty brought by different roles to enable students to look at problems from the perspective of others in later study and work. Panoramic experience makes up for the problem of insufficient narrative ability caused by editing and sorting in the traditional news production process, transforming the original ordinary linear narrative structure into a network narrative structure and presenting the background and the relationship between the characters in news events intuitively and completely[7].

C. Test requirements for virtual simulation experiments

The virtual simulation experiment requires the learner to submit a disaster event report in the specified time, and a score will be given according to the quality of the field report. The core requirements include the work completion speed, report structure integrity, report logic, report information, pre-camera performance and so on. At the same time, learners are required to master the methods of observation, experience and so on. They are actually involved in the whole process of on-the-spot reporting of disaster events including preparation, design, recording, post-stage, release and operation. Through the virtual scene environment, they are required to grasp the key points, emergency measures and the final effect of disaster events, and obtain the experience of reporting and transmitting problems, so as to improve the ability of contingency and pre-camera performance. Through the immersive experience of virtual technology, to help learners build a practical environment, so that to make this experience richer and more real. Students can complete all experimental tasks including receiving tasks, downloading materials, content production, submitting tasks, evaluation and so on. Teachers can log into the background of PC terminal to complete task allocation, material management, student management, evaluation management, collection and recommendation of works and other experimental management work.

IV. CONCLUSION

The development needs of the on-the-spot reporting of disaster events and the expanding trend of virtual reality technology to the new field would constantly promote the development of virtual reality technology to a deeper level of application, higher quality standards. The virtual simulation platform of disaster spot report introduces classroom teaching by mining all kinds of social resources and simulating business practice, which provides convenience for learners' practical business, and is conducive to cultivating new media people's adaptability and professional accomplishment in the face of emergency and major news scene.

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