Constructing a Student Mental Health Education Platform Based on Virtual Reality Technology - Value and Practical Pathways

Dan Liu[1,2]([✉])

[1] Changzhou College of Information Technology, 22 Mingxin Middle Road, Changzhou Science and Education Town, Jiangsu, China
dan957329@gmail.com
[2] Gachon University, 1342 Seongnam-daero, Sujeong-gu, Seongnam-si, Gyeonggi-do, South Korea

Abstract. The construction of a student psychological education platform based on virtual reality technology aims to provide a psychological intervention tool that is more adaptable to students' cognitive and social lifestyles in the information society. The research is based on a prototype development process and includes six functional modules: user management, assessment measurement, psychological counseling, psychological intervention, resource sharing, and data analysis. By combining comparative analysis and validation of the advantages of three mainstream virtual reality development engines, a data resource library structure for the student psychological health education VR platform is established. The study evaluates the feasibility and sustainability of the platform by analyzing collected data and evaluating its value based on three utility factors: treatment effectiveness, user experience, and cost-effectiveness. The research shows that virtual reality technology has significant significance in improving the effectiveness of psychological interventions, achieving personalized education, and improving the accuracy of data analysis and evaluation in the development of psychological health education platforms, and create a favorable social environment for the development of college students' mental health.

Keywords: Virtual Reality Technology · student mental health · Construction principle · resource structure

1 Introduction

Student mental health issues have received increasing attention worldwide. The UNESCO has repeatedly emphasized the importance of school-based mental health education. In 2015, the UNESCO International Education Conference stated that "mental health is the foundation of students' comprehensive development, and schools should help students establish a healthy psychological state through education". Mental health education is a systematic project that requires not only the design of institutional systems

but also the support of information technology to achieve the best results. Specific content of mental health education includes investigating and researching students' mental health issues, designing and implementing mental health education courses, building mental health education institutions, and evaluating and monitoring mental health education. Only by integrating these aspects can we truly improve students' mental health and promote the healthy development of society as a whole. Therefore, the combination of information technology and mental health education is an essential trend, and the application of emerging technologies such as artificial intelligence and virtual reality technology will provide more possibilities and opportunities for the realization of mental health education [1].

2 The Value of Virtual Reality Technology in Student Mental Health Education

The application of virtual reality technology in student mental health education is an innovative approach, and collaboration with IT accelerates the transfer of information data [2]. Firstly, virtual reality technology can provide highly simulated situations and scenarios, helping students better simulate and understand complex real-life situations, and improve their practical and coping abilities. Secondly, virtual reality technology can provide effective intervention and treatment based on student's actual situation through interaction and personalized customization, thus improving student engagement and learning effectiveness. However, virtual reality technology also has some limitations, such as high cost and technical support requirements, the need for targeted design and development of educational applications, and the inability to completely replace traditional mental health education methods. Therefore, when applying virtual reality technology to student mental health education, its advantages and limitations need to be fully considered, and appropriate selection and use should be made based on actual situations.

3 Constructing a Student Mental Health Education Platform Based on Virtual Reality Technology

3.1 Platform Design and Functionality

The design of a virtual reality-based student psychological health education platform follows the basic principles of virtual reality application platforms. First, it is necessary to fully understand the needs of the target users, conduct user research and analysis, and determine the target user's age, gender, cultural background, psychological characteristics, etc., in order to provide more accurate services to users. The number of different indicators varies widely and their comprehensiveness also varies [3]. Secondly, based on the user research results, a design model should be proposed, including the overall architecture, functional modules, data processing methods, etc. of the platform, to ensure that the platform has good user experience and usability. Finally, the platform needs to be comprehensively tested and evaluated, and problems that exist need to be repaired and improved in a timely manner. Based on the above, a virtual reality-based student psychological health education platform that is stable, reliable, and easy to use

and meets user needs is designed. Figure 1 shows the functional module diagram of the student psychological health education VR platform.

1. User Management Module: Includes common functions such as user registration, login, identity verification, etc., which is not only the beginning of platform construction, but also an important component of the platform. In addition to conventional functions, the student psychological health education VR platform should also set up user feedback management and user data management, which is used to manage users' uploaded personal data, including psychological test results, student files, and other information, so that administrators can manage and protect user data.
2. Assessment and measurement module: This module is used to evaluate the psychological health status of students, including questionnaire surveys, VR psychological tests, data analysis, etc., to provide personalized psychological health guidance and advice for students. It is the most important functional implementation module in the platform.
3. Psychological counseling module: This module provides professional online psychological counseling services for platform users, supporting various communication methods such as text, voice, and video, allowing students to obtain psychological health support and help at home or in other environments they consider safe, comfortable, and relaxing.
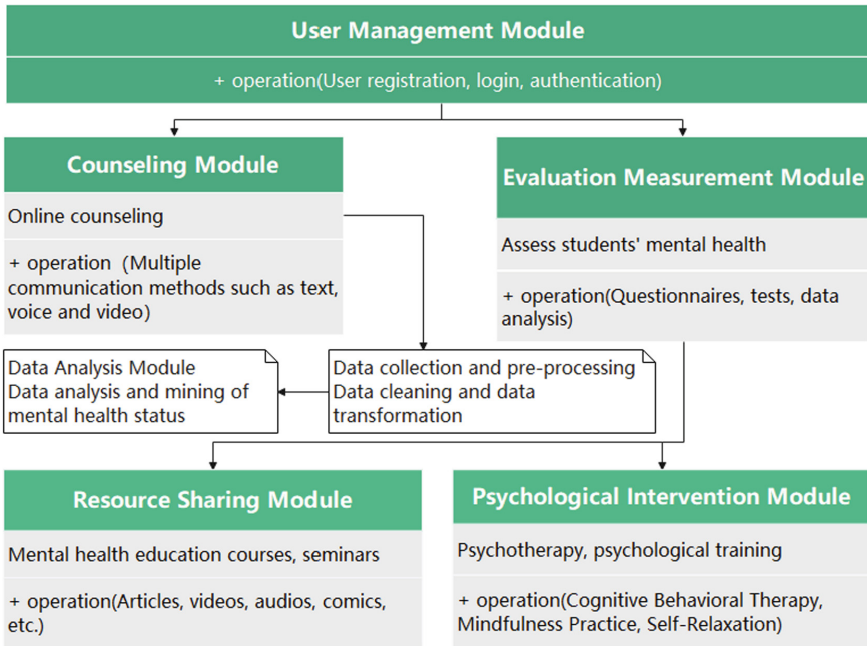

Fig. 1. Functional module diagram of VR platform for students' mental health education
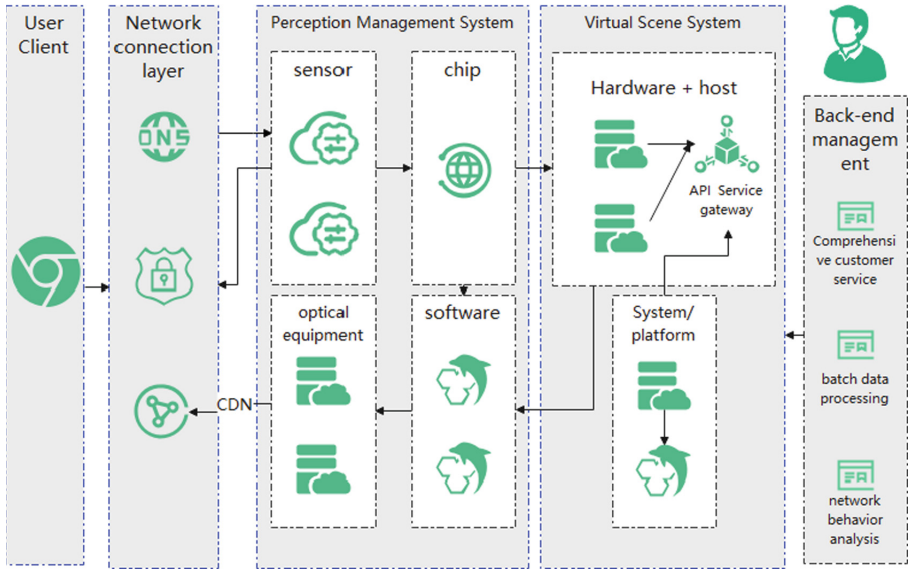
Fig. 2. Deployment diagram of the VR platform for student mental health education

4. Psychological intervention module: This module provides a series of psychological intervention programs, such as cognitive behavioral therapy, mindfulness practice, self-relaxation, etc. Virtual reality technology and related hardware devices can monitor users' real-time emotional and action feedback.
5. Resource sharing module: This module provides high-quality psychological health-related resources, including articles, videos, audios, comics, etc., as well as psychological health education courses, seminars, etc., allowing students to access the latest psychological health knowledge anytime, anywhere.
6. Data analysis module: This module is used to analyze and mine students' psychological health status data, providing accurate psychological health services and guidance for students, while protecting the privacy of the counselee and the patient. It also provides data support for research institutions, schools, and government departments to optimize psychological health education policies (Fig. 2).

3.2 Technical Implementation and Development of Education Platform

1. Virtual Reality Engine: The development engine for the student mental health education platform is the core technology for building the platform and has an important impact on aspects such as performance, reliability, and usability. Currently, commonly used VR development engines include Unity, Unreal Engine, CryEngine, etc. The virtual reality engine can provide core functions such as scene building, object modeling, rendering effects, etc. Table 1 is a comparative analysis table of the development engines for student mental health education VR platforms.

Table 1. Comparative analysis table of development engines of VR platform for students' mental health education

Engine Name	Development Company (team)	Development Advantage	Developmental Reality
Unity3d	Unity Technologies	One of the most popular cross-platform game engines, with strong community support and a wide range of application scenarios to provide efficient tools and resources.	Less customizability, which may be limited when developing highly customized VR applications.
Unreal Engine	Epic Games	Focus on the development of high-end games and visualization applications, especially in graphics rendering and physical simulation.	Higher hardware configuration and larger storage space are required, which increases development cost and difficulty; the rendering engine is relatively complex.
CryEngine	Crytek	An open source game engine for small to medium teams with rapid prototyping and custom rendering pipelines.	Average user experience. There are relatively few applications in the field of virtual reality.

2. Database design: It is necessary to design a corresponding database structure according to the platform requirements, to store the necessary user information, psychological test data, psychological therapy records and other information. Figure 3 shows the structure of the data resource library for the student mental health education VR platform.

3. User interface design: The design should follow principles of usability, aesthetics, and functionality to enable users to easily operate the platform while providing enough information to help them understand their psychological state. It is important to note that although it is a virtual interactive platform, the overall color selection of the interface design directly affects the effectiveness of psychological counseling and treatment. It is suggested to use color combinations suitable for emotional relaxation, such as blue, green, and purple.

4. VR interaction design: It is necessary to consider the ways in which users interact with the platform, such as using handheld controllers, touchscreens, or head-mounted displays, and provide rich interactive methods such as gesture recognition, speech recognition, and eye-tracking to enhance user experience.
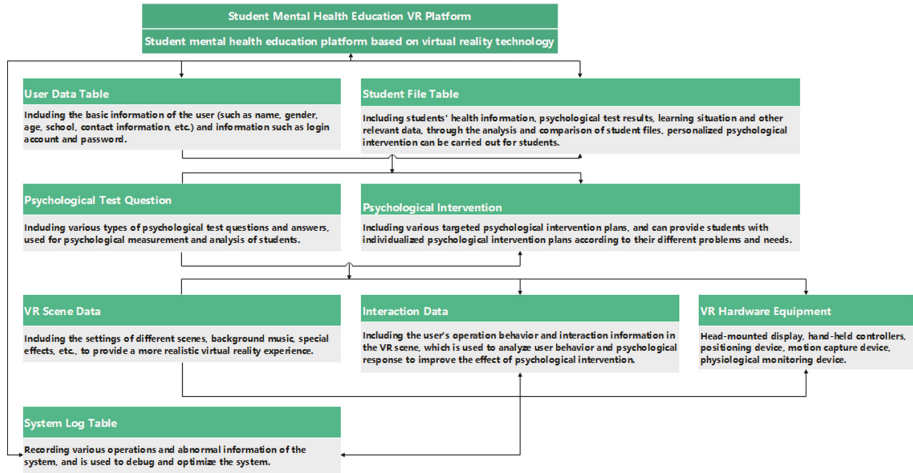
Fig. 3. The structure diagram of the resource database of the VR platform for students' mental health education

5. Data analysis and mining: Based on users' psychological test results and psychological treatment records, data analysis and mining are conducted to provide personalized psychological health advice and treatment plans while providing data support for platform improvement and optimization.
6. Security assurance: The privacy and security of counselees and patients are legally protected. During the platform's development process, secure encryption technologies such as SSL and TLS are used to ensure that sensitive information is not stolen or tampered with by third parties during transmission. The platform should also provide anonymous usage options for counselees and patients so that they can use the platform with confidence without worrying about their personal information being leaked.

3.3 Practical Application and Testing of Educational Platforms

The practical application and testing of the VR platform for student mental health education is an important step in validating its effectiveness and feasibility. By comparing it with traditional treatment methods, the strengths, weaknesses, and value of the VR platform can be evaluated. In practical application and testing, methods such as anxiety scale, depression scale, and stress assessment scale can be used to assess mental health status and treatment outcomes through surveys and questionnaires. Additionally, the feasibility and effectiveness of the VR platform can be evaluated by observing the behavior, psychological status, and feedback of users within the VR environment (Table 2).

Table 2. Student mental health education VR platform user survey questionnaire data analysis table

Test Indicators	Treatment Effect			User Experience			Cost-Effective		
	Duration of Treatment	Cure Rate	Recurrence Rate	Comfort	Satisfaction	Cognitive Change	Cost	Manpower	Time
Strongly Agree	56%	No evidence yet	–	39%	17%	No evidence yet	3%	5%	11%
Somewhat Agree	9%	–	–	28%	19%	–	36%	18%	19%
Neutral	21%	–	No evidence yet	9%	32%	–	19%	41%	28%
Strongly Disagree	11%	–	–	18%	21%	–	29%	21%	30%
Somewhat Disagree	3%	–	–	6%	11%	–	13%	15%	12%

4 Value Evaluation of Student Mental Health Education Platform Based on Virtual Reality Technology

The theoretical value of the student mental health education VR platform lies in its use of modern psychological theories to provide a new way of psychological intervention. This approach differs from traditional psychological interventions, completely revolutionizing the face-to-face communication between the counsellor, the treated and the therapist and the psychology teacher. Exploring the path of students' mental health education with information technology as a carrier [4]. The VR platform creates a safe, isolated virtual environment that allows students to express their emotions and psychological problems more freely. This reduces the psychological resistance and privacy concerns of the counsellor and the treated, while providing a rich and diverse virtual scene and role, allowing students to better experience and explore their emotional world and be more actively involved in psychological intervention. Secondly, through the application and testing of the platform, the collected mental health data can be used to classify and analyze the mental health status of different students, explore the impact of different factors on students' mental health, and formulate targeted psychological intervention plans while protecting the privacy of the counsellor and the treated. The continuous improvement and optimization of the platform's functionality and design are also conducted. The analysis and exploration of these data will help the platform provide more personalized and effective mental health education services to users. The helper can choose the appropriate method to communicate with the tutor and get help [5]. Finally, the student mental health education VR platform can promote interdisciplinary research by combining disciplines such as psychology, computer science, and education to explore new ways and methods in the field of mental health, promoting the development of psychology research.

5   Conclusions

With the development of artificial intelligence technology, mental health research and computer technology continue to combine [6]. This study aims to explore the construction of a virtual reality-based platform for student mental health education. To strengthen the foundation and protect the healthy growth and happy life of school and college students, children and youth [7]. Firstly, the application of virtual reality technology in student mental health education can improve students' abilities in emotional management, self-awareness, and social skills. Secondly, the platform should include three functional modules: emotional management, cognitive adjustment, and social skills, and the design should consider user experience and interactivity. Provide more accurate and scientific data support for college student counseling [8]. Finally, it is confirmed that the virtual reality-based platform can effectively improve students' mental health and has received positive user feedback.

Overall, the construction of a virtual reality-based platform for student mental health education is valuable, as it can effectively improve students' mental health and provide new ideas and approaches for school mental health education. In the future, further research should be conducted to explore the application of the platform in different scenarios, as well as how to better combine it with other technological means to enhance the platform's effectiveness and user experience.

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