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EXPLORATION AND PRACTICE OF INNOVATIVE SIGN LANGUAGE TEACHING BASED ON LEAP MOTION SOMATIC GESTURE RECOGNITION TECHNOLOGY

Globally, the causes of the problem of hearing impairment are varied, and in addition to congenital hearing impairment, there are many cases of hearing loss due to external factors such as war and accidental injury. In recent years, due to the frequent occurrence of local conflicts and wars, many countries and regions have seen a large number of patients with hearing impairment caused by bombings, shootings and other factors. In addition, traffic accidents, industrial accidents and other unintentional injuries have caused various cases in terms of hearing impairment. These people who are deaf due to external factors are in urgent need of effective sign language teaching methods to help them re-establish a bridge of communication with the society. However, traditional sign language teaching methods have many limitations such as lack of interactivity, personalization and immediate feedback [1]. These limitations make the learning process boring and inefficient, making it difficult to meet the needs of diverse learners. Students often find it difficult to receive adequate individualized instruction and timely corrective feedback in the classroom [2], which directly affects their learning effectiveness and self-confidence. Meanwhile, the lack of teaching resources and single teaching method also limit the popularization and promotion of sign language education.

With the advancement of technology, new possibilities for teaching sign language have been opened up with the advent of somatosensory technology, especially the Leap Motion controller, a high-precision gesture-recognition device that captures the user's hand movements and provides real-time feedback[3]. This technology is not only capable of recognizing complex gesture movements, but can also be combined with Virtual Reality (VR) and Augmented Reality (AR) technology to provide an immersive learning experience [4]. This creates an interactive, dynamic and engaging learning environment for sign language learners, making the learning process more lively and fun.

We explore how to use Leap Motion somatic gesture technology to improve the effect of sign language teaching and conduct preliminary experimental verification. We investigate in detail the specific applications of Leap Motion technology in sign language teaching, including the design of gesture recognition algorithms, the development of teaching content, and the optimization of user experience [5,6]. The experimental data and user feedback also show that the use of Leap Motion technology can significantly improve learners' sign language mastery level and learning motivation. Through our study, we hope to promote technological innovation in sign language teaching, to benefit more hearing impaired people and sign language learners, and to promote the widespread use and recognition of sign language in society.

In our study, we adopt Leap Motion controller to capture the user's hand movements and combine it with machine learning algorithms for gesture recognition. The high-precision sensors of Leap Motion controller can track the hand position and movement trajectory in real time to ensure the accuracy and sensitivity of gesture recognition. We have developed a Leap Motion-based sign language teaching system, which can detect and feedback the user's sign language movements in real time, provide instant corrections and guidance, and enhance the user's learning interest, comprehension, and expression skills through games.

In order to evaluate the value of Leap Motion technology in sign language teaching, we designed a detailed experiment. The experiment is divided into two stages: the first stage is the traditional teaching method, which mainly relies on face-to-face teaching and textbook learning by the teacher to assess the learners' progress in this mode; the second stage is the Leap Motion-assisted teaching method, which enhances the learning effect through the interactivity and instant feedback of the somatosensory technology. In the second stage, learners use Leap Motion controllers to interact with the system to enhance their understanding and memorization of sign language actions through visual and haptic feedback mechanisms.

We recorded the progress of each learner in detail in our experiments, including data on gesture accuracy, learning time and error rate. By comparing the learning effects of the two phases, we found that the Leap Motion-assisted teaching method has significant advantages in improving learners' gesture accuracy and fluency. In addition, we also collected learners' subjective feedback on their experience of using the Leap Motion system through questionnaires and interviews. Most learners said that the interactivity and instant feedback features of the Leap Motion system greatly enhanced their interest and motivation in learning, making the learning process more lively and interesting. The learners also felt that the system's personalized content and flexible learning mode helped them to better master their sign language skills. By comparing the effects of traditional and Leap Motion-assisted teaching methods, we evaluated the value of Leap Motion technology in sign language teaching and provided valuable experimental data and user feedback for the future development of sign language teaching technology.

The experimental results showed that sign language learners using the Leap Motion technology significantly improved both accuracy and fluency compared to traditional teaching methods. In addition, learners rated the experience of using the Leap Motion system highly, saying that the system enhanced interactivity and fun, and significantly increased motivation to learn.

Leap Motion somatic gesture technology has revolutionized the teaching of sign language. It not only improves learners' sign language proficiency, but also enhances the interactivity and fun of the teaching process. Although there are still some challenges to overcome, the application of Leap Motion in sign language teaching is promising. Future research should further explore how to optimize the technology to achieve a more efficient and accurate sign language teaching system that can better serve the hearing impaired and sign language learners.

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MODERN INNOVATIVE TECHNOLOGIES IN THE CHINA'S HIGHER EDUCATION SYSTEM

The application of modern innovative technology in the China's higher education system has become an important force to promote educational reform and improve the quality of teaching [1; 3]. Firstly, the popularization of information technology provides rich digital resources and advanced teaching tools for higher education, such as online courses, virtual laboratories and intelligent classrooms, making educational resources more open and shared. In addition, big data and artificial intelligence technology play an important role in education management and teaching evaluation.