Immersive English Teaching System Based on Internet of Things Technology

Xiaohua Guo(✉)

Xi'an Mingde Institute of Technology, Xi'an 710124, China
guoxh@mdit.edu.cn

Abstract. In order to solve the problems that the existing English teaching system has high-heat courses at the same time, there are too few online students and poor teaching video playback fluency, the author proposes an immersive English teaching system based on the Internet of Things technology. Complete the system hardware design by improving the system frame structure, system use case diagram, and administrator interface; The system software design is completed by improving the system database, system error handling process, and background administrator workflow. A comparative experiment was conducted with the teaching videos of high-profile courses as the object. The results showed that: With the increase in the number of online users, the video playback fluency of the improved system has always remained above 90%; The video playback fluency of the ordinary system gradually decreases with the increase of the number of online users, and the lowest point is less than 50%. Conclusion: The application of the English teaching system based on multimedia technology, increase the number of people who can be online at the same time in the course and improve the fluency of teaching video playback.

Keywords: Internet of things technology · English course · teaching system improvement · teaching video · playback fluency · administrator interface

1 Introduction

There are differences between Eastern and Western cultures, and students lack an English practice environment in their daily lives, classroom teaching has become the only way to learn English, and this way is rigid and lacks interest, which can easily make learners feel bored [1]. Therefore, in order to improve the current situation, China has invested a lot of manpower and material resources in English multimedia teaching, and built many media speech classrooms. This enriches the form of classroom teaching to a certain extent, but there are still problems such as weak immersion, poor teaching interaction, and insufficient communication ability training. Immersive learning refers to combining technology and reality to create a learning environment close to reality for students [2, 3]. With a virtual learning environment, students can improve their skills through discussion and practice. The author has adopted somatosensory and speech recognition to teach English, and supports such tasks as human-machine interaction, speech therapy, real-time translation, reading, and playing English.

D. Kumar et al. (Eds.): IEIT 2023, AHSSEH 10, pp. 882–886, 2023.
https://doi.org/10.2991/978-94-6463-230-9_107

2 Methods

2.1 Software Design of English Teaching System

The basis of learning English multimedia is in the creation of interactive features. Adjust the rotation axis of the video display stand so that the angle of the lens does not exceed the set value. Based on the pre-determined learning process, the working process of English multimedia learning will be set up, and the feedback will be used to open up the learning process, change the file, and complete the location change. The calculation instructions for this function are:

$$g(w) = mq - k_i \tag{1}$$

In the formula: g(w) represents the response function based on the training w; m represents the correct software response coefficient; q represents the level of English teaching; Represents the positive response coefficient of the software map based on the chosen i-th objective function. With this project, students can open the mode of operation while learning English, and quickly enter the virtual role as a connected language [4, 5].

2.2 Experimental Analysis

The above method has successfully developed and developed a multimedia technology-based English learning system, and to test the results of the development, an experiment was conducted to compare online users and the ability to play video games before and after the game. Before starting the experiment, complete the test parameters according to the information in Table 1.

The experimental parameters are the number of people who can be online at the same time, fluency parameters, connection response time, user click rate, system connection parameters, system failure rate, the system connection parameters are the main basis for the establishment of the system, so the system data does not change before and after the improvement [6, 7].

Table 1. Experimental parameter setting Table

Experimental parameters	before improvement	After improvement
PON	500	900
FPT	2.48	4.72
RPT/s	7.89	5.04
UCR/%	79.48	96.76
SCP	0.98×10^9	0.98×10^9
SFR/%	66.43	50.01

3 Results and Discussion

After the parameter setting is completed, two computers with the same configuration are selected as test objects, one computer is equipped with general English learning system, and the other is equipped with multimedia technology based on English learning. Count the number of 1,000 students in the university who can log in on two machines at the same time, watch English videos, and stay online in their interests on two machines at the same time. The number of people who can be online simultaneously in obesity classes is the same as the change in the SJF index, the number of people who can be online simultaneously in obesity classes as SJF index increased [8]. Classes increase and vice versa. A comparison of online users before and after the development process is shown in Fig. 1.

Analysis of Fig. 1 shows that when the upper limit of the number of online users is 500, when the ordinary system is applied in the 10th s, the maximum number of online students in high-fat courses reaches a maximum of 370; After the development of the system, the maximum number of people who can be online at the same time in the 12th and fat courses is 500.

Divide 1000 students as experimental subjects into two groups at the same time, with 500 students in each group. One group of students was connected to the ordinary system, and the other group was connected to the improved system, and watched the same English teaching video at the same time, and the playback fluency of the two groups of videos was counted, the specific comparison results are shown in Fig. 2.

Analysis in Fig. 2 shows that as the number of online users increases, the video playback performance of the development is always above 90%; As the number of online users increases, the video playback performance of traditional systems gradually decreases, and the lowest is less than 50%. Therefore, it has been proven that the ability

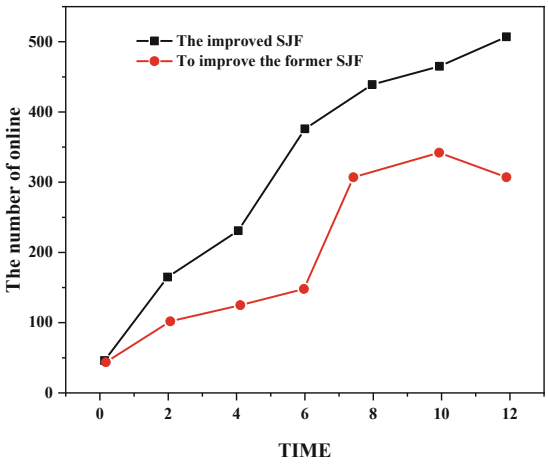

Fig. 1. Comparison of the number of people who can be online at the same time in high-heat courses (below 500)

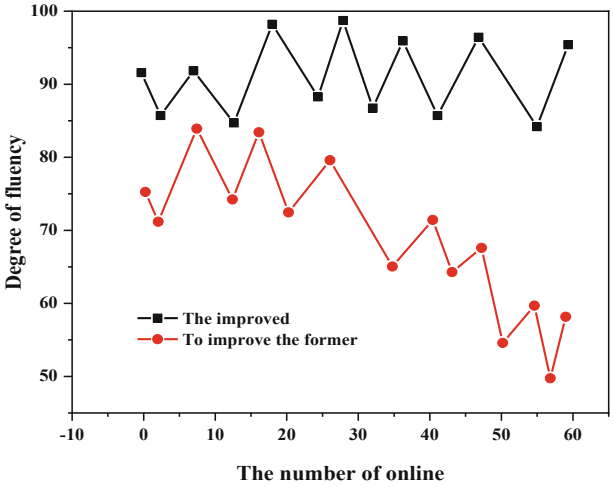

Fig. 2. Comparison of teaching video playback fluency

to teach movies is better after using English education based on multimedia technology [9, 10].

4 Conclusion

The author introduces English learning based on "Internet of Things Technology" as a new type of learning, which is effective in the development of English students. This system not only solves the difficult problem of finding teaching materials when teachers are preparing for lessons, but also improves the ability to monitor and control the learning environment and connected teaching, asking real-time questions and providing real-time feedback, so that students can solve learning problems and improve. However, this system is difficult for raw data input and requires a lot of raw data collection and recording.

References

1. Gao, X. , Tong, Z. , Wu, Y. , Guo, L. , Gu, Y. , & Dardik, A. . (2021). Similarities and differences in peripheral artery disease between China and western countries. Journal of vascular surgery, 74(4), 1417-1424.
2. Li, M. . (2021). An immersive context teaching method for college English based on artificial intelligence and machine learning in virtual reality technology. Mobile Information Systems, 2021(2), 1-7.
3. Shi, L. . (2021). Application of big data language recognition technology and gpu parallel computing in English teaching visualization system. International Journal of Speech Technology, 25(3), 667-677.
4. Abbasikesbi, R. , Nikfarjam, A. , & Nemati, M. . (2020). Developed wireless sensor net-work to supervise the essential parameters in greenhouses for internet of things applications. IET Circuits Devices & Systems, 14(8), 1258-1264.

5. Yu, J. , Hale, S. , Booth, N. , & Rasheed, E. O. . (2022). The impact of external and internal sources of motivation on young womens interest in construction-related careers: an exploratory study. International Journal of Construction Education and Research, 18(2), 159-178.
6. Leong, Y. R. , Tajudeen, F. P. , & Yeong, W. C. . (2021). Bibliometric and content analysis of the internet of things research: a social science perspective. Online Information Review, 45(6), 1148-1166.
7. Lv, X. , & Li, M. . (2021). Application and research of the intelligent management system based on internet of things technology in the era of big data. Mobile Information Systems, 2021(16), 1-6.
8. Aguilera-Alvarez, J., José Padilla-Medina, Coral Martínez-Nolasco, Víctor Samano-Ortega, & Juan Martínez-Nolasco. (2021). Development of a didactic educational tool for learning fuzzy control systems. Mathematical Problems in Engineering, 2021(4), 1-17.
9. Ma, P. , Yang, J. , Li, H. , Zhang, Z. , & Baoyin, H. . (2022). Autonomous navigation for mars probes using only satellite-to-satellite tracking measurements by singularity-avoiding orbit elements. Journal of Navigation, 75(2), 476-495.
10. Irie, K. . (2022). Rethinking the role of classroom communication: learning from older learners. Innovation in Language Learning and Teaching, 16(2), 107-117.