

Application of AI-based Virtual Reality Technology in the Design of English Aesthetic Education Intelligent Assistant System

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Abstract: Everyone has a passion for beauty, and it is understandable that college students have their own preferences and desires when it comes to aesthetics. However, beauty is not limited to a single choice, but is broad and diverse in the free world. When teaching aesthetic education in English, teachers not only need to meet the needs of different students, but also to teach them that beauty standards are different and comprehensive. They must learn to distinguish right from wrong and understand truth, kindness, and beauty. Therefore, this paper explores the application of AI technology in English aesthetic education in universities. Specifically, this paper first discusses English aesthetic education, factors affecting college students' aesthetic views, and intelligent teaching assistants. Then, it designs the management module, oral evaluation model, and VR teaching scenarios in the intelligent teaching assistant system. Finally, it analyzes the adaptability and usage of the intelligent teaching assistant system for college students, and draws corresponding conclusions. The results demonstrate the effectiveness of the AI-based virtual reality technology in the design of an English aesthetic education intelligent assistant system.

1. Introduction

Teaching English aesthetic education in colleges and universities is an important part of quality education, which can effectively promote the development of education and society [1]. English teachers in colleges and universities should integrate the knowledge of aesthetic education in English teachers, cultivate students' correct aesthetic values, develop students' good aesthetic interests, and improve college students' ability to distinguish between good and evil, beauty and ugliness [2]. In recent years, the integration of artificial intelligence in English aesthetic education is a continuous in-depth development, artificial intelligence can support English aesthetic education learning through different tasks, and artificial intelligence system can also cover all the English application scenarios, in the use of the process has been praised by teachers and students [3]. The application of artificial intelligence technology in education indicates the direction of English curriculum reform and facilitates the development of intelligent teaching and learning in English aesthetic education classrooms [4]. From the perspective of English aesthetic education, it is essential to design an intelligent learning aid system that is applicable to English aesthetic learning [5].

In recent years, with the development of artificial intelligence and virtual reality technology, more and more research scholars have started to conduct research on aesthetic education in universities based on these two technologies. For example, Konstantin Shmarko, et al. used artificial intelligence and blockchain technology to detect anomalies in the network with a high degree of accuracy, using artificial intelligence-based anomaly detection technology as a ledger for blockchain technology to address security issues in an intelligent environment, and found that the use of artificial intelligence was sufficient to improve the security performance of the blockchain network [6]. Ulises Cortes et al. developed an effective intelligent system based on artificial neural networks and a new version of the sine cosine algorithm to evaluate and predict the stability of homogeneous slopes under static and dynamic loads, using root mean square error and correlation coefficients to assess the performance and predictive power of the model. Based on the results obtained, the ANN model's is a reliable,

simple and effective computational model and the proposed model may provide better optimal solutions and outperform existing methods [7]. Artificial intelligence technology is conducive to promoting the development of aesthetic education teaching in universities.

With the development of artificial intelligence technology and virtual reality technology, artificial intelligence technology is widely used in the field of English aesthetic education teaching, therefore, this paper conducts an in-depth study based on the application of artificial intelligence technology in English aesthetic education in colleges and universities. The first part is an overview of English aesthetic education, the factors affecting the aesthetic education of university students and the intelligent teaching assistant. The second part is the design of the intelligent teaching assistant system, which is divided into the design of the management module, the design of the speaking assessment model and the design of VR scene teaching. The third part is the design of the intelligent teaching assistant system, which includes the analysis of the adaptability of the university students and the analysis of the usage situation, through which the intelligent teaching assistant system is improved.

2. Relevant overview

2.1 English Aesthetic Education

English aesthetic education refers to the process of classroom teaching in which teachers in colleges and universities teach English aesthetically, so that students can experience the beauty of differences between different cultures through English teaching, thus promoting the overall and coordinated development of college students themselves and making them good at finding beauty from life[8]. In English teaching, the use of artificial intelligence technology to integrate aesthetic education into the objectives of English teaching, the development of English aesthetic education teaching activities, through English aesthetic education teaching to improve the quality and effectiveness of English teaching. English teachers in colleges and universities should take into account the task of teaching English in the process of teaching aesthetic education, and in the teaching process, English teaching should be the main focus, supplemented by aesthetic education, the essence of English teaching is to meet the needs of students to learn English knowledge, and the cart should not be put before the horse[9].

2.2 Factors affecting college students' view of aesthetic education

College students' view of aesthetic education is mainly influenced by the campus environment, the Internet environment and the classroom environment. The beauty of the campus environment is conducive to promoting students' physical and mental health. A large amount of Internet information can increase students' knowledge of beauty and let them experience a variety of beauty, while pan-entertainment and bad culture are not conducive to the shaping of values and aesthetics. In the new era, aesthetic education in colleges and universities is a more open education, which includes all aspects of college students' learning life. The content of English aesthetic education should be diversified, and students should be guided to take the initiative to learn and explore the knowledge of aesthetic education in the teaching situation, and the idea of aesthetic education should be infiltrated in the process of English teaching to strengthen the concept of right and wrong, so as to achieve the purpose of aesthetic education[10].

2.3 Intelligent teaching assistants

The prerequisite for English aesthetic education is better English proficiency, so attention should be paid to improving the English proficiency of college students in the process of teaching English aesthetic education. In this paper, we use artificial intelligence technology to build an English intelligent learning assistance system to assist college students to learn English through intelligent teaching assistants, improve their English proficiency and make them enjoy learning English. Artificial intelligence technology is a relatively advanced technology at present, and the English teaching assistant based on artificial intelligence can help university students to train in four aspects:

listening, speaking, reading and writing. The English intelligent teaching assistant system is designed with the following four requirements (See Figure 1).

(1) Login requirements: user login to verify user access rights and meet system security requirements.

(2) Lesson preparation requirements: intelligent production of English Aesthetics teaching courseware and English Aesthetics materials.

(3) Classroom teaching requirements: English point reading, intelligent voice assessment and classroom resource sharing in the English Aesthetic classroom teaching process.

(4) Management needs: the ability to manage the management of personnel and aesthetic materials resources.

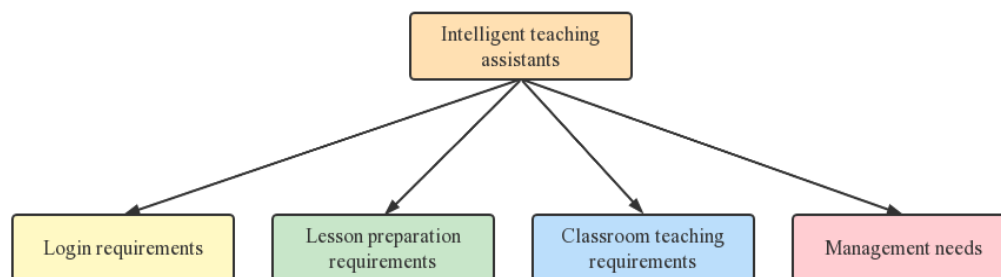


Fig. 1. Intelligent teaching assistants

3. Intelligent teaching assistant system design

3.1 Management module design

The management module of the intelligent teaching assistant system only allows system administrators and administrative teachers to manage English language teaching resources, and students do not have access to the module. The main function of the management module is to manage users, resources and permissions, and its functional structure is designed as described below.

1) User management

The user management function means that the administrator or administrative teacher can add and delete student user accounts and modify user information and passwords. Administrators or administrative teachers can delete unused accounts and modify user information through the key management module, simplifying management and improving system management efficiency. In order to solve the situation of losing user passwords, administrators can modify and reset user passwords.

2) Resource management

Resource management usually refers to the management of public education resources and the removal of teacher education resources. Public education resources can be added or removed and access to resources can be restricted. Teachers can search, share and delete shared resources.

3) Permission management

To solve the problem of insufficient management staff, low-level user administrators are set up in the system. Permission management includes the management of user identity. Administrators can reset the low-level user administrator as a normal user through the back-end management system, and cancel the management rights of the low-level user administrator through the one-click operation button

3.2 Speaking assessment model design

The speaking assessment model is the core component of the intelligent teaching assistant system. The speaking assessment model is constructed by using artificial intelligence technology and acoustic models to measure students' English speaking ability. The workflow of the model is shown in Figure 2.

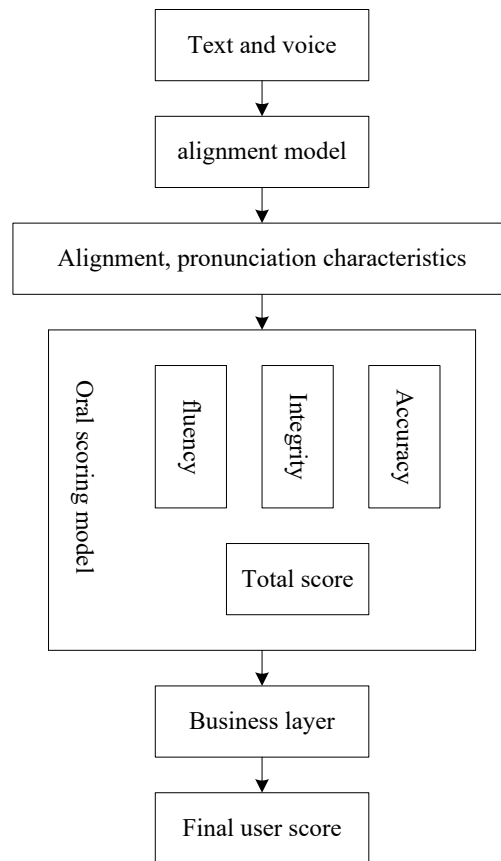


Fig. 2. Flow chart of the speaking assessment model

The scoring model is used to determine the respective GOP corresponding to each phoneme based on the alignment information, to score the test subject's pronunciation based on how close it is to the standard pronunciation, to determine mispronunciation through the scoring results, and to determine the scoring information for each word based on the interview score for each word. Word pronunciation completeness is calculated as Equation (1) and fluency is calculated as Equation (2).

$$C = \frac{R + S}{R + S + D} \quad (1)$$

$$F(Y) = \frac{1}{M} \sum_{e \in Y} K(l_e) \quad (2)$$

Where l_e indicates the duration of the word e and M indicates the number of standardised pronunciations in the word Y . When evaluating students' speaking, the fluency of words and the degree of pauses are evaluated in addition to the fluency and completeness of each sentence as the student speaks. If a word is paused for too long, the pronunciation is considered not fluent enough and the overall fluency score should be lowered.

3.3 VR scenario teaching design

The VR scene teaching is adopted in the intelligent teaching assistant system, using VR to embed English aesthetic knowledge directly into the virtual scene in a timely manner, and the teacher explains the relevant aesthetic knowledge appearing in the virtual scene to guide learning to improve their aesthetics through learning English aesthetic knowledge. In the VR scene teaching design process, the English conversation scenes are firstly pre-designed so that students can experience the charm of more authentic English conversation in virtual reality, gain a deeper understanding of the use and skills of English spoken conversation, and teach students to understand and integrate into external cultures. Through virtual reality technology, students can experience different approaches to learning and feel the presence of external cultural beauty. VR spoken communication in teaching

scenarios can improve students' oral expression skills. Students are given the opportunity to communicate in English through virtual dialogue scenarios, making English learning everyday through spoken communication learning, allowing students to experience the charm of English conversation and improving their English speaking skills. Compared to traditional English classroom teaching, VR scenario teaching allows students to have their own space where they can express themselves in English, increasing their desire to express themselves in English, learn English words and increase their understanding of English phrases in the process of communication, and bring English to life. Students are immersed in English communication and experience the charm of different cultures, improving their aesthetics and quality, and achieving the goal of teaching English as an aesthetic language.

4. System analysis

4.1 Analysis of the adaptation situation

The adaptation situation of college students after using the intelligent teaching assistant was analyzed, and the adaptation situation of college students under the intelligent teaching assistant system is shown in Table 1.

Table 1 Study adaptability of university students

	Average	standard deviation	median
Learning attitude	4.71	0.62	4.67
Self learning ability	4.68	0.65	4.72
Learning interaction	4.55	0.64	4.68
learning environment	4.83	0.63	4.47
Learning adaptability	4.6925	0.635	4.635

As can be seen in Table 1, the standard deviation does not vary significantly and is less than 1, indicating that the overall level of learning adaptability of university students is relatively stable. The mean values are all greater than 3 and the mean value of adaptation is 4.6925, which indicates that the overall level of learning adaptation is high, with the mean value of independent learning ability being the largest and the mean value of adaptation of learning interaction being the smallest, and the adaptation level of individual adaptation variables being high. The analysis of the data in Table 1 shows that the English learning adaptability of university students under the Intelligent Teaching Assistant system is at a high level. A comparative analysis of the mean values of learning attitude, self-directed learning ability, learning interaction and learning environment shows that university students have relatively good adaptability to the autonomous environment and weak adaptability to learning interaction. As a channel of communication, English requires a higher level of communication and interaction in the learning process compared to other subjects. The intelligent teaching assistant system is able to provide timely feedback on students' instructions and instant evaluation of students' learning results, changing university students' attitudes towards learning English. With an emphasis on student-led learning, university English learning relies on students spending time outside of class actively learning English. Although intelligent teaching assistants can develop learning methods and tasks for students and supervise the use of English by university students outside of class time, the most important thing is the self-awareness of university students. Students with poor self-awareness are prone to independent learning and learning environment mismatch due to the lack of extra time for English learning.

4.2 Analysis of usage

A satisfaction survey was conducted on teachers' use of the Intelligent Teaching Assistant, and the results of the satisfaction survey were obtained through the survey as shown in Figure 3.

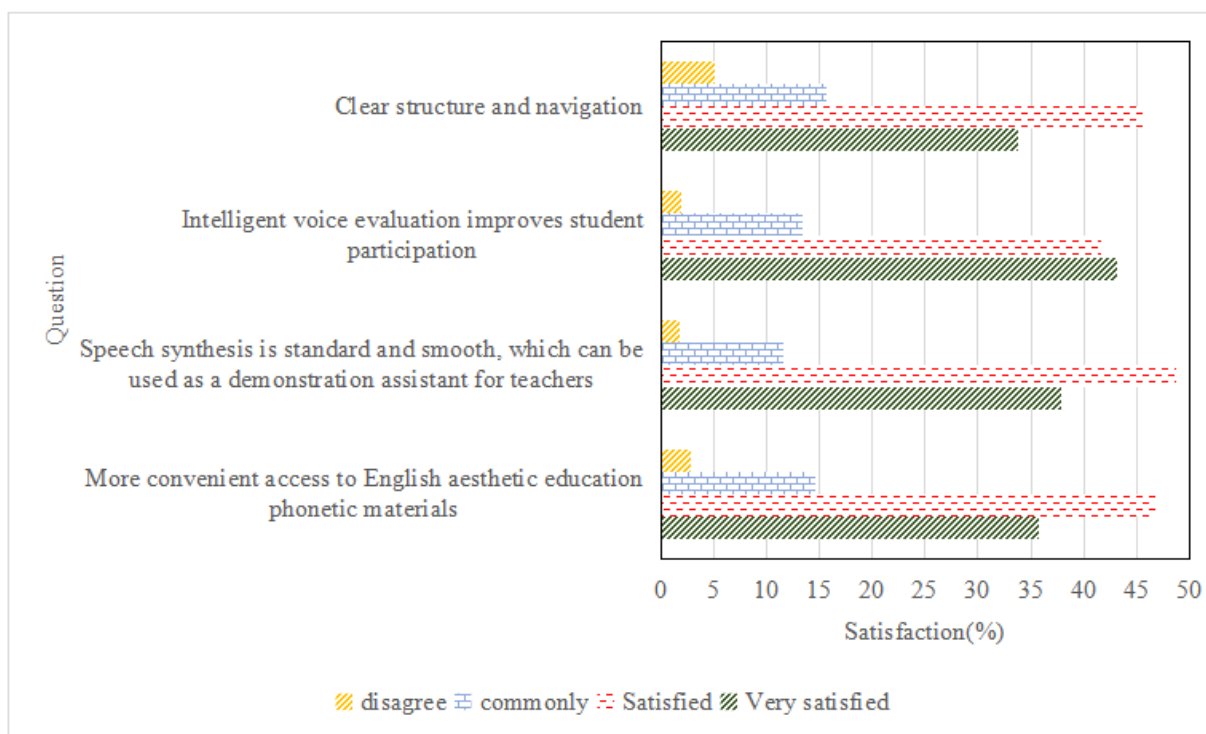


Fig. 3. Satisfaction survey results

The observed data in Figure 3 shows that 79.2% of teachers agreed that the navigation structure of the Smart Teaching Assistant was clear and concise, 84.7% agreed that the speaking assessment model had improved student engagement, 86.6% agreed that the Smart Teaching Assistant had a fluent speech standard, and 82.5% of teachers thought that the Smart Teaching Assistant had made it easier to access English Aesthetics speech materials. The above data reveals that the Intelligent Teaching Assistant meets the needs of most teachers of English Aesthetic Education and is conducive to the development of English Aesthetic Education teaching, but the satisfaction rate of the navigation structure of the Intelligent Teaching Assistant is less than 80%, so there are areas where the system needs to be improved. After English teachers had experienced teaching with the Intelligent Teaching Assistant system, suggestions for improvement were collected from teachers. The analysis of the survey showed that teachers were satisfied with the functions of all the sub-systems of the Intelligent Teaching Assistant, indicating that the Intelligent Teaching Assistant basically met the needs of English teachers in teaching aesthetic education, but some teachers felt that there were areas for improvement in the system. Therefore, based on the analysis of the results of the teacher experience survey, it was clarified how the Smart Teaching Assistant system should be improved: create a database of English language aesthetic education resources with high-quality resources categorised into courses, and set up public resources of high-quality English language aesthetic education courses in the database to meet teachers' needs for English language aesthetic education materials; improve the interface layout, organise the navigation bar and functional areas in a rational way to make the teaching flow usable, and Use uniform colours and make the interface more beautiful and concise; by adding a bilingual database, teachers can automatically switch between Chinese and English Aesthetic texts according to their characteristics to achieve quick comprehension and fluent reading; enhance resource sharing, reduce file sharing, increase resource transfer, and facilitate resource sharing through videos and other big data.

5. Conclusion

With the advent of the Internet era, the aesthetics of contemporary university students have changed greatly. Therefore, this paper designs and analyses an English aesthetic education system for universities based on artificial intelligence and virtual reality technology. This paper uses

artificial intelligence technology to build an intelligent teaching assistant system, which includes three modules: management module, speaking assessment model and VR scene teaching. Through the analysis of the adaptation of college students using the intelligent teaching system, it is found that the overall level of students' learning adaptability is in a high position, but the adaptation to independent learning and learning environment is poor. In this paper, through the analysis of the use of the intelligent teaching system, the teachers' overall satisfaction with the system is high, but the system needs to be improved in areas such as the navigation structure. Due to the limitations of my own expertise, there are many areas for improvement in this paper.

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References

- [1] Jose Mekha, V. Parthasarathy: An Automated Pest Identification and Classification in Crops Using Artificial Intelligence - A State-of-Art-Review. *Autom. Control. Comput. Sci.* 56(3): 283-290 (2022).
- [2] Pablo Negro, Claudia Pons: Artificial Intelligence techniques based on the integration of symbolic logic and deep neural networks: A systematic review of the literature. *Inteligencia Artif.* 25(69): 13-41 (2022).
- [3] Elizabeth Black, Martim Brandao, Oana Cocarascu, Bart de Keijzer, Yali Du, Derek Long, Michael Luck, Peter McBurney, Albert Merono-Penuela, Simon Miles, Sanjay Modgil, Luc Moreau, Maria Polukarov, Odinaldo Rodrigues, Carmine Ventre: Reasoning and interaction for social artificial intelligence. *AI Commun.* 35(4): 309-325 (2022).
- [4] Ayesha Bhimdiwala, Rebecca Colina Neri, Louis M. Gomez: Advancing the Design and Implementation of Artificial Intelligence in Education through Continuous Improvement. *Int. J. Artif. Intell. Educ.* 32(3): 756-782 (2022).
- [5] Irene-Angelica Chounta, Emanuele Bardone, Aet Raudsep, Margus Pedaste: Exploring Teachers' Perceptions of Artificial Intelligence as a Tool to Support their Practice in Estonian K-12 Education. *Int. Artif. Intell. Educ.* 32(3): 725-755 (2022).
- [6] Konstantin Shmarko, Denise RS. Almeida, Elizabeth Lomas: The ethics of facial recognition technologies, surveillance, and accountability in an age of artificial intelligence: a comparative analysis of US, EU, and UK regulatory frameworks. *AI Ethics* 2(3): 377-387 (2022).
- [7] Ulises Cortes, Atia Corte, Dario Garcia-Gasulla, Raquel Perez-Arnal, Sergio Alvarez-Napagao, Enric Alvarez: The ethical use of high-performance computing and artificial intelligence: fighting COVID-19 at Barcelona Supercomputing Center. *AI Ethics* 2(2): 325-340 (2022).
- [8] Sumeet Hindocha, Cosmin Badea: Moral exemplars for the virtuous machine: the clinician's role in ethical artificial intelligence for healthcare. *AI Ethics* 2(1): 167-175 (2022).
- [9] Nathalie De Marcellis-Warin, Frederic Marty, Eva Thelisson, Thierry Warin: Artificial intelligence and consumer manipulations: from consumer's counter algorithms to firm's self-regulation tools. *AI Ethics* 2(2): 259-268 (2022).
- [10] Toufique Ahmed Soomro, Lihong Zheng, Ahmed J. Afifi, Ahmed Ali, Ming Yin, Junbin Gao: Artificial intelligence (AI) for medical imaging to combat coronavirus disease (COVID-19): a detailed review with direction for future research. *Artif. Intell. Rev.* 55(2): 1 409-1439 (2022).