Application of Virtual Reality in English Teaching

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Abstract—VR technology has the advantages of creating vivid situation, constructing immersive learning environment, visualizing the abstract knowledge, innovating educational approaches and assessment methods. This paper tries to conduct the meta-analysis about current research of the application of VR technology in English teaching both at home and abroad. Four typical technologies in VR-assisted English teaching are summarized, including virtual characters, speech and semantic recognition, intelligent dialogue, and panorama technology. At the same time, this paper explores the development tendency of VR and English teaching from four perspectives such as classroom learning, second classroom, English education games, English for Special Professional Fields. In summary, VR technology can better serve language education and promote the innovation and development of English teaching.

Keywords—virtual reality, human-computer interaction, English teaching, second classroom, artificial intelligence

I. INTRODUCTION

The research results of educational psychology show that people can remember 15% of the information through vision, 25% of the information through hearing, and 65% of the information through the combination of audiovisual and audio [1]. For English learners, if an appropriate context is provided to allow learners to gain social knowledge and real knowledge of the language by actively interacting with real things in the context, a better learning effect will be achieved. VR technology has three basic characteristics: immersion, interactivity, and imagination [2]. Therefore, VR technology is combined with English teaching, using animation, sound, text and other multi-dimensional sensory stimulation to present vivid things and stimulate learners' interest in learning, so as to achieve better learning results and help people better understand and grasp knowledge.

This article mainly studies the literature and application cases of VR technology combined with language education at home and abroad, summarizes the core technology of "VR+English", analyzes the application cases of VR in English teaching, and provides ideas for future research.

II. RESEARCH STATUS AT HOME AND ABROAD

Research on the combination of VR technology and education at home and abroad has been increasing in recent years. At present, the research and application of VR technology in the field of language learning is in its infancy, and the application of VR in English learning is still relatively limited. Therefore, when this section briefly introduces the research status of VR technology and English teaching, it will also introduce teaching cases in other languages, which have certain reference significance for the exploration of VR technology and English teaching. In addition, this part also discusses the current deficiencies and limitations of VR technology in the application of English teaching.

A. Research State in China

China's related research on the combination of VR technology and English learning generally tends to be theoretical and experimental. Applied research is slightly inadequate, and the landmark results are lacklustre. At present, there are mainly the following three cases in the exploration and research of the typical domestic VR technology in the application of English teaching.

East China Normal University has developed a virtual English learning environment that can support the connection of devices such as HTC Vive, Gear VR, PC and mobile phones [3], and established a SELL corpus containing the seven major Chinese dialects, developed by technologies such as speech recognition and speech evaluation. An intelligent conversation system is used for English training in specific scenarios such as interviews and speeches, and supports synchronization of multiple devices, providing an interactive platform for learners with different device needs. As shown in Figure 1, the learner has a natural conversational interaction with the AI virtual character in the virtual interview scene.

Fig. 1. Virtual English Learning System by East China Normal University.

Beijing Normal University [4] "VR/AR+Education" laboratory has developed an English vocabulary learning software "Happy Words" for preschool children. The software scans words through the mobile terminal, presents corresponding physical models and voices, and helps preschool children to understand and memorize words through the vivid context of the fusion of virtual and real. As shown in Figure 2:
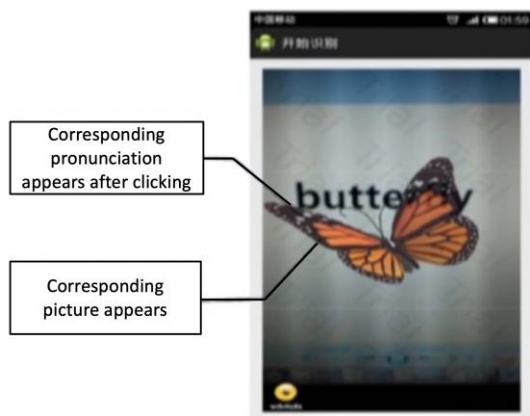
Fig. 2.   Happy Words Interface.

Liaoning Normal University has developed a puzzle-solving English game called "In Order To Dr." [5]. In this game, participants search for task clues through the explanation and guidance of Non-Player Characters (NPC), and finally obtain the "Escape Book" [6] containing grammatical knowledge points, so as to achieve the purpose of learning English in the VR scene. The game software has better stimulated students' interest in learning through puzzle solving and task setting.

Although the above three typical application cases of VR in English teaching are effective, they also have some shortcomings. For example, the practitioners have less interaction with virtual characters in the scene, teaching knowledge points are single grammar or independent words, and Chinese students The combination of English learning characteristics is not close enough, and the evaluation methods of students' learning effects are rarely mentioned.
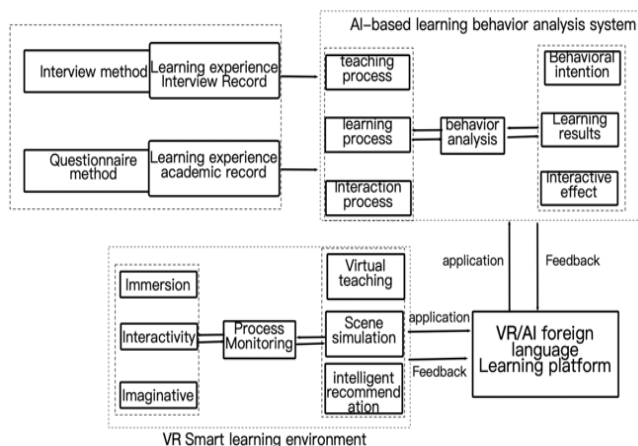

Fig. 3.   Framework of VR-assisted Foreign Langugage Teaching.

In general, the current domestic research on the application of VR technology to English teaching is in its infancy, and future research prospects are promising. For example, the dynamic monitoring advantages and intelligent recommendation functions of VR technology in English learning are rarely mentioned in current research. The VR environment can dynamically monitor the teaching process and learning process, and obtain first-hand student emotional data; through the intelligent recommendation function, ideal learning scenarios

can be set to meet individual learning needs. In addition, it can be analyzed from the technical framework diagram in Figure 3 that the learning effect evaluation method in the VR environment also needs further research. It is expected that the English teaching program based on VR technology can be redesigned in the future, the learning environment, and the foreign language teaching can be reconstructed. The new model allows VR technology to provide reliable support for foreign language teaching.

B. Development History and Research Status Abroad

Computer-assisted language learning [7] covers almost all countries and different languages [8], basically forming a unique theoretical basis and teaching methods [9]. At present, foreign research in this area focuses on the application of VR in language. The following is a representative case of foreign VR in second language learning.

1) Non-immersive foreign language learning platform
Most non-immersive English learning platforms mainly interact with peripherals such as mouse and keyboard, and project 3D games or system pictures to the screen. Users can only click the keyboard in front of the computer to operate without physical movement controls.

Based on the open source platform Open Simulator, Anke et al. designed and developed the VirtUAM three-dimensional virtual German learning game platform [10]. The platform records learners' relevant data about interactions with the system, studies learners' learning motivation and learning effects, and provides real-time feedback on learners' wins in language games. Studies have shown that when learners are immersed in a three-dimensional virtual game scene and establish a competitive or cooperative relationship with others, through active learning, learners can memorize more vocabulary and achieve better learning results. The virtual German game situation of VirtUAM is shown in Figure 4:

Fig. 4.   VirtUAM Virtual German game situation.

St. Petersburg University and other institutions have developed a three-dimensional multi-user Russian virtual world (VWRL) based on the Virtools platform, which is a virtual reality system for teaching Russian as a foreign language. The university's series of teaching experiments show that, compared with learners under the traditional Russian teaching model [11], language learning in the virtual reality world requires learners to master the same amount of language content and obtain the same language communication skills,Learners in the traditional model are much shorter.

The Bernadette Perry team of the French Department of the University of Victoria in France has developed a software called Explorez, which is based on the open source platform ARIS to

create augmented reality games and interactive stories, turning the campus into a virtual French-speaking world. Explorez is the first location-based game for this type of language [12]. In essence, this is a narrative treasure hunt. Players walk on campus and interact with virtual characters and objects based on clues in the environment to improve their performance. French skills.

2) HMD-based immersive learning platform

With the emergence of new interactive devices, interactive devices such as head-mounted displays and handles have been widely used in the virtual world, thereby improving user experience and learning efficiency.

Around 2016, stereo Head-Mounted Displays (HMD) [13] became widely popular, and head-mounted interactive devices began to appear. The use of head-mounted devices in the virtual language learning environment greatly enhances the learner's sense of experience.

Yang et al. developed a Virtual Reality Life English System (VRLE) based on the HTC Vive device. With the help of HTC Vive's tracking technology, users can walk around in the area by wearing headsets and controllers. There are two versions of VRLE: voice-playing, subtitled version and voice-only version. VRLE allows students to complete virtual role-playing by manipulating game characters [14]. The biggest feature of this research is that when users do not know how to express "brown" in English, they can directly point to brown objects. Through the suggestion of the scene, the device brings a real contextual experience to the user.

House of Language is a multi-language learning platform based on Gear VR. It uses a cartoon character named "Mr. Woo" to guide users in language learning [15]. The languages of the platform include English, German and Spanish. In traditional teaching, it is difficult for a teacher to make eye contact with multiple students at the same time. The biggest feature of the House of Language platform is that every student can always keep eye contact with the raccoon role host, thereby increasing students' concentration in the classroom. Studies have shown that the application of VR technology to the teaching of English as a Foreign Language (EFL) is a promising teaching strategy, which is more successful than traditional teaching methods [16].

3) Virtual learning platform combined with AI

With the development of artificial intelligence (AI), AI is gradually applied to virtual scenes and English teaching, and language learning effects are improved through technologies such as virtual characters, voice recognition, and chat robots. AI-based Distributed Virtual Environments (DEVs) [17] support multi-person online interaction, chat robots, intelligent navigation, unified local databases, scene roaming and shared virtual scenes, etc. [18].

Lorenzo [19] and others developed a large-scale, multi-user online learning platform SLRoute. The platform enables learners to interact with others through immersive games. An online Spanish learning tool developed based on the open source platform Open Simulator, which integrates voice or video chat, chat robot or NPC, speech synthesis and other functions to enhance the user experience.

In short, in the development process of combining VR and foreign language learning, many countries and different languages are involved, and it has experienced a development process from a non-immersive foreign language learning platform to an immersive learning platform based on HMD, and then to the integration of AI technology. Studies at home and abroad have shown that new computer science and technology are continuously integrated into the learning environment, constructing an artificial virtual environment that is different from the native language environment, that is, the virtual language learning environment [20]. The development and research of virtual language learning environments, such as the research on inquiry methods and teaching models, has also become a major research hotspot at the moment.

III. Key Techniques in VR English Teaching

A. Speech Semantic Recognition Technology

Speech recognition technology is realized by extracting speech characteristic parameters. The extraction process needs to consider important parameters such as the pitch of the speech, the vowels of the nasal consonants, the frequency spectrum, and the fricative. Speech recognition needs to match the audio model and mode. Audio model modeling is one of the most important parts of the speech recognition system. Acoustic modeling involves modeling unit selection, model state clustering, model parameter estimation, etc., commonly used There are three acoustic modeling methods: Dynamic Time Warping(DTW) based on pattern matching, Hidden Markov Model (HMM), and Artificial Neural Network(ANN) recognition. Audio training models include deep learning, dynamic time Regularization technology and HMM model technology, etc. The principle of speech recognition technology is shown in Figure 5:
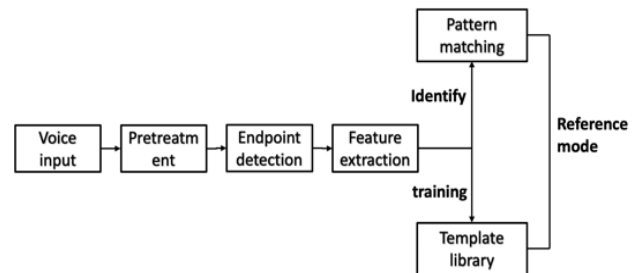

Fig. 5. Principles of speech recognition technology.

The combination of virtual reality and English involves speech and semantic recognition. Its working principle is to use natural language to automatically and efficiently and timely interact with the virtual reality system [21], with emphasis on speech recognition mechanism and speech analysis mechanism. The speech recognition mechanism is a speech-to-text technology, which converts human language information into text information that can be recognized by machines. Voice interaction technology is divided into voice recognition interaction mode and voice dialogue system interaction mode. The speech recognition engine of Microsoft's Speek API is easy to use and can achieve better results. Developers only need to call the speech recognition API interface of the open platform to send the speech recognition request to the cloud. The cloud recognizes the detected speech and converts it into text, and

transmits the text to the caller to complete the speech recognition and call process [22].

B. Virtual Characters

In virtual English scenes, teachers usually use the way of dialogue with virtual characters in the scene to guide students to practice. In a low reality scene, the virtual character has a non-human appearance, without external expression changes and behavior changes; in a high reality scene, the virtual character is a human appearance with rich expressions and body language. Studies have shown that the more realistic the virtual environment, the easier it is for learners to integrate into the dialogue, understand the content of the dialogue, and be willing to communicate with virtual characters [23]. The key technologies involved in virtual characters are: spatial positioning, motion capture, eyeball capture, voice input, etc.

When constructing the situation, students can use Kinect to change the gestures and appearance of the virtual cartoon character, and control the movement and facial expressions of the virtual character, such as opening and closing the mouth and raising eyebrows. The Faceshift plug-in can accurately capture and copy human facial expressions, track facial activities in real time, and control facial expressions of characters [8]. Realistic virtual characters conform to the characteristic structure of the human body. The main control points are selected to simulate the virtual characters, including facial features, facial muscle distribution, and muscle movement characteristics. In the virtual reality English learning environment, when a learner has a dialogue with a virtual character, the more realistic the image of the virtual character is, the easier it is for the learner to be immersed in the content of the dialogue. The actions and facial features of virtual characters change along with the chat, and are consistent with the dialogue feedback in real life, so that learners are more likely to feel immersed and have a better learning experience in the virtual environment.

C. Intelligent Dialogue System

The intelligent dialogue system converts the content input by the user into text through speech and semantic recognition. After natural language understanding, dialogue state tracking, dialogue strategies, natural language generation and speech synthesis tools, the workflow of the intelligent dialogue system is shown in Figure 6. Common intelligent dialogue systems are divided into three categories: task dialogue systems, small chat dialogue systems, and knowledge question answering systems. The question answering system uses a simple and efficient method of information retrieval to provide users with corresponding answers; small chat dialogue systems usually used in open field question and answer, usually keyword-based template matching and database-based search for the sentence with the highest matching degree are used to reply[24]; The task-based dialogue system responds in special scenarios. This method uses three steps: domain recognition, intent understanding, and slot value matching. First, the user's domain is identified, and then the intention is understood, that is, the classifier is used to classify user questions. Finally, the slot value is filled through the typical sequence labeling model and filled.
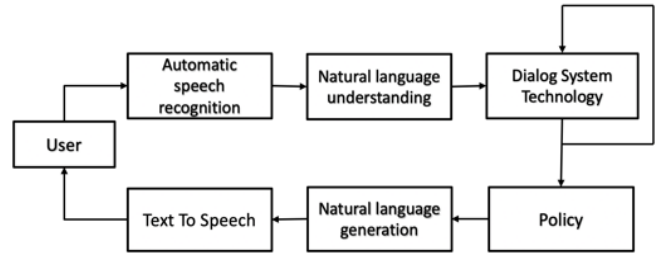

Fig. 6. Intelligent dialogue system process.

Natural language understanding, as an important part of intelligent dialogue system, will directly affect the quality of language processing in the later stages. Natural language understanding has experienced a template-based matching approach, a machine learning-based approach, a deep learning-based approach (including convolutional neural networks (CNN) and short- and long-term memory neural networks (LSTMs), and attention-based oral understanding. Among them, the use of deep learning methods to generate new responses is an important part of the dialogue system, convolutional neural network (CNN) is commonly used in statement modeling, including input layer, convolution layer, pooling layer and classification layer.

1) Input laye

First of all, the user input statement is processed by the relevant word breaker tool, and each word is transformed into a d-dimensional vector x_i using the word vector model, and the converted word vector is stitched together. The calculation process is shown in formula (1), where the $x_i \in R^d$ represents the first word in the statement, $\oplus$ represents the connection operator, and the dimension size is d.

$$x_{1:n} = x_1 \oplus x_2 \oplus \cdots \oplus x_n \tag{1}$$

2) Convolution layer

The h words between the i-th and the i+h-1-th are used as the word window size, and the h×k-dimensional filter w is used for matrix calculation to obtain the corresponding convolution feature c_i. The calculation process is as follows: (2), where s represents the non-linear activation function, $b \in R$ represents the bias term, and $w \in R^{hk}$ represents the dimension of the filter is h×k.

$$c_i = s(w \cdot x_{i:i+h-1} + b) \tag{2}$$

Then the filter is translated on the corresponding sentence, and the corresponding word window has $\{x_{(1:h,)} x_{(2:h+1,)} x_{(3:h+2,...,)} x_{(n-h+1:n)}\}$, the resulting feature map matrix is as shown in equation (3), where $c_i \in R^{(n-h+1)}$ means that in the feature map matrix, the i-th feature vector c_i The dimension is n-h+1.

$$c = [c_1, c_2, \ldots, c_{n-h+1}] \tag{3}$$

3) Pooling layer

The function of this layer is to aggregate all the feature sets generated after convolution, such as the maximum pooling method. The calculation process is shown in equation (4), in the corresponding feature map matrix generated by the convolution kernel $w \in R^{hk}$, Select the maximum value $\tilde{c}$.

$$\tilde{c} = \max\{c\} \tag{4}$$

4) Softmax layer

After using m filters in the convolutional layer, the pooling operation will generate the final feature vector representation $z=[\hat{c}_1, \hat{c}_2, ..., \hat{c}_m]$, input the feature vector into the fully connected layer, and finally use softmax The function obtains the probability distribution of the predicted label. The calculation method is shown in formula (5):

$$y_i = softmax(W_z \cdot z + b) \tag{5}$$

The convolution operation can extract the local features in the sentence, and the final pooling operation can ensure that the corresponding length of the generated feature vector is fixed, so as to avoid different length vectors due to different filters. Intelligent dialogue system needs to pay attention to semantic representation (ambiguity, colloquialism and diversity of natural language), sentence logic, consistency of content and interaction of communication [25]. At present, the key of intelligent dialogue system is to provide better user product experience, more standardized dialogue system components, more reasonable system evaluation method and more independent learning and updating ability.

D. Panorama Technology

Nearpod VR foresees the future classroom form, integrates panoramic pictures and panoramic classrooms into the classroom, uses first person or third person to view the surrounding virtual environment, and uses VR headsets to freely watch and complete tasks in the scene [26]. The panoramic technology can be controlled by the mouse, which brings users an immersive sense of reality [27]. In English education, panoramic technology is used to increase the realism of students' scenes, thereby breaking the limitations of the original scene perspective and giving users a more realistic scene experience. The key technologies of panoramic technology include: feature point matching, image matching, panoramic image straightening, image equalization compensation, and image frequency band fusion. The construction process of the panorama is shown in Figure 7.
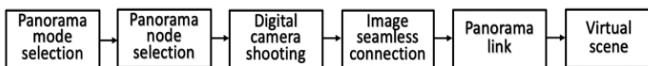

Fig. 7. Panorama construction process.

The most prominent feature of ImmerseMe, a product developed by Cardwell that supports multi-language learning, is to shoot scenes on the spot with a 360-degree camera, which contains language scenes for real tasks, thereby increasing the realism of the scene. The software supports multilingual learning

[28]. This product creates an undersea situation where students can control the sharks, let the sharks find the corresponding letters in a certain area, and spell the words completely. Through this activity, students can learn English while exploring the underwater world [29]. In language scenarios, Cardboard is usually used in conjunction with static panoramic pictures with recording playback to increase the sense of reality. Although panoramic technology can reduce modeling costs and make scene objects more realistic, it also has shortcomings. For example, in panoramic technology, the user's immersive experience and interactive experience are poor, which is a problem faced by panoramic technology.

IV. APPLICATION CASES OF VR IN ENGLISH EDUCATION

A. Classroom Learning

In classroom learning, teachers usually use follow-up reading and dictation to teach English. In oral English learning, teachers need to establish a good language environment to help students practice oral English. EON Relity[30] created the classroom of the future and established the interactive platform EON Coliseum to enable teachers and students to communicate without barriers in a virtual environment. Students and teachers can communicate through a virtual platform that supports multi-user online at any time and any place.

B. Second Classroom

Compared with formal classroom teaching, the second classroom is a new type of teaching mode. It generally refers to teaching activities carried out in museums, communities and other places outside the classroom. The second classroom is derived from teaching materials and is not limited to teaching materials. By constructing an immersive second language teaching environment, English and other second languages are used as the content and tools of language teaching, so that the knowledge of the second language can be fully displayed, which is convenient for students to understand and Master [31].

Second Life (SL) is one of the most popular multi-user virtual environments [32]. A virtual classroom is set up on SL to help users practice oral skills and gain real knowledge and social knowledge through a flexible chat mode [33]. The SL interface is shown in Figure 8. VILL@GE is a virtual language learning environment developed on the basis of the three-dimensional virtual environment platform SL. It has built teaching experiments in many schools in the European Union and achieved certain results [34]. By constructing second classroom scenes such as virtual banks and museums, students play roles in virtual scenes, communicate in a second language, and improve language communication skills [35].

Fig. 8. Second Life.

Jiang [36] developed a 3D virtual environment English learning software. Students and teachers can perform activities in a virtual environment, such as shopping in a virtual supermarket, exercising in a virtual stadium, eating in a virtual restaurant, and so on. For example, in a shopping scene, students are reminded to shop through the broadcast, and each product on the shopping shelf has English prompts such as the name and price. Students in the same group can use English to communicate shopping matters and experiences. As shown in Figure 9, students communicate in real time in a virtual shopping scene to promote cooperative learning.

Fig. 9.   English communication interface.

C. English Educational Games

As a product related to education, educational games carry the desire for education and expectations for games. Malone summarizes the motivations of games as: challenge, control, curiosity and fantasy [37]. Scholars from the University of Iowa in the United States [38] discussed how games can point the way for real-life exploration, pointing out that things that cannot be done in real life can be satisfied in simulation games [39].

Crystallize[40] is a 3D English learning game that uses the head-mounted display Oculus Rift for interaction and gamification of language learning through a task system. In this game, the player can understand the specific vocabulary and grammatical structure while constructing the target sentence. Alan Cheng [41] and others adapted Crystallize, for example, in order to allow learners to better understand bowing etiquette, the Oculus Rift head tracking function was used for behavior monitoring. By observing the NPC character dialogue, students will take the initiative to bow and increase the user experience. The game interface is shown in Figure 10. The main feature of the game is to detect user behaviors, making it easier for users to accept folk culture and get a better learning experience. However, the Oculus Rift used in the game is a wired device that can learn user actions and gestures to perceive user behavior. This kind of wired device will affect the user's actions to a certain extent, and the tactile perception needs to be improved.

Fig. 10. Crystallize game interface.

Mondly VR is the first VR language learning game that supports voice recognition, providing 33 language learning [42].

Mondly landed on Google's Daydream and Cardboard platforms, and VR devices equipped with this platform can be downloaded and used. After wearing the device, the user can have a conversation with the virtual character. Mondly provides users with an immersive environment and pronunciation feedback through a combination of voice chat machine, voice recognition and VR technology. The interface is shown in Figure 11. Mondly is designed from easy to difficult. It understands words from the context and provides machine automatic voice detection. From an educational and technical point of view, this game is a relatively mature VR language learning tool at this stage [43].

Fig. 11. Mondly game interface.

VR learning English software is an online children's English practice software. The software integrates online voice assessment technology, recordings of real foreign teachers, etc. The practice time of this software is more than 300 minutes, including 450 sentences of real foreign teachers' voices and 12 different learning scenarios through 3D. Show contextualized practice methods, capture children's points of interest, and help children improve their learning efficiency. The interface of the VR learning English game is shown in Figure 12. The contextualized dialogue of cartoon characters can increase children's interest in learning English.

Fig. 12. VR learning English game interface.

D. Special Fields of Expertise

Virtual reality can provide targeted teaching design for special subjects or special scenes, and give full play to the advantages of virtual reality contextualization, such as English for marine science and technology, English for marine engineering, English for electrical engineering, English for civil aviation, English for foreign trade, etc.

Kang Yajing [44] integrates physics professional English vocabulary into the physical scene, tracks bilingual explanations through physical models, and enhances the interest in physics professional English learning.

Zhu Lei [45] developed a foreign trade English learning system, which created real foreign trade scenes by simulating

international trade processes. Students set up their own virtual characters to experience, talk with chat robots, and simulate foreign trade English projects for simulated customs declaration and transaction operations, etc.

Marine English, as an important course for marine engineering technology majors in marine colleges and universities, is crucial to the improvement of the English proficiency of Chinese seafarers [46]. Zhang Ning [47] developed a virtual reality simulation and operating system for marine engineering English, combined with force feedback technology, to perform roaming operations in the marine engine environment. The system supports voice interaction and gesture interaction, and the learner is in an immersive environment Practice marine English to improve your English learning level.

In summary, this article describes 18 application cases, which are divided into three categories: non-immersive, immersive, and integrated AI according to the development stage. According to the application scenarios, they are divided into: classroom learning, second classroom, English educational games, There are four special professional fields. A summary of application cases is shown in Table 1. In the above cases, most of them are platforms without interactive devices. Taking Second Life as a typical example, they create contextual teaching scenarios for English teaching based on tasks and roles; for Crystallize based on interactive devices, it brings more interactive experience. Big improvement. With the improvement of the performance of hardware equipment, more advanced equipment is used in the development and research of VR and English learning to bring learners a better learning experience.

TABLE I.   APPLICATION CASE SUMMARY TABLE

Classification method	Non-immersive learning platform	Immersive based on HMD	Integration with AI
Classroom learning	ImmerseMe,VWRL,EON Coliseum	VRLE	Chen Yu
Second classroom	Second Life,Jiang	-	-
English educational games	VirtUAM,VR learn English,In order to Dr,Happy to remember words,Expolrez	Mondly,House of language	SLRoute
Special fields of expertise	Kang Yajing,Zhang Ning	-	-

V. SUMMARY AND OUTLOOK

The above research and analysis show that VR technology is combined with the research of English teaching, and virtual reality technology is an innovative tool for understanding language [48]. It fits well with the law of language learning, and has huge development potential and broad application prospects. Compared with traditional English learning methods, VR English learning has the advantages of immersion, interaction and imagination. With the development of software and hardware, the VR English teaching system will develop from non-immersive learning with mouse and keyboard interaction to immersive learning with head-mounted devices. With the integration of AI technology, the learning effect will continue to be improved. Virtual characters, speech semantic recognition, intelligent conversation, and panoramic technology are the four

typical technologies in VR English teaching, and they are also current research hotspots. VR English teaching can not only be used in the teaching of English majors, but also has important significance and development prospects in the second classroom and special professional fields.

There are also shortcomings in the research on the combination of VR and English. For example, most of the English teaching application cases based on VR technology at home and abroad are only for learning a single grammar, vocabulary or spoken language, and there is a lack of English listening, speaking, reading and writing in the VR environment comprehensive application; the dynamic monitoring advantages and intelligent recommendation function of VR technology in English learning are rarely mentioned in the current research, and the learning effect evaluation method in the VR environment also needs further research. VR English teaching in my country needs to better integrate AI technology, and design a platform that truly conforms to the rules of language learning for English learners in my country, so that VR technology can effectively serve language learning. In summary, the introduction of VR technology into the innovation of language teaching models is the general trend. The combination of VR technology and English teaching will improve the quality of English education and break the status quo of "dumb English" teaching. VR technology is not only a technology, but also a way to change education and teaching methods and provide a new path for innovation and development of language education.

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