

English Virtual Classroom Education--the Future of Distance English Education

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ABSTRACT

It is one of the development trends of English teaching in the future to realize internet-based distance education through virtual English classroom education. The three most important features of the English virtual classroom are interactive online whiteboards, learning databases, teacher tools and controls. The software that makes the English virtual classroom run smoothly usually uses synchronous technologies such as video conferencing, web conferencing and VOIP. Building a virtual classroom project must consider relevant requirements and factors, such as: low latency considerations, equipment accessibility, and security through encryption. In English virtual classroom education, two prominent ways can be adopted are English VR virtual classroom and English mobile communication course. Moreover, many development functions in English virtual classroom education can facilitate learning and simplify the process.

Keywords: *English Virtual Classroom Education, Synchronous Technologies*

1. INTRODUCTION

Today, the world is fighting COVID-19. Implementing virtual learning infrastructure can maintain continuity in English education in the face of school suspensions, especially prolonged ones. Virtual classrooms meet the long-term unsolvable educational needs. In the context of the rapid development of science and technology and the increasing number of teaching methods, a lot of English educators can complement existing courses through virtual courses, especially in flipped or blended Learning in English classrooms. The English virtual education approach promotes inclusive learning by providing accessibility to students of different abilities or who are unable to actually attend classes. The scope of English teaching materials is extended while meeting the interactive or cooperative nature of synchronous English courses. The combination of English education and virtual classroom can meet the high requirements of English education in sensibility, interactivity, situation, timeliness, vividness and so on. Virtual English classrooms usually include video conferencing, a digital whiteboard, group chat, etc. The software that facilitates the smooth operation of the English virtual classroom usually uses synchronous technologies such as video conferencing, web

conferencing and VOIP to make the collaboration real and effective.

2. THE DEFINITION OF ENGLISH VIRTUAL CLASSROOM EDUCATION

This is a teacher-taught, synchronous, internet-based distance English education model. It is different from ordinary traditional English classroom teaching, but it can obtain the necessary resources including relevant English course materials. English virtual classroom education relies on English virtual classroom and is rooted in computer virtual reality technology.

Computer virtual reality technology has three basic characteristics: Immersion, Interaction and Imagination, Multi-sensation. [1] Virtual reality is a combination of various techniques, including real-time Three D computer graphics technology, wide Angle (stereo display technology, wide field of observer head, eyes and hands of tracking technology, the sense of touch force sensing/feedback, stereo, network transmission, such as speech input and output technology, mainly through the establishment of real-time computer graphics mode of Three D visual effect, Then the observation interface of the virtual world is established,

and then the application of the virtual reality technology such as scientific computing technology is strengthened.

An English virtual classroom is an online process and space that simulates a vivid live classroom and requires downloadable executable files to join any virtual lessons. It is similar to a real world English classroom. English virtual classroom software usually uses synchronous technologies such as video conferencing, web conferencing and VoIP to make collaboration real and effective. It allows students to communicate with each other in a variety of ways, including English video group chats and presentations. English virtual classrooms are defined and designed in a way that helps students start learning English lessons from anywhere in the world, rather than being part of traditional English teaching methods. Users can join English classes online.

The lessons in the English virtual classroom are usually synchronized with the English educator, and all English learners are present in the online space for real-time interaction. However, depending on the needs of English educators or learners, many English virtual courses contain pre-recorded components. Like real-world classrooms, English virtual classrooms can be flexibly adapted to the styles and needs of all users. Virtual English classrooms usually contain the following features: video conferencing to facilitate English communication with teachers and peers; a digital whiteboard that provides real-time instruction or collaboration, instant messaging for low-bandwidth communications, participation control so that students can still “raise their hands” or otherwise attend classes; Group English chat for students to work together in groups on the Internet. [2]

Virtual English classroom creates a real-time interactive online classroom for users. Remote audio and video teaching can not only effectively improve the learning effect of online English training, but also meet the needs of English users for large-scale training, comprehensively improve the training efficiency, and establish a competitive online English training system. Its system base mainly consists of courseware making tools, real-time interactive classroom, and courseware on demand system, learning management system and learning gateway.

English virtual Classroom Exhibition interactive provides real-time interactive English classroom, local courseware production, online on-demand, and students' learning behavior analysis report four in-one English virtual classroom solutions. Without changing teachers' teaching habits, the architecture scheme based on proper web design, streaming and real-time interaction can make it convenient for teachers and students to join the real-time classroom. Using the method of combining live broadcasting and recording, the live broadcast content of teachers' classes can be recorded

simultaneously, and it can be broadcast on demand immediately after the End of English classes. Provide powerful and easy-to-use local courseware production function, can let the teacher very convenient at any time, place to make courseware and upload, management, on-demand; The content of the courseware is completely designed for virtual live broadcasting, including audio and video, documents, questions and answers, etc., in line with the characteristics of English education/training to the maximum extent, so that high-quality English teaching content can be quickly spread under the guarantee of safety.

The virtual classroom teacher terminal provides teaching management software for teachers, which enables teachers to master students' English learning. Generally, it supports one-click courseware recording, screen casting, Interactive English answering and other functions, which can make English classroom vivid and interesting. Some software also provides voting, screen sharing, photo comparison and explanation and other interactive functions, supporting any application screen casting and explanation functions.

3. THE MOST IMPORTANT THREE KEY FEATURES OF ENGLISH VIRTUAL CLASSROOM

3.1. Interactive Online Whiteboard

The whiteboard or blackboard makes the room into a classroom, so that the English class has a display area, so that the teacher and students have a place to write and display information together. Similarly, the online whiteboard is just as important for English online classrooms, if not more so, because it provides a shared focus and enables teachers and students to collaborate on learning projects. By embedding English learning materials (PDF, video, audio files) directly into the whiteboard, teachers can organize English lessons to attract more learners' senses and make them more interesting. These are all important aspects of “student-centered” approaches to learning, which have proved more effective than the old “lecturer-led” approach. English online whiteboards allow teachers and students to interact more collaboratively, rather than just relying on video/voice. [3] The repository of preserved learning resources gives teachers immediate access to relevant, rich or structured materials to create a more dynamic English classroom.

3.2. Learning Database

In a traditional English classroom, teachers have access to English textbooks, games, exercises, templates, worksheets, and multimedia resources (print, video, audio) all around them. Teachers also need this in English virtual classrooms. Teachers need to be able to

upload their English digital learning materials to the cloud and save them for future use. This helps teachers prepare for class in less time and provides a more organized and effective curriculum. Most importantly, the English online classroom will enable students and teachers to be on the same page. For example, a teacher can navigate to an exact page in a particular document or even open an English video resource. The useful English virtual Classroom software will ensure that students are on the same page as the English PDF or can synchronize the English video.

3.3. Teacher Tools and Controls

When teachers are in a traditional English classroom, they can use physical location, proximity and body language to control the English classroom. In the English virtual classroom, corresponding teacher tools and controls are needed to complete the control of the English online virtual classroom, such as text tools, mathematics tools, group classroom tools, and student-side control tools, etc. These tools can help teachers complete a perfect live course.

4. SYNCHRONIZATION TECHNIQUE

The software that makes the English virtual classroom run smoothly usually uses synchronous technologies such as video conferencing, web conferencing and VoIP. [4]

4.1. Video Conference

The video conference system consists of video conference terminal, Multipoint Control Unit, network management system and transmission network.

Video conference terminal is a terminal located in each meeting place. Its main work is to encode and package local video, audio, data and control information and send it. Decode and restore the received data packets into video, audio, data and control information. Terminal equipment includes video acquisition front end (broadcast camera or PTC), display, decoder, coder and decoder, image processing equipment, control switching equipment, etc.

As a useful video conference server, MCU provides data exchange, video and audio processing, conference control and management services for each terminal of two-point or multi-point conference. It is the essential equipment for the establishment of video conference. Three or more conference TV terminals must use one or more MCUS. [5] The size of MCU determines the size of video conferencing.

The network management system is the management platform for the interaction between the meeting administrator and MCU. In the network management

system, you can manage and configure the VIDEO conference server MCU, hold and control conferences.

Conference data packets are transmitted between terminals and servers through the network. A secure, reliable, stable and high-bandwidth network is a necessary condition to ensure the smooth progress of video conference. Transmission equipment is mainly the use of cable, optical cable, satellite, digital microwave and other long-distance digital channels, according to the every need of the conference. When videoconferencing is not open, these channels are long distance channels.

Video conference system, including software video conference system and hardware video conference system, refers to two or more individuals or groups in different places, through the existing various telecommunication communication transmission media, people's static and dynamic images, voice, text, pictures and other data to each user's computer. This allows geographically dispersed users to get together and exchange information through graphics, sound and other means, increasing the ability of both sides to understand the content. At present, video conferencing is developing towards multi-network collaboration, HIGH definition and development.

4.2. Network Conference System

Network conference system is a multimedia conference platform with network as the media. Users can break through the limitation of time and region through the Internet to achieve face-to-face communication effect. The system adopts advanced audio and video coding and decoding technology to ensure clear audio and video effects. Powerful data sharing more user provided electronic whiteboard, web, application sharing, speeches, the richness of virtual printing, file transfer, such as auxiliary function, can fully meet the remote video meeting, information sharing and collaborative work, long-distance business, remote training and remote fry and other requirements, to provide users with efficient and fast a new way of communication, Effectively reduce the operating cost of the company, improve the operating efficiency of the enterprise. Network conferencing, also known as remote collaborative office, can use the Internet to share data among multiple users in different locations. Network video conferencing is an important part of network conferencing, and according to the degree of software and hardware requirements, it can be roughly divided into hardware video conferencing, software integrated video conferencing, pure software video conferencing and web version video conferencing.

4.3. VOIP

Voice over Internet Protocol (VOIP) is a Voice call technology that implements Voice calls and multimedia conferences over IP, that is, communication over the Internet. Other informal names are IP telephony, Internet telephony, broadband telephony and Broadband Phone Service. VOIP is used for VOIP phones, smart phones, and personal computers to make calls and send short messages over cellular networks and WiFi. The IP protocol is used to transmit speech in packets over IP networks. Using VOIP, voice communication can be realized on the Internet, Intranet or LAN. On a VOIP network, voice signals are digitized, compressed, and converted into IP packets, which are then transmitted over the IP network. VOIP signalling protocols are used to establish and cancel calls, and transmit information for locating users and negotiating capabilities. The main feature of the telephone network is low cost. The synthesis of data, voice, and video are on the same network. New centralization of services is on the network and simplified management of end users.

5. SOME REQUIREMENTS AND FACTORS OF CONSTRUCTING VIRTUAL CLASSROOM PROJECT

5.1. Low Latency Considerations

The English online learning experience is best achieved when it feels like all class members are in the same room communicating in English. Low latency streaming media is important for English virtual classroom software because it enables students to share their ideas and participate in English classroom interaction in real time. This requirement means that the system allows natural conversations without interruption. At present, among various protocols, WEBRTC is a better way to achieve this goal in English virtual classroom. EASYRTC and other products compiled according to WEBRTC will support the simultaneous interaction of different users, and can automatically record the video of English interactive class into a video for later playback.

5.2. Device Accessibility

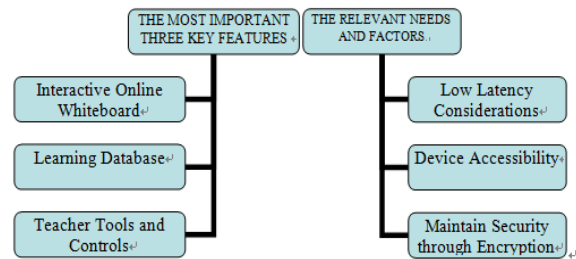
The main goal of English distance learning is to make English education available to those who cannot attend face-to-face English courses. To achieve this accessibility, it's important to remember that not everyone can access the same device. In the English virtual classroom, students and teachers can join through a variety of smart phones, laptops, tablets and desktops. To ensure that all members of the network have access to the broadcast, we recommend creating browser-based applications rather than native applications for a few platforms. When an English class

is being broadcast, other users can enter the direct broadcast room to watch the English class by means of scanning codes and web pages.

5.3. Maintain Security through Encryption

Privacy can be further maintained through encryption and authentication. You can choose video live streaming platforms with built-in encryption functions, including various authentication mechanisms & HTTPS protection mechanisms, to create a more secure live streaming experience. The platform provides connection-level authentication for users, and in conjunction with these security features ensures that only authorized users can access the English virtual classroom, thereby protecting students and teachers from unwanted visitors.

TABLE I. THE MOST IMPORTANT THREE KEY FEATURES & THE RELEVANT NEEDS AND FACTORS



6. ENGLISH VIRTUAL CLASSROOM EDUCATION CAN BE ADOPTED IN TWO PROMINENT WAYS

6.1. English VR Virtual Classroom

VR technology is a media form that can bring users a “high sense of immersion”. Generally speaking, it means that people wearing virtual devices (such as virtual glasses and virtual helmets) seem to enter another world, as if they are in the scene. VR technology itself has the characteristics of ‘immersion’, ‘interaction’ and ‘conception’, which plays a huge role in improving and enhancing the education and teaching environment. The introduction of VR technology in English classroom teaching will create a very inclusive environment for students, enhance students’ sense of experience and initiative of observation and inquiry, and improve teachers’ English teaching effect.

6.2. English Mobile Communication Course

The teaching and training of English mobile communication courses involve a variety of mobile communication devices, interfaces, protocols, network architecture, mobility management and other contents. However, due to many limitations, it is difficult for ordinary universities to build a real mobile communication network environment for English course

teaching by their own strength. For English mobile communication course of mobile communication network involved in the project content, can be cut in virtual simulation teaching software, under the condition of the “net”, adopt accurate, image, vivid fusion wisdom of practice teaching, theory and practice of English teaching effect to achieve the purpose of the perfect combination, improve English teaching quality and effect.

The teaching advantages of English mobile communication course are obvious. It changes students' Way of Learning English, and enables them to learn efficiently whenever and wherever possible to meet the teaching needs of English wisdom courses. By using the English virtual simulation training platform, students can change their English listening and speaking training situation from fixed time to network platform, and independently carry out a variety of English listening and speaking practice anytime and anywhere. Students can carry out English competitions in the way of individual or team cooperation, independently choose the learning cycle, according to different learning progress to complete the English learning content, but also repeated learning, high flexibility, high efficiency of learning. The platform will record students' different English learning situations in real time for teachers to evaluate students' English learning effects and meet the teaching needs of wisdom course. At the same time, on each course website and terminal, teachers will distribute teaching-related materials in advance for students to get familiar with and understand, and the online open platform will update relevant English teaching videos and materials in real time, so that students can enter the relevant platform at any time to learn and ask questions, and solve various problems. In addition, by adopting the model of English virtual simulation and practical training, independent English practical training courses are set up, so that students can practice English directly through the network on the English virtual simulation platform, which effectively improves students' English practical ability.

7. CONCLUSION

Distance learning in English is growing at an exponential rate and is only going to grow faster. There is no reason why all English education must take place in the same physical space. Multi-spatial interaction means greater flexibility for both teachers and students. Virtual classrooms are an ideal way to get real connections in real time from anywhere in the world. With the continuous maturity of computer virtual technology and the popularization of virtual technology operation, the application of English virtual classroom in universities and enterprise universities is bound to be more extensive, more flexible and more intelligent. It will play a greater role in promoting the reform of

English education system and the cultivation of English talents. How to determine a set of perfect and useful English virtual classroom application solutions (technology, security, and maintenance mechanism, etc.) will be a topic that needs to be summarized and improved in practice.

It is worth noting that in the modern virtual classroom, Intel has begun to focus on research: artificial intelligence to detect students' emotions in the virtual classroom. Intel and Classroom Technologies are developing tools that use artificial intelligence (AI) to detect learners' emotions in virtual classrooms. The feature can be used to tell teachers if a student is bored, confused or distracted.

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