

Research on the Application of Augmented Reality in College English Teaching

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Abstract. Augmented Reality (AR) is a live view of reality that is augmented by computer-generated sound, image, or videos. It allows the user to interact with the real physical environment in an enhanced way. AR enriches the existing forms of information presentation, and its combination of virtual and real can be used to create a simulated environment, deepen people's perception of the surrounding environment and understanding of knowledge. It brings new opportunities for teaching innovation. According to the principle of augmented reality teaching application system, a new English teaching mode based on augmented reality is constructed. This model is designed for the application of Augmented Reality and Virtual Reality in English classroom, which is of great significance to English teaching reform.

Introduction

The rapid development of information technology has made it a reality to cover the whole world with digital information. The application of information technology in teaching is becoming more and more mature. As a catalyst to promote educational reform, technology has attracted extensive attention from scholars in the field of education. Augmented Reality (AR), a new type of technology, has gradually entered the research field. Under the trend of economic globalization, English, as one of the major international languages, has become a bridge between us and the world. The virtual scenes created by AR are seamlessly integrated into the real English classroom to support the real and natural interaction between teachers and students in the simulated scenes. By changing the way of knowledge carrying and teaching, the current situation of college English teaching can be improved through the application of Augmented Reality and Virtual Reality.

Analysis of Current Situation of Augmented Reality in Teaching

Overview of Augmented Reality Technology. Augmented Reality (AR) is “a real-time direct or indirect view of a physical real-world environment that has been enhanced/augmented by adding virtual computer-generated information to it.” (Carmigniani & Furht, 2011). It is one of the latest technologies adopted in Computer Assisted Language Learning (CALL). The word “augmented” comes from “augment” which means to add or enhance. Augmented reality intends to create an enhanced user experience by adding graphics, sounds, and touch feedback to the natural world. That is, virtual content can be seamlessly integrated into the display of real scenes. Virtual elements co-exist with the completely real elements, allowing users to interact with virtual elements in a real environment and making learners fully immerse themselves in the context created by the current AR technology.

Compared with the display of two-dimensional objects in multimedia, augmented reality technology can provide more situational and perceptual experience for three-dimensional objects and entities. Azuma(1997) defines AR as systems with three important features: adoption of three-dimension, the combination of real and virtual dimensions, and interactions in real time. three-dimension registration refers to the calculation of selecting a marker as the positioning reference in the real scene captured by the camera, so that the virtual object can be seamlessly integrated into the real environment. The combination of real and virtual refers to the seamless integration of virtual objects generated by the computer and other terminal devices with the real

scene. Users can move in the simulated scene. Interactions in real-time means that users can interact with virtual objects at any time and complete corresponding actions together with virtual objects.

At present, augmented reality technology has been widely used in the film and television industry. However, with the rapid development of information technology, the improvement of network speed and the increase of computer processing speed, augmented reality technology will become more and more mature. It is bound to have a far-reaching impact in the field of education and become a booster for technology to promote the innovation of educational means.

Overseas and Domestic Current Research Situation. In order to understand the current domestic research on the application of augmented reality in education, the author has read a lot of articles about the application of augmented reality in education. Most countries with in-depth research are countries where English is the mother tongue. Since they have the real context of learning English, there are few studies on the application of AR technology in foreign language teaching. However, for Chinese college students, there is a lack of formal language environment for English learning. In order to improve the English application ability of learners, the local research on the application of augmented reality technology in English learning has far-reaching significance. Some experts have pointed out that the higher the consistency between the situation created in foreign language learning and the real situation in practice, the better the learning effect will be. But in the current foreign language teaching practice, there are no conditions for learners to learn in real social situations, which require the application of modern information technology to provide multimodal teaching situation. By using AR technology to construct the oral English situation, combining the real and the virtual, and providing tools for listening and reading, the cognitive load of learners can be reduced and the learning efficiency and practical application ability can be improved.

Challenges of Using Augmented Reality in College English Education. The application of augmented reality in education has all these advantages; however, there are still many challenges in using AR in teaching. The biggest problem was that learners need “sufficient familiarity with the AR-based mobile learning material” and they must know how to use the device before any learning can happen. Therefore, in implementing AR, sufficient time should be scheduled to familiarize learners with operation of the devices as well as the application’s rules. Another limitation of using AR is that instructors cannot readily gauge to what extent students use the target language and cannot monitor usage so that the students do not revert to their first language. Instructors can participate in the field experience with the learners to monitor their use of language. However, it is not practical that all the learners can be monitored. Besides, due to the high price of wearable devices, display devices and other devices, the cost of the infrastructure used to build the augmented reality system is rather high. Augmented reality systems require a lot of bandwidth, and the speed of most campus Internet transmissions is far from adequate. Augmented reality technology is not mature enough, so the experience is not good. At present, there are still many people do not understand augmented reality, so augmented reality technology has not been widely used in education. People do not realize the importance of augmented reality to education.

The Application of Augmented Reality in the Design of English Teaching Mode

Based on the comprehensive consideration of the advantages and disadvantages of augmented reality in the college English teaching and the characteristics of English subject, the application of augmented reality in college English teaching should be studied from the perspective of the teaching mode design of interventional technology. It is necessary to apply the new technology in a reasonable way. AR based teaching system design should follow four principles: first, the content of AR design should come from the course. More information should be provided so that students could access a wide variety of information, selected from the same topic and the same content. Second, the time spent in AR teaching can not be longer than the time used in the traditional teaching mode. Third, the AR system should be flexible enough for teachers to adapt resources according to students' needs and teaching contents. The constraints in the real environment should be fully considered. The last is that sufficient and effective feedback should be available to students. Feedback is important, especially in

the game-based AR system. It should be instantaneous, and it should let the players know whether they are engaging the game in the appropriate manner

Integrating Teaching Objectives to Create a Realistic Teaching Environment and Intuitive Learning Resources. To memorizing English words and basic grammar, students can use three-dimensional models designed by augmented reality. The mobile terminal is used to display the simulated real objects corresponding to English words, and the information content such as words and sounds is integrated into the application. The combination of abstract information and intuitive information also reflects the internal relationship between them, so that learners can understand vocabulary and grammar more intuitively and comprehensively and deepen their memory.

Cultivating Reading Ability. Use augmented reality to recreate some situations in the English text. For example, three-dimensional books based on augmented reality. See Figure 1 for an example of using AR in a classroom setting: The mobile scans some markers on the textbook, three-dimensional images about that part of the article can be seen. Learners can place themselves in the real context of the article and even use wearable devices to generate tactile experience and interact with the characters in the article. Through multi-sensory interactive experience, learners' imagination of plots and characters in the text will be aroused. Learners' cognition and experience of English will be more accurate, and the English reading experience will also change from boring to very interesting.

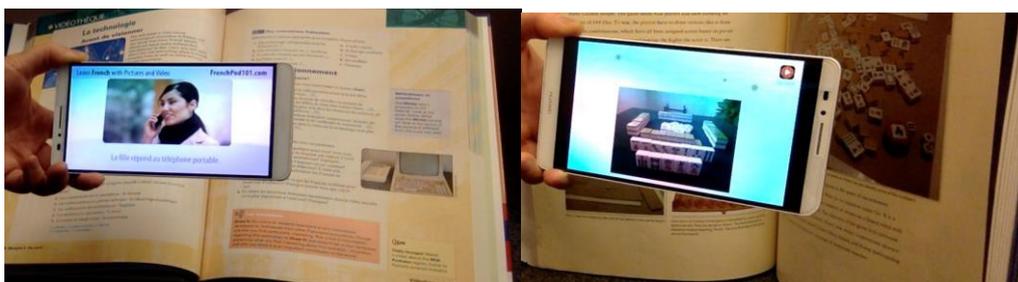


Figure. 1 Using AR with a mobile device in a classroom setting

Cultivating Conversational Ability. The use of role-playing with the help of a simulated environment or character enables learners to have English conversations anytime and anywhere, and to master correct language skills under the condition of blending situations. This requires the software to be able to connect the elements of the real and virtual worlds to the same coordinate system. Learning in a natural context based on a combination of the real and the virtual makes the learners more efficient and direct in acquiring information, and the learning becomes more situational and authentic. It is not only for teachers to teach new knowledge, but also for students to accept and apply new knowledge.

Innovating College English Teaching Mode. In the innovative augmented reality based English teaching mode, first of all, students should independently experience learning. Compared with the commonly used multimedia learning resource, the augmented reality learning resource maximizes the learning experience of learners. In the process of interaction between learners and the learning content of the augmented reality resource, learners can not only inspire their interest in learning, but also discover the knowledge they do not understand in the learning module. Moreover, for some existing problems, students are able to use inquiry-based, collaborative learning methods to solve them. Then the teacher intervened and guided the students, summarized the questions raised by the students, organized and guided the students to have the learning experience again, and solved the problems left by the students.

Secondly, it is necessary to provide learners with a certain amount and high quality of vivid and interesting listening and reading materials that closely cooperate with the text, so that learners can carry out independent learning and inquiry learning individually or in groups according to their own interests and hobbies, and consolidate and improve their reading and conversation ability.

Finally, through the implementation of process evaluation, the realization of teaching objectives is verified. According to the evaluation results, the teaching method is constantly revised, and the teaching environment is created to support the transformation of the teaching mode under the condition of informationization. In the end, the English teaching plan that is truly in line with the "dual master" teaching mode is extracted.

Compared with the existing online teaching mode, the augmented reality system can support teachers and students to play different roles in the same scene for synchronous teaching, and multiple people cooperation learning, which is basically the same as the real face-to-face teaching situation. The teacher sets students' activities and learning tasks in the scene, and controls and assists students to complete the learning objectives in the whole process. In the learning system based on the augmented reality, the voice video, listening and reading process of the operator are recorded synchronously by the video equipment, and the playback of the recorded video is supported, which can realize the cross-time teaching. However, this model still has some shortcomings, for one thing, when students experience learning independently, the lack of supervision may lead to the failure of achieving the expected teaching objectives; for another, from the perspective of teaching design, this model is only suitable for small class teaching. English teaching based on augmented reality can not completely replace traditional classroom teaching, but complement each other with teacher-centered class.

Comprehensive Teaching Evaluation. In the augmented reality system, students practice and take exams electronically or through role-playing. The student account can keep the practice and test scores and reflect them in the form of growth value, which will correspondingly affect the task difficulty level in the scene and the corresponding virtual character animation effect of the user, improve the learner experience and guide students to learn step by step. To construct the learning evaluation index system in the information environment, first of all, the data that can be collected by the system platform based on augmented reality should be determined, such as the learning time, the size of listening and reading materials, learners' participation in English conversation, etc. Secondly, teachers can use the computer for classroom observation, performance analysis. Use information technology to evaluate learners comprehensively. Teachers make the comprehensive evaluation through the observation of learners' classroom performance, report evaluation, log file analysis and standardized tests.

Summary

Traditional classroom is limited by the site and discipline, so students cannot carry out field learning, which makes the knowledge too theoretical and is not conducive for students to apply the knowledge they have learned to the real life. Thanks to the continuous improvement of intelligent terminal performance, our classroom is equipped with basic computer, network, electronic white board, projectors, video cameras and other multimedia equipment, so we do not need special equipments to achieve augmented reality system. Augmented reality will be applied to teaching so that students can use more senses to make learning English easier in the simulative teaching scenes. In the future, we can rely on the cloud to develop three-dimensional education resource according to different course design, realize multi-sensory joint learning, and promote knowledge transfer. With the experience of simulated interaction, we can enhance learners' sensibility imperceptibly and provide an open and interactive space, transforming learners from knowledge consumers into knowledge producers.

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