Research on the Construction Strategy of the Theoretical Framework of Presence in Oral English Teaching Based on Augmented Reality Technology

Dan Xu

Faculty of International Studies, Henan Normal University, Xinxiang, China
Email: x_dan@foxmail.com

Abstract

Aiming at the common problems of "dumb foreign language", oral communication anxiety, low oral communication willingness and other common problems of oral English teaching effectiveness and low motivation. Taking the most advanced augmented reality technology as the starting point, starting from people's basic psychological needs, experience and exploration needs, we study how augmented reality oral English teaching can meet the needs of learners through functional and experiential design, and at the same time stimulate learners' intrinsic motivation and experience. Learn to invest. At present, research on augmented reality education generally lacks systematic research on the construction of the theoretical framework of augmented reality technology perception experience, teaching mode acceptance behavior research and teaching mode application research. Based on this, this paper first proposes the five-dimensional definitions of AR environmental presence, namely: spatial presence, immersion, reality, interaction and social presence. Further, a theoretical framework of augmented reality oral English teaching presence based on 3I characteristics and English teaching background is constructed. Finally, the correctness of the relationship among the proposed dimensions is systematically analyzed and discussed. This paper conducts in-depth research on the application of augmented reality technology in classroom teaching and online education from the aspects of perception, acceptance and application, which has great practical significance and theoretical value.

Keywords

Augmented Reality, Oral English Teaching, 3I Characteristics, Presence

Theory, Build Strategy

1. Introduction

The effectiveness of technology is inseparable from human perception, acceptance and application. With the development of network, mobile and intelligent education, students' perception, acceptance and willingness to participate in educational models have increasingly become the key factors that determine the success or failure of education. The satisfaction of learners' needs and the stimulation of motivation are the inner core driving forces for improving teaching effectiveness (Martin et al., 2020). In the context of globalization, foreign language ability is a significant feature of human capital and an important part of human ability. Many countries attach great importance to the cultivation of foreign language ability. Students start foreign language learning from primary school. After entering university, foreign language is an important compulsory basic course regardless of their major. Foreign language has more and more important communicative value and learning value. In listening, speaking, reading and writing ability, oral communication ability plays a very important role, and it is considered as the goal of language learning in the 21st century. In order to improve the effectiveness of oral foreign language teaching, develop the potential of learners, and help the country to participate in international competition, information technology has been continuously introduced and integrated into the teaching of oral foreign language. On the whole, foreign language teaching techniques, teaching modes, and teaching content are constantly updated and changed in the direction of virtualization and contextualization. Taking China as an example, the technical medium of English education has evolved from traditional books, blackboards, and chalks to projectors, tapes, tape recorders, and later language laboratories, and has evolved into current computer, multimedia, and network technologies (Jarvis, 2019).

Augmented reality technology is a high-level virtual technology, which is rated as one of the most important development disciplines and important technologies affecting people's quality of life in the 21st century. It is also called "immersive multimedia" or "computer simulation reality". Its interactivity, immersion and authenticity all refresh the "cold" impression of technology. It can expand the depth and breadth of human-computer interaction, and achieve realistic full sensory interaction. Applying augmented reality technology to oral English teaching can expand the oral English teaching assisted by other information technologies in terms of experience and teaching function (Li & Xie, 2021).

This paper mainly discusses from three aspects. The second chapter defines the core concepts. The third chapter mainly discusses the current situation of the combination of augmented reality technology and English teaching. The construction strategy of the telepresence theoretical framework of oral English

teaching based on 3I features will be explained in the fourth chapter.

2. Definition of Core Concepts in the Construction of the Theoretical Framework of Presence in Oral English Teaching

Presence is not limited to augmented reality technology, it exists in various media that can provide user experience. In the study of media communication, the study of presence has strong practical and theoretical value. Technologies such as video telephony, high-definition television (HDTV), home and arcade video games, the World Wide Web (WWW) have dramatically changed how people work, play and live. For example: in the business world, video conferencing has begun to replace physical attendance; Web-based systems with various functions have been applied to online games, telemedicine, distance teaching, etc.; Augmented reality technology supports multi-sensory interaction of vision, hearing, touch, smell, and taste, and is widely used in training, simulation, design, image presentation, rehabilitation training for the disabled and other experiential activities (Jin, 2021). One of the important meanings of these media technologies is to create a new mediation experience for users, and understanding the existence and role of presence is very important for the research and creation of mediation experience. From a practical point of view, the research of presence can help explain what will encourage and discourage users from using the media and improve the final product of new media design and current media technologies (Bogicevic et al., 2019). This chapter starts with defining the three concepts of augmented reality technology, core composition of presence, and 3I characteristics, and lays a solid theoretical foundation for constructing the theoretical framework of augmented reality for spoken English teaching presence.

2.1. Augmented Reality Technology Concept Definition

The origin of "augmented reality" technology can be traced back to the Sensorama Stimulator invented by Morton Heilig in the 1950s and 1960s. He used his years of filmmaking experience to design a machine called the Sensorama Stimulator. The Sensorama Stimulator uses images, sounds, scents, and vibrations simultaneously to make people feel like riding a motorcycle through the streets of Brooklyn, New York. The biggest difference from virtual reality technology is that augmented reality aims to enhance existing real-world experiences rather than produce a completely digital new environment. AR interacts with objects in the virtual environment by using science and technology centered on interactive computer technology. A virtual environment that is highly similar to the real-world environment in terms of sight, hearing, touch and even smell is created, and can produce a trans-temporal presence experience similar to the real environment. Its essence is to generate a real-time interactive three-dimensional environment in computer simulation through the use of various technologies (computer graphics system and various interface devices such as display

and control), providing users with an immersive, real, virtual and real use feeling. Breakthrough technologies and innovations have facilitated the development of AR in different application fields. After more than 30 years of development, augmented reality technology has expanded from its early applications in entertainment and simulation training to aerospace research, construction, medical science visualization, defense The fact that it has broad application prospects in all walks of life has been widely accepted by the society (Liu et al., 2019).

From an educational and teaching perspective, AR refers to a simulated interactive environment created by a 3D computer-generated graphics system combined with various distracting devices, which provides an immersive experience where users can explore the augmented reality environment and interact with it. 3D simulation environments have the ability to transform abstract concepts into concrete visualizations, which can enhance users' sensory understanding of objects and environments that would otherwise be unobservable. Research on the application of augmented reality in education shows that it has the characteristics of attracting students' attention, providing vivid and real learning experience, bringing immersion to learners, multi-sensory experience, high conception, and strong interactivity. It is used in education. 3D AR systems are the most suitable alternatives to traditional text-based and web-based systems (Zhu et al., 2019).

2.2. 3I Characteristics Concept Definition

American scholars have summarized the characteristics of augmented reality systems as: Immersion, Interaction and Imagination, which are later commonly referred to as the 3I characteristics. These characteristics are also used as quality metrics for AR systems. In the educational application research of augmented reality technology, the use of 3I characteristics to characterize augmented reality experience has been widely adopted. 3I characteristics appear in augmented reality research in education fields such as medicine, language, mathematics, science, pedagogy, and art, and have a significant impact on student learning. When educators design courses to be taught in VRLE, it is not necessary to deploy all three functions—interaction, immersion and imagination—in their learning environment. All three functions of AR—immersion, interaction, and imagination—should be considered when assessing learner acceptance of AR teaching systems (Méryl et al., 2022). It can be seen that the imaginativeness of AR environments is not as intuitive as immersion and interactivity. In AR environments, imaginativeness can be defined as the ability to stimulate users to perceive and imagine things that do not exist.

2.3. Definition of Presence Concept

The concept of "presence" has been the subject of research and discussion for more than 40 years. For many scholars, presence arises from symbolic interac-

tions, or how new experiences are given meaning based on previous experiences with similar events/items/thoughts. In social psychological theories of interpersonal communication, presence is analogous to the concept of "coexistence" or how we perceive the presence of others in our vicinity (Thyberg, 2022). It can be seen that the definition of presence is not consistent. This article defines it as realism. Realism refers to the extent to which media can generate seemingly realistic representations of objects, events and people, i.e. representations of media content that look, sound and/or feel like "real" things. Human factors engineers often use this concept to assess consumer responses to changes in media properties. In the TV study, for example, researchers manipulated viewing angle, display area, viewing distance, and other variables, and then asked subjects to report subjective ratings of their experiences on the "realism" dimension. Often, what the media describes as reasonable is social realism. The plots and scenes in science fiction programs do not meet the requirements of social realism, but their perceived authenticity is high. Because although the events depicted are unlikely, the visual and visual perception of objects and people in the media is what makes people perceive them to be real.

Based on the definition of the above three concepts, this paper focuses on the construction strategy of the theoretical framework of augmented reality oral English teaching presence integrating 3I characteristics. It provides a more effective reference model for creating a new ecology suitable for future oral English teaching.

3. The Current Situation of the Combination of Augmented Reality Technology and English Teaching

3.1. The Development Trend of Technology-Assisted English Teaching

Advances in information technology have driven changes in the way language is taught, and the advent of email in language learning in the 1980s changed the way students worked in the classroom, connecting them with a multitude of partners and expanding a variety of tasks. The anytime, anywhere flexibility provided by CD-ROMs is enhanced in quality as students are able to complete tasks and perform work in reliable settings, both synchronously and asynchronously. With the development of mobile technology, mobile technology-assisted language learning models utilize mobile technology and devices (such as smartphones and tablets) to support and facilitate language learning. Compared to desktop or laptop computers, mobile devices are attractive in language learning due to their wide availability, convenience, portability, accessibility, multimedia capabilities, Internet connectivity, and cost-effectiveness (Fu & Li, 2021). In recent years, artificial intelligence technology has also been applied to language teaching, and intelligent computer-assisted language learning ICALL tools are used to directly solve the cultivation of various language skills and communication skills.

In general, digital technologies enhance learning through online open courses, blended learning, flipped classrooms, or collaboration tools provided through social media. New technologies create new opportunities to improve education as well as individual learning and support creative, multimodal, experiential and hands-on learning models. On the whole, the development trend of oral English teaching with the assistance of technology shows the characteristics of dynamic and situationalization.

3.2. Augmented Reality Educational Function and English Teaching

Augmented Reality Education Features and English Teaching Due to the interactivity and flexibility, multimedia such as video, images, sounds, animations or simulations can be used in language teaching in a meaningful way and enhance the teaching effect.

Augmented reality technology is described as the use of immersive computer simulation environments in which people can interact, which incorporates these traditional multimedia and significantly increases user immersion, especially in visual perception.

Augmented reality isn't just a new tool, it's a whole new concept, a paradigm shift in human-computer interaction, a whole new way of using computers. Augmented reality has achieved a qualitative change in the following aspects: from pictures to immersive 3D environments, from observation to experience, from use to engagement, from interface to virtual world. The use of augmented reality in education can be seen as a natural evolution of computer-assisted instruction or computer-based training.

English learners should convert both visual and auditory cues into information, and the information conversion function of the immersive AR teaching system can provide a new way of learning to motivate students. AR brings simulations closer to real-life experiences, allowing students to be more immersed in the 3D environment, and they can also improve their skills through more realistic practice. The AR system helps improve students' concentration in language learning, thereby helping them understand what is being memorized. In addition, the AR system allows students to study in a "foreign country" in a simulated environment that is more conducive to allowing students to understand the real culture of the language they are learning. AR immerses or engages learners in a learner-centered, learner-controlled computer-generated environment, which can lead to higher cognitive engagement compared to traditional classroom learning (Ma & Zhang, 2021). AR facilitates access to resources and tools because it leverages the interface structures that people use in the real world, the interaction is more intuitive and natural, and AR also improves the interaction between participants. The application scenario of existing Augmented Reality technology in English teaching is shown in Figure 1.

Its shared environment enables learners to use the indexed language and can provide them with full transcripts of conversations as a future learning resource.

Figure 1. Application of augmented reality technology in English teaching.

In summary, augmented reality technology supports the embedding of traditional multimedia content such as video, audio, animation, image, and text. On this basis, it provides an immersive, interactive and participatory learning method, which deepens the learner's memory of the learning content, enhances the learner's attention, and helps to promote their creativity. However, most studies only focus on the teaching application advantages of augmented reality technology in one aspect, and do not combine teaching theory, perception theory, and motivation theory to analyze the promotion mechanism of AR teaching function on learners' motivation and effectiveness. This paper will make up for the shortcomings of the existing research from the above aspects.

3.3. The Experience Advantages of Augmented Reality for English Teaching

Augmented reality experiences are often characterized by presence, and a series of studies have been produced to support the effect of presence on learning performance.

Studies have shown that learners' perception level of social presence can significantly affect learners' engagement in online learning, and there is a positive correlation between presence and performance, which is moderated by task types. Compared with non-multimodal control, a multimodal collaborative virtual environment developed with a realistic immersive environment framework can stimulate a higher sense of presence and improve students' academic performance. Augmented reality is the simulation and simulation of the real world, making the experience of the VE or teleoperator fun and improving the motivation to learn. Augmented reality environments are more likely to elicit commensurate emotional arousal states that are consistent with those that occur during real-world tasks, leading to improved learning outcomes. In terms of research on the influence mechanism of presence on learning outcomes, educational academia has gradually launched exploration and research. Studies have shown that AR technology can help stimulate the flow experience, thereby greatly improving user satisfaction and user performance. On the other hand, emotion also acts as an intermediary relationship between the learner's learning effectiveness and the presence of the augmented reality environment. The Augmented Reality World Second Life is a novel approach that greatly aids English language learning in a fun and motivating way. The Augmented Reality language learning experience is like a game, prompting learners to use it spontaneously by

interacting with their peers in English (Liao et al., 2019).

It can be seen that the experience advantages of augmented reality can help improve learners' learning motivation and learning performance. There are also studies to explain the impact mechanism of augmented reality experience on learner motivation and performance through flow experience and cognitive absorption. However, most researches only focus on a single dimension of presence, and do not analyze presence as a multi-dimensional and complex structure. In addition, in the research on the effect of augmented reality experience on language teaching, most of the studies have not integrated the experience design and motivation theory of a systematic teaching environment to provide in-depth analysis of the effect improvement mechanism of augmented reality teaching. There is a lack of systematic research results on the mechanism of augmented reality teaching effectiveness. This study intends to conduct in-depth research on the experience perception and teaching effectiveness mechanism of augmented reality environment from these aspects.

3.4. The Application Potential of Augmented Reality Technology in English Teaching

Task-based language teaching methods are suitable for the development of virtual environments. Examples: real tasks, learning by doing, rich input, inductive learning, collaboration and personalized instruction. Augmented reality environments provide an immersive and dynamic space that supports task-based services for language learners. SL's simulation and embedded support capabilities for instructional content provide students with the flexibility to undertake real-world tasks that are impossible or too burdensome in traditional classrooms. From a pedagogical perspective, simulation tasks in SL make learning more meaningful, realistic, and fun than other 2D WEB 1.0 or 2.0 tools. Other researchers believe that large-scale online role-playing games provide rich opportunities for immersion in language, culture, and task-based environments. Because the augmented reality environment supports real tasks, cultures, scenarios, audio-visual learning materials, interactive partners and even people from native-speaking countries. Language teachers can curate virtual lessons to simulate real-world tasks for students to practice their target language by interacting with others around the world as avatars.

Augmented reality-assisted English teaching supports role-playing and collaborative learning models that can effectively improve learner motivation and learning retention.

Adding game elements to the augmented reality learning environment can effectively improve learners' interest and concentration in learning. The real situation provided by augmented reality technology can enhance the learner's interest in learning. Immersive simulations enhance the learning experience, enable students to make meaningful connections, enhance learners' creativity and promote their learning initiative. The interaction between the learner and the virtual world will stimulate the learner to discover more information and enhance their

interest in learning (Paes et al., 2017).

In an augmented reality environment, learners do not need to communicate directly with other people face-to-face. Under the protection of anonymity and avatar mechanism, it can effectively reduce the anxiety of learners in oral language learning. Students who tend to be shy in the real world become more proactive, able to communicate in their own anonymous identities, thereby developing a sense of autonomy and belonging. Compared to 2D text-based environments, avatar-based environments are a fun, less threatening domain that boosts learner confidence, boosts engagement, and inspires learners to take risks. Therefore, the augmented reality environment is one of the environments suitable for learners who are more introverted and who are not good at communicating face-to-face with others. It can effectively improve their willingness to speak in English practice, and improve their introverted personality while improving their language skills.

4. Construction Strategy of the Theoretical Framework of Presence in Oral English Teaching Based on 3I Characteristics

On the basis of sorting out the theoretical structure of classical presence, this paper integrates the 3I characteristics of augmented reality technology into the dimensional design of presence. Combined with the application background of oral English teaching, the theoretical framework of augmented reality oral English presence is constructed, and the integration of five-dimensional presence theories such as spatial presence, immersion, reality, interaction, and social presence is comprehensively considered. Explore the practical feasibility and scientificity of the proposed theoretical framework. Feedback the conclusions obtained from the group comparative analysis of five-dimensional presence to the development environment of the augmented reality educational environment, giving developers more targeted reference information. Guide developers to adhere to the principle of people-oriented, develop practical augmented reality products that meet the differences in the sense of presence of various groups, and improve the promotion and application value of products. This paper expounds the construction strategy of the five-dimensional theoretical framework of telepresence as follows.

1) Spatial Presence. It refers to transporting the user to another place, allowing the user to have an illusion of a deep augmented reality environment, which is the initial measure of presence.

2) Realism. The extent to which a medium can generate seemingly accurate representations of objects, events, and people, i.e. representations that see, hear, and feel like "real" things.

3) Immersion. The degree of psychological immersion perceived by the user.

4) Interaction sense. How well the media-related interaction predicts the outcome, and how sensitive and natural the media is to the feedback of user behavior.

5) Social Presence. The medium is considered to be social, warm, sensitive or intimate when interacting with others, and there are multiple ways of social interaction.

For a long time, the "synonym" closely related to augmented reality technology is presence and 3I characteristics. However, few studies have paid attention to the similarities and differences and the inner relationship between the two. A comprehensive study of presence and 3I characteristics helps to improve the efficiency and user satisfaction of augmented reality technology. This paper aims to integrate the 3Is of augmented reality technology and the theoretical framework of presence, and establish a rational, scientific, comprehensive and reference theoretical framework for augmented reality oral English teaching presence. The theoretical framework of telepresence constructed in this paper is the theoretical basis for the subsequent research on the acceptance behavior of augmented reality teaching, and has a basic supporting role for the development of the entire research.

5. Conclusion

This article starts from the author's years of work and scientific research practice accumulation, and starts from the impact of information technology on all walks of life. On the basis of sorting out the theoretical structure of classical presence, the 3I characteristics of augmented reality technology are internalized into the dimensional design of presence. Combined with the application background of spoken English teaching, the theoretical framework of augmented reality oral English presence is constructed—spatial presence, immersion, reality, interaction, and social presence. The group comparison analysis of five-dimensional presence reveals the differences in the perception of presence among different groups, which has a strong reference value for developers of augmented reality educational environments. Technology should be people-oriented, and the difference analysis of the presence of each group is of great value for the application and promotion of augmented reality technology. The results of this paper have certain application value for guiding the application of augmented reality technology in the field of oral English teaching. Augmented reality technology brings enhancements in both function and experience to oral English teaching. How to make good use of augmented reality technology to effectively serve oral English teaching and serve different groups of learners is the focus of this research and the practical significance of the research. The management practice strategy at the level of teaching design should follow the rules of English teaching and the principles of motivation theory, and maximize the enthusiasm of learners under the support of augmented reality technology. In the provision of virtual environment presence, attention should be paid to the social presence and interactive experience design of AR environment to improve the perceived usefulness of the system. Improve the perceived ease of use of the system through the experience design of spatial presence, interaction, immersion and realism. In addi-

tion, it should meet the requirements of presence experience that different types of learners have a significant impact on receptive behavior. In short, interpersonal communication mediated by technology is necessarily less direct than face-to-face communication, and cannot be used for the use of technology. It is necessary to comprehensively consider the type of learning activities, the stage of learning, the cognitive level of students, and individual differences to decide whether to adopt an augmented reality teaching environment and which form of augmented reality teaching environment to use.

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Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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