

Using VR Games in Learning Spoken English: A VR Instructional Design

Lingfang Li^{1,*}, Wenqi Li^{2,†} and Leyi Wang^{3,†}

¹Department of Computer Science, University of Liverpool, Liverpool, Merseyside, U.K.

²School of Foreign Languages and Literature, Beijing Normal University, Beijing, China

³College of Mount Saint Vincent, 6301 Riverdale Avenue, The Bronx, New York, U.S.A.

†All these authors are contributed equally

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Abstract: In recent years, with the continuous development of international exchanges, fluency in spoken English has become the need and goal of more and more Chinese students. However, domestic classroom teaching cannot meet such needs. In order to solve the problem that oral English is difficult to learn and challenging to practice, this paper designs a spoken English learning system based on VR technology. Creating a language environment with rich interaction not only stimulates and maintains the interest of learners but also allows players to interact with personalized guiding characters. The character is dubbed by native English speakers, assisted by various cultural environments, to create a very close-to-real speaking practice environment for learners. Another feature of this system is that players can improve their English speaking and communicative skills in the game, and learners of different levels can improve from the communication that suits them. It is hoped that this system can provide some reference and inspiration for the new oral English teaching in the future. It is believed that with the support of VR technology, there will be a broader picture for oral English learning in the future.

1 INTRODUCTION

With the development of international communication, English has become a global language worldwide. Then increasingly frequent English speaking between people from different regions facilitates the development of many fields. China has the world's highest number of English learners, but there is a general problem with English education in China. In particular, there are problems in teaching spoken English. To enhance the quality of spoken English education, a variety of methods for studying spoken English need to be used.

According to the Common European Framework of Reference for Languages (CEF), most Chinese learners have a proficiency in English between A1 and B1, which means they have a basic command of it. Nevertheless, for the majority of Chinese students, research shows that their English fluency is

far below the requirements of their English textbooks (Cortazzi & Jin, 1996). Because of the examination-oriented education system, many teachers take the English test scores as the only criterion for evaluating students' English proficiency, resulting in students' utilitarian attitude toward oral English learning, and it is not easy to fully develop students' skills in foreign language learning. As a result, students' oral English communication skills are low. Therefore, how to adapt to the requirements of English communication in the new situation and improve Chinese students' oral English communication ability is an urgent problem to be solved.

In addition, most students feel anxious about learning English in classroom situations because they are afraid of making mistakes. Jakobovits (1971) found that the factors that affect language learning are divided by scale as follows: ability,

^a <https://orcid.org/0000-0001-6680-3197>

^b <https://orcid.org/0000-0001-6364-7846>

^c <https://orcid.org/0000-0003-3787-867X>

emotion, intelligence, and others. The ability is related to learners' motivation and confidence in learning a second language. Students with strong foreign language learning motivation and high confidence can get better results. Due to the pressure and anxiety of foreign language learning in classroom situations, there is a low impact on students' English learning. In addition, interaction will have a slow but stable promotion effect on language learning. By simulating real situations in real life through learning activities, it is possible to learn in an integrated way. Learning a foreign language in real-life settings also helps students build cultural ability. However, with the popularity of computers and Virtual Reality (VR) technology, the way of English learning has gradually expanded from textbooks and classroom teaching to computer-assisted language learning (CALL) (Schwienhorst, 1998).

In recent years, several emerging pedagogical methods and techniques can be used to improve the situations mentioned above. According to previous literature research, plenty of articles have proposed many approaches to learning oral English communication skills (OECS). Figure 1 shows nine main teaching techniques of spoken. Many works have investigated that mobile, social media, and virtual language communities can engage oral communicative skills by providing record and review functions and exposing learners to real discussions and speaking to native speakers, respectively (Hart, 2016; Murphy, Farley, Dyson & Jones, 2015; Smith, Hickmott, Bille, Burd, Southgate & Stephens, 2015; Wiemeyer & Zeaiter, 2015). Therefore, it is essential to utilize modern technology to assist English learners in studying spoken English because current teaching in classroom settings cannot get satisfactory results.

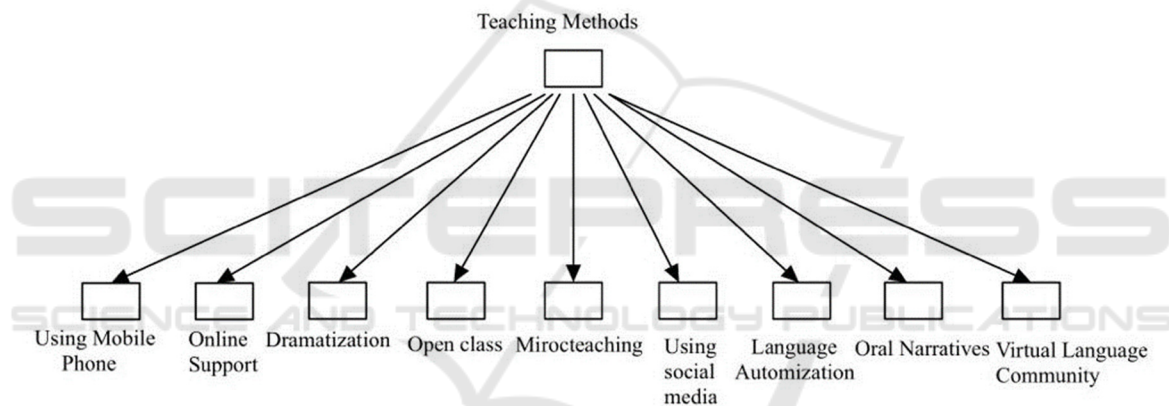


Figure 1: Different teaching Methods.

Facing the dilemma of practicing oral English in China, this project has been thinking a lot about what new technologies might help with that. After several searches, this project turned attention to Virtual Reality. As the name means, VR is an illusory reality in a virtual, software-based world. It makes the users feel they are experiencing a specific experience using special perceptual change tools. Using special hand-held tools or particular floors, users can feel as if they are really walking around the virtual environment and interacting with virtual objects. As a new technology, VR has been applied in many teaching fields. In physics, for example, A virtual reality physics simulation enhances students' understanding by providing a degree of reality unattainable in a Traditional two-dimensional

interface, creating a sensory-rich interactive learning Environment (Kim et al., 2001).

VR can be a suitable technology for the current difficulties in oral language teaching. While creating a language environment in the real world is complicated, creating an environment in the virtual world can be the solution. VR solves the biggest problem of spoken English: the right language environment. The design of a VR world can help the students who want to practice oral English in an all-English environment, for example, by designing virtual characters that speak English to communicate with users. After solving the language environment, the project focus on the second problem -- how to arouse interest of students. In this VR world, having conversations with virtual characters would be boring. Nowadays, most students have great fun

with games. It must be a brilliant idea to combine VR and gaming. Virtual characters can have different conversations with users depending on the tasks and the outcome of the tasks, allowing users to have different spoken experiences in different tasks in the game. VR games can arouse the interest of students in learning and grade speaking level of students through the task score in the game. This grading system can help students have the most suitable environment for their oral practice. In the following paragraphs, this article will analyze our VR game project from three aspects: an appropriate language environment, attracting people to learn with fun, and managing the grading system.

2 A DESIGN OF VR GAME IN ORAL ENGLISH EDUCATION

2.1 An Appropriate Language Environment

This paragraph aims to indicate an appropriate language environment for VR game by using native speakers who are non-player characters (NPC) to standardize spoken English, extend the culture behind English, and provide some relative configurations. When Chinese students learn to speak, they need to learn phonetics, rhythm, accent, and fix grammatical errors in their spoken language. A study considered how distance language learning affects intermediate learners of Italian to negotiate with web-based native speakers of Italian (Tudini, 2003). According to Tudini (2003), the chat transcripts indicate that learners did negotiate for meaning and modified their language when engaged in open-ended conversational tasks with unfamiliar interlocutors, with lexical and structural difficulties triggering most of the negotiations. That is to say, English can also be like Italian, through the native speaker and learning English people to communicate, English learners can unconsciously become aware of some grammatical errors and then correct, but also accumulate some authentic spoken phrases and vocabulary and even sentences, to use in the subsequent communication of the game, and can also be used in real oral communication, these things learned in this program in the Chinese spoon-feed is very difficult to learn, even if they can accumulate some authentic usage, but also with specific difficulties to apply to live. Thus, by communicating with native speakers in the game, Chinese students can improve their grammar and pronunciation skills

to some extent, and learn and even use authentic spoken language.

Despite the focus on pronunciation and grammar as well as authentic spoken usage, it appears that understanding the culture behind the language and having a stronger motivation to learn it can promote the study of spoken English while speaking with native speakers. One study showed that native speaker teachers of English (NTs) spoke more fluently and were more representative of the target culture, while non-native speaker teachers of English (NNTs) showed better unambiguous grammatical knowledge (Andrews, 2007). NTs are capable of better representing their culture by accurately representing it with more examples so that people understand the reasons behind the culture and can better determine what their authentic culture is and what is just misconceptions and rumors.

Moreover, most participants felt that NTs provided a better approach to teaching language learning strategies, provided more information about the English language, and could better predict and prevent difficulties for students (Gurkan & Yuksel, 2012). All these make it easier for learners to learn English, which naturally reduces their inner anxiety and increases their interest in learning. Therefore, they believe they can learn well and are interested in learning to speak, enhancing their motivation to learn.

In addition, one article indicates that it is more motivating for all students to speak the target language since they cannot speak their native language in the class since they must speak the language NTs are saying (Madrid & Perez, 2004). Many NTs can only speak in their language, and when students are in a situation where they have no choice but to try to learn English well, they cannot be lazy to learn another language through their mother tongue, so their motivation to learn can increase. Overall, adding NPCs spoken native language to the game is the right choice, as they can also motivate students and provide a more immersive cultural exchange experience, just like NTs can.

After introducing why this game should use native NPC, the next section will focus on functions regarding the native speaker aspect of the game. First, professional native English dubbers are invited to dub the NPCs. The English dubbers are able to teach students proper English pronunciation and give them a sense of the elegance and necessity of authentic pronunciation, which increases their motivation to learn to pronounce correctly. Moreover, the dubbers who can pronounce

American or British are selected to do the dubbing. Because American and British pronunciations are the two most dominant in China, for example, they are the only two pronunciations used in English listening in the Chinese college entrance examination. In addition, involving native English speakers in the content of the dialogue of the game as well as in the setting of the scenes makes the dialogue more authentic and daily. As mentioned earlier, NTs can more easily identify the difficulties of students and communicate their cultural messages more accurately so that they can design activities that are more targeted to address the learning difficulties of learners and add scenarios that better demonstrate English culture.

2.2 Attracting People to Learn with Fun

In this oral language learning tool based on VR games, making full use of the characteristics of VR games to stimulate students' learning enthusiasm is very important. The beginning of the game is the most challenging tutorial design. The game should not start out confusing or annoying the player. In most games, the arrow is the most commonly used tool, and the arrow displayed on the screen tells the player which button to click next. VR games are highly interactive and realistic, and only arrow guidance may reduce the fun and visual effects of the game. Virtual guiding characters are a good choice. For the virtual guiding character, his/her image needs to appeal to all users in order to make the experience of teaching the game fun. Different preferences for roles can be chosen. People have different combinations of preferences for gender, body type, skin colour, and sound. For example, some people like a muscular man with a baby voice, others like a cute girl with a sweet voice. It is hard to design characters that everyone likes. The ideas of game modelers are limited; instead, the inspiration and ideas of users are infinite. Only users know what they like best. Users can design their virtual guiding characters. People are more enthusiastic about the image they like. This kind of design makes the player feel involved from the start and more patient as they go through the tutorial.

VR games as an assistant for practicing oral English are different from other ordinary story games when it comes to completing story tasks. Unlike other narrative games where learners click on the appropriate dialogue to proceed to the next round of story, in this VR game, the users have to read out the options they have chosen. The VR game has an

accompanying radio system that can be mounted on a VR eye mask. The design of the story is essential in this VR game. First of all, correct grammar and common life expressions need to be paid attention to. Secondly, the story is interesting enough to help students learn faster. A boring story is like watching a TV show that drags on, which makes the player bored and lose the desire to do story quests. The more exciting stories are more likely to be remembered by the students. "Attentional demands and recall for stories that differed in rated interest were examined. The More interesting stories required fewer attentional resources for Comprehension than did less Interesting Stories" (McDaniel et al., 1999). A compelling story allows the player to remember more with less experience than a boring story. In order to make a breakthrough in plot design, we plan to hire a number of fantasy writers to work together on the main story and side story design.

As the story progresses, the player will get to know more fictional characters related to the story. In order to increase the player's immersion in the game, the game will have a virtual character liking system. Different choices in the story will result in a decrease or increase in the favorability of the relevant avatar. Different levels of dialogue will be unlocked according to the player's favorability level with the avatar, allowing players to practice more styles of dialogue. "Cultural elements were selected for study based on their comparable importance in the home culture of the authors. Cultural artifacts, the more visible elements of culture, were studied at the exclusion of cultural values. With the advent of the functional and communicative proficiency approaches in the 1970s, and all through the 1980s, teachers moved away from relying solely on textbooks to teach language" (Paige et al., 2003). Many well-known professors have endorsed the influence of culture on language learning. Language teaching should not only use textbooks but should combine with different cultural backgrounds. People in different cultures speak in different ways. For example, in the same English language, the way people spoke in the Victorian period in England is undoubtedly different from how they spoke in the 1980s in the United States when hip-hop culture was prevalent. In this VR game, cultural elements are put into the dialogue. In the dialogue with different favourability levels, the background of the corresponding virtual character can be combined to make the player's speaking practice scope not limited to the game story. For example, when a player becomes friends with an avatar from the

United States, the avatar will talk to the player about American hip-hop culture.

2.3 Managing the Grading System

This article designs a VR learning system for Chinese English learners, which is localized according to the different English learning statuses and requirements of various groups of learners, so it can better meet Chinese learners' needs. In addition, this system adds NPCs selected and created by users themselves, and there is sufficient voice-driven interaction between characters and users, which ensures the adequacy of interaction and the fun and effectiveness of spoken language learning (Sha, 2009).

Based on former studies, a personalized English learning system can significantly enhance learner English abilities and promotes learning interests (Chen & Chung, 2007). Therefore, this paper designs a spoken language training system for Chinese English learners in a VR environment. The system has high flexibility, which is convenient for learners to customize according to their needs. In this game system, each level is scored on the player's spoken English level, and the player's cumulative score corresponds to three levels of spoken English: Beginner, Intermediate, and Advanced. Players can also choose to test their oral English proficiency before logging into the game system or choose a learning scene according to their actual needs to practice English speaking and communicative skills as well as prepare for later application in real life.

This game system allows learners to have natural conversational interactions with NPCs to improve their spoken language in a variety of fun games. The system will automatically record the learner's learning habits and progress and track their learning. If learners always have access to a large amount of English learning content that is slightly higher than the learner's current English level, that is, the "i+1" level of English learning content according to Krashen (1985), then the learner's English acquisition process will get a very effective promotion. At different levels of the game, the characters use different vocabulary, sentence patterns, and speech rates. As the level of games increases, the players continue to improve their speaking, and the system will also gradually increase the difficulty of the game according to the completion of each mission. At a different level, NPCs will provide conversations in various scenarios and learners interact with the character at the corresponding level according to their capability.

Besides, if players pass the test in the Beginner, Intermediate, and Advanced levels, random scenarios will be unlocked in which players actually apply spoken language, such as interviews, speeches, ordering dishes, partying, Etc. Using the spoken language that players practiced in the previous sections in practice will help them gain close-to-practical experience. Players pass the test in the Beginner, Intermediate, and Advanced levels, and random scenarios will be unlocked in which players actually apply spoken language, such as interviews, speeches, ordering dishes, partying, and so on. Using the spoken language that players practiced in the previous sections in practice will help them gain close-to-practical experience. Advanced learners will unlock some actual NPCs who can have real-time conversations and other more demanding tasks with them.

If provided with adaptive subject materials with adaptive presentation styles, learners will improve both their learning achievements and learning efficiency (Tseng & Chu & Hwang & Tsai, 2007). This is the reason why this paper designs its special conversational mode. After the conversation of each level starts, the NPC will guide the learner to respond. When the learner's response audio is transmitted to the system through the microphone, the system first recognizes what the user said and then performs corpus matching. How the conversation that follows will unfold depends on what the user says. At the same time, the system will evaluate the user's pronunciation, wording, and fluency and comprehensively determine how the NPC needs to respond to the learner. According to this mode, the dialogue continues until all tasks in this level are completed. In order to facilitate the training of spoken English and comprehensively evaluate the learners' spoken language, the pronunciation evaluation system in the game includes three scoring standards: pronunciation, wording, and fluency. After the whole level is completed, the system will automatically calculate the average score and total score of all assessments in the level, and then display the scoring details and total score to the learner, and record the score as the learner's personalized learning information to track learning progress. At the Beginner level, the scoring standard of pronunciation is different from that of the Intermediate and Advanced levels. Since the primary goal of the system is to improve the oral communication ability and enthusiasm of Chinese oral English learners, it is not required that all learners have a pronunciation that is close to native English speakers at the Beginner level. It only

requires learners to pronounce clearly and correctly without affecting communication. However, in the Intermediate and Advanced levels, especially the latter, the more proper and authentic the player's pronunciation is, the higher the score of pronunciation the learner will get. Interest and motivation matter in learning so it is of great importance not to affect it by high standards from the beginning (Harlen & Crick, 2003).

Besides, all learners and their scores in the system are synchronized, and each learner can also see the accumulated scores and learning results of their peer learners. This system creates a virtual environment for multiple learners where they can communicate in real time through speech, text and body movements. Learners can also talk, share information, watch videos and so on at the same time, which will improve the interaction between them.

3 CONCLUSIONS

To sum up, VR games are highly compatible with oral English teaching. VR games can have corresponding solutions regarding language environment, fun, and graded training required for spoken English. The creativity and authenticity of VR games allow users to have a language environment outside of Chinese. By employing native speakers with American and British accents to participate in character dubbing, users can get a standard language environment in VR games. Having native Speakers participate in the character's speaking design also makes the speaking in the game more relevant to life. In terms of attracting users' interest, the virtual guide characters that can be designed by themselves, the exciting story of the game, and the favorability system of the virtual characters not only open a variety of game experience modes for users, but also stimulate the impetus of users to continue to play the game. Personalized graded training is very carefully designed. Depending on how the user responds to different levels of the game, the system will recognize whether the user's accent is accurate or not. According to the user's expression score in the aspect of accent, the oral language level of the user is graded. After the user reaches a certain level of spoken English, the user can also open the communication and interaction of the natural person's virtual character. Integrating innovation into education is a core concept of this project. This project is also based on our team's observation of the

shortcomings of current English education. As a new technology, VR will be integrated into people's lives with continuous development and research.

Moreover, there are some limitations of this study. This article summarizes the author's analysis of the literature to propose a new way of learning spoken English and is not equipped to conduct experiments to prove how feasible the new ideas are. Although all the evidence and methods are objective, few conclusions are based on subjective deduction. Future studies are suggested to carry out pilot tests to verify the validity of this idea. Hoping that the design of this project can be enlightening to the current oral English education so that more people can have a better way of learning oral English.

REFERENCES

- Andrews, S. (2007). *Teacher Language Awareness*. Cambridge University Press.
- Chen, C. M., & Chung, C. J. (2008). Personalized mobile english vocabulary learning system based on item response theory and learning memory cycle. *Computers & Education*, 51(2), 624-645.
- Gurkan, S., & Yuksel, D. (2012). Evaluating the contributions of native and non-native teachers to an English Language Teaching program. *Procedia-Social and Behavioral Sciences*, 46, 2951-2958.
- Hart, T. (2016). Learning How to Speak Like a "Native" Speech and Culture in an Online Communication Training Program. *Journal of Business and Technical Communication*, 30(3), 285-321.
- Kim, J., Park, S., Lee, H., Yuk, K., & Lee, H. (2001). Virtual reality simulations in physics education. *Interactive Multimedia Electronic Journal of Computer-Enhanced Learning*, 3(2), 1-7.
- Krashen, S. D. (1985). The input hypothesis: issues and implications. *Language*.
- Madrid o, M. (2004). Evaluation. In D. Madrid & N. McLaren, (Eds.), *TEFL in primary education* (pp. 441480). Granada: Editorial Universidad de Granada.
- Martin, Cortazzi, Lixian, & Jin. (1996). English teaching and learning in china. *Language Teaching*, 29(2), 61-80.
- McDaniel, M., Waddill, P. J., Finstad, K., & Bourg, T. (2000). The effects of text-based interest on attention and recall. *Journal of educational Psychology*, 92(3), 492.
- Murphy, A., Farley, H., Dyson, L., & Jones, H. (2017). *Mobile learning in higher education in the Asia-Pacific region*. Singapore: Springer.
- Paige, R., Jorstad, H., Siaya, L., Klein, F., Colby, J., Lange, D., & Paige, R. (2003). Culture learning in language education. *Culture as the core: Perspectives on culture in second language learning*, 173-236.

- Schwienhorst, K. (1998). The 'third place' – virtual reality applications for second language learning. *Recall*, 10(1), 118-126.
- Sheppard, R. B. D. C. (1971). Foreign language learning: a psycholinguistic analysis of the issues by Leon A. Jakobovits. *The Modern Language Journal*.
- Smith, S., Hickmott, D., Bille, R., Burd, E., Southgate, E., & Tephens, L. (2015, December). Improving undergraduate soft skills using m-learning and serious games. In 2015 IEEE international conference on teaching, assessment, and learning for engineering (TALE) (pp. 230-235). IEEE.
- Tseng, J., Chu, H., Hwang, G., & Tsai, C. (2008). Development of an adaptive learning system with two sources of personalization information. *Computers & Education*, 51(2), 776-786.
- Tudini, V. (2003). Using native speakers in chat. *Language Learning & Technology*, 7(3), 141-159.
- Wiemeyer, L., & Zeaiter, S. (2015). Social media in EFL teaching: Promoting (oral) communication skills in complex competency tasks. *Dutch Journal of Applied Linguistics*, 4(2), 193-211.
- Wynne, Harlen, Ruth, Deakin, & Crick. (2010). Testing and motivation for learning. *Assessment in Education: Principles, Policy & Practice*, 10(2), 169-207.

