

Spenser Grant Proposal

EDCI 591

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1. Proposal Summary:

Project Title: Impact of Virtual Reality on Prospective International Teaching Assistants' Conversational English Proficiency, Self-efficacy, and Situated Learning

Start and End Dates: January 2024- December 2025

Central Research Question: Do role-playing speaking simulations in the VR application *Immerse* improve prospective international teaching assistants' conversational English skills compared to role-playing speaking simulations in a traditional classroom?

Project Summary:

International teaching assistants (ITAs) need to develop their conversational English proficiency because they interact with undergraduate students in colloquial spoken English inside and outside of the classroom. However, instruction with conventional multimedia doesn't effectively help develop conversational English skills because it does not provide opportunities to engage in authentic, interactive, and meaningful learning contexts (Yang et al., 2020). Virtual reality (VR) can provide an alternative to real-life settings (Huang & Liaw, 2011). It can offer a more interactive, context-embedded, and immersive learning environment (Bahari, 2021). In addition, self-efficacy has a tremendous impact on English learners' language performance and there is a positive correlation between English self-efficacy and achievement (Açikel, 2011). However, less research has been conducted to investigate how the use of VR

can impact prospective ITAs' conversational English proficiency and how speaking self-efficacy influences conversational English performance under the context of VR. As VR can satisfy two key elements of situated learning-authenticity and social interaction (Falconer,2013), the project will also explore whether immersive VR-*Immerse* can improve situated learning when international teaching assistants develop their conversational English proficiency. Therefore, by using a mixed-method research design, this study will address the above-mentioned three research questions.

2. Budget and Budget Justification

Budget

Project period: Jane, 2024-December, 2025				
Item	Cost per unit	Quantity	Subtotal	Use for project
Participant Incentives	\$25	16	\$400	Gift cards will be given away to 16 students in both groups
Interview participation compensation	\$50 per person	4	\$200	Recruitment incentive for interviews of students from the treatment group
VR headsets	\$399.99 for 128 GB, 7% sale tax	10	\$4280	The project needs 8 headsets for instruction and 2 headsets as back-ups.
Roundtrip airfare	\$180	1	\$180	Results will be presented at AECT 2025 conference
Registration fees	\$317.2	1	\$317	
Hotel fees	\$155	5 nights	\$775	

Interview transcription service	\$100 per hour	4	\$400	Transcription of interviews to help with the coding process for analysis of students' perception of VR in English speaking.
PI salary	\$100 per hour	30	\$3000	The principal investigator will be responsible for overseeing the grant administration, designing the instruments, and data analysis.
Co-PI salary	\$100 per hour	18	\$1800	The Co-PI will be the instructor for the course, teaching one-hour lessons for six weeks. He will spend extra two hours preparing and evaluating the classes every week.
Graduate student salary	\$24,124.00	1	\$36.872	A graduate student research assistant will be responsible for assisting with the interventions, assessments, inputting of data, and analyses. This work should involve approximately 20 hours per week during the Spring and Fall semesters.
Graduate student insurance	1686.00	1		
Graduate student tuition remission	\$10,920.00	1		
Graduate student fringe benefits	\$142.00	1		
Total: \$48,224.00				

Budget Justification

To carry out the proposed project, I am requesting a total of \$ 48,224.00 to contribute toward presenting my result at AECT 2025 Conference along with services and incentives for recruiting participants and conducting interviews. The \$25.00 incentive for each participant will aid my recruitment of participants. The \$50 incentive for each interviewee will be helpful since

the interview will require participants give an hour of time to answer questions. Transcription services for the interviews is requested to accelerate the coding process, which is expected to be completed by December 2024. At the conclusion of the project, I will present my results at the AECT 2025 Conference in Las Vegas, Nevada in October 2025. I am requesting to have the airfare costs, conference registration, hotel costs covered by this grant. AECT is the largest international conference on educational technology which offers opportunities for me to share my results with experts and learn about the latest theories in immersive VR in language learning and teaching. VR headsets are technology tools in the project. In *Immerse*, 8 students can participate in one class at the same time so I plan to purchase 10 headsets with 2 headsets as back-ups in case that one or two headsets can't function well. PI will devote 30 hours to develop the research design, analyze data, write the manuscript and oversee the entire project. Co-PI will spend 18 hours delivering the lessons and analyzing the data. A graduate student will spend 20 hour per week on the project developing research design, instruction materials, instruments. providing VR orientation to participants, collecting, and analyzing data, writing manuscripts, and presenting in the conference. Therefore, the grant will cover her salary, tuition remission, benefits and salary for one year.

3. Proposal Narrative

Description of Project

This project aims at investigating whether the use of a fully immersive VR application- *Immerse* can improve prospective ITAs' conversational English proficiency, the relationship between speaking self-efficacy and conversational performance, and understanding prospective ITAs' perceptions of speaking learning experience with VR in developing situated learning.

Therefore, the project will address three questions:

Q1: Do role-playing speaking simulations in the VR application *Immerse* improve prospective ITAs' conversational English skills compared to role-playing speaking simulations in a traditional classroom?

Q2: Is ITAs' speaking self-efficacy correlated with conversational English performance?

Q2: How do prospective ITAs perceive their experience with *Immerse* to develop the situated learning?

The study is significant to the field in several ways: First, the current research fills the gap that scant research has been done to investigate whether the use of VR can improve prospective ITAs' conversational English proficiency, and whether speaking self-efficacy can influence conversational English performance. Second, with VR being increasingly adopted in various classrooms, the in-depth analyses about how learners interact with VR are instrumental for future VR design and research. As a new and potentially powerful technology, understanding the parameters and consequences of VR usage has significant meaning for teachers, practitioners, and instructional designers for the classroom. The study also has the potential of informing the best practice about how to invigorate language classrooms and outreach with the immersive VR technology for meaningful language learning.

Rationale for Project

Literature Review

As foreign language speakers, ITAs face linguistic, social, professional and cultural challenges (Ashavskaya, 2015; Gorsuch, 2016). ITAs' language proficiency constitutes a

crucial barrier (Choi, 2017) and is regarded as the most common problem affecting their classroom performance and causing undergraduates' problematic understanding (Chiang, 2009). Except developing academic English proficiency to present lectures, ITAs also need to develop their conversational English proficiency to interact in colloquial spoken English inside and outside of the classroom (Bailey et al., 1984) and build good rapport (Thornbury & Slade, 2006) with undergraduate students.

VR is described in terms of associated devices and functions as a 3D graphics interacted through computer or mobile (Barrett et al., 2020). Research indicates VR is an invaluable tool in the language classroom (Parmaxi, 2020) which can promote language learning through providing immersive learning experience, enhancing motivation, creating interaction, reducing learning anxiety and increasing learners' engagement (Chen et al., 2022; Dhimolea et al., 2022).

VR is believed to be an ideal educational technology to provide an authentic learning environment (Lan, 2020) to practice role-playing speaking simulations and improve conversational English skills (Scavarelli et al., 2021). Researchers have found that VR has the potential to transform the conventional approach towards language teaching and learning, as the affordances of VR such as immersion, authenticity, participation, and interaction provide a unique learning environment for improving English speaking skills (Damio & Ibrahim, 2019). Students also find that compared to the academic environment, VR can create a more natural conversation setting to enhance the target-language speaking experience. VR can provide the opportunity for the users to build the skills necessary to carry out a conversation without the fear of social consequences present in the physical world (Rosenfield et al., 2019). Therefore, VR is a promising avenue for improving conversational English skills as a way of

dynamically creating believable scenes for conversational training and role-play (Chang et al., 2012).

Theoretical Framework

Situated Learning Theory

Lave and Wenger (1991) believe knowledge is only present in the situation where learners must participate in the process and explore the materials in the context to truly understand the significance and usefulness of knowledge. Learning is a social process during which knowledge is constructed and learning takes place in authentic physical and social and cultural contexts (Dawley & Dede, 2014; Falconer, 2013). Therefore, Herrington and Oliver (2000) suggested instructors should provide authentic contexts that reflect the way the knowledge will be used in real life and authentic activities to enable situated learning. Because all learning takes place in a specific context and the context significantly impacts learning (Yasin et al., 2012), VR can be an ideal technology tool to help enhance conversational English proficiency through situated learning. Falconer (2013) concluded that exercises in VR can offer effective opportunities for situated learning as VR can satisfy two key elements of situated learning-authenticity and social interaction.

Self-efficacy

(Bandura, 1977) defined self-efficacy beliefs as “beliefs in one’s capabilities to organize and execute the courses of action required to produce given attainment” (p.3). Accordingly, English speaking self-efficacy can be defined as English learners' confidence in their ability to speak English effectively. It can determine the effort, involvement, and determination a person puts into achieving a goal (Schunk, 2003). Research has indicated that self-efficacy has a tremendous impact on the English learners’ language performance and there is a positive

correlation between English self-efficacy and achievement (Rahimi & Abedini,2009). Thus, it can be expected that English learners' beliefs on their speaking competencies will influence their English-speaking performance.

Relationship of Proposed Study to the Literature

As indicated, self-efficacy is generally closely associated with language performance and VR have unique affordances to improve language speaking experience, less research has been conducted to investigate how the use of VR can impact prospective ITAs' conversational English performance in speaking simulations, and the relationship between ITAs' speaking self-efficacy and their conversational English performance. Therefore, this study will address the gaps. The researchers also want to investigate in what ways *VR-Immerse* can promote situated learning. The new knowledge gained will provide language teachers with strategies to improve speaking self-efficacy under the context of VR and insights on how to invigorate language classrooms and outreach with VR technology for meaningful language learning.

Methods

Research Design

This research will adopt an explanatory sequential mixed-method design. In the quantitative strand, a pretest-posttest treatment-control design will be used to investigate whether role-playing speaking simulations in *Immerse* can improve prospective ITAs' conversational English proficiency compared to role-playing speaking simulations in a traditional face-to-face classroom. Both groups will complete a pre-survey and post-survey on their demographic information and speaking self-efficacy. The treatment group will also fill out a questionnaire concerning overall perception of *Immerse* on improving their conversational

English proficiency. In the qualitative strand, a case-study approach will be employed, with researchers conducting semi-structured interviews with the individuals from the treatment group to understand participants' perceptions and experience on whether *Immerse* can facilitate situated learning.

Participants and Context

The participants are prospective ITAs registered in a TA preparation course at a large public university in the U.S. The prospective ITAs will voluntarily participate in 6 one-hour classes which will be provided as the supplementary language enhancement course to improve conversational English proficiency on a no-credit basis. Participants will be randomly assigned to the treatment group and the control group. Two groups will have the same instructor. The instructor has been teaching prospective ITAs English preparation courses for more than 10 years. The treatment group will complete 4 conversation simulation activities in *Immerse*, while the control group will complete the same simulation activities face-to-face in a classroom.

Data Collection Instruments

Instruments for this study: A pre-test and a post-test on a same task-based conversational simulation activity will be adopted to measure learning performance. Rubrics based on the FSI Proficiency Rating (as cited by Higgs & Clifford, 1982) will be used to evaluate students' performance in conversational English. The proficiency description covers five areas: accent, grammar, vocabulary, fluency, and comprehension. There are six statements under each criterion with the best performance rating 6 and the worst performance rating 1.

A pre-survey and a post-survey on speaking self-efficacy are adapted from (Zhang et al., 2019). The survey includes two parts: participants' demographic information such as their names, class, gender, their English learning duration and, and their perceptions on speaking self-efficacy. All the items will be presented on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

A questionnaire adapted from Enkin (2022) and Liaw (2019) concerning students' perception of VR in improving conversational English proficiency will be filled out by the treatment group. All the items will be presented on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Four students from the treatment group will be randomly selected for a semi-structured interview. The interview protocol is adapted from Herrington and Oliver (2000) students' perception of how a multimedia facilitated situated learning . The researchers will change "multimedia" to *VR-Immerse* in the interview questions.

Procedures for Data Collection

This experiment will include 6 separate sessions, with each session lasting one hour. Both groups will have a face-to-face pretest in the classroom in their first session and fill out a pre-survey on speaking self-efficacy and demographic information in Qualtrics. Later, the treatment group will use *Immerse* to have 4 conversational speaking simulations while the control group will have the same learning activities with the pictures, PowerPoints slides and paper-based materials in the classroom. At the last session, the treatment group will have a posttest in *Immerse* while the control group will have the posttest in the classroom. At the end of the experiment, both groups will complete a post-survey on speaking self-efficacy and the treatment group will complete additional questionnaire on overall perception of *Immerse* on

improving their conversational English proficiency. The researcher later will conduct semi-structured interviews with participants from the treatment group to further understand their perceptions of using *Immerse* in improving situated learning.

Procedures for Data Analysis

The speaking test scores will be rated by two experienced raters. Inter-rater reliability was calculated using Cronbach's alpha. In terms of data analysis, independent-sample t tests will be performed on the pretest and the posttest scores. ANOVA will be used to test the relationship between speaking self-efficacy and conversational performance. Items on the questionnaire regarding students' perceptions of VR will be calculated by percentage to determine the extent of agreement. The qualitative data obtained from the semi-structured interview will be transcribed verbatim and analyzed using content analysis (Thomas, 2006), which could be used to understand students' perception by grouping the categories and themes (Han, 2020).

(1675 words)

4. Project Timeline

This project will last for two years starting from Jan 2024 to December 2025. The researchers will spend 6 months conducting the experiment and another 6 months analyzing the data. Next, the researchers will write the manuscript and proposals, and present at the conference in the second year.

Project Timeline (January 2024 - December 2025)	
Activities and Milestones	Timeframe

Data collection	1. Conduct pre-tests	January,2024-June,2024
	2. Integrate interventions into the course	
	3. Conduct post-tests	
	4. Conduct post-surveys	
	5. Conduct interviews	
Data analysis	6. Analyze the data	August,2024-December, 2024
Writing manuscripts	7. Write up the manuscripts	January 2025-June, 2025
Conference proposals	8. Write and submit proposals for AECT 2025 Conference	August,2025 – December, 2025
Conference presentations	9. Give presentations in in AECT 2025 Conference	October, 2025

5. Project Team

The project team consists of Dr. Victoria Lowell (Walker), Clinical Associate Professor in the Learning Design and Technology (LDT) program, at Purdue University. Dr. Lowell completes research on immersive teaching and learning, and language teaching and learning. The supporting researcher is Dr. Mark Haugen, Director and lecturer of Oral English Proficiency Program (OEPP) at Purdue, and Weijian Yan, a doctoral student in the LDT program at Purdue.

This is a multidisciplinary team bringing diverse perspectives and expertise on English language teaching and testing. Each of the supporting researchers completes research in English language learning and instructional design with technology. Each team member will assist in the development of the pre-tests, post-tests, post-survey, and interview protocol. The PI and supporting researchers will all assist with developing the research design and intervention,

creating the instruments, gathering data, assessing the participants' performance in the pre-tests and the post-tests, recording the class videos, and completing interviews. Finally, all research members will work towards analyzing data to culminate with the report and manuscripts for publication.

Appendix A

Conversational English Proficiency Rating

Accent

1. Pronunciation frequently unintelligible.
2. Frequent gross errors and a very heavy accent make understanding difficult, require frequent repetition.
3. "Foreign accent" requires concentrated listening and mispronunciation lead to occasional misunderstanding and apparent errors in grammar or vocabulary.
4. Marked "foreign accent" and occasional mispronunciation that do not interfere with understanding.
5. No conspicuous mispronunciation but would not be taken for a native speaker.
6. Native pronunciation, with no trace of "foreign accent".

Grammar

1. Grammar almost entirely inappropriate or inaccurate, except in stock phrases.
2. Constant errors showing control of very few conversational micro skills or major patterns, and frequently preventing communication.
3. Frequent errors showing inappropriate use of some conversational micro skills or some major patterns uncontrolled and causing occasional irritation and misunderstanding.
4. Occasional errors showing imperfect control of some conversational micro skills or some patterns, but no weakness that causes misunderstanding.

5. Few errors, with no patterns of failure.
6. No more than two errors during the conversation.

Vocabulary

1. Vocabulary limited to minimum courtesy requirements.
2. Vocabulary limited to basic personal areas and very familiar topics (autobiographic information, personal experiences, etc.).
3. Choice of words sometimes inaccurate, limitations of vocabulary prevent discussion of some common familiar topics.
4. Vocabulary adequate to discuss special interests and any non-technical subject with some circumlocutions.
5. Vocabulary broad, precise and adequate to cope with complex practical problems and varied topics of general interest (current event, as well as work, family, time, food, transportation).
6. Vocabulary apparently as accurate and extensive as that of an educated native speaker.

Fluency

1. Speech is so halting and fragmentary that conversation is virtually impossible.
2. Speech is very slow and uneven, except for short or routine sentences; frequently punctuated by silence or long pauses.
3. Speech is frequently hesitant and jerky; sentences may be left uncompleted.
4. Speech occasionally hesitant, with some unevenness caused by rephrasing and groping for words.

5. Speech is effortless and smooth, but perceptibly nonnative in speed and evenness.
6. Speech on all general topics as effortless as a native speaker's.

Comprehension

1. Understands too little to respond to conversation initiation or topic nominations.
2. Understands only slow, very simple speech on topics of general interest; required constant repetition and rephrasing.
3. Understands careful, somewhat simplified speech directed to him or her, with considerable repetition and rephrasing.
4. Understands quite well normal educated speech directed to him or her but requires occasional repetition or rephrasing.
5. Understands everything in normal educated conversation, except for very colloquial or low-frequency items or exceptionally rapid or slurred speech.
6. Understands everything in informal and colloquial speech to be expected of an educated native speaker.

Appendix B

Interview Protocol

1. What do you think of the effect of virtual reality platform Immerse on English conversational interaction?
2. Have you ever used a virtual reality application before? If so, which titles?
3. Have you used any VR in your course before?
4. What are the strengths of Immerse in improving English conversational interaction skills?
5. What are the weaknesses of Immerse in improving English conversational interaction skills?
6. How effective do you think the Immerse is in improving English conversational interaction skills?
7. What strategies did you develop in learning English conversational interaction skills in Immerse?

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