

## Technology-Enhanced Language Learning: A Case Study of a Global Classroom in Second Life

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**Abstract**—This study reports on a case study about conversation practice in Second Life, a three-dimensional (3D) virtual environment, between 12 English language learners and 18 special education teachers. The purpose of the study was to examine participants' perceptions of the usability of virtual worlds as a language learning platform and to identify the unique skills required for successful teaching in a 3D environment. Specifically, the anxiety-reducing features of the virtual, anonymous environment in which oral language skills can be practiced through avatars were investigated. Extensive challenges inherent to the lesson design and audio quality were identified in this study. Guidelines on how to address these challenges as well as ideas for alternative, more effective learning designs, such as the discussion group format, are outlined. The study resulted in nine suggestions for virtual conversation practice in 3D environments. These findings will be relevant to other language instructors who plan to use Second Life or a similar virtual world for oral fluency enhancement in collaborative language practice.

**Keywords**—Second Life, virtual worlds, foreign language acquisition, oral fluency, collaboration, conversation partners, anxiety, oral production, teacher education

### I. INTRODUCTION

This article reports on an investigation of the usability of Second Life, a highly compelling visual and immersive virtual world, to improve English language learners' (ELLs) oral fluency by engaging them in purposeful interaction with English native speakers [1]. Second Life (<http://secondlife.com>) is a popular example of a 3D interactive environment.

Oral fluency is a complex, difficult-to-measure construct. It has been defined as the ability to produce language without undue pauses or hesitations [2]. Four types have been identified [3]. These include the ability to (i) fill time with talk, (ii) produce logical and semantically dense language, (iii) have appropriate things to say in a wide range of contexts, and (iv) express oneself in a creative and imaginative way, using a wide variety of alternative linguistic devices and choosing the one that is most situation appropriate.

The current study is situated in a 3D immersive virtual world. Virtual reality has been defined as “a computer-generated display that allows or compels the user (or users) to have a sense of being present in an environment other than the one they are actually in, and to interact with that environment” [4]. Educational platforms can be found in the

areas of astronomy, medicine, music, literature, biology, history, mathematics, forensic science, ecology, and tourism, to name a few. The Abyss Observatory [5], for example, is a museum and aquarium of earth and oceanic science, marine life, and underwater technology. Sploland [6] is a virtual science museum with more than 100 hands-on exhibits.

Second Life provides a powerful platform for situational language practice. Recent studies [7]-[11] indicate that a virtual world can assist language learners by extending the traditional language classroom. It provides an environment for stress-free, one-on-one oral practice through activities, such as role-playing, discussions, presentations, debates, games, and simulations. English language learners, in particular Chinese students, tend to be apprehensive of spoken communication for fear of being negatively evaluated [12]. The results of a study by Wehner et al. [13] suggest that virtual worlds may help to reduce student anxiety and increase their motivation to learn a foreign language. Virtual worlds could be an effective way to help Chinese ELLs overcome these fears and inhibitions.

In a group of 313 Chinese ELLs, Mak [14] identified five factors leading to speaking-in class anxiety. These include: “speech anxiety and fear of negative evaluation; discomfort when speaking with native speakers; negative attitudes towards the English classroom; negative self-evaluation; and fear of failing the class/consequences of personal failure” (p. 202). Appropriate wait-time has particularly strong implications for Chinese-speaking ELLs because it helps to reduce their anxiety. Chinese students appreciate a longer wait-time to speak up and respond than European language learners “because ‘group unity’ and ‘face’ are important elements of their culture” [14]. These two constructs may be at risk when the students are under pressure. Given the linguistic and cognitive demands on oral language production, learners should be given ample preparation time prior to giving a speech or presentation in front of an audience in order to reduce their anxiety. Large amounts of teacher talk and limited student talk obstruct students' speech in the classroom [15] [16]. While Chinese ELLs may be willing to participate in interpersonal conversations, for example with one conversation partner at a time, they may be reluctant to speak English in class, that is, in front of an audience, for fear of negative evaluation [17].

The current study contributes to the research about language learning in virtual worlds by identifying ELLs' and special education (SPED) teachers' perceptions of Second Life as a language learning platform, the unique skills required for teaching in a 3D space, and potential challenges. Recent studies in the field of second and foreign language acquisition are reviewed in the next section, followed by the purpose of the present study. The sample, the six data collection instruments, the procedures, and data analysis are described in the method section. Results are organized around the instruments and are presented from the perspective of both the ELLs and the SPED teachers. The discussion section is organized around the research questions and concludes with suggestions for alternative learning designs. The conclusion summarizes the impact of the study and concludes with the study's limitations and suggestions for future research.

## II. LITERATURE REVIEW

This review starts with a discussion of recent findings suggesting the superiority of 3D virtual environments over traditional learning environments for specific tasks. The second part of the review elaborates on virtual worlds research in the field of second language acquisition.

### A. Objective Measurement of Learning Outcomes

Overall, despite an abundance of studies examining teachers' and students' perceptions of their virtual world experiences, only few studies have objectively measured learning outcomes. Chau et al. [18], for example, evaluated whether 3D virtual environments could facilitate students' learning outcomes. The task required students in an introductory management information system course to identify information security issues in a virtual office set-up in Second Life. The experimental group using Second Life gained higher test scores in the tasks than students in the control group who watched a video showing the exploration in the 3D virtual environment. The difference reached a statistically significant level ( $p < 0.0001$ ).

Using a true experimental design with two randomized groups, Farra [19] investigated the longitudinal effects of virtual reality simulation on the learning outcomes and learning retention of disaster training with nursing students. The experimental group completed Web-based modules and a virtually simulated disaster experience, whereas the control group only completed the Web-based modules. The main effect of the virtual simulation was found to be significant ( $p < .0001$ ). Although both groups showed similar improvement of scores following the teaching interventions on the first post assessment, significant differences were seen in the scores at the two-months follow-up, indicating that the virtual reality simulation demonstrated stability over time, whereas the non-simulation control group showed declining scores.

Another recent example demonstrating the superiority of virtual worlds to traditional environments for specific tasks

comes from Moskalium, Bertram, and Cress [20] who compared three training conditions (virtual condition, standard condition, and control condition). The training was designed for police officers whose communication skills were being trained for collaboration between ground forces and a helicopter crew during an operation. In terms of knowledge transfer, the findings showed that the virtual training was significantly more efficient than in the standard condition and the control condition ( $p = 0.02$ ). Also, virtual training was equally efficient as standard training regarding knowledge acquisition, indicating that virtual training is an effective tool for training complex collaborative tasks that cannot be fully trained for in reality due to excessive risks.

### B. Language Acquisition in Virtual Worlds

Specifically in the field of language learning situated in virtual worlds, a review of the literature by Peterson [21] has produced broadly encouraging findings, such as the reduction of constraints on learning (e.g., inhibition) through the use of avatars, an enhanced sense of presence and copresence, increased access to diverse groups of interlocutors, and enhanced participation for target language use, provided that teachers take full advantage of the unique affordances of a virtual environment. At the same time, Peterson also identified a number of challenges, for example, that the management of the virtual world interface can cause technostress, which, in turn, may hamper participation.

Through interactions with target language speakers in Second Life, ELLs can benefit from immersive language practice; tasks for learners at all levels can be designed [22]. Second Life has been shown to offer an "interactive, immersive and content-rich virtual environment for input, interaction, task-based learning and output production" [22]. Virtual worlds offer a suitable platform for synchronous language interaction and the opportunity for conversation and collaboration between language learners and native speakers of the target language.

Wang et al. [23] investigated effective and practical ways to integrate Second Life into an English as a Foreign Language (EFL) program for students in Chinese universities, in which Chinese students conversed with American native speakers. Their findings suggested that virtual worlds not only extend the language learning classroom but that they also offer practice opportunities that a traditional instructional setting does not allow. Second Life can complement face-to-face learning, for example, by conducting interviews, surveys, literary tours, or practicing giving directions in Second Life. Many study participants reported having a positive attitude towards using Second Life for language learning and perceived the collaboration with their American conversation partners as interesting, effective, and helpful in improving their English skills. Meaningful and authentic interactions with the American students were identified as key motivational factors. Once the Chinese students were immersed in Second Life, they demonstrated more active and sustained speaking events,

which helped them to improve their communicative abilities. Their positive experiences were, however, tarnished by technical problems, including poor audio quality (echoing and interrupted audio) and frozen screens to an extent that they seriously interfered with smooth communication and task completion in Second Life. Wang et al.'s [23] recommendations for facilitating language learning events in Second Life include: preparing students for task completion, setting a time limit for any given task, closely monitoring student language performance, encouraging post-task reflection, and providing feedback. Despite technical issues, the collaboration was found to enrich the cultural and communicative experience.

Similarly, Knutzen and Kennedy [24] reported on a partnership between ELLs in Hong Kong and student teachers enrolled in a Teaching English to Speakers of Other Languages (TESOL) program at a university in the U.S.. The two groups met in Second Life at a virtual American diner and communicated through text-chat and voice. Among the conditions that resulted in the most productive interactions was the use of voice communication to practice speaking and listening, as well as the use of separate sound parcels in the form of Cadillac diner booths to allow private conversations.

Support also comes from Wehner et al. [13] who investigated the relationships between motivation, virtual worlds, and foreign language acquisition. One section of a Spanish course used Second Life as part of its instruction, while the other section participated in the traditional curriculum. Overall, the group using Second Life consistently reported more positive feelings in all areas of motivation and lower levels of anxiety than the traditional group.

The findings of Ishizuka and Akama [25] were also supportive of the potential of Second Life for second language acquisition. Good scenarios and controlling learning environments based on second language acquisition theories have the potential to change language teaching and learning. Several attempts to use Second Life for language learning have been made in the past. A number of EU-funded, large-scale projects include the Access to Virtual and Action learning Live Online (Avalon) project, the Networked Interaction in Foreign Language Acquisition and Research (NIFLAR) project, and the Talk with Me project. These projects aim to facilitate cross-cultural language learning by taking advantage of virtual worlds to simulate communicative acts and provide information on learning models and practices using Second Life as a language learning platform [25].

The current study reports on the findings of an exploratory case study with two groups. International students enrolled in an ELL program and SPED teachers studying at the same university in the United States met in Second Life for conversation practice. The overarching question that framed this research was to identify the usability of Second Life for oral fluency enhancement. The study was guided by the following research questions:

1. What are the English language learners' and the special education teachers' perceptions of Second Life as a language-learning platform?

2. What are the unique skills that a teacher should have to teach in Second Life and similar 3D virtual worlds?
3. What types of problems associated with language instruction in Second Life were identified?

### III. METHODS

#### A. Needs Assessment

Prior to the conversation practice workshop, an extensive needs assessment was conducted to identify the ELLs' performance gap in terms of oral fluency. It revealed that many Asian, particularly Chinese students, at this university were experiencing a performance gap between their actual oral proficiency in American English and the proficiency they needed to fully contribute to class discussions and be understood when they speak. Multiple class sessions of courses intended for international students were observed, a self-report oral proficiency survey was administered to those students, and their instructors were interviewed.

Fifty-eight percent of Asian students (i.e., of 80% of international students), were from China, which explains the student homogeneity in some English as a Second Language (ESL) classes. Some oral skills classes consisted of Chinese students exclusively. Class observations indicated that the Chinese students tended to speak in English only when necessary (in front of the class or when speaking with the teacher), otherwise conversing in Chinese.

Oral comprehension was found to be much less of a challenge for these students than oral production. It was determined that the main reason for the performance gap was a lack of interaction with English native speakers and a resulting lack of oral fluency skills. The lack of more teacher time to work one-on-one with each student, in addition to the lack of time and frequent feedback in situations close to students' lives seemed to reinforce students' low self-confidence and their constant use of the mother tongue to communicate with each other.

A lack of motivation was identified as another cause for the performance discrepancy. Because the community of Asian students at this university is very large, these students feel no social pressure to improve their oral skills. They have the tendency to lead insular lives within their communities, where they speak their native language and where English is not a necessity. If their grades are sufficiently high to continue their studies, they may have little motivation to work on their oral English skills although they may be aware of their inadequate oral fluency.

Finally, a lack of knowledge and skill was identified as another cause for the lack of oral fluency. Many Asian learners tend to focus their efforts on reading and writing, whereas they neglect their comprehension and production skills. Only 19% of the Chinese students in oral skills classes have spent at least one year in an English speaking country, compared to 59% of the culturally more

heterogeneous, higher-level classes. The short duration of their time spent in an English speaking country (6 months or less) explains the need to further develop their oral production skills.

### B. Purpose

The purpose of the conversation practice workshop was to improve learners' oral fluency and comprehensibility by engaging them in purposeful, extended interaction with English native speakers in Second Life.

### C. Sample

Twelve ELL undergraduate students at a university in California were teamed up with 18 SPED teachers enrolled in a graduate course at the same university for the purposes of English conversation practice.

### D. Data Collection

Six different instruments were used for data collection. The two groups, ELLs and SPED teachers, each received a different set of the following instruments: a preliminary survey, a mid-reflection, and a post-survey (see Table I).

Table I. Overview of Instruments

Instrument	ELLs	SPED Teachers
Preliminary survey	37 items Multiple choice; rating and open-ended questions	17 items Multiple choice, open-ended and rating questions
Mid-reflection	6 items Open-ended and rating questions	7 open-ended questions
Post-survey	33 items Multiple choice; open-ended and rating questions	5 open-ended questions

The preliminary survey was completed after watching a 5-minute video showing a tour of the National Oceanographic and Atmospheric Administration (NOAA) Second Life region and prior to the two virtual meetings for conversation practice. In the preliminary survey, the ELLs and the SPED teachers were asked about demographic information, their technology background, and their perception of the usability of Second Life as a language learning platform. In addition, the ELLs were asked to share their perceptions of their oral fluency in English, their attitude toward English native speakers, and their perception of their motivation and self-efficacy in learning and speaking English. Participants replied to the mid-reflection prompts after the first of two meetings in Second Life. The prompts were designed around the research questions and provided an opportunity to reflect on the usability (i.e., practical applicability) of virtual worlds for language learning. The post-survey offered an opportunity to reflect on the experiences after the second virtual meeting. Respondents were expected to be able to make informed decisions about the usability of Second Life for language learning after the two virtual meetings. Both researchers kept a researcher journal to take field notes. Although most studies

investigating the potential of Second Life as a language learning platform reported positive findings, the practical issues that make Second Life-based language learning "conceptually applicable but difficult to conduct" [26] remain unsolved. The purpose of the researcher journal was to identify such issues and develop appropriate solutions.

### E. Procedures

The two groups, ELLs and SPED teachers, were each introduced to Second Life by their instructors, respectively. The SPED teachers spent 30 minutes in Sploland as a class to experiment with hands-on activities and then teleported to Spaceport Alpha for a short fieldtrip. The purpose of these preliminary fieldtrips was to provide students with a chance to familiarize themselves with navigation and voice communication. The instructor was physically present in the computer laboratory together with the SPED teachers, whereas the second author joined the group in-world as a technical facilitator. The following week, a small group of ELLs met in Second Life with a small group of SPED teachers on EduNation. ELLs and SPED teachers met twice for one to two hours each. Sound checks were conducted before the meetings. All participants were required to use USB headphones. The meetings were organized by an external English instructor, who was commissioned to design and lead the workshop on account of her specialization in teaching ELLs in Second Life. Examples of the activities include: playing domino to increase vocabulary (see Fig. 1), a scavenger hunt requiring the oral description of interactive household items in the instructor's virtual house, a TV quiz show in a TV studio, conversation practice in a conference room (see Fig. 2), playing taboo, a grammar rummy, brainstorming ideas at a lounge (see Fig. 3), and a murder mystery in a castle.



Figure 1. Playing domino.



Figure 2. Conversation practice in Second Life.



Figure 3. Collaborative brainstorming.

#### F. Data Analysis

In this exploratory case study, the qualitative data, which emerged from the preliminary survey, the reflection, and the post-survey, have been used to gain insight into the personal reflections and perceptions of the participants. Emerging themes were identified through open coding and combined into recurring patterns. Quantitative data from the surveys inform the story and substantiate the qualitative information.

### IV. RESULTS

The results have been arranged chronologically.

#### A. Preliminary Student Survey (ELLs)

(1) *Demographic information:* The sample consisted of 12 ELLs between 18 and 21 years old. Most students' mother tongue was Chinese. The sample consisted of 8 women (67%) and 4 men (33%), mostly (87%) ranging between 18 and 21 years old. All, but two, students had Chinese as their mother tongue.

(2) *Technology background:* Twenty percent of the ELLs reported using technology for less than an hour each day, a slight majority (53%) between 2 and 5 hours, and 27% for at least 6 hours a day. On a 10-point rating scale, they self-reported their technological expertise at 7.33 (1=lowest, 10=highest). In terms of 3D virtual worlds, 76% reported having no or little experience.

(3) *Oral proficiency:* While these learners reported relatively good aural comprehension in English, they had difficulty understanding conversations among their English-native peers. Most, however, reported struggling to express what they wanted to say, rarely speaking up voluntarily in English, and lacking the confidence to do so.

(4) *Intelligibility:* All, but one, reported that they believed they could be understood mostly well. When asked about the reasons why people may have difficulty understanding them, 87% reported that it was due to a lack of vocabulary.

(5) *Motivation:* On average, respondents' motivation to learn English was 5.4 on a 7-point rating scale (1=weak, 7=strong). On average, their attitude toward English native speakers was 5.7 (1=unfavorable, 7=favorable). When asked to rate how worried they were about speaking English outside of class, the average rating was 2.4 (1=very little, 7=very much). Their attitude about their English course(s) was, on average, rated at 5.7 (1=negative, 7=positive).

(6) *Anxiety:* Most respondents (67%) reported that they were not nervous when they had to speak English to someone they just met, whereas 33% reported being somewhat nervous. Seventy-three percent agreed that they did not have to worry about losing face in Second Life because their conversation partner could not see their real face. In the same vein, 80% replied that the use of an avatar in Second Life made them feel more at ease because it helped them disguise themselves.

(7) *Usability of Second Life:* A clear majority stated that they perceived Second Life as easy (88%) and interesting (100%) to use. In terms of the usability of Second Life for language learning, 95% perceived it as useful. Everyone reported being interested in communicating with others in Second Life. While most students (80%) were looking forward to the Second Life meetings with English native speakers, 20% were undecided.

#### B. Students' Mid-Reflection (ELLs)

The mid-reflection was completed after the first virtual meeting with their native English-speaking partners, that is, the SPED teachers. All ELLs reported finding the virtual meeting with their English native speaking partners useful. They all appreciated the opportunity to practice speaking in a relaxed environment. They suggested that the virtual environment may have helped them to overcome shyness, to save face even when mistakes were made, and that they felt more comfortable speaking in an online setting than face-to-face. Being able to make friends, engaging in interesting interactions in a relaxing, game-like, and visually appealing environment were mentioned as critical factors.

The activities in Second Life, however, could have been more interesting, entertaining, and interactive. There were too many people at the same place at the same time (lack of functioning sound parcels) and it was hard to understand each other and the teacher. For example, due to poor sound quality and interference, instructions were unclear so that tasks could not be completed accurately. Also, Second Life was perceived as being too complicated. The ELLs would have liked to practice pronunciation and grammar, have

more activities, and have separate sound parcels for private conversations. Despite these challenges, the average rating of the usability of Second Life for language learning on a scale from 1 (useless) to 10 (excellent) was still quite high at 7.7. Most students were looking forward to the second meeting.

### C. Students' Post-Survey (ELLs)

In contrast to their answers in the pre-survey, no one reported difficulties in understanding their native-English speaking partners. No one reported difficulties in expressing their own thoughts and opinions in English. Everyone was confident that they were able to express the full nuance of their thoughts and opinions to varying degrees (very confident: 33%, quite confident: 50%, moderately confident: 17%). On average, respondents' motivation on a 7-point rating scale (1=weak, 7=strong) was unchanged at 5.4. The statements about being nervous when they had to speak English to someone they just met were almost unchanged, compared with the pre-survey. Their attitude toward English native speakers was almost unchanged at 5.8 (1=unfavorable, 7=favorable). When asked to rate how worried they were about speaking English outside of class, the average rating was almost unchanged at 2.1 on a 7-point rating scale (1=very little, 7=very much). The perceptions in terms of losing face remained unchanged compared with the pre-survey.

Again, the majority (58%) reported technical difficulties. Most students reported having sound issues, although their English instructor had conducted a sound check with them in an Adobe Connect classroom. Even when they did have sound, some voices could not be heard clearly. In terms of the Second Life viewer software, some students were frequently logged off and lost valuable time having to log in again or having to restart their computer. One student reported motion sickness due to the navigation in a 3D immersive space. As in the preliminary survey and the mid-reflection, all students, but one, agreed that the use of an avatar in Second Life made them feel more at ease due to the anonymity. All students found Second Life easy and interesting to use and confirmed its usability for language learning, although 83% stated that Second Life was not necessary for the type of language practice they had experienced. The same learning effect could have been achieved through other means with less hassle. Despite various challenges, everyone reported having enjoyed interacting through their avatar.

Benefits of using Second Life for speaking practice were identified as: communicating without seeing each other, more opportunities to meet native speakers, reduced nervousness, increased confidence, and overall more opportunities to speak than in real life. When asked what the external ELL instructor, who had conducted the activities, could have done differently, several students stated that they would have liked more opportunities to speak with their partners and more interesting activities. All students reported being satisfied with the experience and encouraged their own instructor to use Second Life as a language-learning platform.

### D. Preliminary SPED Teacher Survey

(1) *Demographic information:* The convenience sample consisted of 18 (16 female and 2 male) special education teachers. All teachers were between 20 and 30 years old, except for two older participants.

(2) *Technology background:* In terms of virtual worlds experience, 61% reported having no experience, 22% reported having little experience, and 17% reported using virtual worlds occasionally. Seventy-one percent reported using technology for up to five hours a day, while 29% were using technology for more than five hours a day. When asked to rate their computer expertise on a 10-point rating scale (0=lowest, 10=highest), the average rating was 7.1, which is a little lower than the ELLs' self-reported expertise. Respondents were also asked to describe themselves in terms of Roger's technology adopter categories [27] (see Table II).

Table II. Technology Adopter Categories

Adopter Category	Responses
Innovator ("techies", guaranteed to adopt technology as a pedagogical tool)	22%
Early adopter ("visionaries", will adopt technology earlier than majority)	28%
Early majority ("pragmatists", will adopt technology as soon as majority of teachers does)	44%
Late majority ("skeptical", reluctant to adopt technology)	6%
Laggard (unlikely to adopt technology as a pedagogical tool)	0%

(3) *Usability of Second Life:* Based on the NOAA video they watched, the average rating of Second Life for education on a 10-point rating scale (1=useless, 10=extremely useful) was 6.28. Overall, their first impression of Second Life was that it had potential for education and seemed user-friendly. When asked what they hoped to gain from the two virtual meetings with their ELL partners, most said they hoped to identify the best techniques to work with ELLs and to see some of the educational applications of Second Life from a more active role, rather than just being a student in it.

(4) *Unique affordances:* The experiential value emerged as one of the key affordances of virtual worlds for educational purposes. "Very usable for education. It appears to be a very professional approach to virtual reality, allowing people to interact in a social way while maintaining the capability to have an emphasis on education." The immersiveness of the 3D environment emerged as another unique affordance.

*I think it is a great idea to use Second Life for education. It immerses the student into what they are learning about. In the video it says users can actually experience how a tsunami looks and how why it happens. This learning experience is more fulfilling than just reading from a textbook.*

### E. SPED Teachers' Mid-Reflection

Nine out of 18 SPED teachers submitted the mid-reflection. Their usability ratings went down quite markedly from 6.28 (preliminary survey, N=18) to 4.33 (mid-reflection N=9) on a 10-point rating scale (1=useless, 10=extremely useful). The ratings ranged from 1 to 10, which reflects the wide variety of attitudes. Due to the frustrations of the first meeting, nine participants failed to submit their mid-reflection, but it can be assumed that the mean rating might have been even lower than 4.33 if everyone had submitted their comments. Only one participant found the first meeting useful. She described that when she and her conversation partner met at the ELL instructor's virtual house, they had to describe household items. Being able to interact with the objects that the ELL student was trying to describe was perceived as useful.

The remaining eight respondents provided several reasons for not finding the meetings useful in terms of getting teaching experience. The set up (i.e., planned activities) failed to encourage discussion between the two groups. There were too many people and it was hard to talk because everyone else could be heard too. Although each team worked in a separate room of a house, the lack of (functioning) sound parcels resulted in the participants hearing everyone speak, which made it challenging to identify one's team members' voices. Separate sound parcels would also have satisfied the participants' desire for private communication in a less threatening environment without public exposure. The following statements illustrate that the potential loss of face was a concern not only among ELLs, but also among SPED teachers, "I felt uncomfortable trying to talk when I knew the whole group would hear me" and "I could imagine how hard it was for the other students who were not native English speakers to have to speak English in front of everyone".

More interaction and better time management would have been appreciated. The following statement describes the amount of spoken interaction between SPED teachers and ELLs that was distinctive of all sessions that the authors observed (eight sessions totaling approximately 10 hours for all teams combined).

*I asked the student I was working with questions about herself to get to know her, and she wouldn't even respond to my questions even though I tried to rephrase what I was saying to her to help her understand. She would just stay quiet. Maybe it's because it was online, but actually working with the ELL student in person may have been more helpful. Since it was online and you can't see her face that could be why she didn't respond at all. She then only read the prompt to me when asked to by her professor and only asked for help on three words. I asked the student if she needed help understanding anything in the prompt, and she said no. That was as much time as we talked with each other out of the whole hour and a half.*

As evidenced by the following statement, the virtual presence did not seem to promote interaction, rather, it encumbered interaction.

*The ELLs seemed very apprehensive to engage, even laughingly reverting to chats in their native languages when they perceived no one to engage with in English. The facilitators encouraged all to engage freely. However, without the prompts, neither group seemed to readily approach the other.*

The second prompt asked how useful the virtual meeting had been in terms of expanding their experience of using a virtual world. Only a minority found the first virtual meeting useful. A unique affordance, however, was identified as, "Being able to virtually meet with my ELL partner was nice, and I couldn't imagine doing the activity over the phone." The remaining comments were mostly negative. Respondents were disappointed because mostly they "just stood there", without having a purposeful role assigned. Due to the lack of interaction, they did not have the impression that the meeting had helped to improve the ELL partners' oral fluency. It was suggested that a tour would have encouraged interaction more effectively.

The third prompt inquired about features they liked about the interaction and their perceptions of the unique benefits of Second Life for this type of learning activity. While some respondents liked nothing about it, several respondents appreciated that there were no limitations by location or by physics. The potential to establish personal rapport in a virtual setting was emphasized.

*We actually had a few minutes at the end of the activity to explore the boathouses' kitchen and we both agreed that it (the kitchen) was very nice and we chuckled about that. It was nice being able to connect to my buddy about something we both appreciated.*

The virtual environment was described as offering language immersion to ELLs and as a way to introduce teachers to novel technologies.

*I realized the usefulness and the possibilities for offering an environment that may be less intimidating than face-to-face meeting for ELLs. I liked interacting exclusively with a group that had a facilitator who helped to orient the Cohort to the space, and who provided us with a shared set of expectations and goals. The unique benefits were that it not only provided ELLs with a means for immersion, it also gave new teachers access to technologies that we may not have engaged before.*

The following comment illustrates the importance of having a back-up plan in case of technical issues.

*It's hard to say what I liked about this interaction because I only spent about 10 minutes working with my ELL student while 60 minutes were spent on tech glitches from other students and 20 minutes were based on directions from the other professor. However, overall I think the concept of using Second Life is a great idea because you get to integrate technology in the lesson and stay at home while interacting with another student. You still have chances to communicate and interact with them (such as seeing the written cue cards the ELL student was reading) while online.*

The fourth prompt specifically inquired about challenges the SPED teachers had experienced. Although some spaces

offered separate sound parcels, they did not offer privacy:

*You and your ELL partner had to go to a separate corner to work but other people would come and sit with you, this loud TV background noise kept interrupting the conversation, and other noises were distracting so it was hard to work with this student.*

All eight sessions were heavily impeded by technology glitches. "Some people's headphones, microphones, and speakers were not working, which is what took a majority of the time," thereby minimizing the time that could actually be spent productively. "All of the technology glitches caused us to only really work on the activity for half an hour." Getting everyone on the same page and understanding the directions of the activity were also perceived as difficult. The inability to see a partner's facial expression, the lack of sound parcels, the difficulty to access note cards, programming errors, and the apparent group divide were other challenges. One respondent who did not have sound wrote, "Also, as an observer, I noticed each group's inclination to remain comfortably divided."

The last prompt asked what could have been done to improve their virtual experience. Three respondents wrote that they would have liked to know exactly what was planned for them to do during their virtual experience. It was also criticized that the sound issues should have been resolved sooner. Some respondents would have preferred to be together at the school's computer laboratory, similar to the introductory fieldtrip to Sploland and the International Space Museum. "As new users of the program, it would be helpful for us to have support as we try to support ELLs." Finally, one respondent who had problems logging in suggested that there should have been a checklist of things to do beforehand. They had received a comprehensive manual but it is unclear how many of them had actually browsed the manual. Only two out of nine respondents were looking forward to the second meeting with their ELL partners.

Overall, the first virtual meeting was neither perceived as useful for the development of teaching skills nor as an expansion of their virtual worlds skills and experience. The unique affordances of virtual worlds were perceived as being useful for language immersion (given adequate settings and time and room for private discussions), distance learners, and for learning activities that would benefit from the absence of physical boundaries. The two major challenges were the lack of a setting and lesson design that would encourage discussion, the lack of effective private sound parcels, and the apparent technical glitches that consumed the major portion of the lessons. Due to these impediments, the SPED teachers' usability ratings of Second Life decreased dramatically after the first virtual meeting with their ELL partners, to the extent that the majority of SPED teachers were not looking forward to the second meeting.

#### F. SPED Teachers' Post-Survey

Nine themes emerged from the SPED teachers' post-survey.

##### (1) Maximized Interaction

All 18 SPED teachers completed the post-survey after the second meeting. The first prompt asked, "Do you think that the meetings between you and your ELL partner(s) have helped them to enhance their oral proficiency? How would you have designed the meetings to help them improve their oral proficiency?" Only two out of 18 participants stated that the meetings might have helped the ELLs to increase their oral fluency. Specific instructions and scenarios that would have guided the interactions would have been appreciated, such as guessing games, giving a tour, and speed rotation activities.

*I would have designed the meetings to get more voice time with their English counter parts, or even have them do a "speed rotation" activity where they would talk to someone for a few minutes, practice common phrases "my name is, I am \_\_\_ years old, I live in, something I like doing is \_\_\_" etc. and then have them move onto the next English speaker.*

##### (2) Purposeful Roles

The SPED teachers would have appreciated the allocation of specific roles to justify their presence and promote involvement. They sometimes perceived themselves as by-standers rather than active participants due to the lesson design.

*An activity that might have been more successful would have been one that would have required not only speaking but actual interaction between the ELLs and the native speakers like a guessing game such as a version of 20 questions or Guess Who. These would give the ELLs a chance to practice speaking more than just two words. It would also give the native speakers a reason to be there and involved.*

##### (3) Extensive Second Life Training

The following statement highlights the need for more extensive training in the use of Second Life and the need for an effective set-up, time management, and trouble-shooting.

*I felt that the sessions were poorly run and inefficient. I think that more training was needed, especially on the ELLs' part, on how to use Second Life. They seemed very confused about how to navigate the software and it took most of each session just to get them set up. By the time everyone was set up and "ready to go" the session was over and nothing was accomplished besides both parties feeling frustrated.*

##### (4) Clear Instructions and Prior Information

Similar to the mid-reflections, it was criticized that the instructions were confusing. Several respondents stated that a face-to-face meeting would have been more effective and doubted the effectiveness of Second Life for these purposes.

It was suggested that prior information about the activities and expectations would have been helpful to prevent the ELLs from disengaging.

*The activities and set up were so confusing for English speakers I cannot imagine how difficult it must have been for ELLs to follow. Also, when we were all at the brink of frustration they would start speaking to each*

other in Chinese. There should definitely have been some trouble shooting and background information given to all participants prior to the first session.

#### (5) Reduced Anxiety

Most SPED teachers acknowledged that Second Life has great potential because it allows for more interaction than other media, such as a video call, and because communicating through avatars appears to be less intimidating and to reduce anxiety levels. It provides anonymity for the ELL student and allows them to relax.

#### (6) Technical Facilitator

“I think that using Second Life as a language learning platform makes things harder than they need to be,” even to the extent that technology is a barrier to learning. One participant pointed out the risk of cognitive overload due to the dual focus on language learning and technical aspects. Extensive Second Life training and support by a technical facilitator can help to prevent cognitive overload.

*There may be times where a student is unsure how to use the program (such as opening the notecards, using the programs to write on boards, etc.), which can make it hard for that student to focus on language-learning when they are too occupied trying to figure out the technical things.*

#### (7) Compensating the Lack of Social Cues

The lack of social cues, such as facial expressions, was evident. It was unclear whether silence meant active listening, confusion, disinterest, or headphone issues. The design of the activities needs to be carefully thought out in order to compensate these deficits.

#### (8) Taking Advantage of the Unique Affordances

When asked if the two teaching sessions on EduNation had taken advantage of the potential of virtual worlds, most respondents reported that the tools, such as a game show set, were not used in a way to promote oral communication successfully and that the lesson design failed to allocate the SPED teachers a purposeful role. The following statement describes several of these challenges, for example, excessive teacher talk making the SPED teachers redundant.

*The dominos game was a clever idea but there was almost no opportunity for interaction and the native speakers did not seem to have much purpose in being there. With the game show activity again the idea was clever but the reality was that the ELLs were the only ones participating and their participation consisted of saying only two numbers at a time. The native speakers just sat and watched and every once in a while were able to give definitions if we knew them but the majority of the time the host would give the definitions eliminating any need for the native speakers.*

Among the benefits were the convenience of working from one's home and the integration of multimedia into Second Life. In addition, most respondents agreed that Second Life would allow for interaction in shared activities that they might not ever have the opportunity to do, but “in terms of actually taking advantage of the virtual worlds and letting two students explore something together was limited. The

sessions were low contact, low learning environments and activities.” One suggestion was, “We could have explored different parts of the island we were on, or gone swimming in the ocean to see what we could find, etc.”

When asked to describe how this project had helped them to familiarize themselves with virtual worlds, most SPED teachers agreed that it had, indeed, helped them to see how Second Life could be used and, in particular, how it could have been used differently. Surprisingly, it also became evident that even experienced users of virtual worlds and videogames had difficulties with the voice chat configuration.

#### (9) Mastery of the Unique Teaching Skills Required for Teaching in 3D Environments

The final prompt inquired about the unique skills that a teacher should have to teach in Second Life. A long list of unique characteristics and abilities was generated: patience, kindness, understanding, non-judgment, technical expertise, strong communication skills, excellent Second Life expertise, creativity in order to make materials enjoyable and accessible to many different learners, the ability to anticipate student needs without being able to read body language and facial expressions, the ability to diagnose a technical problem and troubleshoot, the ability to plan and implement a virtual lesson, the ability to specify and explain expectations and give clear directions in a calm manner, the ability to be clear and concise, the ability and willingness to organize activities in a way that everyone gets an opportunity to engage in an extensive conversation in a private chat area, the ability to stay calm in the face of technical glitches and not let the participants feel one's frustrations, think through the language demands of any given activity, and the ability to accommodate the needs of ELLs in a culturally sensitive way in order to allay their anxieties. A teacher in Second Life needs a back-up plan if technological errors take over the lesson.

The following statement summarizes many of the unique skills required to teach in Second Life from the SPED teachers' perspective:

*Know how to have everyone set up ahead of time, how to give clear, concise directions to everyone, both written and oral, give group wide instructions more frequently, keep everyone on the same page and interested, pick good material and topics that both groups of student can discuss and participate in, and create quick, friendly opportunities between each pairing/group with clear objectives of what the conversation should be based around with small sheets providing words to be used throughout the conversation.*

Despite the numerous frustrations that these SPED teachers experienced, the post-survey reflected that, overall, the respondents found the experience interesting because it showed them practical examples of teaching in Second Life, although they thought that the unique affordances of Second Life were not fully taken advantage of. The potential of virtual worlds was recognized, provided that the activities

are carefully planned and that technical glitches can be drastically minimized to enhance everyone's experience.

*Fun experience. Frustrating at times, but awesome to see where technology can go in education. The thought of kids being able to do this on an iPad with more ease and perhaps a webcam feature with kids from across the planet is a very exciting concept!*

## V. DISCUSSION

The discussion of the results has been arranged around the three research questions.

1. *What are the English language learners' and the special education teachers' perceptions of Second Life as a language-learning platform?* Almost all ELLs perceived Second Life as a useful and interesting language-learning platform. A perception that was shared by many was that they had more opportunities to speak with native speakers than in real life. On the one hand, this statement is surprising, considering that all ELLs were actually studying at a university in the United States where the majority of students were English native speakers. On the other hand, it could be an indicator of the difficulties that these students may have in engaging in conversations with native English speakers. ELLs have frequently indicated that communicating through a virtual world helped them to alleviate their anxiety, which is in agreement with Wang et al. [26] and leads to the suggestion that learning activities be designed in a way that only the instructor knows the true identity of an avatar for assessment purposes.

2. *What are the unique skills that a teacher should have to teach in Second Life?* The SPED teachers provided a long list of qualities that they would like to see in a teacher teaching in Second Life, which were informed by their own experiences in this workshop. Many of these skills should not only apply to virtual worlds teachers, but should be present in all teachers. Examples include patience, kindness, and understanding. It is hypothesized, however, that a virtual teacher may need even stronger skills in these areas when teaching in a virtual environment where social cues and non-verbal gestures are mostly absent. To give directions, for example, an avatar cannot rely on supporting verbal directions by gestures. Especially the lack of smiling and eye contact makes it more challenging to establish rapport and to convey kindness and understanding. Among the most frequently mentioned skills of a virtual teacher were: the ability to give clear and concise directions in a 3D environment, the ability to stay calm in the face of technical glitches, and the willingness and flexibility to resort to plan B if the lesson is not working out the way it was planned.

3. *What types of problems associated with the EFL program in Second Life were identified?* Although the ELLs' perception of the usability of Second Life for language learning was much more positive than that of the SPED teachers, both groups identified the same two main challenges. First, the way that the lessons were set up failed to encourage interaction between the two groups. On the few occasions when they spoke with each other rather than listening to the instructor, the ELLs tended to give monosyllabic answers. It is possible that the Chinese

students were reluctant to reply or elaborate on their answers because they were under pressure and had not been given appropriate wait-time [15] [16]. To reduce anxiety in ELLs, it is recommended that language-learning activities in Second Life be designed in a way that opportunities for interaction in private sound parcels are maximized. The risk of negative evaluation by either the instructor or other listeners should be minimal. The visually stimulating and interactive environment in Second Life lends itself to extensive and engaging collaborative activities in relatively authentic and contextualized settings, such as a collaborative scavenger hunt at the Star Trek Museum of Science in Second Life [28].

Technical issues, mainly related to voice communication in Second Life, were the second major challenge. Instead of the use of Second Life voice chat, it is recommended that Skype be used instead to accommodate both text and voice chat [16]. It is also recommended that an in-world facilitator support the instructor. Prior to the actual Second Life assignments, students will wish to familiarize themselves with Second Life. The authors described an 11-Step Virtual Worlds Teacher Preparation Workshop with an introductory fieldtrip to five Second Life islands to ensure that students master the navigation skills required for the subsequent training steps [28].

Overall, nine guidelines emerged from the SPED teachers' post-survey (see Table III).

Table III. Nine Guidelines

#	Themes
1	Maximized interaction
2	Purposeful roles
3	Extensive Second Life Training
4	Clear instructions and prior information
5	Measures to reduce anxiety
6	Technical facilitator
7	Compensating the lack of social cues
8	Taking advantage of the unique affordances of virtual worlds
9	Mastery of the unique teaching skills required to teach in 3D environments

Virtual worlds have provided broad access to native speaking communities and virtual spaces for learning and collaboration [24] and provide the potential to address the five components of the National Standards for Communication, Culture, Connections, Comparisons, and Communities [24]. Collaborative project design, however, can be challenging in virtual worlds. The findings of this study concur with Warburton and Pérez-García [29] who identified a set of guidelines that address factors fostering collaboration in 3D environments, such as running a social event before the main activity, ground rules for communication, making collaboration intrinsic to the tasks, guidance and regular briefing in order to scaffold gradually increasing levels of task complexity, video tutorials, and live mentoring/assistance.

In conclusion, alternative activities and learning designs have to be found in order to make Second Life more appealing for ELLs and their native or nonnative English speaking conversation partners. In addition to the ideas brought forward by the SPED teachers, such as giving tours,

speed rotation activities, and guessing games, the discussion group format may be an effective alternative. Morgan [30], for example, described the integration of the U.S. Holocaust Museum in Second Life into a history classroom using a student-led discussion format through voice chat. Similarly, Prude [31] described teaching Asian religions in Asian-inspired destinations in Second Life, also using a synchronous discussion format. Although the latter chose text chat for communication, the learning design could easily be adapted for voice communication in order to practice oral production in a foreign language. The discussion group format would allow ELLs sufficient preparation time, which would likely reduce their anxiety in oral production [15] [16]. Having students explore a virtual space prior to the discussion would allow them to take advantage of the unique affordances of virtual worlds, such as spatial representation, experiential learning, motivation, transfer, and collaboration [32].

## VI. CONCLUSION

Despite serious challenges, the participants perceived Second Life as a useful, supplementary tool for instructors because it promotes contextualized language practice, provided that the lesson design follows the nine guidelines suggested earlier. Most importantly, the teacher should master unique teaching skills required to teach in 3D environments. Failing this, the same or possibly superior learning effects can be achieved in alternative environments (e.g., Skype) with less hassle. The time needed to prepare participants for the technical requirements of Second Life or other virtual worlds should not be underestimated. More than one fieldtrip as a class is recommended.

The findings, practical guidelines, and ideas for alternative lesson design will be relevant to other language instructors who plan to use Second Life for oral fluency enhancement. Virtual meetings between ELLs and English-native speakers in Second Life have the potential to offer an innovative, creative, and stimulating way to practice speaking English in contextualized settings, provided that the activities are framed by a pedagogical rationale that justifies the use of 3D technology. If ELLs are teamed up with native English speakers, specific roles should be assigned to the latter. But, even without the presence of native speakers, language learners can benefit from mutual interaction by practicing their language skills in content-rich virtual worlds [24]. Increased speaking opportunities with English-native speakers is likely to enhance ELLs' confidence and may encourage them to transfer the skills practiced in virtual worlds to the real world, specifically their university settings. Limitations of this research are that all instruments relied on self-reporting and the teams only met twice for one or two hours each, which made it impossible to measure potential gains in oral fluency. No statistical analysis of the usability ratings could be conducted because half of SPED teachers failed to complete the mid-reflection.

Recommendations for future research include a more in-depth investigation of the effectiveness of virtual worlds on the oral fluency of ELLs and how instructors can design in-

world activities effectively to take full advantage of the unique affordances of virtual worlds.

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