

Journal of
• **Virtual Worlds Research**

jvwresearch.org ISSN: 1941-8477

The Metaverse Assembled

April 2013

Volume 6, No. 1



Volume 6, Number 1

The Metaverse Assembled

April 2013

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Volume 6, Number 1
The Metaverse Assembled
April 2013

Language Learning in Virtual Worlds: The Role of Foreign Language and Technical Anxiety

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Abstract

This project examines whether or not learners feel less foreign language anxiety (FLA) in an online multiuser 3D virtual world simulation than in the real world classroom. Previous research has shown FLA to have negative effects on learner performance and learning outcomes. Research into learning in virtual worlds has indicated that performance anxiety may be lessened in these environments, however, the use of such virtual environments also places demands on the learner to develop a range of technical skills to facilitate interaction. The project examines whether or not learners feel less FLA in an online multiuser 3D virtual world simulation than in the real world classroom and also attempts to establish what impacts these demands have on learner performance and FLA. This work-in-progress paper, on the basis of preliminary analysis, has found 1) there are multiple sources of FLA in both classroom and virtual environments; 2) students found the virtual environment less stressful in terms of language use and 3) there was not a significant inherent level of technical related anxiety.

1. Introduction

1.1 Virtual Worlds

In recent years there has been an increasing interest in and move towards online and blended learning across all disciplines in the tertiary sector. This interest has been generated from both an institutional and an educational perspective. Institutionally, these modes of learning potentially address issues of limited resources, equity of access and changing learner preferences and circumstances. Educationally, they may offer new ways of learning and of addressing different learning styles. Tools such as virtual worlds like Second Life offer a range of options for aiding learning and cost-effective collaboration (Smart, Cascio, & Paffendorf, 2007) including document and file sharing, and importantly, a "space" in which to meet, share, and collaborate (de Freitas, 2008), and to give learners control in exploratory learning experiences (Saunders, 2007). Other virtual world affordances considered to be conducive to learning include the strong sense of presence learners feel, the possibility of experiencing "true simulations of real world conditions", a more active and interactive experience than common text-based chat environments, additional non-verbal communication through avatar movement and gestures, many-to-many communication, and anonymity (creating a profound change in the relationship between teacher and learner and providing opportunities to participate for learners who would normally be left out) (Kim, Lee, & Thomas, 2012). While traditional modes of learning continue to remain important, relevant, and in demand, all disciplines need to embrace the challenges and opportunities online and blended learning bring. This is no less true for the discipline of language and culture learning.

Kim et.al. define 3D virtual worlds as "a new computer medium that allows many users to simultaneously access the same computer generated space as virtual placeholders called avatars". Further, they state that "Virtual worlds ... can provide opportunities for synchronous interaction in a designed space with objects and conditions created by the designer" . They argue that while other e-learning tools can offer a high level of flexibility for designing the environment in which learning takes place, "they cannot provide the deep sense of environmental and conditional immersion for multiple users afforded by virtual worlds" (2012, p. 3).

In a review of research on educational uses of 3D virtual worlds over a period of years up to December 2011, Kim et.al. (2012) developed a framework of research field classifications grounded in the review data itself. Seven major fields (plus a general field of "other" which incorporated health education and philosophy education) were distilled from this classification framework including computer education, economy education, science education, interdisciplinary education, design education, general education and foreign language education. Foreign language education represented the largest percentage of studies done accounting for 25% of the total. Indeed Kim et. al. concluded from their analysis that "virtual worlds have mainly been used for foreign language education" (2012, p. 13).

1.2 Foreign Language Anxiety

Foreign language learning in a classroom environment can be stressful (E. Horwitz, M. Horwitz, & J. Cope, 1986; Tóth, 2008). Known as "foreign language anxiety" (FLA) (E. Horwitz, et al., 1986), this kind of stress in face-to-face (f2f) learning can have a detrimental effect on learners in foreign or second language classes (Elkhafaifi, 2005). Students may feel comfortable during drill practice or prepared dialogues, but may freeze in 'role play' (E. Horwitz, et al., 1986). Hauck and Hurd (2005) report that anxiety is greatest during output, due to fear of negative evaluation by the teacher or fellow peers. Horwitz et al. (1986) further comment that: "Anxiety levels are likely to be lowered if students

can learn in a non-threatening environment which encourages them to try things out and have fun, which builds confidence and promotes respect for different learning styles, approaches and personality traits"

Virtual worlds have often been portrayed as "non-threatening" environments for learning (Broadribb & Carter, 2009; Cuoto, 2010; Levy & Stockwell, 2006). Sheehy (2010) also argues that virtual environments provide new opportunities for thinking about and implementing inclusive educational practices. In addition to an absence of real world consequences (e.g. physical injury), the mediating effect of interacting within the 3D environment in terms of anonymity, emotional distance and enactment of the "possible self" (Schultz & Leahy, 2009) have been argued to lower anxiety during communication (Broadribb & Carter, 2009).

1.3 Technical Anxiety

Despite these benefits for potentially lowering foreign language anxiety, Carr et al. indicate that first-time users of a virtual environment like Second Life may encounter a "pain barrier" at the outset, comprising issues with the interface, and the "public and potentially intimidating nature of this virtual world" (2010: 19). More generally, technical or computer anxiety may contribute to students feelings of apprehension in the virtual world.

Brown et al., (2004) found that computer anxiety and oral communication apprehension contribute to computer-mediated communication (CMC) anxiety which in turn impacts on attitudes towards CMC, and potentially learning outcomes, and Matsumura and Hann (2004) also claim that use of technology in teaching has been accompanied by an increase in students experiencing computer anxiety.

2. Background and purpose of the study

The current study is being conducted under the auspices of seed funding from the LCNAU1, and involves collaboration between Monash University, the University of Queensland, the University of Western Sydney, and Glendale Community College, Arizona, USA. In the first stage, 55 students of Chinese at Monash University completed pre- and post-lesson online surveys. In stage two of the project, students from the Chinese program at University of Queensland and the Spanish program at the University of Western Sydney will also complete surveys. This paper will report on stage one of the study.

Since Horwitz et. al. (1986), there have been a number of investigations into FLA in Spanish, French, Hungarian EFL and Arabic (M. Hauck & S. Hurd, 2005; E. K. Horwitz, et al., 1986; Hussein, 2005; Toth, 2008), in f2f and distance settings (M. Hauck & S. Hurd, 2005), and via digital technologies (Felix, 2004), however, there has not yet been an in-depth study of FLA in virtual worlds. Of the 65 articles on educational uses of virtual worlds reviewed by Kim et.al. (2012) the majority involved descriptive research aimed at exploring ways 3D virtual worlds could be used in new educational settings rather than testing existing hypotheses. They also found that in more recent times there has been an increase in experimental research focused on learning outcomes (2012, p. 15) rather than just describing and understanding the variables of the virtual environment (2012, p. 10). While not looking specifically at learning outcomes our study set out to test the hypothesis that foreign language anxiety, which has been reported as having a negative impact on learning in face-to-face foreign language classrooms, would potentially be lessened by the affordances of the 3D virtual environment.

¹ Languages & Cultures Network for Australian Universities, <http://www.lcnau.org/>
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Our goals are to examine (a) whether there is a reduction in FLA in virtual worlds compared to f2f classes as previously claimed, (b) what levels of "technical anxiety" are generated by the use of this technology and (c) whether the technical anxiety outweighs any reduction in FLA.

3. The lesson and methodology

As part of the formal curriculum for introductory Chinese at Monash University, students undertake three 1.5 hour lessons each semester in a simulation of a Chinese township in Second Life. The virtual township has a number of venues used to conduct task-based learning activities related to themes in the textbook. The lesson on which the study was based took place in a restaurant and farmers' market. Each lesson involves tasks where students must use Chinese character text-chat to communicate with non-player characters (NPCs) programmed to recognise and respond to student input. Students must use conversational language learnt and practiced during classroom-based lessons in free-form, i.e. they must formulate what they want to say or ask, then send their message to the NPCs via chat. Where communication breaks down due to incorrect language, mistakes in characters or where sufficient information to move on with the task has not been elicited by preceding interactions, students must reformulate their output until they obtain the information or artefacts they require.

Prior to commencing the lesson, volunteer students completed an online pre-lesson survey made up of 12 demographic questions, 16 questions on computer/chat use, and 24 focused on their feelings relating to learning Chinese in general and in the classroom specifically. The language-related questions were adapted from the Foreign Language Classroom Anxiety Scale (FLCAS) developed by Horwitz et.al (1986), and the questions on computer/chat use were adapted from the multi-item scales developed by Brown et.al. (2004). A five-point Likert scale was used for both sets of questions. The post-lesson survey was made up of 27 questions related to the use of Chinese within the virtual environment and 10 questions relating to the use of technology in the form of the Second Life virtual environment. The first set of questions was designed to elicit information about FLA, while the second set was focused on technical anxiety. Each of these sets of questions also used a five-point Likert scale. A total of four open-text questions were also included in the surveys, not analysed here.

4. Progress to date

Part one of the study has concluded and preliminary quantitative analysis has commenced, including 2-tailed Pearson Correlations used to test the statistical significance between factors obtained from the demographic survey questions and general computer/text-based chat anxiety, FLA in the classroom/virtual environment, and technical anxiety related to the virtual environment; 2-tailed Pearson Correlations to test the statistical significance of the correlations between factors; analysis of the prevalence of FLA in the classroom/virtual environment and of technical anxiety in relation to computers, chat, typing Chinese, the virtual environment and user interface (UI) specifically.

5. Some preliminary findings

Respondents (55) were roughly half female (25) and half male (30), mostly undergraduates aged 18-20. Around two-thirds had previously studied another second language before undertaking this course. Many indicated that they spent 2-4 hours a day using computers (42.5% of students), or even longer (37.1%), and most of this time was spent online. Email, study, watching or downloading music or movies, and social networking (each undertaken by over 80% of students) were the most popular activities. Less than a third of students, however, played 3D games like World of Warcraft, and an even

smaller proportion (12.5%) engaged in other 3D environments like Second Life. Very few (less than 15%) played games regularly.

5.1 Computer and text-based chat anxiety

Overall, students had a reasonably low level of inherent computer anxiety, reflected in the responses to propositions such as "Computers make me feel uncomfortable" (79% disagreed), "I get a sinking feeling when I think of trying to use a computer" (80% disagreed), and "I feel comfortable using a computer" (88% agreed). In relation to the use of chat in general, 68% of students indicated that they had a lot of experience with chat, 68% felt comfortable using chat and 59% indicated that they chatted several times a week. However, only 55% indicated that they "liked conversing in text-based chat", with 41.9% non-committal. These figures suggest that students do not experience any inherent anxiety from the use of chat, although it may not be their preferred form of communication.

For those who do experience computer/chat related anxiety, the 2-tailed Pearson Correlation analysis found a significant correlation (all $p < .05$) with gender, the amount of time a student spent on the computer (82% more than 2 hours a day, 37% more than 4 hours a day) and the frequency with which they play interactive games (13% daily, 16% weekly, 48% not regularly, and 14% never). Overall, males were more comfortable with chat and those who spent more time on the computer/playing games were less likely to be anxious. This has pedagogical implications in that female students, especially those who use computers less frequently, may need more support to be comfortable using computers and text-based chat.

5.2 FLA in the classroom

In terms of anxiety tied to classroom performance, there was a fairly even split between those who worry about making mistakes (37%) and those who do not (34%). Even so, making mistakes in class is a source of anxiety for a significant percentage of students. Furthermore, 29% of students said they were afraid other students will laugh when they speak Chinese, and another source of anxiety for just under a third was knowing they were going to be called on to perform in the language. Not understanding what the teacher says in the language "frightens" 42% of students. Other manifestations of anxiety come in the form of panic when having to speak without preparation (45%), forgetting things already mastered (39%), and feeling self-conscious in front of other students (39%).

Whether FLA was experienced in the classroom or not was significantly correlated with factors such as age, prior language learning, and personality (all $p < .05$). Older students were less worried about making mistakes, but more frightened when they did not understand the teacher. Those with no previous language learning experience were more anxious about being laughed at by other students, but somewhat counter-intuitively, were more willing to speak to native speakers (NS). Interestingly, those with more outgoing personalities are more anxious about being laughed at by classmates. This means older and inexperienced learners and those outgoing students may need more encouragement in the language classroom activities.

5.3 FLA in the virtual environment

Overall, levels of FLA appeared lower in the virtual environment, with students' level of uncertainty about communicating in Chinese online slightly lower than in f2f, and a much lower level of anxiety about making mistakes in the virtual environment, with only 6% of students disagreeing with the

statement "I didn't worry about making mistakes in Chinese in the online 3D environment"². In terms of knowing that they were going to have to use Chinese in the online environment, only 16% of students "trembled" and only 13% were anxious about not understanding what an NPC said to them. Just 15% felt panicked when they had to communicate with the NPCs without preparation, 9% forgot things they had already mastered, 12.7% experienced their heart pounding when starting a conversation, and 7% felt self-conscious about typing a conversation in Chinese with other students around them in the lab, much lower rates than the counterpart questions asking about the class environment. This is consistent with the previous findings that language learning in virtual world can reduce FLA (Hundsberger, 2009; Peterson, 2011).

Factors that correlated with FLA in the virtual environment were similar to f2f. According to the correlations analysis, female students were more confident communicating with NPCs in chat, but males felt they would be more confident communicating with live NSs. Older students were more worried about getting left behind in the lesson due to taking longer to read the responses and were more nervous when communicating with the NPCs. Students with no prior language learning experience felt anxiety from a number of sources in the virtual environment, and interestingly, students with more outgoing personalities appeared less sure of themselves when communicating in the virtual environment. The results indicate that language classes in the virtual world also need to give enough support to older and inexperienced language learners so that they are able to make fuller use of resources in the virtual environment for learning. Students with more computer/Internet time were more confident about speaking Chinese using voice in the virtual environment, but more anxious about the lesson in the virtual environment, even when well prepared. This interesting finding indicates that those students confident in using computers/internet are not necessarily confident learners in the virtual world; on the contrary, they may also need more support for the effective learning to occur.

5.4 Technical anxiety in the virtual environment

Levels of anxiety related to the UI, keyboard and mouse appeared relatively low, reflected in responses to statements such as "I found the Second Life viewer easy to use" (64% agreed) and "Using the keyboard and mouse to move around made me feel quite stressed" (53% disagreed). However, while 36% found the Second Life UI to be well laid out, 49% were non-committal and 14% disagreed. In terms of reading the dialogues with the NPCs, 53% of respondents disagreed with the statement "Reading Chinese characters in the instant messages and general chat was stressful", with 35% were non-committal and 13% agreeing. This result runs contrary to our hypothesis that technical anxiety may be a major contributor to the impairment of language learning in SL.

With regard to the virtual city itself, there were clearly some issues related to students finding their way around, with 36% of students finding it confusing (38% non-committal, 26% disagreeing). On reflection, this is a source of anxiety that students would not normally experience in the classroom. In counterpoise, 56% disagreed with the statement "I felt anxious looking around the visual environment because there were too many things to look at and take in" and 62% finding "lots of things in the virtual environment that helped me understand what was being said to me by the NPCs, other students and teachers in Chinese". These results reinforce the importance of pedagogical and curriculum design in virtual world which have great impact on students' anxiety and learning confidence (Henderson, Huang, Grant, & Henderson, 2102). Students also felt safe in the virtual city/environment (82%) and comfortable communicating via their avatar (78%).

² The figures presented are a combination of "agree" and "strongly agree" or "disagree" and "strongly disagree" from each side of the five-point Likert scale.

Factors that correlated with technical anxiety in the virtual environment were fairly sparse, but included gender, age, previous learning experience, and personality (all $p < .05$). Students with previous language learning experience found many things in the virtual environment that helped them understand what was being said by the NPCs, other students and the teachers. Counter intuitively, students with a calmer disposition were more stressed by having to read Chinese characters. Unsurprisingly, those of a more naturally tense disposition found using the mouse and keyboard to move around quite stressful.

6. Conclusion and future directions

Preliminary analysis indicates that there are multiple sources of FLA in both classroom and virtual environments. Initial indications are that overall, students found the virtual environment less stressful in terms of language use. It would also appear that there was not a significant inherent level of technical related anxiety, nor did the technical aspects of interacting in the virtual environment present significant additional levels of technical anxiety. This does not necessarily mean that students found the virtual environment more useful or enjoyable. The qualitative analysis of open ended comments from the survey currently being carried out and further quantitative analysis (e.g. through factor analysis) will provide a clearer picture about these aspects of student experience, and stage two of the study will add valuable data to that discussed above.

All the students in stage one were present in the same physical computer laboratory during the virtual world lesson. Students in stage two will be participating in a number of lessons in the virtual environment (two warm-up and one actual lesson) in distance mode. While their own teachers may be present, the lessons will mainly be conducted by an instructor who is in another location, so all communication will be via the virtual environment. The second part of the study will attempt to clarify whether this factor will itself become an additional source of anxiety for learners in the virtual environment. Moreover, while students from University of Queensland will be doing lessons in the same location as the Monash University students (and indeed will cover the same tasks and content) students from the University of Western Sydney will be engaging in Spanish lessons at another Spanish-themed location in Second Life and will carry out language learning tasks of a different nature to those of the Chinese language cohorts.

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