

# Exploration through Virtual Reality: Encounters with the Target Culture

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**Abstract:** This paper presents the results of a study on the use of a virtual reality (VR) world in a German language classroom. After participating in a lesson on the use of commands, students experienced the language and culture through navigation in a VR world. It is argued that this new medium allows for students to be immersed in the target culture and language in ways that are not possible through the use of other media. The results of the study indicate that the virtual world experience enhances students' awareness of the target culture.

**Keywords:** virtual reality, culture, second language learning, task-based instruction

**Résumé :** Cet article présente les résultats d'une étude sur l'emploi d'un monde de réalité virtuelle (RV) dans un cours d'allemand. Après une leçon sur l'emploi de l'impératif, les étudiants ont été exposés à la langue et à la culture allemandes en naviguant dans un monde RV. Nous suggérons que ce nouveau média permet aux étudiants d'être immergés dans la culture et la langue cibles d'une façon qui n'est pas possible avec d'autres médias. Les résultats de l'étude montrent que l'expérience d'un monde de réalité virtuelle accroît la conscience qu'ont les étudiants de la culture cible.

**Mots clés :** réalité virtuelle, culture, apprentissage en langue seconde, enseignement basé sur les tâches

## Introduction

Although the teaching of culture in the language classroom has historically been relegated to a peripheral status – as can be seen in the terminology applied to it, such as the 'fifth dimension' of language learning (Damen, 1987)<sup>1</sup> – there have recently been calls to incorporate cultural instruction more fully into the curriculum (e.g., Chavez, 2005;

Ware & Kramsch, 2005). Policy documents such as the *Standards for Foreign Language Learning in the 21st Century* (1996, 1999, 2006) point to the integral role that culture should play in the teaching of foreign languages. *Standards* 2.1 and 2.2 speak to three important aspects of the target culture: (a) behavioural practices (i.e., 'patterns of social interactions' such as forms of discourse and the use of space); (b) philosophical perspectives (i.e., 'meanings, attitudes, values, ideas'); and (c) both tangible and intangible products (i.e., 'books, tools, foods, laws, music, games') (*Standards*, 2006, p. 47). Knowing a language today, therefore, means having an understanding of and appreciation for the culture(s) in which it is spoken.

It has been argued that cultural understanding is especially important for students who never travel to the target culture (e.g., Dubreil, 2006). The difficulty lies, however, in presenting a representative picture of the target culture to students (e.g., Kramsch, Cane, & Murphy-Lejune, 1996; Tseng, 2002). Chen (2003), Robinson-Stuart and Nocon (1996), and Tseng call for a new interpretation of culture as a *process* of learning 'rather than an external knowledge to acquire incidental to the "facts" of language' (Tseng, p. 13). Coming to know a culture – its products, practices, and perspectives – *through* language is now meant to be a central focus of foreign language teaching.

Culture is, of course, a contested concept. Providing a comprehensive definition thereof goes beyond the scope of the current paper. Discussions surrounding the various definitions of culture can be found, for example, in Kramsch et al. (1996), Robinson-Stuart and Nocon (1996), and Shanahan (1998). They focus on such aspects as a set of facts to be learned, a collection of practices to be studied, a set of values embraced by a people, observed behaviour of a group, and "'the etiquette" of a society' (Podromou, 1992, cited in Abrams, 2002), to name a few. Levy (2007) provides a multifaceted approach to exploring culture by developing it along five key dimensions:

1. Culture as elemental. We are cultural beings who must understand our own culture before understanding that of others.
2. Culture as relative. Students must be engaged with the target culture. While contrastive approaches are problematic, generalizations have some value.
3. Culture as group membership. We all belong to many formal and informal groups, each of which requires a common language among its members.
4. Culture as contested. Culture is contested at many levels, often through language. Differences should be identified and negotiated.

5. Culture as individual (variable and multiple). Each of us has a personal knowledge of culture that we choose to represent in a particular way (p. 112).

Thus, language instructors have a variety of ways to engage their students in the process of learning a second culture along with its language. For the purposes of this paper we, like Levy (2007), rely on Kramsch's (1998) definition: 'culture can be defined as membership in a discourse community that shares a common social space and history, and common imaginings' (p. 105). We take guidance from Kramsch (1995), who proposes a framework for teaching culture *through language* that 'embraces the particular, not by being consumed by it, but as a platform for dialogue' (p. 83).

The introduction of virtual reality (VR) to foreign language instruction allows students to truly experience the culture – both its practices (e.g., virtual family routines, as described in Purushotma, 2005) and its products (e.g., through virtual museum tours, as described in LeLoup & Ponterio, 2004) – while at the same time exposing them to a range of linguistic data. Authors (e.g., Goodwin-Jones, 2004; Johnson et al., 2004; LeLoup & Ponterio; Purushotma) have described the possibilities for utilizing VR in the language classroom, but they have not systematically investigated such a use. Therefore, we would like to determine whether students focus purely on linguistic aspects of the game or whether cultural products and practices are important to them as they navigate the virtual world. This study reports on students' interactions with the target culture presented in a virtual world that is based loosely on Salzburg, Austria. Given that there is an actual cityscape where they can walk and explore, students are exposed to a German-speaking environment, and this can reinforce the connection between language and culture.

### **Learner autonomy and cultural awareness through virtual reality**

#### *What is virtual reality?*

Simulations<sup>2</sup> can be quite valuable in the language classroom (e.g., Cerratto, 2002; Davis, 1996; García-Carbonell, Rising, Montero, & Watts, 2001; Hulstijn, 2000; Jung & Levitin 2002; Kovalik & Kovalik, 2000; Magnin, 2002). Benefits of simulations include a sense of realism, increased motivation, the student-centred nature of interactions, identification with the target culture, and reduction in anxiety levels. Virtual reality (i.e., 'an immersive, interactive medium that relies on

computer-mediated manipulations of the visual, aural, and tactile senses to provide learners with the simulated experiences in computer generated worlds'; Dennen & Branch, 1995, p. 101)<sup>3</sup> takes the concept of simulations to a new level in that students inhabit, experience, and have the ability to interact with the target language environment (Bricken, 1990, cited in Schwienhorst, 2002).

Three defining characteristics of VR include its interactivity, three-dimensionality, and real-time feedback (Settekorn, 2001; Stone, 2002; Whyte, 2002). Another important aspect of VR is the notion of *presence*. That is, users 'feel they are inside the computer-simulated environment, rather than just looking at a video display' (Winn, Hoffman, & Osberg, 1995, p. 11). As such, Stevens (1995) notes, VR 'is being touted as a revolutionary and easy way to stroll through worlds too far away, too small, too experimental, or too dangerous for ordinary access' (p. 435). Virtual reality is a computer-generated version of a real-life setting that can be experienced in a variety of formats (e.g., as an individualized computer video game, in a 3D stereoscopic CAVE setting, or as a collaborative learning environment that can be projected in a classroom). Unlike interactive media built using video, VR is a three-dimensional world that permits exploration through space. It affords the opportunity to *participate in* new and distant experiences (Stone).

#### *Virtual reality in the language classroom*

In the classroom, there are clear advantages to making use of virtual reality. Brett (2001) argues that people remember what they experience to a much greater extent than what they read (cited in Dubreil, 2006). Virtual reality has been successful in helping students understand difficult concepts (Winn, 1995; Winn et al., 1995). Among these are biomedical techniques (Stevens, 1995), water phases and phase transitions (Trindale & Fiulhais, 2000), and planetary phenomena (Bakas & Mikropoulos, 2003). It is not without its detractors, however. Goodwin-Jones (2005) states that '[p]arents of teenagers who spend inordinate amounts of time finding treasure, zapping evildoers, and exploring imaginary worlds may take a dim view of electronic games and [are] skeptical about any potential benefits to their children' (p. 19). We argue, however, that a video game – a medium with which students are familiar<sup>4</sup> and which, therefore, may have a motivating effect on learning – that is both culturally appropriate and contains a wealth of linguistic data can encourage language students' cultural learning.

Games, when designed with a particular pedagogical goal,<sup>5</sup> may be classified as tasks. While definitions of task-based instruction abound, Lee (2000) maintains that the central aspect of a task, as opposed to a mere activity, is the notion of *purpose*. That is, language manipulation is not the central focus; instead, 'learners use language as a means to an end' (p. 31). Littlewood (2004) argues that the best tasks call for a high level of task involvement and learner engagement. As such, games are tasks only when learners work toward a goal external to the language itself in the second language (L2).

In spite of its promise (and no doubt because of its cost), VR has been underutilized in foreign language teaching. Major benefits of VR include its ability to motivate students and build confidence (Johnson et al., 2004). Purushotma (2005) cites the possibility of using the Sims computer game in language classes simply by switching the language setting. Thus, students are able to gain contextualized practice with everyday vocabulary items. The game Sim Copter has been used in ESL classrooms for giving directions and for peer review of writing (Goodwin-Jones, 2005, p. 20). While such uses of games may be helpful for vocabulary learning or for improving writing in the L2, we argue that they do little to address the cultural aspect of language learning, since students are not interacting with a culturally specific (i.e., based on the target culture as opposed to merely a generic setting) version of the game.

Goodwin-Jones (2004) presents a number of VR language learning environments, some of which introduce aspects of the target culture. One virtual environment, the Tactical Language Training System, introduces students to both the Arabic language and the culture through a virtual world (Johnson et al., 2004). To date, however, there has not been a systematic study into the usefulness of such games in the university language classroom, especially a study of their effectiveness in teaching aspects of the target culture. Students in the current study followed commands to navigate through a virtual world environment based loosely on Salzburg and were given the task of finding the mayor's daughter.

#### *Virtual reality and cultural awareness*

There are numerous ways to utilize the computer to foster cultural awareness. Dubreil (2006) discusses the benefits of multimedia, including video, the Internet, and electronic learning communities, for gaining perspective on the culture of the L2. He cites Cameron (1998), who states, 'It is virtually impossible to devise a CALL

program which does not have some connections with cultural issues. CALL is about language and language is a cultural issue par excellence' (p. 238). One successful example of the use of CALL to develop students' understanding of foreign cultures is the *Cultura* project, as described by Furstenberg, Levet, English, and Maillet (2001). This project provides students with the opportunity to explore culture through an online forum, 'where they exchange their respective viewpoints and perspectives and try to understand each other's culture through the eyes of the other' (p. 59). Webquests, as described by Skehan (2003) and Goodwin-Jones (2004), are computer-mediated tasks that allow students, while gathering and organizing data, to interact with target language Internet material intended for native speakers. Virtual field trips (e.g., Goodwin-Jones, 2004<sup>6</sup>; LeLoup & Ponterio, 2004) give students the chance to view some of the material available in museums that would otherwise be too distant to explore.

Unlike other forms of multimedia that can be utilized in the language classroom, VR allows students to physically experience the culture. They are able to hear the sounds, come into contact with the language in use, explore the environment, and interact with the culture in ways that are not possible through other media. Dubreil (2006) foresees the role that VR could play in the future: 'One could envision, in the future, the development of [...] more advanced applications involving virtual reality [...] that could help teachers and learners become better culture learners' (p. 258). This study tests the effectiveness of Dubreil's vision.

Given the lack of studies into the use of VR in the language classroom, we sought to investigate students' reactions to a VR experience in a German language classroom and their interaction with the target culture as a means to set the groundwork for future research into the use of VR in the language classroom. Two main research questions guided this study:

1. *What do students feel is the primary focus of the VR environment?* Given that this study was performed in German language classes in which the central focus of study was the language, it was expected that students would focus on the linguistic aspects of the game. On the other hand, if students did not focus on the language but instead focused on some other aspect of the game, then it can be argued that this virtual world experience truly is a task.
2. *Do students focus more on the cultural practices or on the cultural products in the VR environment?* Because the virtual world experience is interactive and requires students to participate in

the experience, it was expected that, on a free-recall task, students would remember more cultural practices than cultural products, as was the case for both beginning-level (Herron, Corrie, Cole & Dubreil, 1999) and intermediate-level (Herron, Dubreil, Corrie & Cole, 2002) learners who watched videos in the L2 and remembered mostly cultural practices.

## Methodology

### *Participants*

Participants in the study were 42 students from three sections of first-semester German at a Canadian university. There were 19 male and 23 female students, and their average age was 20.5 years. On the pre-task questionnaire (see Appendix A), most indicated that they were self-motivated to learn German, and the mean motivation rating given by students was 5.5 on a 7-point scale. Students who took part in the study were performing well in their German classes. There was a high class average of 89% (range: 75–95%). When asked to choose which aspects of learning German were important to them, they indicated that the most important aspects were general fluency, grammar, and vocabulary. Some indicated that they were interested in learning about German culture and pronunciation, although these aspects were given lower ratings of importance compared to the more traditional and quantifiable foci of fluency, grammar, and vocabulary.

All participants in the current study spent at least one hour of German class time per week in the computer lab, working mostly on grammar activities through cloze activities within a curriculum that focuses primarily on the acquisition of the four language skills: listening, speaking, reading, and writing. Students in the first-semester German course were evaluated on all skills through classroom interactions, daily homework assignments, written and oral examinations, and written and oral projects. Culture was taught sporadically through the 'By-the-Way' approach as described by Galloway (1985, cited in Omaggio Hadley 2001, p. 349). Students were not evaluated on cultural knowledge or understanding.

Only 25% of the participants in this study claimed to be regular game players. Of this group, the average number of hours of game play was 7.5 hours per week. At the other extreme, 25% of the group had played a video game only once in the last year, while an additional 13.7% stated they have never played a computer game. Students indicated that they

play these games for the following reasons: 'they are fast and fun and you get to have a goal,' 'they are fun to play and have challenging puzzles to solve,' they are good to play 'for relaxing and unwinding.' Three indicated that they play games to pass the time; two indicated a social aspect of multi-player games; and two others noted that they play video games because they are lifelike. When students were asked to name educational games that they enjoy playing, only 11 of the 42 students were able to name one.

On the pre-task questionnaire, students indicated that they believe that video games can be utilized in the classroom (mean = 5.16 on a 7-point scale). The most common responses included that the games are interactive ( $N = 10$ ), that they are interesting ( $N = 6$ ), that they are different from traditional classroom lessons ( $N = 4$ ), that they are a familiar medium ( $N = 4$ ), and that they are entertaining ( $N = 2$ ) or motivating ( $N = 2$ ). The questionnaire responses provide an indication that the students in this study were interested in seeing how a video game could be used in a German language classroom, but they had lower expectations for this educational game than they have for games that they play for entertainment.

### *Tasks*

On the first day of the study, all students were introduced to the linguistic aspect of the game: the imperative in German. Commands were taught in the following way:

1. Students received simple classroom commands and were asked to follow them.
2. The instructor presented the grammatical fundamentals of commands.
3. Students performed a listening activity with commands in German.
4. Students created commands with partners.
5. Relevant new vocabulary specific to the virtual world was presented to students through PowerPoint and an accompanying partner activity.
6. Students were given a map and were asked to follow directions given orally.

Students completed a pre-study questionnaire on the night before they experienced the virtual world environment. This questionnaire, referred to above, probed into students' motivation for learning German and asked students to discuss their computer usage generally.

The game played by students in this study is a computerized task situated within a proficiency-oriented communicative classroom. Two important aspects of task-based instruction (Swan, 2005) that are central to this game are natural language use and learner-centredness (e.g., Skehan, 1998; J. Willis, 1996; D. Willis, 2003). From the pedagogical design standpoint, we had two goals for the task: (a) to enable students to interact in a real-life L2 setting; and (b) to provide students with exposure to and experience with carrying out commands in the L2.

The virtual world built for this game was created by the second author in a 3D modelling environment (Audiodesk 3ds MAX) and imported into Virtools, an interactive gaming application. The architectural backdrop for the game is based on photos, drawings, and maps of Salzburg. Many of the public squares and spaces would be recognizable to a tourist today, including the Domplatz, Salzburg Cathedral, Residence Square, and Old Market. The game itself is a mystery in which the students are expected to follow commands and collect clues to find the mayor's missing daughter, Laura Koch (L.K.). Students are exposed to a variety of clues including spoken commands, written commands, conversations between characters, radio and TV broadcasts, cellphone messages, and signs (see Figures 1–4). Students experienced the virtual world in one of three environments: individually in the computer lab, as a class with a projection-screen version of the world, or in groups of three in a computer automated visual environment (CAVE). A CAVE involves multiple stereoscopic projections on screens usually placed orthogonally to each other in the form of a cube. There can be three to six screens, and a 3D sensation is accomplished by using either active or passive stereo projection. Control in the space can be achieved by using trackers, gloves, and gyro mice. Each student spent approximately 30 minutes in the virtual world in one of the environments (i.e., on the PC, in the classroom with the projection screen version, or in the CAVE).

On a post-treatment questionnaire (see Appendix B), students were asked, among other things, to speculate as to the goal of the task. They also were to discuss in a free-recall task the aspects of the culture they retained from the virtual world, and they were to compare and contrast the culture presented in the virtual world with Canadian culture. Finally, students completed a post-test in which they were asked to follow directions in German through a city. This probed whether students could follow and create commands after they made use of the VR technology. The results of the linguistic task go beyond the scope of the present paper.

FIGURE 1

The hot dog stand, where students receive their first written clue, which reads, 'Help! Unknown men kidnapped me. Quickly! Go to Vollkornbäckerei Waldherr! Straight ahead to the building with the green roof! Then go right and walk along the building! L.K.'



## Results

### *Student perceptions of the VR environment*

Upon completion of the virtual world task, students participated in a post-test on the use of commands and rated the usefulness of the VR software. The results of the linguistic post-test on commands were inconclusive; however, on the questionnaire, 26 of the 42 students indicated that the virtual reality task improved their knowledge of German. Students were asked to rate on a 7-point scale (7 = most helpful) which aspects of their German were most bolstered by the virtual world experience. Mean ratings given to each of the aspects are presented in Table 1.

Students felt that the virtual world was most helpful for developing their listening skills. They indicated that the virtual world was less helpful for developing the following skills: learning vocabulary,

FIGURE 2

Another written clue provided to students. It reads, 'Help! The men in black suits are dangerous! They kidnapped me! Help! L.K.' At this same location, students also receive an audio clue on the cellphone: 'Look for the man in the black suit! He knows something that you want to know. At the moment he is walking toward the marketplace. Find him and follow him to get your next clue!'



TABLE 1  
Mean ratings regarding best use of VR for teaching German

Aspects of German language bolstered by VR experience	Mean rating
Listening	6
Learning vocabulary	4.65
Learning about culture	4.45
Gaining speaking fluency	4.44
Pronunciation	4.60
Reading	4.18
Grammar	3.32
Writing	2.67

learning about culture, gaining speaking fluency, and improving pronunciation and reading skills. They indicated that the software was least helpful for learning grammar and improving their ability to write in German.<sup>7</sup>

FIGURE 3

A television screen that plays the 'news of the day'



After the experience, students indicated that they thought virtual worlds should be utilized in the German classroom (mean = 4.91 on 7-point scale). However, although enthusiastic about the experience, they spoke with caution when they explained when and why virtual reality should be used in their own German classrooms. The most common responses included that the VR experience was fun and different and that it was a good review that allowed students to apply what they had learned in class. Others, however, said that it should only be used occasionally as a supplement to more communicative classroom activities. The four most critical students said that this technology reduced their level of participation and that they would, therefore, be hesitant to suggest making regular use of VR in their German classrooms.

As noted above, it was important for us to determine what students believed to be the goal of the task in order to determine where they focused their attention while completing it. When students were asked the free-response question 'What was the goal of the task you just performed?' they gave the following responses: (a) to practice listening skills ( $N = 5$ ), (b) to test the effectiveness of VR technology ( $N = 8$ ), (c) to follow commands ( $N = 13$ ), and (d) to find the mayor's daughter

FIGURE 4

Austrian police indicate that students have successfully completed the game. The headline of the newspaper reads, 'Laura Koch is free! The police hand out the €1000 reward':



( $N = 15$ ). While each of these was a goal for us as creators of the experience, it is important to note that a game-related response (i.e., finding the mayor's daughter) was cited as the goal of the activity by more students than cited either of the responses related to the promotion of language skills. This suggests that students focused on the game, not only on the language.

When students were asked which aspect of the experience they enjoyed most, the greatest number ( $N = 13$ ) mentioned the explorational aspect (i.e., seeing, exploring, and navigating through the city). None of the students in the study had ever actually been to a German-speaking country, but the virtual world enabled them to experience a German-speaking city.

#### *Cultural products and practices*

After students participated in the VR experience, they were asked a number of free-response questions. These included questions about what they remembered most from the experience and also what they

TABLE 2  
Results of free-response questions

Aspects of the virtual world remembered	<i>N</i>
Buildings and other structures	21
Marketplace	16
Cobblestone	7
Similarities to Canadian cities	
Modes of transportation	14
Types of shops	12
Giving and receiving directions	4
Not similar	3
Differences from Canadian cities	
Marketplace	22
Age of city	12
Cobblestone streets	8
Language	7
European look	2

found were similarities to and differences from Canada. Results are presented in Table 2.

When students were asked to indicate which aspects of the virtual world they remembered, they mentioned buildings and other structures (e.g., cafés, flower shops, bookstore, pretzel stand, McDonald's); the marketplace (i.e., the shops, the proximity of shops to one another, the variety of goods available); and the cobblestone streets. Note that all of these aspects are cultural products.

Students' responses to the question, 'How is the world similar to an experience you might have in a Canadian city?' can be classified in the following categories: modes of transportation, types of shops (e.g., restaurants, including McDonald's, and flower shops), giving and receiving directions, and the lack of similarities between the two situations. Once again, most students tended to focus on cultural products in their responses. They noted that there were cars, buses, streetcars, bicycles, and semi-trucks, and some students also said that people walked around the city, as they do in Canadian cities. Four of the students, however, did focus on a cultural practice – that of giving directions. These students noted that in this German-speaking city, as in a Canadian city, people ask for and receive directions when they are unsure of where to go.

Finally, when students were asked how the city that was portrayed in the game differs from a Canadian city, they gave the following

responses: there is a marketplace, which one does not often find in Canada; the city is much older than a Canadian city; there are cobblestone streets; the language differs (i.e., people in the world speak German); and it has a European look. As was the case with the other questions, students again focused on cultural products.

### Discussion

The results of this small-scale study into the use of a VR world indicate that this is a successful use of technology. We would like to remind the reader that the greatest number of students focused neither on a linguistic nor on a cultural aspect when they were asked to name the goal of the virtual reality experience. Instead, a number of students focused on the game itself. The question that then arises is, Is this a negative outcome? Similarly, should games in the language classroom be created such that students are most focused on the linguistic aspects? We would argue that the focus on the game is certainly not a negative aspect of the experience. The result may mean that students were engaged enough in the game itself to forget that they were performing an educational *task* in German. They were working toward a goal that was external to the language, while at the same time developing their linguistic skills, especially listening.<sup>8</sup>

An essential aspect of teaching about culture is focusing on the similarities and differences between the native culture and the target culture. As *Standards* (2006) points out, students need to be made aware of both similarities and differences as a means to enable them to 'develop cross-cultural understanding and respect' (p. 49). Students were able to remember both the similarities and the differences after they experienced the virtual world. It is interesting to note, however, that several students were unable to identify areas of cultural similarity. This points to the need for follow-up tasks that allow students to discuss and analyze the experience, thereby encouraging students to 'become skilled observers and analysts of other cultures' (*Standards*, p. 48). There were students who merely noticed (i.e., allocated attention to) what they encountered. However, the goal should be understanding, which implies that students actually recognize 'a general principle, rule or pattern' and are able to organize it into their system of knowledge (Schmidt, 1993, p. 26). Researchers such as Ware and Kramsch (2005) note that the onus is on the teacher to make the target culture accessible and meaningful to students by ensuring that these objectives are being met. Similarly, Dubreil (2006) states that 'more than ever before, FL teachers have to play a crucial

role inside and outside the classroom and [...] learner-centred pedagogy is more intensive for the FL teacher than teacher-fronted instruction' (p. 250).

The reader is again reminded that students in this study tended to focus on cultural products more than cultural practices after they participated in the experience. This stands counter to the results of Herron et al. (1999, 2002), who found that students tended to focus on cultural practices after having watched videos in the L2. One might argue that the reason students in the present study were likely to mention cultural products has to do with the fact that the game's primary focus is cultural products.<sup>9</sup> While we do not argue with the fact that students were exposed to a wide variety of cultural products when they experienced the virtual world, they did also come into contact with cultural practices. For example, since the various characters in the game do not know one another or the student playing the game, the formal address is used throughout. In addition, the marketplace culture is such that vendors sell products in the open, people spend time sitting outside in cafés, and the marketplace is not open to traffic. Nonetheless, students failed to mention any of these aspects and instead focused on the tangible aspects including *modes* of transportation, *types* of shops, and building *materials*.

This brings us back to the notion of presence that is at the heart of virtual reality. Were students in this study actually present in the virtual world that we created? A look at some of the answers provided by the students lets us know that students clearly experienced the world and did not merely feel that they were outside observers. Some students mentioned interactions between characters: it 'seemed like a normal day'; there were 'townspeople milling around'; they 'overheard interactions between people.' Others mentioned the sounds: they enjoyed the 'music and background noise' and noted 'the cellphone ring.' Still others mentioned different aspects of the city: they were 'surrounded by many tall buildings'; in the marketplace there were 'lorries driving through courtyards, but no other vehicle traffic'; the city was 'very spread out'; there was a 'big open square with many open shops'; there was 'more cobblestone and less concrete [...] than in Canada'; and there was a 'different city layout.' Perhaps the best indication of a virtual presence comes in the form of the following responses: the city '*feels* a lot older,' and the city 'seemed to have a much different *ambiance* to it.'<sup>10</sup> The students who participated in the experience became immersed in the virtual world and felt they were *inside* the environment.

We would like to remind the reader that students participated in the experience in one of three possible settings: in the lab, in the classroom, or in the CAVE. Students were working in small groups of three to five students, individually, or as a class to solve the problems presented on the screen. Though the size of the display varied, the content was always the same. In testing the students, semantic scales (e.g., attractiveness and colour) were used to see if the visual experience was the same across platforms. Results of statistical analyses indicate that the experience was largely the same. The main difference worth noting is that there is a 'wow factor' for students who experienced the world in the CAVE setting. Students were asked to rate expansiveness on a scale of 1 to 5 in which 1 indicates most expansive. The results of a one-way ANOVA indicate that the CAVE students found that the experience was significantly more expansive  $F(2, 40) = 7.60, p = .002$  (mean = 1.38) than did students in either of the other two environments (mean lab = 2.58, mean projection screen = 2.59). This is a unique experience for many, which most likely heightened their interest in the content on the screens.

While it is important to be cautious of 'edutainment' products, many of which were designed for profit over learning (Papert, 1996, cited in Wood, 2001), we argue that there is a place for VR in the language classroom. In the context of this game, students reported an improvement in their listening skills, and they also noted that the experience was beneficial for learning vocabulary, general fluency, and improving pronunciation and reading skills. Moreover, students clearly showed that they experienced the target culture in new and meaningful ways. Barr and Gillespie (2003) propose that 'technology is used to enhance already effective teaching methods for the benefit of learners and teachers' (p. 69). The responses of students in this study supported this finding. They indicated that the experience was fun and different as well as a good review that should be used as a supplement to communicative classroom tasks. We do not believe that this software could or should replace classroom communication; however, we have found it an effective tool for enhancing cultural learning and students' perceptions of language gains.

None of the students in this study had experienced a German-speaking city before they took part in this experience, and only eight of them mentioned that they plan to visit a German-speaking country in the future. However, approximately one-third of the students mentioned that their favourite aspect of the experience was exploring the world. We are reminded of the importance of the process of learning: 'culture is not just a body of facts to be acquired by learners,

but something actively created by learners through interactions' (Tseng, 2002, p. 20). It is through participation in the virtual world task that students in this study came to truly experience the target culture for the first time in their lives.

### Areas for future research

After the first round of testing with university students, we made a number of changes to the software, including, but not limited to, the following:

1. A stable set of characters acting as 'helpers and friends' was added throughout the virtual world. These members of the police force were added as a constant source of information for students. Thus, students who were unsure of the last set of directions they heard were able to walk up to a policeman to hear the directions in a different way.
2. A large TV screen with local news was added both to increase the types of clues students received and to provide another type of cultural realia.

We are currently testing the revised VR world in high school classes. For these students, a linguistic pre- and post-test have been given so that we are better able to analyze the linguistic gains made by students. Moreover, students' movements in the game were tracked, which allows us to analyze how students explored the virtual world.

In future studies with the software, we hope to add speech recognition technology as a means of making the experience more interactive. This added feature may provide additional feedback for introductory levels of language instruction, as was shown by Johnson et al. (2004). By being able to respond to a game character's questions with a simple 'yes' or 'no,' students will be provided with additional clues and information at critical points in the game. Students who fail to understand a single clue may avoid getting lost by receiving additional information. Additionally, we hope to expand the VR world to include additional linguistic goals and also aspects of daily life (e.g., visiting the doctor, taking public transportation) that will allow students to focus more on the cultural practices of German-speaking culture(s). Finally, we plan to create and test virtual worlds for ESL students.

Readers who would like to try the virtual world for themselves may download it at <http://www.ucalgary.ca/Salzburg/>.

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### Notes

- 1 One reviewer pointed out that culture has indeed been taught in the language classroom, beginning with the grammar-translation method. Here 'high culture' was the focus of the material to be translated. However, as researchers such as Martínez-Gibson (1998) and Robinson-Stuart and Nocon (1996) point out, most language pedagogy in the last 50 years has focused on the four skills (listening, speaking, reading, and writing), and culture has been presented 'as a body of facts that frequently dealt with food, festivals, buildings, and other cultural institutions' (Robinson-Stuart & Nocon, p. 434).
- 2 García-Carbonell et al. (2001) refer to Jones's (1995) definition of simulation as 'an event in which the participants have (functional) roles, duties, and key information about the problem to carry out these duties without play acting or inventing key facts' (p. 482). Therefore, the reality of the situation is greater than it is in role plays, for example.
- 3 It is important to note that a number of researchers (e.g., Davis, 1996; Richards, 2000; Jain, Holett, Ichalkaranje & Tonfoni, 2002) use the term 'virtual reality' as an all-encompassing term synonymous with

- 'computer-mediated.' Schwienhorst (2002) cautions against such misuse of the term. This is only one aspect of the working definition of virtual reality used in this paper.
- 4 Buckingham (2006) notes that research has shown that 'games are now children's primary means of access to the world of computers' (p. 79–80), and the National Institute on Media and the Family ([http://www.mediafamily.org/facts/facts\\_effect.shtml](http://www.mediafamily.org/facts/facts_effect.shtml)) reports that 83% of 8- to 18-year-olds have at least one video game player (e.g., PlayStation, Xbox, Wii) in their homes. More information about game-playing habits of *participants* in the current study is provided in the methodology section.
  - 5 Such games are often referred to as 'serious games.'
  - 6 Note that the 'virtual field trips' described in Goodwin-Jones (2004) are only 'virtual' in that they are computer-mediated. Students are not in a three-dimensional setting when they view the museums. The museum described in LeLoup & Ponterio (2004), however, is a virtual-reality experience.
  - 7 This is not surprising, given that the game is not text focused.
  - 8 It is important to note that listening comprehension is an area in which learners generally report a surprising lack of success (Graham, 2005).
  - 9 Dubreil (2006) posits that the subjects in the video studies tended to focus on cultural practices for two reasons: the culture presented in the episodic narrative used in Herron et al. (1999) was more 'high-brow,' and thus 'removed from their daily activities' (p. 244), and students in the Herron et al. (2002) study who watched the journalistic videos have a 'fundamental interest in the patterns of daily living' (p. 245).
  - 10 Italics our own.

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## Appendix A

### *Pre-task questionnaire*

This questionnaire concerns your language experiences over the course of your lifetime. Feel free to elaborate where you think it would be helpful to the study. All responses are confidential. *Thank you for your participation.*

Name: \_\_\_\_\_ Gender: M \_\_\_ F \_\_\_  
 Age: \_\_\_\_\_ Current German class: \_\_\_\_\_  
 Expected mark in your current German class: \_\_\_\_\_  
 Major \_\_\_\_\_ Year of study \_\_\_\_\_

1. Are you a native speaker of English? Yes No  
If not, what is your native language? \_\_\_\_\_
2. Why have you enrolled in German classes?
3. How would you rate your motivation for learning German on the following scale?

Not motivated Extremely motivated  
 1            2            3            4            5            6            7

4. On a scale of 1 (not very important) to 6 (very important), rate the importance to you (in your own German speech) of

	Not very important				Very important		
Knowledge of German history	1	2	3	4	5	6	7
Native-like pronunciation in German	1	2	3	4	5	6	7
Knowledge of German geography	1	2	3	4	5	6	7
Grammatical accuracy in German	1	2	3	4	5	6	7
Knowledge of German vocabulary	1	2	3	4	5	6	7
Knowledge of social aspects of German language use	1	2	3	4	5	6	7
General fluency in German	1	2	3	4	5	6	7
Knowledge of daily life of German speakers	1	2	3	4	5	6	7
Being treated as an equal by native German speakers	1	2	3	4	5	6	7
General cultural knowledge of German speaking countries	1	2	3	4	5	6	7
Being mistaken for a native speaker of German	1	2	3	4	5	6	7

5. How often do you play video games?

- \_\_\_ At least once a day \_\_\_ hours per week
- \_\_\_ At least once a week \_\_\_ hours per week
- \_\_\_ At least once a month \_\_\_ hours per month
- \_\_\_ More than once in the last year
- \_\_\_ Once in the last year
- \_\_\_ Never

6. What are your favourite video games? Please list them below.

1. \_\_\_\_\_ (Your most favourite game.)
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

Why do you enjoy these games?

7. In evaluating a video game what do you consider important (Circle)

	Not very important					Very important		No opinion
Game play	1	2	3	4	5	6	7	NA
Graphics	1	2	3	4	5	6	7	NA
Audio (sound/voice tracks)	1	2	3	4	5	6	7	NA
Story line	1	2	3	4	5	6	7	NA
Character animation	1	2	3	4	5	6	7	NA

8. What are your favourite educational video games?

1. \_\_\_\_\_ (rank 1 is your most favourite game of all time)
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

9. In evaluating an educational game (video only) what do you consider important (Circle)

	Not very important					Very important		No opinion
Game play	1	2	3	4	5	6	7	NA
Graphics	1	2	3	4	5	6	7	NA
Audio (sound/voice tracks)	1	2	3	4	5	6	7	NA
Story line	1	2	3	4	5	6	7	NA
Character animation	1	2	3	4	5	6	7	NA

10. Have you ever experienced a 3D stereo environment (check all that apply)

\_\_\_\_ 3D Movie

- 3D Video
- 3D Computer Display
- 3D CAVE

11. Do you think that video games can be used in classes in school?

Strongly disagree Strongly agree  
 1            2            3            4            5            6            7

Why or why not?

### Appendix B

#### *Post-task questionnaire*

I. Please complete the following after you have completed the virtual world tasks.

1. What do you think was the goal of the activity you just performed?
2. Please write down any aspects of the world that you can remember.
3. How is the world similar to an experience you might have in a Canadian city? Please list as many items as you can.
4. How does it differ from a Canadian city? Please list as many items as you can.
5. Which kinds of clues did you follow most (e.g., spoken commands, signs, radio broadcasts)?
6. What was your favourite part of the activity?
7. What did you like least about it?
8. What features would you add to the virtual environment?
9. On a scale of 1 (least helpful) to 7 (most helpful), rate the usefulness of the software you just used:

	Not helpful					Extremely helpful	
	1	2	3	4	5	6	7
for learning grammar	1	2	3	4	5	6	7
for developing listening skills	1	2	3	4	5	6	7
for learning about culture	1	2	3	4	5	6	7
for learning vocabulary	1	2	3	4	5	6	7
for gaining speaking fluency	1	2	3	4	5	6	7
for improving pronunciation	1	2	3	4	5	6	7

for improving reading skills	1	2	3	4	5	6	7
for improving your ability to write in German	1	2	3	4	5	6	7

10. Do you think that this activity improved your knowledge of German? Yes No

Why or why not?

11. Do you think that activities like this should be used in your German classroom? (Circle one.)

never							always
1	2	3	4	5	6	7	

Why or why not?

III. Please evaluate the virtual environment by answering the following questions.

12. How attractive do you consider the imagery as a whole?

unattractive					Attractive
1	2	3	4	5	

13. How did the environment represent the actual audio levels?

not accurate				accurate
1	2	3	4	5

14. Please rate the following relating to the aesthetics of the images.

unique				common
1	2	3	4	5
exciting				dull
1	2	3	4	5

15. How would you rate the organization of the images?

ordered				chaotic
1	2	3	4	5

16. How would you rate the space of the images?

loose				compact
1	2	3	4	5
expansive				confined
1	2	3	4	5

17. How would you rate the ornateness of the images?

ornate				plain
1	2	3	4	5

18. How would you rate the colouring?

Colourful				subdued
1	2	3	4	5
Warm				cool
1	2	3	4	5

19. How would you rate the lighting?

bright				dim
1	2	3	4	5

20. How would you rate the sound level?

soft				loud
1	2	3	4	5

Please make any additional comments in the space below.

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