Virtual Reality for ESL Students

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ESL students who wear 3D goggles and gloves enter the CAVE (see appendix) room that is a multi-person, room-sized virtual reality system consisting of three walls and a floor. As the language teacher starts the program, all students wear special lightweight glasses that allow them to be in a huge and well-organized Wal-Mart. They can hold any product and put it into their shopping cart by using lightweight gloves. As students shop around, they can talk with other students or ask for some help from a saleslady so that they can make the best choices by comparing products. After that, they talk with a cashier to pay for their purchases. The teacher then stops the program and reviews the scenes with the students in the classroom.

Description of Virtual Reality

Rheingold (1991) defines virtual reality as an experience in which a person is surrounded by a three-dimensional computer-generated representation, and is able to move around in the virtual world and see it from different angles, to reach into it, grab it, and reshape it. Currently, virtual reality generally describes the technologies of head-mounted displays, boom-mounted displays and surround-screen projection-based displays. A head-mounted display consists of a pair of miniature displays positioned in goggles or in a helmet strapped to the user's head so that each eye sees one display. A boom-mounted display is like a head-mounted goggle display but is suspended from an articulated arm and is held to the viewerís face with handles.

Moving Virtual Reality into Education

This technology, with real-time interactive control and user-centered perspective, is actively being used in health care for visualizing surgical processes, in architecture for visualizing large and small scale design processes, and in training pilots for visualizing virtual air fights. Nowadays, virtual reality is notable in education because of the userís interaction in virtual environment that can represent any three-dimensional world that is either real or abstract. The virtual worlds can be buildings, the human body, underwater, a cruise, space, a museum, a crime scene, a dinner party, and so on.

Many educators and researchers (Bricken, 1991, Cromby, Standen, & Brown, 1995.) support the view that virtual reality will afford opportunities to experience environments which, for reasons of time, distance, scale, and safety, would not otherwise be available to many young children, especially those with disabilities (Cromby et al., 1995). This technology will be used to explore, create, play and learn in virtual environments such as crossing roads, talking with strangers, or emergencies. With this technology, young children can visit places that would otherwise be impossible, impractical or too dangerous.

Language teacher can develop programs for realistic situational communication such as job interviews, restaurants, or international airports. Also student can cooperative in one preprogrammed virtual world or can be divided into different virtual worlds depending on the studentsí language levels. Students will interact with classmates or animated characters in the setting with 3D goggles, gloves, or other devices that help seeing and acting in the virtual world. For example, in the interview situation, an interviewee (a language learner) will shake hand with an employee (a 3D animated character) in a meeting room and the employee will start with an interview or with chitchat in the target language. If the students makes any mistake, they can review the scene and try again. Virtual reality will be helpful in overcoming obstacles of traditional language classrooms that highly rely on textbook and local resources in a limited time. Currently, we can find many sites that help users pick a free browser, visit virtual communities, build their own worlds, share with other users, and develop curriculums with virtual reality (see appendix).

Uses in the Language Classroom

The most unique and powerful characteristic of 3D virtual environments for language learning is that they afford a first-person form of

experiential learning (Chee, 2001). Unfortunately, most schooling today is based upon third-person knowledge such as how students learn or what they learn about, without the opportunity to directly experience for themselves the thing that they seek to learn (Winn, 1993). It explains why the traditional language education based on textbooks was not so effective. The knowledge in the English textbooks is based on a third-personís knowledge, so it is not meaningful to language learners (Chee, 2001).

The qualitative outcomes of third-person versus first-person learning are very different. A preponderance of third-person learning has meant that student learning outcomes are usually shallow and retention rates are low (Singhal & Zyda, 1999; Chee, 2001). With virtual reality, students will put themselves in various realistic settings and learn the language by their experiences with autonomy or control over their learning experience. According to Fox, Furmanski, Nilan & Small (1994), because of the way in which the virtual environments are modeled and constructed, learners receives appropriate and immediate feedback. The feedback in the language learning encourages cognitive language learning by which students can judge whether they have taken appropriate or correct communication in the virtual world. Eventually the immediate feedbacks from the computer or other students increases motivation and interaction in the language classroom.

Learner-directed communication and problem solving also foster a strong sense of ownership of the activity and its response. Because virtual environments for language learning lend themselves naturally to first-person learning (Chee, 2001), the virtual reality settings will usually be programmed on the use of simulation including the objectives of the language classroom, or the specific needs of learners (Singhal & Zyda, 1999). ESL teachers can set up and save the environment depending on the studentsí need and this will facilitate learner-centered learning which emphasizes encouraging students to construct their own language knowledge. In short, virtual worlds are constructive environments in which learners can create, manipulate and edit any form of digital information with their own needs (Chee, 2001). Thus, virtual reality programming can develop important communication skills rather than just repitition and memorization. Virtual reality curricula may engage ESL students experientially in many possible situations. Students may participate in responsive environments in which they become engaged in full body-mind learning (Maule, 1991).

Impacts of Virtual Reality

There is certainly no substitute for actually communicating with native speakers of the target language in a real world. However, the time, money, technology and native speakers for real world language learning are not available for all language classrooms and language learners. Students generally learn the language from textbook explanations and examples. However, the increasing availability of computers and the Internet in classrooms give us a way that virtual reality may be a viable supplement to traditional textbook instruction. The students may learn languages more interactively, in less time, and with less expense than by visiting the country of the target language. Virtual reality systems may provide a less formal experience, but they may be fun and certainly more realistic than mere pictures and dialogues in an English textbook (Chee, 2001). As learners begin to work, study and communicate in virtual environments, they may learn not only the target language, but new ways of thinking and structuring information (Maule, 1992). The customization and interactivity may permit users to shape their interpersonal and collaborative electronic experiences.

Also virtual reality supports communication, coordination of actions, and collaboration in learning activities between many different people at the same time (Chee, 2001). In a collaborative virtual environment, people might be a very useful learning resource for one another. The ability to communicate through the technology, either by means of a text or audio chat system, allows users to engage in meaningful language exchanges. The fact that multiple users are engaged in a mutually shared context of experiences makes this a natural human learning activity. (Singhal & Zyda, 1999). Thus, if users are puzzled by an observation or do not understand the meaning of a shared video stream that they are watching together, they will find it very natural to ask questions to others who are sharing the same virtual world. This meaningful interaction motivates learners to learn their target language naturally (Chee, 2001).

Simulation-based language learning overcomes time and space limits and gives learners the sense of their presence. Students are given control over critical elements of the environment. They are able to manipulate the environment such as language, place, and time variables. They can freely play with any situation that might be impossible to conduct in the real world such as interviewing the president of a country. They can also run the simulations as many times as they wish, taking time to focus on different side of the simulation each time it is run. Simulation-based learning environments, in turn, present objects with natural situations for supporting interaction. Thus, users are able to act directly upon virtual handles, levers, or controls in the environment, and the ability to do so creates a sense of presence in the virtual environment (Cromby et al, 1995).

However, virtual reality is a technology, which has the potential for negative implications through misuse and abuse. Students might receive biased cultural perceptions from the virtual reality in addition to learning the language. In other words, the virtual reality

programming designersí cultural bias such as stereotype may transfer to young learners unconsciously.

Also children who spend too much time in virtual reality may withdraw from real-life (Cromby et al, 1995; Winn 1993). Therefore, it might cause social isolation. For instance, a Christmas party in virtual reality cannot be replaced with a real one. With virtual reality, students may practice the target language at the Christmas dinner setting, but they might not learn the sprit of Christmas and meaning of a family gathering. Learning language is not only learning how to speak the language but also learning the cultural concepts. But as it becomes more and more convenient to view high-quality representations of objects and communicate with others, this type of access eliminates a richness and depth of experience that students can get in the real world.

According to Pastore (2000), the biggest gap in the Internet adoption rates in the U.S. exists between rich and poor, not between ethnic groups. He points that ethic background alone does not explain the existence of a digital gap. Although a combination of factors determines if a consumer is online, income is the strongest predictor. Across all groups, online penetration rises as income rises. Virtual reality technologies are extremely expensive. So the financial situation of the school districts may be critical to provide the rich learning environment offered by virtual reality. Naturally the rich districts will more likely use the virtual reality technologies in their school that provide a better chances for students to learn their target languages or other learning. Also there will be private virtual reality institutes that may provide extra opportunities to learn after school. However, it may cause economic gaps between students depending on the parentsí wealth. Students who have rich parents or are in the rich districts may learn the target language faster.

Conclusion

The medium of virtual reality represents one step closer to a social world where the lines between the symbolic and the real are merged. Through a careful analysis, the problems of virtual environments may be anticipated and perhaps prevented. Educators and researchers should try to identify and address potentially harmful side-effects related to the use of virtual reality technology. Virtual reality cannot replace experiences with native speakers. It cannot infuse a student into a real environment that has all the culture and feeling that the real location and people have. What virtual reality can do is to create experiences that help students understand places, people, language and processes better. Therefore, we can use virtual reality to learn the target language, to enhance our real social lives and understand others better.

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Appendix

- CAVE is a projection based virtual reality system developed at the Electronic Visualization Lab (http://www.evl.uic.edu/home.html). More recent VR systems based on the CAVE are the ImmersaDesk

(http://www.evl.uic.edu/pape/CAVE/idesk/) that is a one-screen, drafting table style device.

- VRML at the Teacher's ResourceBank (http://3dgraphics.about.com/gi/dynamic/offsite.htm?site=http%3A%2F%2Fwww.teacherresourcebank.com%2FVRML%2F) provides many resources for teachers that want to use VR technologies in the classroom with teacher training and lesson plans/ classroom activities.
- VRML works (http://hiwaay.net/~crispen/vrml/) explain how to view and build 3D virtual world in detail.
- The VRML Repository (http://www.web3d.org/vrml/vrml.htm) contains software, sample worlds, documentation and links to projects and worlds.
- The VRML Repository tutorials (http://www.web3d.org/vrml/tutv.htm) provide specific instructions with each example of 3D virtual worlds.
- VR world by Jeff Harrington (http://www.parnasse.com/vrml.shtml) provides a lot of examples that you can try by using your mouse.
