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PATRON: Keast, Dan
PATRON ID: 777410
PATRON PHONE: H: 446-8516 W: 489-8171
PATRON DEPT: 303B Townsend Hall
PATRON STATUS: Graduate
PATRON FAX:
PATRON ADDRESS:
PATRON E-MAIL: dan and michelle keast@yahoo.com
PATRON NOTES:

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Implementing the general principles of constructivism within language learning can come almost naturally and effortlessly with the introduction of virtual reality environments. This article presents the constructivist rationale for introducing virtual reality in language learning and teaching and describes various virtual reality environments available. Finally, various ways of implementing constructivist learning through virtual reality are suggested as well as some basic guidelines for successful implementation in the classroom.

Virtual reality in this article does not refer to the high-tech, three-dimensional sensory reality, requiring head mounted displays and data gloves, as portrayed in the motion picture Disclosure (Levinson, 1994). In this article, virtual reality refers to a more accessible type of reality, freely available to the public through the Internet. It is more imaginative than sensory virtual reality (Reid, 1995) in that our imagination has to work to create it, and it is not merely up to the senses to feel it. This is due to the fact that it is either fully text-based (e.g., schMooze University) or uses text plus visual cues (e.g., Active Worlds).

Virtual Reality

Streef, Jacobson, and Gibson (1996) believe that virtual reality

is not the true, factual reality, but a simulation that gives the effect and essence of reality. The illusion of reality is generated through the computer’s interface with its user; ... the goal is to create the illusion of immersion in a virtual environment or virtual world. (pp. 9–10)

It is within this framework that this article looks at virtual reality environments, which are accessible to most of us, create an illusion, and manage to immerse us in a new environment, but do it by stimulating our imaginations, not our senses.

The creation of illusion is mostly achieved through the feeling of telepresence. Telepresence means the feeling of transmission of the user’s presence to another location (in this case, a virtual location), allowing the user to act from a distance but at the same time giving him or her the illusion of actually being present in this other (virtual) location (Schwienhorst, 1997). Although users may be sitting in a classroom, they are able to act in the virtual environment and to feel that they are present in the virtual environment.

Virtual Reality and Constructivism

Some of the major constructivist principles are that learning should

- be an active process
- occur in authentic, interesting, and meaningful contexts
- take place in whole activities, such as projects, and not isolated skill exercises
- be context-dependent (e.g., activities should be linked around a situation or topic in which students are interested)
- be related to out-of-school experiences
- involve collaboration
- involve social negotiation of knowledge

Telepresence allows students to act in a variety of settings and use language in authentic contexts, which is very difficult to achieve within the confines of the classroom. Students are allowed to take on a variety of roles and engage in authentic role-play with genuine discussions and concerns about language appropriateness and accuracy; that is, not to please the teacher but because this is the reality of their virtual world. The principles of communicative learning, which are inherent in the constructivist approach, are all adhered to in a virtual world without laborious efforts from the teacher. Students have a reason to use language—whether it is to discuss with a virtual friend or to build their room in a virtual dormitory.

In virtual reality environments, students can create strong friendships with other language learners or target language speakers, who can act as caretakers (Vygotsky, 1978), helping them develop their language ability either by correcting them or by offering examples and opportunities for scaffolding. Introducing students to these environments opens a window of target language opportunities for them, a window to experiences that are part of out-of-school modern life.

Using virtual reality worlds is primarily a social activity (Curtis, 1992). Users of virtual reality environments are mostly chatting with other users and making friends, which means that they are engaged in an active process that involves social negotiation and collaboration.

Learning in a virtual reality environment comes from communicating and is thus a whole activity, as students learn by using the language for a purpose, whether it is one set by them or assigned by the teacher. Even when students
are assigned a task, they have a say in how it will be interpreted and carried out. It is up to them to decide what kind of person their virtual character will be and how he or she will behave in the virtual world.

Virtual Reality Environments

The virtual reality environments (VREs) that are currently widely accessible to the public and to educators are of three types:

1. text-based
2. graphical
3. three-dimensional

Text-Based VREs

Text-based environments do not have photo-style graphics, only graphics made up of letters and symbols (e.g., see Figure 1). An educational or social environment of this kind is called a multiuser dungeon (MUD) or a multiuser domain, object oriented (MOO). MOOs and MUDs are virtual worlds built with text around a theme. The most popular MOO for English language learning is schMOOze University (http://schmooze.butter.cuny.edu:8888/), built especially for English language learners and English language teachers.

Text-based virtual reality is, as stated earlier, more imaginative than that which is sensory-based. Users read the text and, by visualizing the objects described or discussed in it, create the reality in their minds. Palazzetti (1994), the creator and owner of schMOOze, describes being in a MOO environment like being in a book, but with some important differences: "Unlike a book, you and the other characters present can step out of the pages and create your own story" (n.p.). Every object in a text-based MOO is a textual description, even the user's own character, which the user has to create.

SchMOOze is popular with language learners and teachers because it has many advantages. For instance, users

- can run it even on an old computer
- do not need state-of-the-art software
- do not need a fast Internet connection
- can enter a safe, friendly, and hospitable online environment
- can practice reading as well as writing and communicating
- are not distracted by cute graphics

Another safe MOO with a friendly atmosphere and an easy Web interface is Tapped In (http://www.rappedin.org), which was created for the professional development of teachers. Tapped In hosts a variety of professional events, allows teachers to take their students there, and provides excellent support. Another benefit is the personal recorder feature that follows each user, recording interactions, and sends the transcript to the user's e-mail box once he or she leaves the program.

Graphical VREs

Graphical VREs are also called MOOs, but they are usually referred to as graphic MOOs or graphical user interface (GUI) MOOs. The main difference between them and the pure text-based MOOs is that they incorporate graphics to portray the area the users are in as well as the users themselves. Users do not have to do much reading, and they do not have to verbally describe themselves. Text is limited to the interactions between users, which usually take place in the form of speech bubbles. An example of a graphical MOO is The Palace (http://www.thepalace.com), as shown

![Figure 1. Opening screen for schMOOze University, using a Web client. (Screen shot used with permission.)](image-url)
in Figure 2. This environment has not been specifically designed for language learners, but it is open to the public and is very popular with teenagers and young adults. Although a VRE that is open to the public allows students to meet a variety of people, it also creates a few problems. The language used in The Palace is cluttered with teenage slang expressions, and sometimes students may be harassed by other users.

Three-Dimensional VREs

These VREs use three-dimensional graphics to portray the background and the users. In three-dimensional environments, one can observe the change of scenery while the graphic of the user (an avatar) is moving. One can also change the pace of the movement and turn the avatar around so that, eventually, a 360-degree view of the scenery is available. Avatars can be made to dance, wave, and perform a variety of other actions. An example of such an environment is Active Worlds (http://www.activeworlds.com). This site is still not used much in language learning, probably because of the demands it places on computer hardware and on the speed and bandwidth (the amount of data that can be transmitted through the communications circuit per second) of the Internet connection.

Examples of Implementing Virtual Reality for Constructing Meaning

The activities described below conform to the basic principles of constructivism. They are whole, context-dependent activities, which allow students to be active and construct their own reality, manage their contributions, collaborate with other students, and reflect on their actions.

Building/Constructing

One of the benefits of most VREs is that the user can build areas or objects within the environment. This allows students the opportunity to work individually or in groups with an aim to constructing an area or various objects. Building or constructing in a VRE is, in essence, a process in which all the skills come together and the result is there for the world to see, not locked up in the teacher's cupboard. Examples of projects include a virtual kibbutz built in schMOOze University by high-school students in Israel and a virtual Versailles in MOO Francois built by French learners after studying the real Versailles palace.

Construction can be adjusted to various levels of difficulty. Beginners, for example, can construct their own characters, whereas more advanced students can construct their own room or house, or work as a team to plan a large area, such as a palace or a town, and then divide the
building amongst themselves. Constructing in text-based MOOs entails mainly writing textual descriptions and can, therefore, implement the principles of process and collaborative writing. For example, once students have prepared their characters or their rooms, they can visit each other online and offer feedback on one another’s work.

Simulations/Role-Plays

Simulations and role-plays are popular techniques within the constructivist approach and are easy to carry out in VREs because these are environments rich in imagination where users already take on different personas. Students may build an area to act as the background for their simulation or may use any other existing area in a virtual world. Role-plays may be based on a classroom text. Students can take on the roles of the main characters and continue the story in a VRE. They may also take an existing text and change the personalities of the characters, then role-play the situation to see how the story will evolve.

Business students can simulate a board meeting at which they make important decisions on the marketing of a new company product. Management students may simulate selecting a candidate for a position. In this case, some students can prepare to be interviewed while others prepare to be the interviewing panel. Teenagers may take on roles for a simulation in which they are bullied and complain to the teacher or in which they are being pressured to try drugs.

Even though these environments foster role-plays, they also offer opportunities for many situations to become real. Students may, for example, be harassed and will have to react. They may be interviewed for an authentic job offer or present a product to a virtual forum/group, interview a drug addict, or visit a counselor— all authentic experiences.

Surveys

Virtual environments offer an opportunity for students to escape the limits of the classroom, meet people from all over the world, and discover others’ opinions on various subjects through online surveys. Just as in real life we might interact with a stranger on the street and ask them a polite question (e.g., for directions), students in a virtual environment have to engage people politely, collect data, and thank them. Successful surveys have been those about cross-cultural issues, such as the age of marriage, opinions about marriage, customs, and proverbs. Still, nearly every issue that is dealt with in class can potentially be turned into an international survey (e.g., smoking, drugs, abortion, astrological signs, school days).

Open/Free Discussions With Native Speakers

Virtual environments can offer nonnative-speaking students opportunities to engage native speakers in meaningful discourse. To help language learners maximize their contact with native speakers, teachers can assign virtual reality-related homework, such as exploring a particular area, meeting interesting people, and telling the class about them, or even using the people they meet in these virtual worlds as resources for various projects.

These tasks can help teach students how to use the environments effectively for language practice, including how to approach users, make friends, access more target language input, and create learning opportunities for themselves. VREs have their own communities, which students have to get to know and join. Such an experience can help students develop valuable skills for real-life communication, such as clarifying misunderstandings and miscommunications. In these situations, students can develop their communication strategies and their peers can act as caretakers, helping them improve their language abilities.

Projects

VREs are used as meeting places where students from the same class or from a number of classes around the world can meet to discuss and work on joint projects, such as building a common Web site or preparing an online journal. Students can share their work, viewing and discussing it simultaneously online. In educational MOOs, there are various tools, such as whiteboards (shared places for writing and drawing) and virtual overhead projectors (tools with which one can project graphics, screen shots, or previously prepared texts to everyone else); minutes can be kept by printing out the discussion logs.

Tandem Learning

Tandem learning is based on bringing together two learners with different mother tongues to learn each other’s language (Ruhr-University Bochum, 2001). The two learners are responsible for planning, monitoring, and evaluating their own learning. They meet and converse either in free or task-based discussions, which they manage. During their meetings, and the duration of their learning partnership, they are responsible for their own and their partner’s learning. Their discussions should have a balanced use of the two languages. Text-based MOOs can be successful meeting places.

Basic Guidelines for Successful Implementation of VREs

Choose the Right Environment

Try a variety of VREs before you decide which one to choose. It is easy to be tempted by flashy graphics, but it may be best to start with a text environment first so that students can concentrate without being distracted by graphics. Furthermore, text-based communication, which is used in all VREs, is often more efficient in purely text-
based environments due to certain limitations of graphical MOOs. For example, graphical MOOs, such as The Palace, display users’ contributions in speech balloons, but these balloons tend to load slowly on the screen and then only appear for a brief amount of time, making it difficult for some students to read the text at a comfortable pace or reread if necessary. Three-dimensional MOOs, such as Active Worlds, present each user’s contributions above the user’s avatar, but the background color on the screen is sometimes dark, making the text difficult to read. In addition, Active Worlds offers only a limited view at any one time, so users miss the others’ contributions that do not appear on the screen at the same time.

These difficulties, as well as the fact that users often need to refer back to what was said, lead users of The Palace and Active Worlds to use a text box/log window like the users of pure-text MOOs. Despite these limitations, graphical MOOs can be used as a change of pace from time to time to introduce students to a variety of environments in which to practice their English.

If none of the available environments is satisfactory, teachers can build or create their own area in an existing MOO. This area can be designed to suit specific needs and be a private meeting place for the teacher and students. Adding an area to an existing MOO has benefits over creating a new MOO because a private MOO would limit the students’ opportunities to use it outside of school and meet other people.

Get Comfortable With the Technology

Teachers should allow themselves time to use the technology in order to become familiar and comfortable with it. This will help them to anticipate problems that students may have, answer students’ questions, and resolve problems that may arise.

Empower Students to Deal With Unwanted Incidents

Students need to be made aware that not all VREs are educational sites and be prepared to deal with unpleasant or unwanted situations online. For instance, they should be cautioned about giving out any personal information, such as their real name and address, and coached on how to respond if they are faced with obscene or harassing messages. In the latter case, students may quit or gag the offender, which enables them to block all utterances from another user from reaching their screen.

Allow Ample Training Time for Students

Usually two sessions are adequate to introduce students to MOOs. To make this introduction less difficult and confusing, the teacher can (a) start students off with paired or small-group interactions to familiarize them with the use of text boxes at a comfortable pace, (b) pair poor typists with better typists on the same computer, (c) have students use pseudonyms to avoid having them feel embarrassed if they make mistakes, and (d) introduce students to the appearance of the graphical interface using screenshots on handouts before they go to the lab.

Hold Virtual Reality Sessions Regularly

Frequent visits to the virtual environment will help students form friendships and feel like part of a community. This will also help create a nurturing atmosphere in which students act as caretakers, helping one another develop language and technological skills.

Organize Debriefing Sessions or Reflection Time

Debriefing sessions may be either in the form of a class discussion or small-group discussions. The sessions may help students reflect on how they carried out a task, what problems they faced and how they resolved them, ways to better accomplish a task, or ideas for future tasks. Debriefing sessions may also help inform and encourage students who find this method of communication awkward, who have difficulty understanding or using the technology, or who have had a negative virtual experience, such as harassment.

Students may also reflect on their experiences individually by studying the logs of the interactions/activity that took place in the virtual world. Depending on the objectives of the class, such as interaction management or writing development, students may print out the log and study it in order to carry out a self-assessment and identify areas for improvement. Having a ready transcript of all the interactions may also help teachers implement activities based on discourse analysis (Burton, 2000).

Allow Students to Take Control

Students should be given the opportunity to take control of their own learning. Once they familiarize themselves with the VREs, they can recommend ways in which they would like to use them in the classroom. Even if a task is assigned by the teacher, students should be given a degree of freedom to determine how to carry it out, so they can personalize the task and make it interesting and meaningful to them. If, for example, the students have been assigned to decorate their virtual rooms, the results will be as many different rooms as the number of students. Some may focus entirely on sports, some on music, and others on movies.

Include Online Interaction With Other MOO Users as Much as Possible

The more time students have to interact with other MOO users, the more opportunities they will have to learn and practice English. Keep in mind that it is sometimes diffi-
cult for them to meet others due to time differences. It is therefore a good idea to investigate who frequents the MOO and when so that students will know the best times to log on to the site.

Virtual relationships may be created even within the boundaries of a physical classroom. Having the students log on to the MOO site and assume different personas (using pseudonyms) allows them to reinvent themselves and their friendships. Having them guess who the other users in their class are can help them become better acquainted with their peers and dispel preconceptions they may have about one another. Shy students may feel more liberated behind the security of pseudonyms (Kern, 1995), becoming more sociable and willing to take on leadership roles (Ioannou-Georgiou, 2000). As they project a more confident image, others are encouraged to interact with them. This often helps break down the barriers of well-established cliques so that students can form new friendships in the classroom (Ioannou-Georgiou, 2000).

Integrate the Virtual Reality Sessions With the Overall Language Course

Students are more motivated to engage in virtual reality activities when they realize the activities are related to other aspects of the course. Teachers can help integrate virtual reality activities into the course by

- assigning homework to be carried out in the virtual world (if the students have Internet access outside the classroom)
- assessing performance in the virtual reality activities and making the results part of the overall grade for the course
- having students relate other classroom work to their virtual experiences (e.g., writing about events that took place in VREs, preparing the description of their virtual room as a writing assignment, researching topics in order to build a relevant area in the MOO)
- adapting course book activities to a VRE

Conclusion

Virtual reality offers many benefits for language learners. It presents a nonthreatening environment in which learners can use language in authentic ways to communicate with others, thus facilitating a constructivist approach to language learning. A virtual reality learning environment can be tied to the curriculum or used as a stand-alone supplement. Teachers and students can take advantage of available MOOs or build their own virtual environments. Used thoughtfully and purposefully, virtual worlds can be powerful tools in creating a constructivist learning environment.

References


Author

Sophie Ioannou-Georgiou has worked as an EFL teacher, materials developer, and teacher trainer. She is currently pursuing a PhD at the University of Nottingham, in England. Her research interests are language interaction, computer-mediated communication, and computer-assisted language learning.