

# Learning a Second Language in Three Dimensions: Potential Benefits and the Evidence So Far

Klaus Schwienhorst  
klaus.schwienhorst@fsz.uni-hannover.de  
Centre for Applied Linguistics,  
Leibniz Universität Hannover, Hanover, Germany

## Abstract

When looking at virtual environments and language learning we can take our pick where to begin. Should it be technology or pedagogy? I will use the pedagogical concept of learner autonomy to approach virtual environments in different ways. First, there is a need to look at interaction and online interaction; second, reflection as an essential ingredient to learning processes; and third, experimentation as the freedom to play around with learning tools in a stress-reduced learning environment. All three have strong links to the way we understand virtual environments. I will finish with a quick look at current research projects involving a promising virtual environment, Second Life.

## Introduction

When thinking about second language acquisition and virtual reality (VR), I could begin by looking at highly impressive three-dimensional (3D) technologies or online environments and speculate on the marvellous possibilities that we might see there. Instead, I would like to begin by looking at pedagogy. What do we need to learn a second language? And then: in what way could and can virtual environments (VEs) and the concepts of VR help us in achieving these aims? And finally: does VR offer concepts and tools that widen our perception of pedagogical possibilities in the language classroom and language learning in general?

Few would argue if I mention that we need regular exposure in various forms to authentic communication in the target language. Not only do we need to be exposed to this communication, we also need to be engaged or even be forced to use the target language regularly while we learn it. Ellis (1985), in that respect, has coined the famous phrase of “language learning is language use”. The possibility or necessity to

interact in a second language may be fairly prominent if we find ourselves within a target language community where this is our daily language of communication. However, if we are learning one of the lesser known languages, or if we are in some way isolated from target language communities, it may not be easy to communicate regularly with native speakers in authentic contexts.

We may well ask whether exposure to and pressure to interact in a second language is not just a necessary condition of language learning but even sufficient for language learning to take place. Target language input is certainly an important ingredient of successful language learning environments. However, research in recent decades has pointed to the fact that reflection on the language and language learning itself, that is, strategies, habits, motivation, and so forth also have an important role to play. Whether these reflective processes only influence procedural knowledge, that is, knowing how to do something, or whether these reflective processes also influence declarative knowledge, for instance our knowledge about grammar, is still the subject of much debate. Still, reflection has been acknowledged as an important element in language learning, at least beyond a certain level of skill, and has been discussed in such contexts as language learning awareness or metacognitive awareness.

Research on motivation has also in recent decades pointed to another important element in the language learning process. Because learners become better learners when they assume responsibility for their learning, when they make their own decisions on learning content and processes in collaboration with peers and teachers, it has become more important to emphasise that language learners need the space and the encouragement to experiment with language and language learning. This process of experimentation is crucial, as it allows the learner to find the learning strategies that work best for her and avoids simply copying strategies that others or textbooks are suggesting. For instance, does learning take place in an environment that does not punish errors but encourages the use of structures that are maybe incompletely understood? Does the environment encourage or provide inspiration for the use of different problem solving strategies or new learning strategies?

So, if I were to combine elements that encourage successful language learning, I would name a combination of interaction, reflection, and experimentation, or, as it has also been called, learner autonomy: "autonomy is a capacity - for detachment, critical reflection, decision-making, and independent action. It presupposes, but also entails, that the learner will develop a particular kind of psychological relation to the process and content of his learning. The capacity for autonomy will be displayed both in the way the learner learns and in the way he or she transfers what has been learned to wider contexts (Little, 1991, p.4)".

Of course, looking at pedagogy is just one side of the coin. We also know that by working with technology, we often get ideas about pedagogy. For instance, the rise of different communication media means that we also need to prepare our language

learners for an ever increasing variety of communication tools. In addition, now more than ever before, we need to increase their awareness and sensitivity to the different affordances and cultural uses of communication media. For instance, while it may be fine to use an acronym such as “imho” in chat, SMS messaging or email, it may not be fine to use it in formal business letters or oral speech. Or we may discover a way of communicating that has previously been unavailable to us. Walther speaks about these options as “hyperpersonal” ways of communication (Walther, 1996, 1997). Biocca (1997), in an almost identical meaning, calls this “hyperpresence”.

The rise of content management systems (CMSs) has been a major force in re-thinking online VEs. While especially open source environments such as MOODLE have become more widespread, educators have also become more interested in 3D versions or connections between CMSs and VEs. One initiative is SLOODLE, which tries to connect MOODLE and Second Life (<http://www.sloodle.org/>). Whether full-scale VEs will remain popular in the long term is at least questioned by some critics (see, for instance, Stevens, 2006), but its media presence and continued attraction for mainstream players from many arenas (sport, music, politics, and so forth) currently seems to suggest a strong presence in the way people choose to communicate and collaborate.

## From pedagogy to technology

I have emphasized the importance of interaction, reflection, and experimentation, or in short, learner autonomy, for the process of language learning. The goal must be to support learners in their ability to set themselves goals, monitor their progress, and evaluate the achievement of goals. Within this concept, learners carry the sole responsibility for their learning, a difficult and even painful experience or transition for many learners. In many ways, learning can take place without a teacher, but rarely without a (motivated) learner. In this context, the teacher’s role is not one of a passive observer but quite the opposite. The teacher must carefully assess the learner’s ability to make decisions and adapt a flexible learning environment to each individual learner’s needs.

As a teacher, it is my responsibility to create a manageable framework for the learner’s level of autonomy they have achieved. Just creating a VE or a MOO (Multi-User Domain Object Oriented) is insufficient. I created mechanisms so that learners worked in pairs with native speakers, that they worked at prearranged times in class, that they knew the most important functions of the MOO, that they had tasks to work on, that they had advance organizers to make the task easier to complete, that they had a deliverable for each task with which they completed the task. During the project and during the meetings, however, teacher intervention was minimal. Learners had the framework they needed to work in to make their own decisions on topics,

working methods, and so forth. So, it is certainly the case that VR alone does not create interaction, but it can facilitate and enhance interaction in a variety of ways.

## Interaction and VR

Let us first look at the various forms of interaction in VR. Together with a number of colleagues, I have conducted several projects in text-based VEs, mostly in object-oriented multiple-user domains (MOOs). As open source programs, MOOs offer maximum flexibility and editing ability for learners, while at the same time providing enough models to get started very quickly. Results were published in various journal articles and a recent book, so I will not describe the details here. However, the role that VR played for interaction in these projects cannot be underrated, although it is as of now still under-researched.

Let us take a simple communication mode like chat, which we may define as communicating live or almost live by using text typed in via a computer keyboard. I would say “live or almost live” because many would agree that we would still call a communication mode chat even though many programs only transmit a message after the enter key or a virtual button on screen is pressed. Does it make a difference? Almost certainly it does. The delay in message transmission means that often there is no way (as in face-to-face communication) to signal that you are preparing a message, so messages and topics get mixed up, the more participants we have. Some other programs transmit letter by letter, which also means that editing is visible to the communication partner(s). Again, reports on editing behavior in chat programs with whole utterance transmission (O'Rourke, 2008) suggest that live versus quasi-live chats work very differently. This same research also suggests very specific tools that learners make use of while chatting. Some may scroll up a list of previous utterances in an output window such as that displayed by MOOs or Skype to look at utterances that were received or transmitted several minutes before. Other programs may not have an output window, or only limit the display of previous utterances.

Another functionality that we added to the MOO was that all learners automatically received a transcript of their communication session via email straight after the session. You may wonder how this could affect communication in language learning scenarios. The knowledge that I can look in peace and quiet and in detail at the whole communication again and again may help me focus on those pieces of information that I absolutely need to continue my chat with a native speaker. For instance, if I ask: “What was the film about that you saw last night?” I may receive tons of information that is beyond me in this live situation, just as a waitress at a bar in a Russian airport may give me lots of additional information in a reply to a request for coffee. In the situation I may only be interested in the question whether I succeed in getting the coffee or not, but afterwards I may wonder whether she mentioned various kinds of

coffee (cappuccino, espresso, double espresso, latte,...), various politeness forms, useful expressions around money transactions in general, and so forth. This may encourage me to look these up and study them in such a way that I can build them into subsequent situations myself. After all, ordering a coffee from a Russian waitress or waiter may be a situation that is likely to reoccur.

We can very easily think of other functions that differ across chat software. Strongly linked to functionality is, of course, interface design. The MOO, for instance, offers amazing functionality and has done so since the early 1990s. However, access to this functionality is pretty limited, unless you are familiar with command line language. Increasingly, therefore, modern MOO releases have been successful when they integrated familiar interfaces using hyperlinks, as for example in the enCore database (see <http://encore-consortium.org/>).

Another aspect that is largely under-researched is whether it makes a difference to have a VE with avatars or whether learners might as well use Skype or Messenger software. Yes, both offer live communication in text, but MOOs offer communication embedded in an albeit VE. Even a short analysis of the use of the word “here” and the German equivalent “hier” in my Germany-English projects showed that learners far more frequently used these indexical terms by default for the VE (Schwienhorst, 2004). This may indicate that their mental maps had adapted, at least during their chats to the virtual (and textual!) environment of the MOO and their avatars, rather than real life, where the real learners existed in two different physical locations. It may also further indicate that the use of VR allows learners in different locations to use at least one aspect of language, namely indexical language, in similar ways as when they share the same physical location. In other words, an aspect where VR is enabling a crucial testing ground for language. We need more evidence, of course. It would, for instance, be interesting to compare the use of “here” in different scenarios: Second Life, Video conferencing, Skype, MOO, telephone, face-to-face, email, and so forth. Thus, interaction may be directly influenced by the sense of presence or co-presence with others.

It is quite obvious that this kind of interaction would allow large communities of learners who are isolated from target language communities and authentic communication with native speakers to communicate in a meaningful and realistic way, in short, authentically. As I am writing these lines, I am sitting in a hotel room in Irkutsk, Siberia, where I am working with enthusiastic Russian teachers on this particular question: how to bring learners in touch with target language communities. To these learners, Germany, Austria or Switzerland almost seems to exist in a different world. I think the concept of authenticity applies in a simulated world (see Turkle 1995, p. 254) as long as a foreign language is used for everyday purposes with real native or non-native speakers.

## Reflection and VR

I have emphasized the importance of reflection in the process of language learning. Some may argue that successful language learners can learn a language sufficiently just by listening and speaking alone. Indeed, at least for some companies, the tenet seems to be listen, repeat, and learn (and please buy our product, one may add). We all know that this is, unfortunately, in many cases not the case. One thing we have learned from the audio-visual method is that mere repetition does not lead to the communicative flexibility learners need in the “real world”. When I look at successful language learners, there are many moments when they “notice” something in the input they receive, or the output they produce. In other words, there are many moments when good language learners consciously or subconsciously perceive a “noteworthy” linguistic occurrence. Schmidt (1990, 1992) has written at length about the importance of “noticing” and this concept has been widely adopted in the discussions of reflection. Reflection is often linked to the notion of language and language learning or metacognitive awareness.

We may ask what kinds of communication modes focus on reflection. One important area that has been researched in detail is negotiation of meaning. As it may be largely irrelevant in relation to VR, I will not enter into a detailed account of this here. Another area is writing vs. speaking. Here we have a more relevant research base for VR. There is very little evidence that speaking can support processes of reflection as well as writing. Some readers may recognize themselves when I say that often on trips abroad I find myself thinking after successfully buying a bottle of water with limited linguistic knowledge: “well, if I only had a transcript of that little chat now, I would be much better prepared the next time”. Indeed, recent research of an old colleague of mine, O’Rourke, has demonstrated by using eye-tracking equipment how learners re-read passages in MOO transcripts (O’Rourke, 2008). In other words, they make use of scripts by re-reading old text while they are communicating, a luxury that we do not possess in spoken communication due to our limitations in phonological memory. So, there is every indication that written language has a definite advantage over spoken communication as regards to reflection, which is maybe a disappointment to the proponents of graphical and more immersive VR (including audio-interaction modes). Unfortunately, reflective tools for oral communication are still very difficult to create and implement.

Another area of reflection lies with the learner herself. I think it is important to research in more detail the importance of non-representation and avatar-representation in telecommunications systems. My own research in text-based MOOs has indicated that learners may well feel greater detachment from the personality restrictions of their real character when they appear as an avatar online (Schwienhorst, 2000, 2004, 2007). This in turn might lead to greater freedom in reflection on learning habits and possibly experimentation with new learning behavior. The fact

that modern graphical worlds such as Second Life allow users to customise their characters in a variety of ways may also lead to learners trying out new personalities which may facilitate reflection.

This process of detachment, reflection, and experimentation is one way of dealing with the customizability of an online character. My research, however, also showed that learners wanted to preserve elements of their identity online. In other words, they were looking for two kinds of continuity: first, some form of continuity between their “real” self and their virtual self, and second, continuity in their virtual self (as a character that does not change constantly), a tendency Turkle reported in 1995 (Turkle, 1995, p. 205). It may be common sense that we want to preserve elements of recognizability when such crucial elements that identify us, voice and appearance, are no longer present (for voice, see for instance, Levitin, 2006).

I do not want to drift too far away from reflection and the concept of awareness here. I would simply like to summarise that there are ample indications that reflection in language learning is strongly influenced by the communication mode we choose and the way we are represented or not in online environments.

## Experimentation and VR

Virtual reality, by definition, involves the use of virtual (re)presentations of space and/ or people. As such, it allows for much more flexible environments and configurations of users. Even in text-based environments that I have used extensively in language learning projects, this flexibility resulted in learners creating their own personalized environments and allowed for quick changes between various communication scenarios. One moment they would have a private chat with their native speaker partner, the next moment, privately contacting another learner in another virtual location, then speaking to the teacher or fellow students in the physical classroom, all of these in quick succession. Here, VR demonstrates quite clearly advantages over the physical language learning classroom, where creative and institutional restrictions often apply.

A physical language learning classroom can often not be dedicated exclusively to language learning, but is also used by other subject disciplines, in schools as well as higher or adult education. This also means that any use of learning materials, any learning environment that surrounds and envelops the learner, whether posters, books, maybe to a lesser extent computer resources, have to be “rebuilt” every time the class returns.

This also means that we are limited to the mental construct of class, that is, a room for a certain group size. It is usually not feasible for an institution to create many small rooms where learner pairs would meet, or flexible room configurations that can be changed according to learning needs at that particular moment. What is un-

thinkable in many physical and institutional learning environments is a permanent environment that learners can configure according to their individual taste and needs. By permanent I mean an environment they can return to and find it unchanged.

Even text-based VEs and content management systems (CMSs) make this possible. The big differences between VEs and CMSs mainly in the spatial (VE) vs. primarily (menu-driven or hyper-) textual (CMS) organization; the presence (VE) and absence (CMS) of physical (re)presentations of spaces and people; and quite often the lack of customizability of function and interface in CMSs. On the whole, I would see a difference between more openness in a VE and more framework in a CMS. Ideally, finding the balance between openness and the appropriate framework for learning to take place lies at the heart of the teacher's role (it also appears to be a prominent feature of the conductor's role, if we listen to Sir Simon Rattle of the Berlin Philharmonics in the recent movie "Trip to Asia"). In any case, VEs and CMSs can help to open up the restrictiveness of the physical classroom, just as mobile devices can do this, again in very different ways.

The important point about learning environments I would like to make in this context is that learners can create and collate learning tools according to their needs. Thus, for instance, if they have a favorite online dictionary, favorite resources for reading, favorite grammar sites, they can install links in their learning space and have them at their disposal. Text-based chat systems (and some audio systems now, too), as I mentioned above, also offer ways to record interaction so that learners can use this as a future learning resource. For example, learners in my telecommunications projects have used chat transcripts to collaborate on improvised short stories. They used the transcripts as a resource to edit and revise a written text which was then submitted. For these reasons, we should make sure that we do not just recreate physical environments and their shortcomings in VR but rethink the concepts of learning spaces without forgetting that what we learn in VEs should of course be useful in physical environments. One of the first mistakes people made when they used the computer in the language classroom was to try and replicate what they did in class and just do it faster or in a more convenient way. Thus, early programs in computer-assisted language learning (CALL) included endless drill exercises that were simply too monotonous to the teacher, or vocabulary programs that could repeat the same words over and over again.

Today, much of this has thankfully changed. Error correction now focuses more and more on corpora of individual learner data or interlanguage corpora that track an individual learner's development see, for instance, Heift & Schulze, 2007. Feedback in error correction also focuses more and more on revision processes where the learner's attention is drawn to particular passages that are problematic to encourage "noticing", rather than giving solutions that go literally "unnoticed". Instead of one

correction at the end, learners now often work with various versions of a text, expanding and correcting each other and themselves. Rather than filling in exercises, learners are creating exercises for other students. More and more, they determine the learning agenda and how it is carried out. It is only natural that this approach requires an experimental, laboratory-like atmosphere which not only allows errors but encourages them. If we want learners to go beyond what they know, if we want them to explore new territories, we need to encourage them to make errors. When learning in VEs on the Internet, they may even decide to collaborate with people outside our classroom, they may decide to work on their own at times, and they may decide to work in different VEs than the rest of the class, or decide against VEs on the Internet in favour of alternative real-world learning spaces or mobile devices. These are simply possibilities for experimentation that the physical classroom has not offered until recently.

## **VEs and second language research**

In my publication, (Schwienhorst, 2002), on the state of VR in language learning, I reported on various projects in 3D or immersive VR and language learning. Since then, the use of massively multiplayer online role playing games (or MMORPGs) such as Second Life has become widely distributed and discussed in the media. Language learning companies and several research projects have begun to evaluate what language learning in these environments means, and we can say that 3D VEs are slowly beginning to enter into mainstream research literature on computer-assisted language learning (Lamy & Hampel, 2007). Recent articles by Stevens (Stevens, 2006) and Peterson (Peterson, 2006) suggest that the spread of Second Life may spawn more research projects in the future. At a special computer-mediated communication Special Interest Group (CMC SIG) event in April 2008, the Eurocall organisation dedicated a whole section to “Second Life and CMC” which demonstrated ongoing research in the use of this VE for second language learning. While there have been several private companies and individual teachers setting up language learning activities in Second Life, we now begin to see some of the first research projects that involve several universities in Italy, Sweden, and the US based on principles of learner autonomy, with a strong focus on increasing language awareness. Whether these projects will provide enough starting points for other researchers to follow remains to be seen. Levy (1997) has noted that one of the major obstacles to CALL research has been the lack of subsequent research in a new area and Second Life, in this respect, may be just another example.

However, we should not overlook the fact that VEs have been quite influential in the way we think about learning environments, both online and in physical terms. Content or Learning Management Systems are by now firmly established as tools for collaboration and communication in language learning. An open source system such as

Moodle has become a dominant learning platform in many subjects, including language learning. These CMSs and LMSs provide areas for learners to present themselves, to publish to an authentic audience, to enter into meaningful dialogue with others, and to experiment with new learning tools. Many universities pride themselves of new learning spaces that they create in often expensive physical environments, combining coffee house comfort with flexible learning spaces using mobile devices and various displays. Indeed, one of the most persistent influences of VEs on language learning theories may be the focus on the identity of the language learner and the importance of the language environments that the learner finds himself or herself in. As regards to the evidence from research projects, we still have to wait for a definitive answer.

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