

Virtual Worlds

Inherently Immersive, Highly Social Learning Spaces

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Immersive learning is not new — it has been around as long as there have been reasons to include context, application, and practice as part of the process of knowledge acquisition. Role-playing scenarios, case studies and simulations are forms of immersion that have long been part of the teaching toolkit. Adaptations such as non-linear narratives added an element of discovery and adaptability to these sorts of (generally) text-based immersive learning experiences, and with the emergence of computer-based multi-user-domains (MUDs) in the late 60s and 70s, it became possible to follow many potential pathways through a simulated or “virtual” experience. As networks evolved, and computers (and people) increasingly became interconnected, the ability to interact with other people in real time often became a part of these experiences, and the concept we now think of as a virtual world began to take shape.

While technology has added much to the sorts of experiences one can have in a virtual space since those early days, the core element in any virtual world is the ability for the visitor to interact with the environment — people, objects, and places — and to influence the course of events as a result. When other people are also interacting in the same space at the same time, as in today’s massively multi-user environments, friendships, communities, and even societies and cultures can emerge, and the overall effect can become analogous to or an extension of experiences participants have in the real world.

In recent years, virtual worlds have not only emerged as highly social environments, but also richly expressive environments that immerse the participant in a setting that includes sound and visual cues, rich textures, and realistic perspective. The most popular virtual worlds allow movement in three dimensions, and vividly create a sense of place. People enter these worlds via an avatar which is their representation in that

space, moving their avatar through the space as if they were physically walking—or in some cases, flying.

While many popular games take place in virtual worlds, virtual worlds are not themselves games. Pure virtual worlds like *Second Life*, *Active Worlds*, or *There* can be applied to any context, as opposed to game worlds, such as *World of Warcraft* or *Everquest*, which generally have a fixed, goal-oriented purpose, or simulations like the *Sims*, in which most of the characters are computer generated and controlled.

In worlds where everything can be created by the participants, who might be logged in from anywhere with Internet access, the possibilities for learning, creative expression, and cultural interaction are especially rich areas for educators to consider.

The authors of this paper have been exploring the potential of virtual environments for such activities for a number of years, first on the web, and more recently as part of a multi-year research project in the three-dimensional virtual world of *Second Life*[™]. At the time of this writing, this work had involved more than 3,000 participants, primarily faculty, administrators, and instructional support staff who were using a virtual campus to explore interaction, self-expression, and learning. The insights gained from that work inform the perspectives presented here.

Learning Modes, Experiential Learning, and Virtual Worlds

The experiences of participants as they enter and acculturate themselves to a massively multi-player virtual world follow a predictable pattern common to many experiential learning situations. Rumelhart and Norman (1978) described this pattern in terms of three learning modes: *accretion*, or the addition of new knowledge to memory; *structuring*, which is a means of organizing that knowledge into schema or conceptual patterns; and *tuning*, which is the adjustment of knowledge through practice or use.

Kolb (1984) described the process as a learning cycle in his seminal work, *Experiential Learning: Experience as the Source of Learning and Development*. In his model, immediate or concrete experiences provide a basis for observation, and then

reflection. In higher modes of learning, these observations and reflections are refined into abstract concepts which can be applied across contexts. Discovering these new applications and putting them into practice (testing) comprises the highest level of the learning cycle, and is the impetus for creating new experiences, which in turn start the cycle all over again. Experience refines understanding, and that understanding generates new experiences.

This cycle is observable over and over again among visitors to any new virtual space, and is simply a reflection of the fact that a virtual world, just like the real world, must be learned before it can be exploited. While there are many similarities between virtual worlds and the real one to which we have become accustomed, there are nonetheless basic skills which must be learned to prosper, resources which must be discovered and for which uses and adaptations must be found, and a working knowledge constructed so that one can anticipate the effect of his or her actions within the world.

Indeed this dimension is a critical and exciting characteristic of a successful virtual world — the cycle of learning is an inherent part of the experience, and new learning leads directly to new experiences. One is rewarded for this investment by having a greater facility within the world, greater power to influence it, and thus greater respect from one's social contacts within the world.

Another Lens: Maslow's Hierarchy of Needs

The notion of reward is a powerful component of virtual worlds, especially in game spaces, but even in user-constructed worlds, one can find many examples where simple rewards and reinforcements drive the cycle of learning. There is another very important dimension to successful virtual worlds, however, and that is that they are designed to foster social interaction and the formation of groups and communities.

The numbers of "residents" in the most popular virtual worlds can be very large — many populations exceed five million inhabitants, and tens of thousands online at any given moment. At this scale, the macro-characteristics of the collective inhabitants begin to mimic real societies in many many ways. Inhabitants form themselves into

alliances, affinities, families, and peer groups. Cultural mores and expectations can be very sophisticated, and socialization very much involves the learning processes of observation, reflection, and assimilation.

In interpreting the learning behaviors of a new entrant to a virtual world, Maslow's Hierarchy of Needs (Maslow, 1943) is illuminating. Maslow's pyramid places basic human needs — in real life, these correspond to one's basic physiological needs — at the most fundamental level. These needs tend to be met before others are considered.

For a new faculty or staff member entering a virtual world, the groups we have studied most with our observations, there are few physiological needs. Avatars do not need food, air, water, or warmth — but there is an almost universal concern for one's "safety" — although applying the term here is a slippery concept when all one needs to do to escape a situation generally is to log out or switch off the computer. New virtual world residents typically do not need to fear for their physical safety, of course, but they are extremely interested in learning about any potential dangers or embarrassments in the new world, and how to avoid them. They tend to be cautious, not only how they explore the world but also in how they imagine its uses.

In most virtual worlds, one assumes a new identity upon entering, and so a common concern among newcomers is understanding how to relate the avatars they meet to real people, and more so, who to trust. That concern provides a strong impetus to seek out others from whom one can learn, and to form friendships and relationships, a need reflected in the "Love/Belonging" level of Maslow's pyramid. Most virtual worlds facilitate this by making it easy to track people who have agreed to be on your "friend's list," to tell when they are online, and to communicate with them in real time.

The most powerful learning tends to come from experiences and interactions with one's friends and social groups within the virtual world. These interpersonal relationships are observable everywhere in virtual worlds — indeed they are quite the norm — and it is extremely common to see people interacting in ways to tend to increase the skill levels of everyone in the social group. Because these worlds not only

allow, but encourage rich forms of expression through the provision of tools and powers, residents can communicate not only with text or voice, but also with objects, video, images, and through demonstrations. The active learning mode of “speaking” translates in these spaces as “showing,” since one can communicate literally within three dimensions, using texture, form, sight, and sound.

Informal social interactions are powerful motivators for learning, because most people involved in these groups either are operating or are poised to operate at the fourth level of the hierarchy, “Esteem.” It is through social interaction that one’s confidence in the virtual world is reinforced, and through which the virtual world’s cultural norms for respect and achievement are communicated.

At this level, discovery and interaction is highly encouraged, and learning progresses very quickly and efficiently. One ceases to consider him or herself a *noob*, as new residents are often called in such spaces, and the focus of the learning shifts to becoming not merely competent, but expert. The dynamics of the social and learning forces combine to make the immersion highly engaging, increasing the desire to explore further, share more experiences, and gain expertise.

Students who reach this level are ready to tackle significant projects, as most of the impediments to their learning within the space have been minimized. Until an educator reaches this level, it is very difficult for him or her to visualize learning applications that are truly reflective of the potential of the space. Most initial experiments are attempts to replicate teaching approaches used in real world classes. This phenomenon is seen repeatedly, as virtually all teachers and trainers initially refine their skills in the virtual world by learning how to show slides or videos, how to create handouts, replicate posters and books, and the like.

New faculty, for example, generally go through a process of “retrofitting” teaching strategies into the new environment. Approaches that are clearly modeled on common classroom practice may not make any particular use of the affordances of a virtual setting, but they are indicative of the typical new faculty member’s own learning cycle as he or she goes through a period of discovering how the virtual world

may be similar or different to the real one. A JISC report on immersive worlds (de Frietas, 2006) that suggests that in virtual world environments, connections are not often easily made between the learning and application, may simply be reflective of the fact that virtual worlds had not yet reached the level of notice that they had a year later, and not many faculty at the time the report was written had yet had the time to become expert in these environments — indeed most were very much still operating at the lower levels of the pyramid vis-à-vis the virtual world.

Enlightened Teaching — Realizing the Potential of Virtual Worlds

That situation resolved itself in time, and it is now clear that once feelings of accomplishment and confidence are achieved, both students and faculty usually have the basic knowledge, skills, and understanding to begin to operate at the top of the virtual Maslow's pyramid. For experienced residents, concerns about the virtual world have at that point been generally replaced by understanding and acceptance, and if the individual is a teacher, he or she is ready to creatively apply all that they have learned in truly addressing educational challenges.

In a world where scale and form can be manipulated at will, where avatars can assume any form, and where setting can be modified and adjusted endlessly, it is possible to consider the real strengths of virtual environments — the social dynamics, and the ability to richly express oneself through “showing.”

This extends even to the manipulation of identity and even the form and size of the physical world. Imagine a lesson in particle physics being delivered by Einstein — at the scale of a photon! Such a lesson could be enormously compelling, and provide a view into the subject matter that is both memorable, and illuminating. With the instructor inhabiting an avatar modeled on Einstein, and the lesson simulated at nanoscale in three dimensions, an entirely new way to interact with the material could be explored by both the teacher and the student. By allowing the student to manipulate the parameters influencing the behavior of the photon, those effects could be visualized in real time. Comparing the results to the mathematical predictions of Einstein would open the door to much reflection.

Historical reenactments offer considerable promise as a way for students to role play famous figures and analyze and reflect on the events and decisions of the past. Courtroom enactments are especially suited to highlighting the issues involved in what were, at the time, very controversial decisions like the trial of Socrates, Brown vs Board of Education, or the Scopes Monkey Trial.

Role playing and case studies offer similar promise when coupled with the flexibility of a virtual world. As part of the process of creating an avatar for a particular role play, not only can the likely internal perspectives of a role be considered, but also the manner of dress and appearance can be manipulated, and the tools or other objects that might be associated with the role.

Several schools are already experimenting with immersive language environments where students can not only practice their foreign language skills, but also interact with native speakers from across the globe in real time. Related to this are experiences designed to share understandings between cultures, such as *Virtual Morocco*, a *Second Life* site designed to illuminate positive aspects of Arab and Muslim culture.

Processes that might be too expensive or too dangerous to expose students to in real life can be often be quite effectively simulated in a virtual world. As but one of many actual examples, at Bard College, a professor has created a 3D model of a scientific quality optical telescope. Students must learn the precision adjustment controls and operation of the instrument with the virtual telescope and demonstrate their knowledge before being allowed to go hands-on with the real device.

Northwestern University is using a virtual holographic theater (developed by the New Media Consortium) in which the basic elements of set design and lighting are being taught. In this virtual theater, it is possible to quickly and easily switch the entire theater between any of the seven classic stage configurations — ie, proscenium, thrust, runway, etc. Students can design a production and easily see which of several possible stage layouts for their ideas is optimal.

As a final and more general example, virtual worlds are uniquely suited for illustrating basic traits of human interaction, behavior and group processes. One of the essential and fundamental aspects of a virtual world that remains to be fully explored is the fact that a person who places his or her avatar in a virtual space is *extending* him or herself into that space.

Just like the ways people inhabit a real space, in a virtual world they do it in a way that communicates something relevant about them — who they are, the image they wish to convey; there is even body language in some worlds, like Second Life. People bring with them a sense of personal space, and others respect it. (To test that, watch when someone accidentally bumps into another person's avatar; an apology invariably follows). If one stands too close to someone else in a virtual environment, he or she will move. If someone stands too close to your avatar, *you* will feel uncomfortable. Similarly, allowing someone into your personal space, even if it is virtual, is a way of communicating intimacy or closeness.

Conventions of appearance apply, and offer a rich treasure trove for discussions and analysis of our collective notions of race, bias, beauty, and appropriate behaviors. Norms and mores can be explored by students inhabiting the world as a member of another race or a different gender for a period time.

From the earliest models of learning we know of, immersive experiences have proven to be effective and efficient ways to learn at high levels, and quickly. One can point to many immersive sorts of experiences in the real world, such as apprenticeships, cooperative education programs, and on-the-job training, all of which have enjoyed long-term success because they encourage hands-on experience and observation as key strategies for learning. The downside of these approaches is that rarely are students encouraged to move to the higher order forms of learning, where abstraction and experimentation can begin to occur.

That is the unique promise of virtual worlds, as it is possible to experiment not only with little risk in terms of danger or costs, but also in a myriad of ways, taking

advantage of scale, texture, sound, and other attributes to fully explore ideas and concepts. Virtual world platforms have evolved over the past several years into highly flexible, configurable blank canvases for teachers to design new sorts of learning. These experiences, if designed by someone who is truly understanding and appreciative of the form, can be compellingly immersive and very engaging.

The inherent social focus of these spaces, and the way that new learners are brought up the ladder of expertise and experience through interaction with a community, offers a tremendous potential to increase not only the efficacy of learning, but the joy in learning that all self-directed learners know.

Citations

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