TECHNOLOGY //

3D environments create some brand new challenges for learning professionals. Fortunately, there is already a solid set of best practices for designing meaningful and effective instruction in virtual worlds.

Designing Virtual Immersive Environments

The popularity of 3D virtual immersive environments for learning and collaboration continues to increase as more organizations realize the benefits of 3D for learning. The increased use of these environments creates a challenge for learning and development professionals because they must now learn how to design meaningful and effective instruction within 3D worlds. Fortunately, some pioneering work has already been done in virtual worlds by a few brave people who have leveraged these worlds for learning success.

The lessons learned from those early programs have been distilled into a number of design considerations that can help even the most novice virtual immersive environment designer get a handle on creating effective instruction in 3D virtual immersive environments (VIEs).

Take design into consideration
First, when designing instruction in a VIE, it is critical to always remember that you are designing a learning “environment” and not an e-learning module or an instructor-led course. The primary objective of a VIE is to design engaging experiences that logically lead the learner along an optimal course to rapidly assimilate new learning. The key is the design of the experience and environment.

The learning that occurs within a virtual learning world surfaces at the moment when the lack of knowledge or capability of the learner intersects with the need to have that knowledge or capability to overcome a challenge. The learning should be engineered so that teachable moments surface as often as possible.

Those teachable moments are not the same for everyone, but areas covered in the 3D learning environment are encountered, consumed, and applied based on the experience of the learner not the mandate of the instructor. No two people can be expected to come out with exactly the same experience in a virtual learning world experience. That is precisely the design point for these environments. The experience of the learner within the environment drives the learning and aids in retention and application.

Experience is much more about context than content. In a VIE, content is king, but context is the kingdom. Context renders explicit topics and principles and makes them actionable. The true value of a virtual learning world is not how well it can mimic the classroom but how purposeful the world can be in allowing learners to act and interact toward a common goal, to fail and try again in a different way, and to eventually (but much faster than in real life) achieve the desired learning outcome.
Given this backdrop, there are a number of general design points to keep in mind when creating 3D virtual learning experiences:

- **Create the right context.**
- **Create specific objectives.**
- **Provide minimal guidelines.**
- **Encourage collaboration.**
- **Allow opportunities for demonstrating learning.**
- **Build in incentives.**

### Create the right context

In a traditional classroom or in a 2D synchronous learning space such as WebEx or Centra, the context is pre-established. The learners are faced with a slide of content, a shared application, or a whiteboard on which they can collaborate. There is little variation from session to session in terms of context. The content may change but the environment is static—a digital interpretation of the physical classroom.

In a VIE, the entire context of the learning can change many times within one session. For example, a salesperson learning about a soon-to-be-released product may arrive in a space designed to teach him about that product with a 3D model of the product he can walk around in, but within a few minutes, the learner could be transported to an actual warehouse where that product is used on the job. Learners could then be whisked to a retail store to observe how the product is displayed in-store.

The responsibility for creating those environments and anticipating the needs of the facilitator within a virtual learning environment is the job of the 3D learning environment designers. It is not possible for a facilitator to "whip up" a VIE with the same speed she could whip up an ad hoc slide to clarify a point in a 2D synchronous learning situation.

The learning context is critical to the learning process in VIEs. How you create the context affects the learners and influences how much they will learn from the facilitator, each other, and the environment. The designer must establish a context that

- fosters peer-to-peer interactions
- provides the right context for the instruction to occur. In 3D learning, context is critical.

### Create specific objectives but don't tell the learner

In a 2D synchronous learning space, the instructor typically presents the learners with an introductory slide labeled "objectives" or "agenda" that tells him what he is going to learn in the session. The objectives are specifically spelled out for the learner. In a similar fashion, the 3D learning environment designer needs to have specific objectives and goals in mind for the learner to achieve. However, the objectives do not need to be explicitly spelled out for the learners on a virtual slide.

You should not provide a myopic step-by-step sequence of events or step-by-step objectives. Instead, take advantage of the openness of a VIE and let the learners explore the area in a sequence and flow directed by them.

Create the environment to achieve the objectives of the learning.

Rather than provide objectives such as "you will be able to identify seven safety violations," pose questions to the learner. "What safety violations do you see on this virtual shop floor?" Or provide tasks that lead to an understanding of the objective such as "examine this machine and place the required safety guard in the proper position," or "correct seven safety violations within this production line."

### Provide minimal learner guidelines

While the learning objectives should be specific in the design of the 3D learning environment, the methods for achieving those objectives should be open. VIEs allow for real-time collaboration and interactions among learners. However, the learners typically need some level of guidance to achieve a learning goal.

Establish a set of minimal guidelines and then allow the learners to engage with the environment. Provide chances for them to discover elements within the environment independently or with small groups. Don't provide didactic step-by-step instruction.

Minimal guidelines will direct learners toward the "Aha!" learning moment. If the right context and guidelines are provided, employees will learn from each other, from the environment, and from the immersive experience. They will learn in a manner that increases retention and recall of information.
Encourage collaboration
A huge advantage of a VIE is that it naturally enables peer-to-peer collaboration. The collaboration afforded within the VIE includes creating items, pointing out features of a specific environment, and participating in the same activity at the same time in the same virtual space. When designing virtual world learning events, create a context in which collaboration is necessary and required for success such as working on a team exercise to solve a puzzle—the facilitator can act as the host in these situations to monitor interactions and the associated learning.

Allow opportunities to demonstrate learning
One of the most critical aspects of training is the transfer of skills learned in the classroom into the actual work environment. VIEs provide learners with the opportunity to practice skills under the guidance of the facilitator in an environment that mirrors the actual workplace in digital form.

When designing a context for these types of sessions, provide time for instructor review of the application of the skills taught, and for peer-to-peer review of actions and results. Having an avatar go through the exact same motions as the person will on the job, in an environment similar to the workplace, is an excellent assessment of the ability of the person to transfer the skills learned in the synchronous session to her job. The realistic approximation of the work environment aids knowledge transfer and provides a more realistic context than a virtual or physical classroom.

Build in incentives
In designing a VIE, create a context that leverages immersion and interactivity to increase engagement. This means that incentivization or tokening can be a key lever in these environments. The promise of winning tokens can drive engagement and encourage learners to work to overcome specific challenges. Game developers have long leveraged tokening to drive a perpetual flow state in gamers.

Managing the fine line between challenge and boredom by introducing levelling and tokens is central to the huge adoption and usage numbers that successful games such as World of Warcraft have achieved. As we move into delivering instruction in virtual immersive environments it makes sense to learn from our colleagues in the gaming industry and leverage incentives and tokening to make learning both instructional and engaging.

However, there are risks with this approach such as making it seem to upper management that the environment is simply a game, so adding incentives needs to be done carefully to avoid too much of a game feel. A fine line must be maintained to gain buy-in of both executives and the employees involved in the learning process.

Learning in 3D
In many organizations today, the goal of learning professionals is to provide instruction that improves organization-al operations while reducing learning costs. Virtual immersive environments have the ability to replicate an actual work environment through visual, audio, and spatial cues. Using the design points described above creates a context and an environment for the application of skills to a realistic environment where authentic and targeted practice can take place.

When designed correctly, 3D virtual immersive environments provide a realistic learning context in which employees experience learning rather than just attend a class.

This article is adapted from Learning in 3D: Adding a New Dimension to Enterprise Learning and Collaboration, by Karl Kapp and Tony O’Driscoll. To learn more about implementing, designing, and creating instruction in virtual immersive environments, visit www.learningin3d.info.

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