

Learning in three dimensions

By Clive Shepherd, independent e-learning consultant

Learning face-to-face and on-job looks and feels different to learning that takes place via print media or online: the learner's perception of the learning experience is fully three-dimensional. Computers are powerful machines which connect us with millions of other people and any amount of information; it's just that most of this information is represented in 2D – through photographs, diagrams, illustrations, charts and animations. Even video, which can accurately depict a 3D world, is ultimately two dimensional, because the learner cannot manipulate the video image in any meaningful way, nor enter into the scene in order to interact with it.

Virtual worlds – real-time, digital 3D environments with which the user really *can* interact – are certainly familiar to us, but usually only in the context of video games. If you've played 3D video games or watched others interacting with them, you'll be well aware of how convincing these environments are and how engaging the experience can be. In a virtual world, the user feels very much in control, not as a passive recipient of information, but as an active player. They feel like they have really entered the on-screen world and respond emotionally in the same way they would do in real life. Contrast this with a typical e-learning programme, that relies on text and still graphics. Not even classrooms, which although face-to-face are in no way authentic work environments, can create this level of engagement.

If, as someone who works with e-learning, you have gazed longingly at 3D video games wishing you could create programmes which were as realistic and compelling, then you've probably assumed this type of production was out of reach. After all, video games cost millions to produce and, not being in the business of training pilots or tank commanders, you don't have those millions available to you. However, as with so many other media, costs are tumbling. Tools and templates are reducing the need for custom programming and 3D models are being shared more widely, meaning you can often piggy-back on someone else's work (after all most offices do look alike, don't they?).

The result is that e-learning projects based on 3D virtual worlds are now accessible to organisations which have the sort of budgets that currently allow them to afford to pay external contractors to create bespoke e-learning solutions. Virtual worlds will not, in the short to medium term, be as quick and cheap to produce as rapid e-learning modules, but who knows what will be possible ten years from now. In a way, as rapid e-learning products begin to resemble their much more expensively produced bespoke counterparts, organisations should now be expecting a lot more for their money when they spend tens of thousands of pounds per hour on e-learning content: not just good graphics, a nicely written script and some multi-choice questions, but something a bit special, perhaps an interactive scenario, a game, a simulation, a 3D interface, perhaps all of these.

Before we get greedy about what we should expect from our new 3D version of e-learning, let's start with the basics. Leaving games and simulations to one side, a 3D environment in itself provides some significant advantages. It's more compelling, more involving and more authentic. Let's take a real-life example. Car salespeople not only need to be experts on their products, they need to be well versed in legislation such as the Trade Description Act

and Data Protection. Learning all this is dull at the best of times and finding time to release staff from the forecourts to undertake the necessary training, is a serious challenge.

Volvo were looking for a training programme that would be innovative enough to encourage participation, easy to update to ensure longevity, accessible to a dispersed workforce, suitable for use in short sessions, and suitable for acting as a refresher for those that wanted to update their knowledge of a particular area. The solution, 'Knowledge Drive,' came from a collaboration between Caspian Learning, a leader in the development of virtual worlds for training, and Fimtrac, a face-to-face motor industry training company. The programme, 'Knowledge Drive' consists of a set of modules that feature interactive 3D-based scenarios incorporating a range of learning tasks. The user enters a 3D environment, and meets 3D figures along the way that impart information related to their task or learning goal. For example, a virtual customer will enter a show room and ask questions that the user must answer. There are deliberate law breaking scenarios that must also be identified and rectified throughout the game, such as spotting what information sources are covered by the various clauses within the data protection act and removing breaches of these within a virtual workplace.



Volvo Knowledge Drive, produced by Caspian Learning and Fimtrac

Each game is designed by Caspian to look like a real Volvo show room by taking images, photos and schematics of a real environments and creating accurate 3D representations of these. The worlds are then populated with virtual characters from Caspian's library of assets, which includes over 150 3D environments and 1000 3D characters.

Virtual worlds can be enriched by adding elements of simulation and game play. Let's start with simulation. A simulation provides a learner with a safe environment in which to practise

skills, to learn by doing. Simulations vary in their *physical fidelity* – the extent to which they look like the real thing, and their *functional fidelity* – the extent to which they behave like the real thing. Not all simulations need physical fidelity. For example, let's say you wanted to provide managers with an opportunity to hone their financial management skills. You could create a perfectly adequate financial model in a spreadsheet or with some custom program code; you would gain little by trying to model the business environment by having managers make their financial decisions in a life-like 3D office environment. In other situations, as with this flight simulator (below), physical fidelity is critical.



Microsoft Flight Simulator X, © 2006 Microsoft Corporation

Simulation is important because it bridges the gap between observing a demonstration of a skill and then practising it, alongside a buddy or coach, in the real job environment. It allows for safe practice, without risk to life, limb or budget. It provides the learner with the opportunity to experiment, to see what happens when you try something different. It allows the learner to make mistakes when those mistakes don't matter. All this without the fear of failure and the stress of competition that learners experience with classroom role plays.

All this and learners might even have fun. "When learning isn't fun, it's not learning", says Roger Schank, author of *Virtual Learning*. "Listening to endless lectures and memorizing countless facts and figures aren't fun activities. What's fun is doing."

We'd probably all agree that the most fun, and the most effective, learning experiences that we've had have been when we've been able to get stuck into something practical – a project, a case study, a chance to try things out for ourselves. But, according to Marc Prensky, effectiveness – let alone fun – is not always the primary driver for trainers: "The problem with most companies' use of learning technologies, from the learner's point of view, is that they are used today primarily to make things easier for the trainer. Most of what exists so far in terms of web and other technology used for learning is so elementary or old-

fashioned in its learning approaches that, apart from remote delivery, it adds little to learning and often subtracts from it.”

Which is where an element of game play adds value. Games provide a player with challenges in which they have to overcome obstacles (hazards, misfortunes, competitors) in order to achieve well-defined goals, while working within established constraints (time, rules, ‘lives’). Well-designed games provide the player with sufficient reward to tempt them to ever-greater efforts. They are the ultimate motivator and can, of course, be integrated into 3D worlds, with or without the added bonus of simulation. Imagine a retail scenario, in which trainees progress to higher levels by tackling more and more difficult customer situations; or a simulation of a warehouse in which trainees compete to find health and safety hazards in the shortest possible time.

So far we have concentrated on the asynchronous applications of 3D virtual worlds, in which learners work individually at their own pace. For the same reasons that many enterprises concentrate primarily on the self-study applications of e-learning, they are likely to similar favour 3D environments that can be accessed at any time, in any place and in small chunks. But, just as e-learning can also be usefully deployed in real-time, using chat rooms, instant messaging and web conferencing software, so the synchronous applications of virtual worlds should not be ignored.



1st responders training, developed by Forterra Systems

Within the United States, there are over five million ‘first responders’ distributed across more than 40,000 federal, state, and local agencies. Together, they must prevent attacks on critical infrastructure, conduct security operations at countless locations, and prepare for consequence management following mass casualty incidents caused by acts of terrorism and natural disasters. Providing realistic and frequent training opportunities for interagency operations is imperative, but nearly impossible to carry out cost-effectively and with sufficient frequency using traditional live training and table top exercises.

Using the OLIVE platform developed by Forterra Systems, trainers can replicate within a virtual environment events at locations where they are likely to occur, easily repeat exercises as often as necessary, and eliminate the need to co-locate trainees and trainers by conducting the training from standard PCs connected to the Internet. Each key ‘player’ in one of these exercises is a real person, interacting in the virtual environment with the aid of an ‘avatar’, what Wikipedia defines as “an internet user’s representation of himself or herself, which the user employs to navigate the 3D world.”



A university presence in Second Life

Perhaps the most familiar example of a real-time, collaborative 3D world is *Second Life*. Anyone can establish a presence in *Second Life*, meet and interact with other inhabitants, buy and develop land, even trade with each other in the world's own Linden Dollars. Apart from the many personal uses of the platform, many organisations are finding value in developing their own virtual real estate in order to meet and collaborate with prospective customers and employees. Applications for education and training can extend from simply running a PowerPoint presentation in a 3D space to hosting workshops and group activities based in realistic virtual environments. *Second Life* may not represent the most powerful potential platform for 3D collaboration, but at the moment it's a testing ground for all sorts of ideas likely to have value in the medium term for learning and development.

OK, so virtual worlds are unlikely to become your mainstream delivery method for corporate training. Although they are much easier to set up than many of us would believe, the process is still not trivial. You're going to use them where you have time, a reasonable budget and an application that demands learner engagement, a high degree of realism and a safe environment for exploration and practice. Many current 2D e-learning projects meet those criteria. Time to expand into the third dimension.