3D Learning and Virtual Worlds

**An ACS: Expertise in Action™
White Paper**

March 2009

expertise in action™

ACS Capabilities – 3D Learning and Virtual Worlds

Globalization, a challenging economic environment, a younger workforce with rising expectations of collaborative, interactive work environments — all of these forces have converged to create conditions favorable to creating learning exchanges in Second Life® and other 3D virtual worlds.

These multi-dimensional virtual worlds provide a perfect environment and a host of tools for mentoring, telepresence, brainstorming, expertise-sharing and capturing "informal" learning exchanges — any type of exchange which lends itself to engagement and interaction. In fact, Brandon Hall researcher Tom Warner suggests that Linden Lab has changed its focus for Second Life from a "gamer's world" to a business-to-business tool. With over 6 million registered users, Linden Lab's Second Life has scores of corporate "islands" that are used for recruiting, on-boarding, peer-to-peer engagement or group work. Accordingly, ACS Learning Services has developed a strategic perspective and methodology for design and facilitation in this environment, offering our clients assistance in leveraging this exciting new technology in the context of other "blended" learning strategies.

Virtual Worlds Make Real Sense

3D should be seen as a new learning delivery channel — a channel through which companies can deploy facilitated experiential or simulated learning or group activities in a secure or semi-secure space. Not only does this capability address varying learning styles, interaction and outcomes, it also offers significant business advantages in cost, time and the ability to reach broadly dispersed audiences efficiently and effectively. ACS has built a Learning Center within Second Life to explore the design of other facilitated learning experiences with other client scenarios. ACS' investment in this capability is continuing evidence of our commitment to thought leadership in our markets and our continued desire to help clients address and adapt to changing trends and business requirements.

In spring 2009, ACS participated in a study sponsored by Forterra Systems to explore different use cases and the promise of 3D learning for corporations. While the purpose of the study was to examine employee development and training, one extra benefit of the process was identifying virtual worlds, specifically OLIVE, as a cost-effective, richer alternative to other methods of teleconferencing. Rather than simply dialing into a conference call or setting up elaborate and expensive telepresence systems, users can share a sense of presence from their own computers. We have found that working in private 3D platforms such as OLIVE or Protosphere offers features, functionality and privacy that is not readily available in open-source, public sites.

expertise in action™

While high-end, online simulated learning environments are designed to be highly engaging and compelling, we have found the bulk of our 3D "first adopters" are interested in finding cost-efficient yet engaging ways to extend the "blend" in their traditional formal learning programs. Many clients have over 85 percent of their curriculum in workshop format due to requirements for learners to engage with experts and peers. Specifically, many of our clients are looking for a specific solution to reduce the number of instructor-led workshops while still providing the opportunity for participant interaction. Our belief is that helping companies understand how to deploy sound instructional design principles across a range of learning experiences in 3D will be the key to success and sustainability.

In fact, as published in the recent ASTD study on informal learning, e-learning providerSkillSoft interviewed HR practitioners from nearly 60 firms and polled 5,365 employees and found that 62 percent of the HR practitioners said that online learning (such as desktop courses, virtual classrooms, or other online materials) will make up the major part of their firms' training in the future.

Here are a few of the business reasons that have corporations taking a hard look at virtual world applications.

Businesses are seeking innovative solutions to do more with less. Virtual world applications are significantly cheaper then video conferencing, e learning development and traveling to instructor-led events but still provide an engaging and enjoyable learning medium.

There is a relentless focus on innovation to drive additional growth and competitive viability. For professional outsourcing firms, this means innovating not only with enhanced products, processes and services, but also with vision and expertise that help organizations develop new strategies to recruit, develop and retain top talent.

Best-in-class organizations must find ways to harness the power of informal learning exchanges to capture and share knowledge throughout the organization. With up to 85 percent of "on the job" knowledge transferred via information interaction, no wonder businesses are concerned their expertise is at risk. The fast-growing development and adoption of Web 2.0 tools and enterprise social software make it not only possible but fairly easy and engaging and, most importantly, instructionally sound. "Digital" engagement and collaboration allows organizations to capture and share expertise in a manner not previously available.

## 3D Worlds as a Strategic Enabler of Learning and Proficiency

Just as businesses are seeking innovative solutions to do more with less, so are learning organizations. In addition to leveraging strategies and partnerships that help with day-to-day transactional efficiencies, ACS believes that learning partners, such as ourselves,

expertise in action™

must also offer new ideas to help learning leaders motivate, develop and prepare their workforce to compete effectively in their markets. Our early findings show that virtual world applications offer very effective and engaging platforms for creating high-value learning exchanges, with the same sense of "presence" and collaboration as single-site events. At the same time, the cost of utilization is very low compared to other distance modalities when compared to high-end gaming platforms for simulated learning or web conferencing and telepresence rooms for instructor-led. ACS believes the power is in the design and delivery, not just the technology. Here are a few other areas where 3D shows tremendous promise.
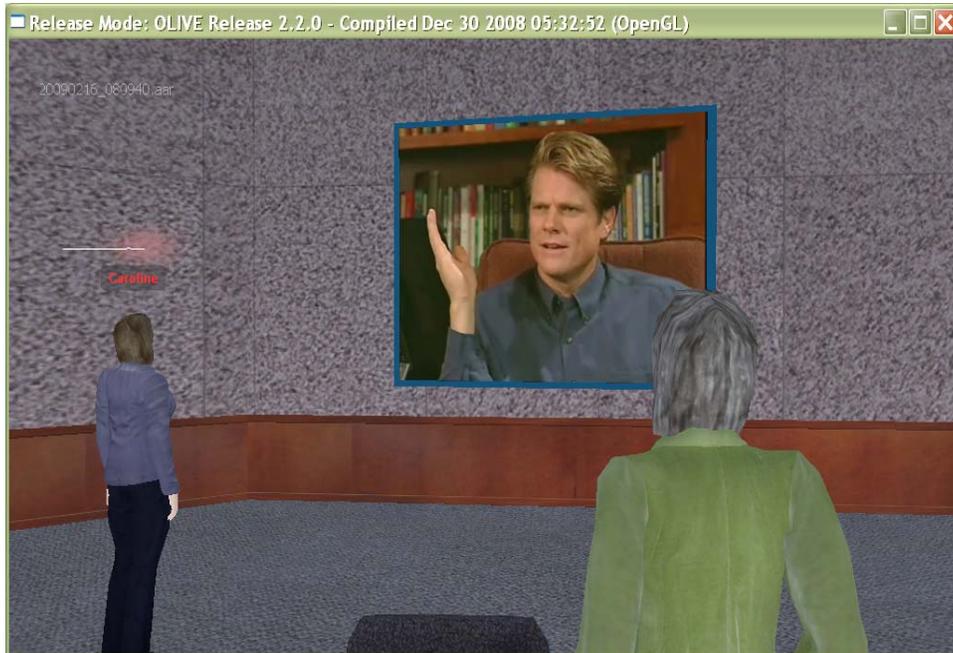
3D worlds provide an excellent platform for achieving performance results when designing for the needs of the adult learner. Studies have shown that adult learners require engaging interactions in order to improve retention. Our trials have shown that learning in a 3D environment allowed the enhanced interaction with content and other individuals in a unique way because of the notion of "advanced presence," or feeling like you are really there. Adult learners prefer learning that is real-time, applies directly to their work and offers a customizable experience. Since our 3D environment is electronically generated, the platform allowed for creation of interactions that are both unique and meaningful for the learner, including "hands on" and immersive experiences unique to this environment. Dr. Gary Woodsill, researcher for Brandon Hall, states that there is real value in what he calls "collective learning". Woodsill notes that any individual might not have all the pieces, but a whole group would likely provide a solution. Having the ability to deliver and measure the value of any one of these outcomes should be key for any learning leader or organization.

expertise in action™

3D worlds allow for the complete range of the learning taxonomy. Our 3D experiences have allowed for various levels of learning, from cognitive and affective to skills or competency-based learning. For knowledge and comprehension levels, asynchronous and "on demand" knowledge objects, such as knowledge objects in our "file cabinet," were accessed by the learner. For application and analysis levels of learning, we created role-playing and team breakout exercises. John Seeley Brown writes, "Virtual worlds require us to think about knowing, rather than knowledge. The problems players face inside virtual worlds, the things that require players to put knowledge into action." Participants interacted in live situations, explored business school-type tasks or assignments and then presented findings to other learners via virtual 3D classrooms.

3D worlds allow for both passive and active learning, as well as synchronous and asynchronous learning. Traditional online learning appeals to learners, since it is just-in-time and time-managed by the learner, yet learners complain that online learning lacks the opportunity to explore and engage with other learners. 3D worlds create an environment where learners can explore and discuss content, as well as build professional networks. 3D worlds can provide a blended approach that allows people to learn on their own as well as interact in groups.

Here are a few examples of our work. Our island provides "objects" that, when touched by the avatar, provide either note cards of information or links to 2D assets for self-paced learning.

Robots or facilitator avatars act in a role, in a staged event, to allow for simulated learning such as modeling a sales call or reinforcing a business process. 3D animated objects, when clicked, reveal layers of information such as the inside workings of a machine. 3D formal classrooms with screens provide streaming video, electronic presentations and/or software application sharing. Informal discussion areas, such as tables in a garden to a tiki bar on the beach, encourage conversations between avatars for informal learning and knowledge-sharing. Some 3D environments allow for recording of the experiences to be able to "archive" the training for future users or to replay the experience immediately for assessment by the learner.

expertise in action™

Varied engagement "sets" or environments on the ACS Learning Island"

Best Practices for Incorporating 3D into Your Existing Learning Portfolio

There are hundreds of organizations currently in Second Life and scores of others using proprietary platforms such as Forterra Systems' OLIVE™, ProtonMedia's Protosphere™ and the open-source Project Wonderland™. Our approach dictates that although platform capabilities and technical qualities are part of the design consideration, "success" is based on developing sound instructional strategies that are directly linked to performance outcomes and business goals.

However, before we get into some of our "tips" on design and business alignment, we would like discuss a few of the challenges you may need to address before launching a 3D strategy within your organization.

Overcoming the Technical or User Challenges of 3D

There are many success stories for designing learning for a 3D platform. However, there remain a few hurdles for some enterprises as they move to support this new medium.

IT requirements and firewalls – Like any other new technology, enterprises are still working on the cultural and technical challenges that adoption of these virtual worlds and other 2.0 technologies require. Most virtual worlds have historically required a wide range of system requirements and adaptations that address security issues in organizations such as TCP and UDP ports opened through a corporate firewall. Other platforms can be installed behind the firewall, which necessitates another range of requirements and support on the part of the IT department. However, we have found in many best-in-class organizations that chief technology officers who spend some time looking at 2.0 and 3D technologies can be a wonderful resource when considering your first pilot or proof of concept.

expertise in action™

PCs and audio – Most PCs were purchased for business computing, and thus they typically were not specified to run graphically rich, system-intensive applications like virtual worlds. Many require upgrades to graphics cards, CPU and memory or adjustments to video drivers. Others do not have the right software plug-ins to view the environment properly. Again, most 3D providers are modifying platforms to run on traditional business systems. One example of a low-bandwidth world is Venuegen.

Audio – The best experience in virtual worlds relies on natural discussion between participants using VoIP-based audio. This allows for the avatars (online personae) to respond to the learner's tone of voice by gesturing. These gestures, such as head nods and shrugs, increase the fidelity (or real-life feeling) of the experience. To participate in the platform's VoIP, users need either a headset with a microphone or, occasionally, they can use the built-in microphone and speakers in the PC. However, we have successfully run many events where a combination of online chat and conference calls sufficed.

Bandwidth – To deliver their graphically rich, immersive experiences, most virtual worlds use an architecture that involves a client download in the range of several hundred megabytes. The size of this download takes awhile and is easily managed on individual business computers. However, to download over many networks, or with many different laptop configurations, could be potentially hard for IT to support. Bandwidth is also an issue for the ability to provide good resolution of graphics and features such as streaming video. Private 3D environments tend to control the amount of users in a space and also provide dedicated servers to help minimize bandwidth issues.

Ensure Strategic Alignment with Business or Performance Outcomes

Transformation, transition and optimization: these are just a few of the terms consultants use to help companies turn learning strategies into successful business initiatives and performance improvement programs. But how do you know which path is right for your organization? For many years, we have held that to create rich, measurable learning interventions, one must follow a clear, step-by-step approach to understanding and defining both the business goals and the organization's broader talent management needs.

What this means for learning professionals looking at 3D learning is that our design palettes just became a little more colorful. Because learning activities and performance support are becoming more closely fused, many businesses are becoming increasingly focused on their educational processes, with outcomes as the focus. Virtual worlds offer us more varied and cost-effective options for learning "point solutions" and reinforcement. We have always asked, "What is the business need, and what is the performance gap?" In a 2.0 world we ask, "What skill or knowledge could be best learned in a synchronous or collaborative environment versus a more traditional or formal program?" In our approach, the secret is not to become so enamored with the technology but to leverage what we know about adult learners and design accordingly to serve the learning needs of the participant, the business needs of the company and the performance goals of the program.

expertise in action™

Addressing the Culture: the Power of Change Management

Web-based learning, LMS, and webcasting software learning tools have all gone through an acceptance curve. To this point, all corporations will experience a ramp-up time for learners to be comfortable operating in 3D. Most of these platforms utilize a tool called an avatar; that is, the online persona of the learner. While many young adults might be familiar with avatar-based interactions, senior learners will not have that experience. At the same time, we have found that there is not an age-barrier as, given a chance, senior learners become quickly engaged in participating with their avatar.
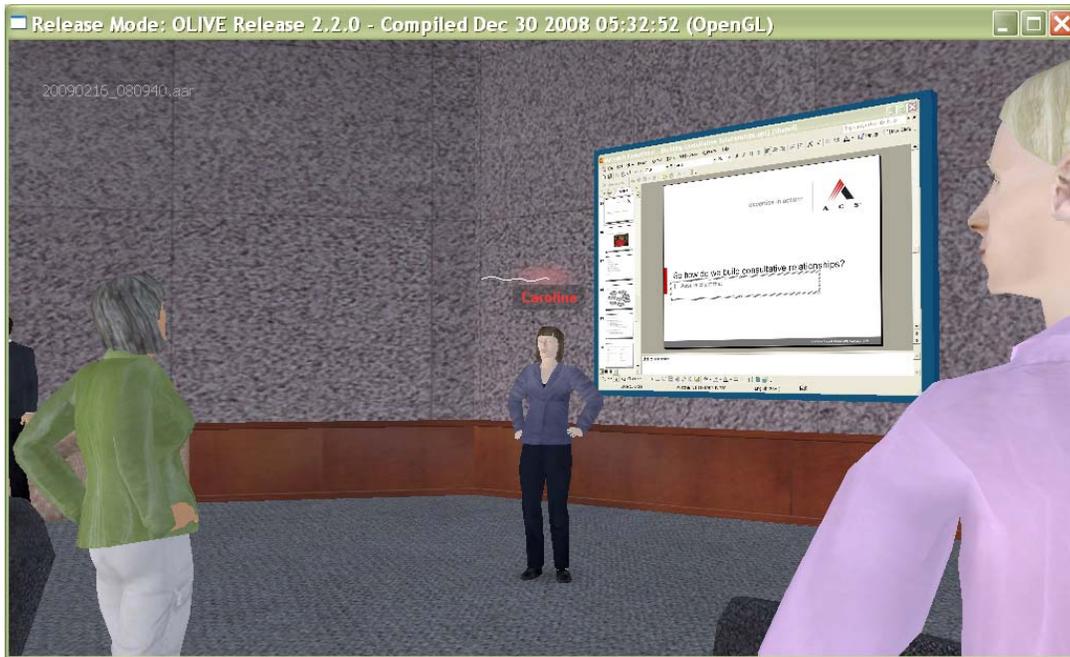
In developing our learning programs in 3D, we provided an environment and experiences that help learners increase their comfort in using avatars. Examples are providing asynchronous challenges to the learner such as picking up objects for note cards, or moving through the world to observe and participate in experiences. For instructor-led events, we created online "icebreakers" to encourage participants to use their avatars to interact. In the Forterra trial, our learners associated a link to their personal LinkedIn site. As avatars greeted each other and talked via VoIP, they also clicked on their fellow avatars to review the other participant's information stored in LinkedIn. We have also found that as learners progressed through a learning program, their capability and confidence increased with each module. Finally, encouraging participants to meet in informal team sessions, outside of the formal learning events, help the avatars explore and practice in a casual learning experience.

One other cultural consideration is the corporate perspective of 3D environments. 3D environments have become successful in gaming environments such as Halo and World of Warcraft. Additionally, public platforms such as Second Life have made the news for their

expertise in action™

"adult" content, risqué avatar outfits, and casual interactions among users. Corporate learning spaces should incorporate aspects of corporate branding within an environment that is conducive to working collaboratively.

Designing Learning in 3D Worlds: A Use Case

Recently we had the opportunity to design a live (synchronous) complex event in the Forterra platform. A synchronous solution was essential to connect learners directly with the subject matter experts. To truly simulate the real-world client-facing experience, we explored integration of 2D assets into the 3D environment through links to online networking, web-based resources, and to an LMS in order to document and assess participant learning.

In evaluating options for the training, a face-to-face instructor-led setting was considered too disruptive to the participants and too costly, nor would it encourage participants to research, explore together and collaborate. Breaking the workshop into time chunks enabled teams a realistic schedule that was not disruptive to their jobs and yet enabled independent and team work. This idea of a "time span" for learning, instead of a one-time event, was critical to our notion of creating a collaborative community that was in sync with the business instead of disrupting it.

expertise in action™

Additionally, by sequencing modules over a period of time, instead of a one-day workshop, we found that learners had the opportunity to "process" concepts and skills that they learned in the sessions and were better prepared to discuss concepts in future sessions.

While a webcast could have supported some of the requirements, it lacked the sense of "immersion" that we wanted to build in the collaborative communities. The virtual world afforded an opportunity for "observation" of team and individual performance. A traditional web-based program was not considered an option, since again, our client desired a collaborative community that allowed for observation.

Course Design

With distance and collaboration, we focused on a 3D learning environment. We did embed 2D links and individual work for a blended program; however, the primary delivery medium was a virtual world. Forterra Systems was our virtual world provider on the previous trial, and they rose to the challenge of how to work on our distance collaborative learning project. Here is a high-level overview of the course design.

- Session 1: networking exercise with LinkedIn, presentation with projected slides and group discussion, video, application-sharing, team assignment, link to a Ning networking site for team resources, polling, session recording (one hour)
- Team work session: held at a time mutually convenient to team members; organize data and prepare for presentation; application-sharing; team self-directed collaboration session; link to resource/blog URL for document repository (one hour)
- Individual work: review resources, contribute to private networking site, document in a blog and participate in discussion threads

- Session 2: review Session 1 content, team presentations and demonstrations, record and play back team performance, observer avatar, large group discussion of team work, then presentation of additional content, link to Zoomerang for evaluation, link to ACS LMS for assessment (one hour)

Additional Design Elements
- Social networking in 3D through links to Facebook and/or LinkedIn
- Application-sharing
- Use of document-sharing links from 3D to online repositories such as the Ning
- Use of an online polling technology, linked through 3D
- Recording of entire session
- Recording of individual participant performance to replay during learning event
- Observer avatars
- Post-learning experience, link to survey tool from 3D, evaluating the experience based upon a set of criteria suggested by academic thought leaders
- Post-learning content assessment, link from 3D to ACS LMS course assessment

Results

Virtual World as a Design Enabler

Having concluded the Building Consultative Relationships training, our team can not imagine conducting it in any other medium. To that effect, here are a few of the key ways the virtual world enabled the learning:

- Acted as a portal to 2D resources
- Provided an environment conducive to team-building and collaboration
- Provided a consistent experience for various learning strategies; the avatar can observe other participants, the content, a video and the presenter all from one vantage point
- Afforded a multi-environment experience for a change of pace, where some sessions were held in a large conference room and other sessions held in a breakout room
- Provided the participants with more than one means of communication through the use of chat (they did use it), use of VoIP (everyone used it), and use of avatar gestures to convey emphasis or add meaning to their speech
- Enabled application-sharing, video, presentations, and replay of participant work all in the same application and format
- Provided participants with real-time feedback by replay of their performance

Virtual World Support of Learning Objectives

Since the first three learning objectives were written at the "awareness" competency level of Bloom's Taxonomy, they could have been achieved through just about any learning delivery method:

- Define different levels of client relationships
- Describe aspects of a successful consultative relationship
- Define BEAMS,™ a relationship building process

The application and evaluation-level objectives required an immersive environment. To that point, the virtual world enabled us to achieve these learning objectives and still meet the

expertise in action™

A C S®

parameters of the original business needs (see comments below on business needs):
- Collaborate to explore skills of building consultative relationships
- Demonstrate a relationship-building skill
- Assess performance of relationship-building skills

Virtual World as a Solution to the Business Needs

Even though the users and stakeholders didn't request this, we feel it important to tie our "solution" to tie the learning outcomes back to the original business needs. Here is a short assessment:

- **Talent Management:** Through the use of the virtual world, we were able to take the tried-and-true consultative skills content and convey it in an entirely different and applicable way.
- **Foster Innovation:** Since neither of the firms had comprehensive experience in 3D or other 2.0 technologies, this learning experience was considered very innovative and encouraged innovation between the participants given the collaborative environment and self-discovery enabled through the use of the virtual world.
- **Informal Learning:** The staggered timing and distance delivery model enabled by virtual worlds allows the learner an opportunity to "process" the learning in between the sessions. Additionally, the course design provided an opportunity for sharing of ideas through the research and also through the link to the networking site.
- **Adult Collaborative Learning Theory:** We feel that the virtual world platform allowed us to very successfully address this need through provision of a collaborative environment within a technology-enabled solution.
- **Value Proposition:** Again, the virtual world platform allowed us to bring the training to the participants, instead of the other way around. At the same time, the learners had direct contact with "experts" and the opportunity to share experiences with other participants. The staggered time schedule was less disruptive to the client-serving professionals. Overall costs were significantly lower than travel for a face-to-face event. In short, the virtual world provided the experience of a face-to-face event without the travel.

Measurable Benefits

"We have determined an opportunity for a positive return will be when companies are able to amortize their 3D world development costs and leverage their monthly user costs against travel savings for multiple classes. While a class size design consideration in 3D would be notably smaller with 15 participants and one facilitator, the hard cost of one face-to-face class in the real world could be a minimum of $1,000 per participant for a one-day class*. Additionally, there is the soft cost avoidance by minimizing the time participants are away from their work since the travel time and stress are diminished. (Client participant)

While 3D learning may not replicate completely the effectiveness of a face-to-face experience, we believe that for some course topics, such as our consulting skills course, a slightly reduced effectiveness is worth the savings, risks, and work efficiency gained through deployment of learning in 3D. Additionally, our project results indicate that while

expertise in action™

the hard cost savings might be only one consideration for virtual worlds, there is real value in designing effective learning for this environment (not just replicating face-to-face courseware in 3D world) and that there are opportunities for evaluation and measurement that have yet to be explored." Caroline Avey, ACS Learning Services senior learning strategist and proof of concept deign lead

As for Forterra, many of their customers have indicated a superior user experience in a virtual world over an audio or web conference meeting. "A Virtual World is less expensive to operate than audio or web conferencing," notes Chris Badger, vice president of Forterra Systems. "Therefore, the combination of savings for both training and general purpose meetings strengthens the overall ROI behind using a virtual world."

Learner Outcomes

Here are the results of some post-course evaluation against learning objectives.

As a result of this learning, I am able to:	Yes	Neutral	No
• Define different levels of client relationships	100%		
• Describe aspects of a successful consultative relationship	100%		
• Define BEAMS,™ a relationship building process	100%		
• Collaborate to explore skills of building consultative relationships	100%		
• Demonstrate a relationship-building skill	95%	5%	
• Assess performance of relationship-building skills	95%	5%	

Post-Course, Level 2 Evaluation for a 3D Immersive World
Note that we partnered with industry researcher Mitzi Montoya from North Carolina State University. Dr. Montoya has been gathering data on virtual world experiences, and she worked with us to develop this set of criteria for evaluating the experience. Here are the results of the post-course evaluation that was linked directly from the 3D site to Zoomerang, a free survey tool.

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I was intensely absorbed in the learning activity.	17%	58%	25%	0%	0%
I felt in control during the learning activity.	25%	58%	17%	0%	0%

expertise in action™

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
The environment was responsive to my actions.	25%	75%	0%	0%	0%
When working with my team in the environment, I was able to anticipate what would happen next in response to the actions that I performed.	17%	58%	25%	0%	0%
I used nonverbal cues (e.g., gestures) to communicate with my teammate(s) in the environment.	25%	0%	33%	42%	0%
I was able to examine objects I needed to from multiple viewpoints in the environment.	50%	25%	17%	8%	0%
I was deeply engrossed in the team activity.	25%	42%	33%	0%	0%
I noticed my teammate(s) using nonverbal cues when we were working together in the environment.	25%	17%	0%	58%	0%
I was able to closely examine the objects I needed to in the environment.	33%	50%	17%	0%	0%
The learning activity was interesting.	42%	58%	0%	0%	0%

Proof of Concept Conclusion

In evaluating options for the training, a face-to-face instructor-led setting was considered too disruptive to the participants and too costly, nor would it encourage participants to research, explore together and collaborate. Breaking the workshop into time chunks

enabled teams a realistic schedule that was not disruptive to their jobs and yet enabled independent and team work. This idea of a "time span" for learning, instead of a one-time event, was critical to our notion of creating a collaborative community that was in sync with the business instead of disrupting it.

expertise in action™

While a webcast could have supported some of the requirements, it lacked the sense of "immersion" that we wanted to build into the collaborative communities. The virtual world afforded an opportunity for "observation" of team and individual performance. A traditional web-based program was not considered an option, since again, we wanted to create a collaborative community and allow for observation.
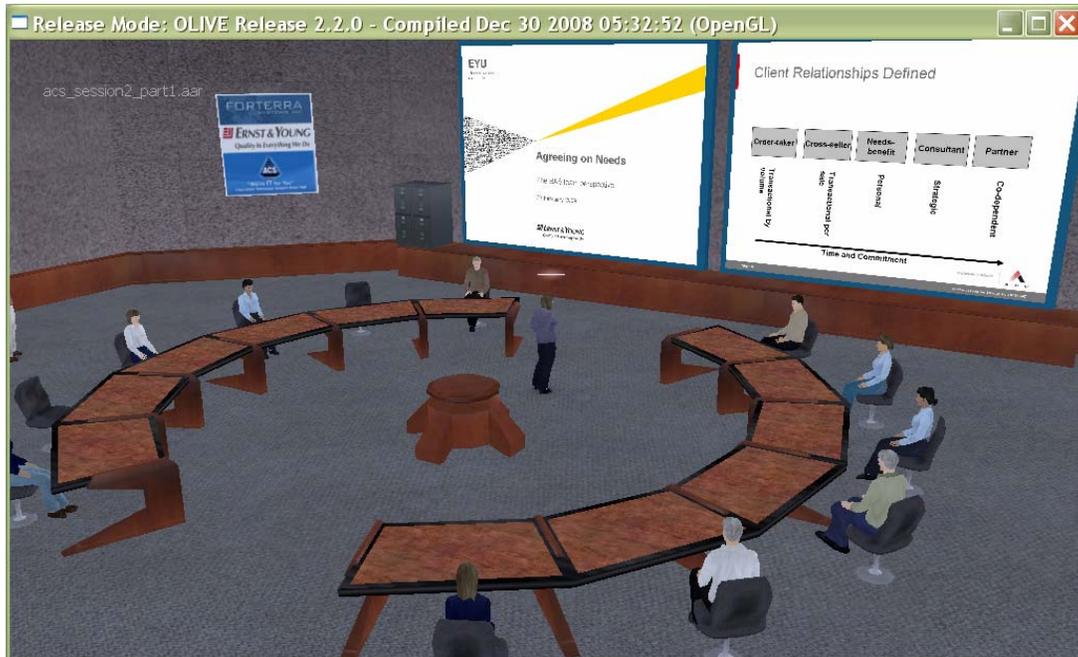
White Paper Summary

Based upon our 3D virtual world experiences both externally with clients and through internal trial and exploration, ACS Learning Services believes that 3D worlds provide a new and effective learning delivery platform. Specifically, 3D can be used in a variety of ways to include the following:

- Discovery learning by clicking on objects with associated information
- Reinforcement learning by offering a repository of job aids, tools, etc., again associated with objects in 3D
- Collaborative workspaces, such as 3D breakout rooms and informal sites for discussion, encouraging graduate school-style case study and research
- Traditional instructor-led learning through a distance delivery method
- Simulated learning by modeling a process or interaction that closely resembles the real world in terms of fidelity and outcomes

As a trusted partner and a leader in the delivery of cost-efficient learning BPO services, ACS will continue to offer flexible, adaptable and innovative solutions to our clients to help them grow and thrive in these uncertain times.

expertise in action™