

**Virtual Team Building: Employing Immersive Virtual Learning Environments to
Facilitate Team Trust and Identity**

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Tom Dennison, a metallurgical engineer with Northrop-Grumman walks into a coffee shop, dressed in his best business suit. “Hi, Tom, over here” shouts Lauren Winfield, another Northrop-Grumman metallurgical engineer. “Great looking ball gown, Lauren” Tom replies, thinking he should have dressed up. Soon they are joined by Josh Grabel, a major with the United States Air Force, who is dressed in a WWI Red Baron flight suit, and Corinne O’Brien, a nuclear physicist from California Polytechnic University, who today is dressed like the robot R2D2 from Star Wars. They all gather around a fireplace, sitting in highly sumptuous leather chairs in an upscale coffee shop; steaming cups of coffee sit on the mahogany table in front of them.

Sounds like a routine business meeting by a highly-skilled engineering team, right? Except that Tom is in Pascagoula, Mississippi, Lauren is in Norfolk, Virginia, Josh is at the Pentagon in Washington, DC, and Corinne is in California. Rather than spending hours and considerable expense to travel and meet in person, their avatars have come together in a virtual immersive environment, a three-dimensional ‘world’, meeting at a traditional venue—the ubiquitous coffee shop—to discuss their current design project for a new Air Force fighter jet. Oh, and of course, they are dressed in a manner that fits their personalities rather than a corporate dress code, all the while enjoying the comfort of their homes or offices.

Beginning approximately 6 years ago, this type of immersive virtual learning environment¹ (IVLE) has become increasingly more popular for social activities, meetings, product demonstrations, college courses, and a variety of other pursuits. Armed with highly complex software, a reasonably configured computer, and a fast Internet connection, many people have transcended the world of two-dimensional cyberspace into three-dimensional worlds where they become immersed in the virtual activity using an avatar, and participate in nearly every activity open to them in the real world. These IVLEs operate and occur in real-time, and allow for both text-based chat and voice-chat, all of which can be recorded for a permanent record as well as for reuse and distribution.

In this paper this author will investigate the use of IVLEs in general, and Second Life (a specific VLE) in specific as a means of providing high-quality virtual team formation and interaction. As the reader will see, at a time when budgets are severely restricted, companies are operating with lean staffs, and travel becomes increasingly more disruptive, an IVLE represents a more viable, efficient, and effective means for creating teams, deploying teams, and conducting team’s activities than more common two-dimensional virtual methodologies. Even with the infancy of the IVLE field, the reader should have no problem seeing that the future of global communal activities will be via three-dimensional cyberspace.

Emerging research is clear that IVLEs are here to stay, and will be an increasingly visible component of virtual experiences. A new study by Jarmon, et al., (2009) showed that working teams that operated in Second Life expressed satisfaction with the experience, the feeling of ‘being there’, and an overall transference of the activities to the real world while a similar study by Chodos, et al., (2009) indicated a high potential for IVLE use as compared to other forms of virtual interaction, particularly video. Others, such as Steven Warburton (2009a; 2009b; 2009c) have written also extensively about the richness of experience, the feeling of presence, and the development of connections and attachments promulgated by IVLEs.

In the interests of full disclosure, not all organizations have expressed the same comfort level with IVLEs as with two-dimensional modalities such as electronic mail, educational

¹ Immersive Virtual Learning Environments are also called Multi-User Virtual Environments (MUVES). For the purposes of this paper IVLE will be used but will mean both.

delivery platforms, and audio/video conferencing. In a white paper by Forterra Systems of San Mateo, California, the leading proprietary producer of IVLEs, Badger (2008) noted resistance by executives who equated virtual worlds as “a twin to video games” (p. 6). In addition, Forterra’s experiences closely link acceptance of IVLE use with existing organizational culture. Hansen, et al., (2008) conducted a study of 25 executives who were immersed in Second Life and isolated 7 “tensions” regarding the organizational role of virtual worlds. Thus, while most researchers concur that using IVLEs saves time and money, not all corporate and organizational leaders are ready to embrace the technology without reservation and without more hands-on use within their own unique cultures.

Definition of Terms

First, in order to create a firm framework for this paper, IVLEs are taken to exist within a broader context of a ‘*virtual world*’, a location in cyberspace that transcends the real world as we know and live. Although a unified, accepted definition does not exist, Mark Bell (2008) has posited a working definition by compiling and interweaving a variety of sources. According to Bell, a ‘*virtual world*’ is “A synchronous persistent network of people, represented as avatars, facilitated by networked computers” (pg. 2). The key element here is ‘persistent’, meaning that the virtual world continues full-time in cyberspace regardless of individual avatars that may come and go at will. Research clearly shows that IVLEs have added value as effective virtual places for play, learning, and work, with a major factor being the ease with which collaboration can be facilitated and encouraged (Messinger, et al., 2008; Waters, 2009).

Second, an avatar is simply a three-dimensional, digital, representation of a person that can perform actions and roles by a living human in real-time within a virtual world. Avatars may be any textual or graphical representation that may have a humanoid form, or that may take on any other created image. Figures 1 and 2 provide examples of two humans and their avatars. Research has clearly shown that humans develop a deep connection and identity with their avatars, whether those avatars closely resemble their actual selves or not (Yee, et al., 2009; Warburton, 2009a). Rebecca Nesson of Harvard University, a school with an old presence within the Second Life ILVE, also noted while real people are behind every avatar, they still bring their personalities, biases, likes, and dislikes into their virtual world, which further strengthens the sense that avatars are real, and their environment is real (Nesson & Nesson, 2008).

Figure 1



Figure 2



While some organizations may develop strict guidelines concerning avatar creation and use, this type of corporate control may very well backfire in the long run. As the researchers

from New Zealand's SLENZ project note, "Requiring students[or virtual team members] to remain in their initial pre-built form may be counter-productive and hamper rather than foster the feelings of engagement with the environment" (Salt, Atkins & Blackall, 2008, p. 16). Thus, perhaps allowing virtual team members to create unique avatars will have a positive effect on the overall success and efficacy of a virtual team.

A 'virtual team', for the purposes of this paper, is a team that goes through the typical phases of group development; forming, storming, norming, and performing within cyberspace by a group of individuals who are geographically dispersed with limited ability or need to communicate in a face-to-face manner. Virtual teams may conduct business via traditional two-dimensional methods such as electronic mail, instant messaging, texting, chatrooms, educational platforms (e.g. Blackboard and WebCT), WebExs, Webinars, audio conferencing, or other 'flat' synchronous or asynchronous methods. Virtual teams may also employ video modalities, such as video conferencing, Skype calling, video educational platforms (e.g. Wimba or Centra), or video instant messaging.

Virtual teams may also meet and conduct business in an IVLE, which by definition is a three-dimensional environment wherein the team members become 'immersed' inside a virtual world. IVLEs may employ typed chat, voice chat, and webcam video as well. Currently, IVLEs can be public (e.g. Second Life, Open Life, and Open Life Grid) or proprietary (e.g. Forterra Systems) depending on the purpose of the team. This paper will concentrate on these virtual teams.

Creating Virtual Teams

A virtual team is generally considered to be a group of people who work "across time, space, and organizational boundaries" strengthened by "webs of communication technology" in which collaboration and cooperation is facilitated and encouraged (Free Management Library, 2009, pg. 1). Others have echoed this 'definition' as virtual teams have evolved over the last two decades (Geisler, 2002; Jarvenpaa & Leidner, 1999; Kimball, 1997; Thompson, 2000).

Without question, the benefits for creating and deploying virtual teams are many, including cost savings, effective time management, and the ability to bring together a wide variety of dispersed individuals on a common project. The principal advantage is flexibility. Employees can work with each other without regard for their physical location, time zone or organizational affiliation (Williams, 2010). Virtual teams also lend themselves to including members outside the organizational boundaries such as customers and suppliers due to the limited time and travel commitment. Even so, experts caution that not every project can go virtual, and not every team member can work effectively on a virtual team. Thus, rather than a universal tool to be implemented widely, organizations must be cognizant to match virtual teams to virtual projects (Time Management Guide, 2009a, 2009b).

As with any organizational strategy, barriers exist with virtual teams as well, some of these being part and parcel of team building, such as trust and identity, and others concerning the technology hardware, software, and skills. Virtual teams must also learn to express themselves differently and in different contexts. This is difficult in a flat, two-dimensional environment. Traditionally, companies have had to resort bringing virtual teams together in offices or special trips to minimize this problem (Williams, 2010). As shown below, the IVLE, by its immersive nature solves this issue.

Researchers and academics like Jarvenpaa & Leidner (1999), Barbara Geisler (2002) and Robbins & Judd (2008) all point to trust and identity as two of the most significant barriers to for effective creation, operation, and maintenance of virtual teams. While these are critically

important to all teams, virtual teams by their very character amplify the bonding issues, thus making them even more important to organizations investigating the use of cyberspace.

As with all activities in cyberspace involving participants who have never met in a face-to-face environment, members of virtual teams may not ever truly 'know' the identity of their teammates. While one might argue that virtual teams composed of employees of the same organization have somewhat of a security factor, without the use of real-time video questions may still arise concerning members' identities. With two-dimensional, non-video virtual teams, individual identities may be a casualty of the 'flat' transmission mode. In other words, one team member may know the technical identity of another member, yet not feel any connection or relationship with a real being.

Likewise this is also true with trust among group members. Research has shown that trust levels suffer among members of virtual teams, particularly if the communication is asynchronous and not in real time, for example a team working strictly via electronic mail. (Jarvenpaa & Leidner, 1999). Without some visual component, many team participants 'see' their colleagues as email and instant messaging creators, not as real people, having the subsequent effect of reducing trust and cohesion among group members.

Finally, many authors highlight the importance of, and requirements for, high quality technological infrastructure and participant skills (Jarvenpaa & Leidner, 1999; Geisler, 2002).

Impact of IVLEs on Virtual Teams

Beginning with the creation of the SIMs computer games and continuing with the development of online gaming and virtual worlds, IVLEs began emerging around 2003 as a viable, yet futuristic, platform for more than just entertainment. As technology improved—especially graphics rendering—and Internet speeds increased, the ability for the masses to run IVLE software exploded, especially in the corporate world where high-end equipment has been the norm rather than the exception. Thus, while Geisler (2002) predicted the technology barriers early in the century, for many virtual teams these barriers no longer exist at all or at least with minimal disruption. One can only imagine the difference another five years will make.

IVLEs in general overcome, to varying degrees, the two major issues that have plagued virtual teams over the years, namely identity and trust. The question will be whether the advantages of immersive virtual worlds will be the panacea many expect, or whether new barriers will arise.

The major advantage, as this author sees it, centers on the sense of identity, belonging, and presence that develops when operating within a three-dimensional virtual world. For anyone 'playing' a virtual world 'game' (for, in reality, IVLEs are nothing but gaming software), the attachments that develop between avatars is undeniable. Indeed, in the social segment of these environments, albeit primarily the public ones, avatars from all over the globe meet, develop deep personal relationships, marry, have virtual families, divorce, and even die, all in a software created world that does not exist. Avatars make and sell goods, buy and sell property, build houses and businesses, all the while engaging as if these creations truly do exist. In fact, this author has often asked the question, "If I turn off my virtual world, does it continue to operate?" The answer is, of course, as Mark Bell pointed out—persistence.

Clearly, then, a virtual team that is created in a IVLE, meets in an IVLE, and successfully completes a project in IVLE, exists in nearly the same fashion as real live humans living on planet Earth. The connections and attachments provide a real sense of identity between the people behind the avatars. One can get a true sense of how this operates by spending even a small amount of time in an IVLE with their avatar.

Although from a social perspective an avatar's true identity is usually a closely guarded secret, details of which are only revealed to the closest of friends, because, of course, avatars are not always who they pretend to be just like in any computer-mediated social network setting. Even so, most players in the IVLE arena really don't seem to care, accepting other avatars at face value, and expecting the same. Thus, does it matter that Merrybelle that cute little avatar with the high heels, short skirt, and skimpy top might indeed be a middle-aged grandmother from Ohio? Does it matter that the snazzy avatar in the designer tuxedo, youthful hair, and young body might really be a retired truck driver from Poughkeepsie? In actuality, the answer is a resounding 'no', because participants in an IVLE—at least socially—want the fantasy to exist irrespective of the reality.

Extrapolating that to a virtual team, then, the true identities, looks, dress, and mannerisms of the group members really do not matter, since it is the avatars who conduct the team business, not the real people. IVLEs serve as a transformational device in which even the most unpopular, uncooperative, and unflattering employees can reinvent themselves and become fully accepted and fully functional members of a virtual team.

Professional relationships, and professionally-developed IVLEs, however, tend to be more open and transparent. Indeed, many companies who are now participating in one type of IVLE or another often strive to create avatars that look as close to their real selves as possible, some spending thousands of dollars for graphic artists to create lifelike avatars. Many of the proprietary IVLE developers, such as Forterra Systems, include lifelike avatars, many with faces so real one has to look twice.

With the attachment and identity that flows from team operations within an IVLE, trust building flows naturally. This author's personal experience has shown that avatars who meet in an IVLE form close and strong bonds, which are built on a foundation of trust. While this trust is not necessarily ground in actual real-world truth, it is grounded in the concept that what is being said and done is truthful within the mutually accepted confines of the virtual world. In other words, an avatar may be lying to my avatar about their gender, but I trust them when they share real feelings and emotions inside the IVLE. This is the same type of trust that virtual teams will be able to develop that is simply not possible in a two-dimensional virtual reality where little or no interpersonal investment occurs.

The bottom line, then, is that companies and organizations will have to make certain decisions when moving into the realm of virtual teams, decisions that revolve around constructs such as budgetary resources, secrecy and privacy of team projects, cost of IVLE creation, and the overall intent of the team. For some, having a proprietary virtual world will be mandatory, but for others socially open and available IVLEs will be more than satisfactory.

Second Life as Microcosm

For the purposes of this paper, a closer look at a specific ILVE seems beneficial for the reader who may or may not be familiar with online immersive virtual worlds. In this case the ILVE chosen is Second Life, a virtual world created by Linden Labs, and arguably the most popular, free, virtual 3D immersive software used today. Because Second Life (SL) is very popular, because it is free, and because many global citizens use SL for social networking purposes, this may be the first choice among organizations and virtual teams seeking a place in cyberspace for a quick meeting that does not require a high level of security.

Second Life is a server-side application which means the actual software, databases, and hardware resides at the Linden Labs corporate offices in San Francisco, California, and users access Second Life via the use of a viewer which resides on the user's computer. For the casual

user, or an organization for which a public ILVE is appropriate, Second Life makes an excellent, cost-effective choice albeit with some inherent security issues. For those organizations desiring more control over the actual software, some emerging IVLEs such as Open Life and Open Life Grid are available as client-side installations, although these environments are fairly new, lagging SL by about two years. For those companies that require complete encapsulation, proprietary ILVE packages that are client-side and self-contained are perhaps better choices.

The lure of IVLE use within organizations, whether for meetings, project development, employee networking, customer service, or vendor interfacing, is the inherent ability of virtual worlds to create ‘spaces’ wherein people can meet together in a physical sense, develop true interpersonal connections, bond, and conduct business in a mediated reality. Along the way, those same employees can have fun because “3D applications are more engaging, immersive, memorable, and fun than web conferencing and most e-learning content” (Badger, 2008, p. 4).

Instead of drab office conference rooms or dreary lookalike hotel meeting rooms, avatars can meet in SL in a multitude of whimsical and creative venues, dressed in wild costumes, fancy get-ups, or corporate attire. Indeed, this ability to transcend the tedium of real life has also been highlighted as a major resistance point for many executives (Badger, 2008). In the sections that follow, some venues in SL will be illustrated to give the reader a ‘feel’ of a virtual world populated by international avatars.

In SL, many avatars maintain residences and office mirroring real life, although generally far more appointed and luxurious the one might actually own. Figure 1 shows this author’s husband, Harleydoc Outlander, in his house in SL, providing a view of the living room which would make a cozy meeting area for a virtual team.

Figure 2 shows a meeting amphitheater at ISTE (International Society for Technology Education) Island, with a group gathering for a presentation. In this figure the reader will note quite a number of avatars, most of which look surprisingly normal. This presentation was by two nationally known online researchers (whose real names, alas, have been forgotten) and attended by nearly 50 people interested in the subject area.

Figure 1: Harleydoc’s House on Golden Eagle 1



Figure 2: Meeting Space on ISTE Island



While virtual teams might usually be pictured as small groups of between 3-5 individuals, certainly large organizations have teams of many more individuals, especially when suppliers, vendors, and customers are included. SL is awash in large meeting spaces, most of which can be used without specific permission. For those that may require permission or a scheduled event time, a simple 'IM' to the builder or owner often results in a positive response. Figures 3 and 4 are simply examples of some large meeting spaces.

Figure 3: Classroom Setting in the Round



Figure 4: Meeting Space with Avatars



The reader is invited to note that in Second Life, there is no inclement weather and the rules of physics are completely suspended. Thus seats float in the air, exist high in the atmosphere, are composed of an infinite array of materials and colors, and seem to be placed anywhere the builder and designers desire.

In addition to more traditional meeting spaces for larger group, SL is filled with interesting and quirky meeting spaces for smaller virtual teams. These spaces are often provided by residents who work and play in SL for fun—such as with any hobby—as well as for profits, most existing on generous ‘tips’ of Lindens from users. Among these spaces are a plethora of coffee shops, long favorite meeting places of real-world teams. Two examples of these spaces are shown in Figures 5 and 6.

Figure 5: One of Many SL Coffee Shops



Figure 6: Grey Hare Coffee Shop in SL



Many presenters in Second Life strive to provide a relaxing and inviting venue for participants, again without resorting to the traditional (and boring) settings in which most real-life meetings take place. In Figure 7, the presenter has scattered comfy beanbags about. In SL, thousands of places exist where virtual teams could gather, throw down some beanbags, beach towels, folding chairs, sofas, or any other furniture, conduct their meeting, and then ‘take’ the items back into inventory. Try doing that in the real world!

Figure 7: Presentation Space with Beanbags



Figure 8 is another example of flexible meeting spaces illustrating the author’s spouse Harleydoc’s beach house in SL, complete with a dock and western-facing view. Once a week Harleydoc conducted a graduate class where the students would meet, discuss the class materials, watch YouTube videos, and view PowerPoint presentations. When class was over many would hang around to dance on Harleydoc’s scripted dance floor, ride jet skis and boats, and spend non-academic time together. The class originated in a traditional setting on the East Carolina University SL campus, but the students voted to hold class on Harleydoc’s dock, watching the sunset and enjoying being ‘outside’.

Of course, whether all of this fantasy and whimsical opportunity transforms into increased effectiveness and usefulness may ultimately depend on the people behind the avatars; in other words, a new environment will not be a guaranteed panacea.

Figure 8: Harleydoc's Beach House and Graduate Class



As a final example, Figures 9 and 10 are screen captures of an Etiquette class conducted by Texas State Technical College staff. TSTC actually offers complete classes and training within the Second Life ILVE. The class was open to anyone, and about 20 avatars gathered for the one-hour presentation. During the class, the instructor from TSTC used voice to talk to the avatars, which did not use voice. The avatars also used open chat and instant message to communicate, as seen in Figure 10.

Figure 9: Etiquette Class Cocktail Party



Figure 10: Etiquette Class Scripted Table with Chat



Clearly organizations could conduct virtual teams, virtual training, and virtual meetings in much the same fashion, with little or no disruption as attendees and participants could join in from the comfort of their home or office. In fact, Harleydoc, who attended the etiquette class still remains friends with several of the ‘strangers’ he met, both personally and professionally, people he in all likelihood might never have met in the real world.

Conclusions and Parting Thoughts

Since teams are now such an integral part of most organization’s work structures due to the focus on improving productivity and efficiency, organizations are looking to get the most out of its teams while at the same time containing costs. Due to the nature of the economic situation and budget constraints being experienced at most organizations, virtual teams make sense. Virtual teams can take advantage of the many benefits of teams. They can include a diverse array of participants from inside and outside the organization. This allows organizations to take advantage of the knowledge base of customers, suppliers and other people outside the organization and combine it with the knowledge base of employees and managers in different departments and geographic locations. Using an IVLE such as Second Life can further enhance the virtual team experience and address many of the problems commonly encountered by traditional virtual teams. One advantage of using an IVLE for virtual teams is to create a sense of cohesiveness among team members through communicating with each other’s avatar in this immersive environment. It definitely gives one a sense of being part of the team. The technology has come a long way since the first introduction of virtual environments and it looks like it will continue improving and becoming more accessible to even to the novice technology user. In the not too distant future all meetings may be replaced by this type of technology as the benefits and cost effectiveness become more apparent to organizations.

Works Cited

- Badger, C. (2008). Recipe for success with enterprise virtual worlds. *Forterra Systems, Inc*
- Bell, M. 2008. Toward a definition of “virtual worlds”. *Journal of Virtual Worlds Research* 1(1), p. 2-5.
- Chodos, D., Naeimi, P., & Stroulia, E. (2009). An integrated framework for simulation-based training on video and in a virtual world. *Journal of Virtual Worlds Research* 2(1), p. 4-28.
- Geisler, B. (2002). Virtual teams. Retrieved 11-8-2009 from <http://www.newfoundations.com/OrgTheory/Geisler721.html>
- Free Management Library. (2009). Retrieved 11-8-2009 from <http://managementhelp.org/grp-skill/virtual/virtual.html>.
- Hansen, S., Berente, N., Pike, J., & Bateman, P. (2008). Productivity and play in organizations: Executive perspectives on the real-world organizational value of immersive virtual environments.
- Jarmon, L., Traphagan, T., Mayrath, M., & Trivedi, A. (2009). Virtual world teaching, experiential learning, and assessment: An interdisciplinary communication course in Second Life. *Computers & Education* 53, p. 169-182.
- Jarvrnpaa, S. & Leidner, D. (1999). Communication and trust in global virtual teams. *Organization Science* 10(6) p. 791-815.
- Kimball, L. (1997). The nature of virtual teams. *Speech for Team Strategies Conference*, Toronto, ON.
- Messinger, P. (2008). A typology of virtual worlds. *Journal of Virtual Worlds Research* 1(1), p. 1-18.
- Nesson, R. & Nesson, C. (2008). The case for education in virtual worlds. *CyberOne Wiki*. Retrieved April 24, 2009 from http://cyber.law.harvard.edu/cyberone/wiki/The_Case_for_Education_in_Virtual_Worlds.html.
- Parker, G. (2009). New teams in the workplace. Retrieved 11-8-2009 from <http://www.glennparker.com/Freebees/new-teams.html>
- Piccoli, G., Rami, A., & Ives B. (2001). Web-Based virtual learning environments: A research framework and a preliminary assessment of effectiveness in basic IT skills training. *MIS Quarterly*. 25(4), p. 401-426.
- Robbins, S. & Judge, T. (2008). *Organizational Behavior*. Saddle River, NJ: Pearson Prentice-Hall.
- Salt, B., Atkins, C., & Blackall, L. (2008). Engaging with Second Life: Real education in a virtual world. Literature Review. *The SLENZ Project for the New Zealand Tertiary Education Commission*. p. 1-99.
- Thompson, J. (2000). Leading virtual teams. Retrieved 11-8-2009 from <http://www.qualitydigest.com/sept00/html/teams.html>.
- Time Management Guide. (2009). Online meeting basics. Retrieved 11-08-2009 from <http://time-management-guide.com/virtual-team.html>
- Time Management Guide. (2009). Virtual team benefits and challenges. Retrieved 11-08-2009 from <http://time-management-guide.com/virtual-team.html>
- Yee, N., Bailenson, J., & Ducheneaut, N. (2009). The Proteus effect: Implications of transformed digital self-representation on online and offline behavior. *Communication Research*, 36. Sage Publications. p. 285-312.

Warburton, S. (2009). Loving your avatar: identity, immersion, and empathy. *Liquid Learning Blog*, <http://warburton.typepad.com>.

Warburton, S. (2009). Second Life in higher education: Assessing the potential for and the barriers to deploying virtual worlds in learning and teaching. *British Journal of Educational Technology* 40(3), p414-26.

Warburton, S. (2009). Six barriers to innovation in learning and teaching in MUVES. *Liquid Learning Blog*, <http://warburton.typepad.com>.

Waters, J. (2009). A “second life”. *T.H.E. Journal*, January, pp. 30-34.

Williams, C. (2010). *MGMT2*. Mason, OH: South-Western Cengage Learning.