

5-2010

Sense of Place in Virtual World Learning Environments: A Conceptual Exploration

Vipin Arora

University of Nebraska at Omaha

Deepak Khazanchi

University of Nebraska at Omaha, khazanchi@unomaha.edu

Follow this and additional works at: <https://digitalcommons.unomaha.edu/isqafacproc>

 Part of the [Databases and Information Systems Commons](#)

Recommended Citation

Arora, Vipin and Khazanchi, Deepak, "Sense of Place in Virtual World Learning Environments: A Conceptual Exploration" (2010). *Information Systems and Quantitative Analysis Faculty Proceedings & Presentations*. 8.
<https://digitalcommons.unomaha.edu/isqafacproc/8>

This Conference Proceeding is brought to you for free and open access by the Department of Information Systems and Quantitative Analysis at DigitalCommons@UNO. It has been accepted for inclusion in Information Systems and Quantitative Analysis Faculty Proceedings & Presentations by an authorized administrator of DigitalCommons@UNO. For more information, please contact unodigitalcommons@unomaha.edu.



Sense of Place in Virtual World Learning Environments: A Conceptual Exploration

Vipin Arora

University of Nebraska at Omaha
varora@unomaha.edu

Deepak Khazanchi

University of Nebraska at Omaha
khazanchi@unomaha.edu

ABSTRACT

In this paper we conceptually explore the notion of sense of place and its potential use in the design of a ‘place for learning’ in 3D immersive environments such as virtual worlds. We draw from earlier research in the fields of environmental psychology, social psychology and Human Computer Interaction. Our goal in this paper is to summarize the conceptual foundations that will form the basis for further empirical research aimed to inform institutions aspiring to create learning spaces in 3D virtual worlds.

Keywords

E-learning, Virtual worlds, Sense of place

INTRODUCTION

Research in the educational use of graphically rich, 3D virtual worlds provides compelling evidence of their potential for active and experiential learning (Dickey, 2003). There have been a variety of educational initiatives incorporating 3D virtual environments both as a supplement to traditional classroom education and as a primary medium for distance education (Barab, Hay, Bamett & Squire, 2001; Corbit & DeVarco, 2000; Dickey, 2003). Since 3D virtual environments are relatively new, there is much to be known about how they might best be designed to support learning. Educational research regarding 3D virtual worlds and their effects on learning outcomes is lacking. In the recent years, scholars have moved forward in conducting research about virtual worlds but there is lot more to be done (Bainbridge, 2007; Davis et al., 2009). Research associated with the design of 3D environments has revealed some issues that may potentially impact learning. Some of the problems that users experience in 3D virtual learning environments (VLEs) are feeling of isolation, disorientation, difficulty in navigation, and way finding (Marsh & Wright, 2000; Dede, 2003). People find it difficult to identify and reach a particular place, locate previously visited places, and construct a cognitive map of the environment. This concern is compounded when a virtual environment is being used for education and even more so when used as a medium for e-learning (Dickey, 2004). Another key issue relates to the models of learning spaces in virtual worlds that range from replicas of real life buildings and spaces with the look and feel of a real campus, to the extremes of imaginary or fantasy locations (Jennings & Collins, 2007). Minocha et al. (2008, p. 230) correctly conclude that, “[W]ith such a wide range of possibilities, research is needed to investigate which kinds of virtual environments students find conducive for learning and for the socialization which supports this. However, there is little published research on the design and evaluation of 3D learning environments. Therefore, when institutions aspire to create learning spaces in 3D virtual worlds, there are few studies or guidelines to inform them.”

Researchers in the past have proposed methods and models for designing virtual environments to foster way finding and reducing disorientation. These include the use of environmental cues by overlaying semi-transparent virtual maps and grids across the environment (Darken and Sibert, 1996), architectural environmental perspectives by placing objects such as landmarks and signs (Chariots, 1997; Dickey, 2004), and cinematography conventions such as exit and entry points like doors and paths (Marsh and Wright, 2000).

There has been some research on the effect of sense of place on the learning experience of students in 3D virtual worlds. Clark and Maher (2001) developed a virtual design studio where students could go to present, discuss, and develop website designs. The response of the students to learning was found to be positive. The same researchers later created a classroom-like place surrounded by student galleries and used it for teaching a website design course. Analyzing the discussions that took place in the virtual learning place, they found that the virtual place provided the students with a way of focusing attention and a context for discussion (Clark and Maher, 2003).

OUR RESEARCH

Given the previous background, our overall research goal is to study the concept of ‘sense of place’ and its potential use in the design of virtual learning environments (VLE) in a more holistic way by incorporating the phenomenological,

sociological, and psychological perspectives of physical learning spaces from the well established fields of social and environmental psychology (Relph, 1976; Tuan, 1977; Canter, 1997). We also draw from some earlier research in the field of Human Computer Interaction (HCI) (Erickson, 1993; Benford et al., 2001). Our contention is that by providing a *replica* of a university's real-life campus in a virtual world, we can convey a message about its intended use to potential learners. The learners may feel a psychological/emotional connection to this environment that may result in their regular visits and frequent interactions with other learners and instructors. This may help reduce the feeling of isolation experienced by distance learners. Moreover, as learners get more acquainted to this environment, the above mentioned issues of disorientation and navigation difficulties may also get resolved.

Therefore our overarching research question is as follows: *Does the design of the learning environment (replicas of real life buildings and spaces with the look and feel of a real campus vs. imaginary or fantasy locations) affect the sense of place of e-learners in Virtual Worlds?*

In addressing this research question, the ultimate goal of our study is to provide guidelines for institutions interested in creating learning spaces in virtual worlds. In this paper we describe the conceptual foundations that will form the basis for addressing this question. In the next section, we discuss the relevant theoretical foundations followed by a discussion of what we mean by sense of place. We conclude the paper with a discussion of next steps.

THEORETICAL FOUNDATIONS

Space and Place

Ciolfi and Bannon (2005) assert that the physical environments we inhabit shape our everyday experiences and activities. They further argue that we are emotionally attached to particular physical environments because they mean something to us and evoke strong feelings and emotions. The importance of space and spatial metaphors for interface design supporting social interaction are evident in earlier HCI literature (Erickson, 1993 and 2000). Lainer and Wagner (1998) discuss how specific qualities of social use can be supported through the design of appropriate spaces, whether physical or digital. This vision is based on an assumed direct connection between physical qualities of spaces and the patterns of social activities occurring within them. In both these cases, space is not seen as simply a 'stage', but rather as the 'substrate' for human interaction. Thus, *it is possible to support and even trigger particular uses and behavior within a space through the features of its physical design*. The importance of the notion of space has also been highlighted within virtual and augmented reality systems, particularly with respect to the design of collaborative virtual environments (Benford et al., 2001).

Place is defined in anthropological terms as *a space that has acquired meaning as a result of human activities* (Nova, 2005). Space becomes place when we associate context, activity, behavior, and emotions with it. Fitzpatrick (2003) proposes place, and not space, as the foundational metaphor for her "Locales Framework", a perspective on the analysis and design of collaborative systems. She argues that place represents a lived relationship with the structures and resources that support communication and interaction within a group. Many other researchers also suggest that 'place', rather than space, should be the term to describe environments that people invest with understandings, meanings, and memories (Relph, 1976; Erickson, 1993; Harrison and Dourish, 1996; Turner and Turner, 2006).

Sense of Place

The term 'sense of place' is often used in relation to those characteristics of a place that make it special or unique, as well as those that foster a sense of belonging and authentic human attachment with the place (Relph, 2007). *A sense of place has to do with the interaction of three elements—location, landscape, and personal involvement; each by itself usually is insufficient to create a sense of place* (Salvesen, 2002). In other words, 'sense of place' refers to one's ability to grasp and appreciate the distinctive qualities of places (Relph, 2007).

The research about sense of place can be divided into three major themes—the phenomenological, the sociological, and the psychological.

Phenomenological Perspective

Relph (1976, p. 47) identifies three broad dimensions of place identity. In his words, "The static physical setting, the activities, and the meanings—constitute the three basic elements of the identity of places." Tuan's work (1977) has been a parallel source of inspiration for place researchers. For Tuan, place entails a continuing relationship: "What begins as undifferentiated space becomes place as we get to know it better and endow it with value." Turner and Turner (2003) also conclude that this perspective of place can be used to inform the design of virtual models of real places.

Sociological Perspective

The work of the sociologist Gustafson (2001) provides a representative example of a more data-driven approach to place. Based upon a semi-structured interview survey of fourteen people who were asked about places that were important to them, Gustafson identified three main themes: the self, the environment, and the others. Tuan (1998) discusses the many layers of human experience that contribute to making a space into a place: *sensory perceptions, memories, feelings, social connections and the presence of others, cultural rules and conventions.*

Psychological Perspective

The work of environmental psychologists also includes the study of place. For example, Canter (1997) developed a facet theory of place that includes activities, physical characteristics, the individual, social and cultural experience and the scale of the place. More recently, Jorgensen and Stedman (2001) propose that the interpretation of sense of place could benefit from its treatment as an attitude. They conclude that the attitudinal components of sense of place are: (i) beliefs about the relationship between self and place (the cognitive component); (ii) feelings towards the place (the affective component); and (iii) behavioral exclusivity of the place compared with alternatives (the conative component).

From this brief review, it is apparent that irrespective of the organizing framework, the components of **sense of place** generally comprise:

- The physical characteristics of the place;
- The affect and meanings including memories and associations;
- The activities afforded by the place; and
- The social interactions associated with the place.

Relationship between Physical Places And Learning

“It’s an axiom of design that the physical environment sets a psychological mood, and research has shown the tremendous effect of the total atmosphere on learning outcomes” (Swor, 1987). Environments that provide experience, stimulate the senses, and encourage the exchange of information can support active learning (Lippincott, 2006). At the same time, environments that evoke positive emotional responses may also enhance learning experience apart from causing an emotional attachment to that space (Graetz, 2006). Graetz summarizes this by saying, “[I]t may become a place where students love to learn, a place they seek out when they wish to learn, and a place they remember fondly when they reflect on their learning experiences.”

Strange and Banning (2001) emphasize the importance of physical aspects of a campus by citing research that links the physical attractiveness of a space to the motivation and task performance of those in the space. Peck (1993) reviewed research on how space makes us feel and related it to knowledge creation, communication, and application, arguing that space configurations exert powerful influences on these activities.

Educational institutions such as universities, colleges and schools have long understood the importance of providing a ‘place’ in which learning activities can be supported (Clark and Maher, 2003). Place in these institutions include the usual familiar structures - classrooms, lecture theatres, laboratories, libraries, and conference rooms. This environment provides students the tools, resources and facilities to build a learning community where they can engage in building knowledge and understanding (Clark and Maher, 2003).

Sense of Place in Virtual Environments

Research dealing with physical space also includes studies with the virtual environment as a faithful or a realistic re-creation of natural environments. Researchers have found that the similarity of virtual space with natural space is an important element in the users’ spatial navigation and orientation (Rinalducci, 1996; Colle and Reid, 1998), and have argued for designing virtual environments as truly realistic reproductions of real environments (Hirose et al., 1996).

Virtual communities became aware of the significance of sense of place during the 90s (Clark and Maher, 2003). This was in contrast to Meyrowitz’s (1986) notion that virtualization would create a sense of placelessness. A key role of ‘virtual places’ is to provide a context for an activity. Virtual places within the virtual community provide an environment in which dynamic interactions could occur (Harrison and Dourish, 1996). According to Relph (2007, p. 22), “for education, games and research it is important to design what might be called virtual geographical places, those that capture the manifold qualities of the real world.” Similarly, Nesson and Nesson (2008, p. 280) assert that “a virtual campus that provides a persistent sense of place and a platform for the formation of interpersonal relationships and community pride offers the missing piece in distance

education.” According to Relph (2007), a sense of virtual place in virtual environments develops through participation and engagement and it is likely to be just like a sense of real place. “It (a sense of virtual place) will involve many senses and emotions because it is mediated electronically.” (Relph, 2007, p. 24)

DISCUSSION

A virtual world learning environment (VWLE) brings in the social context, an essential element for learning, which is often missing in other traditional e-learning tools. This social context can make the students’ learning experience engaging and satisfying. Students may feel that they are actually present in an environment where they can find resources including other students and instructors, to support their learning. A unique thing about VWs is that they offer a sense of place, a sense of presence and a sense of presence of others in the place (Clark and Maher, 2001; Mason & Rennie, 2008, p. 88). As discussed above, a holistic view of the concept of sense of place captures all three of these to a large extent.

Selecting a virtual world as the technology for a virtual learning environment provides the basis for a place, but the place itself needs to be designed (Minocha et al., 2008). Based upon the review of the literature about the concept of sense of place in the physical (real) world, we contend that the design of learning spaces in the virtual worlds needs to be influenced by the learners’ understanding of a place associated with learning activities. To achieve the sense of place within a VWLE, its design must convey a message to the learners about the nature of the place and the expectations of how it will be used. Hence, this design should replicate the physical characteristics of the learning environments that the learners are used to in the real world (e.g. schools colleges and universities). This will provide opportunities for learners to develop the same kinds of meaning and emotional attachment as experienced by them in real learning places. They will be motivated by the real campus like look and feel of the virtual world campus. The resulting initial engagement of the learners with the learning environment may also help them in utilizing the unique educational advantages (e.g. ability to actively interact with 3D-objects and experiment without real world repercussions) afforded by the technology capabilities inherent in virtual worlds.

Incorporating place in virtual learning environments has pedagogical significance as well (Clark and Maher, 2003). Persistent contact of the students with the class community and with instructors is considered a main factor in explaining the difference in quality of learning experience between face-to-face and distance learners (Nesson and Nesson, 2008). In college campuses in the physical world, students interact with other students and professors formally as in classes and in the professors’ offices during office hours, and also informally as in lawns, cafeterias, libraries, student centers etc. These interactions contribute to the learning experience of the students. We contend that by designing the virtual campus like a physical campus, we can provide the students with an opportunity to have similar experiences in the virtual campus. They can schedule (virtual) meetings with other students or with professors at specific ‘places’ within the virtual campus. This may help in overcoming the feeling of isolation of distance learners. The virtual campus will act as an inviting place to which students will have the desire and purpose to come and spend quality time performing meaningful activities and interacting with other learners and instructors. Finally, as learners get more acquainted to the virtual campus and the location of specific ‘places’, the issues of disorientation and navigation difficulties often associated with virtual worlds may also get resolved.

It must be understood that to ensure students’ desire and purpose to come to such a learning environment, learning activities will need to be designed so that learners are required to spend quality time in learning and interacting with other learners and instructors. Learners will form relationships and communities over a period of time. This feeling of community brings a social element and also a sense of responsibility to the educational experience (Nesson and Nesson, 2008). Also to maintain the educational environment of the virtual campus, entry to the virtual campus may need to be restricted to enrolled students only. VWLEs fundamentally change the way things are taught and students are engaged. Hence, the standards by which student achievements are judged and the methods by which student accomplishments are evaluated will also need to be changed to reflect that change (Sheingold and Frederiksen, 1994).

SUMMARY AND CONCLUDING REMARKS

In this paper we have laid out the conceptual foundations of the concept of sense of place and discussed how we can make use of it in the design of learning environments in virtual worlds. Sense of place is only one of the several variables that can potentially affect learning in virtual worlds. For example, role of collaboration involving interaction among learners and instructors would be very important. We intend to extend our work by doing further empirical research to address the research question raised in this paper. We will design an experiment wherein two groups of students will be exposed to different types of VWLEs in a virtual world such as Second Life. One group will visit a university that has been designed to mirror its real life campus, and the other will visit a university that has been designed as an open space with no resemblance

to its physical campus. In our study, we expect to use survey instruments to measure the students' perceived sense of place, disorientation and isolation. In addition, qualitative data in the form of videos and social interactions will be collected. With new development in VW capabilities it is becoming possible for people to create their avatars to resemble their real life appearance. For future study, it may be interesting to see whether using such avatars makes any difference in the interaction with others and students' overall learning experience in VWLEs.

REFERENCES

1. Bainbridge WS. (2007). The scientific research potential of virtual worlds. *Science* 2007 Jul 27; 317(5837):472-476.
2. Barab, S.A., Hay, K.E., Barnett, M.G. and Squire, K. (2001). Constructing virtual worlds: tracing the historical development of learner practices/understandings. *Cognition & Instruction*. 19(1) pp. 47–94.
3. Benford, Steve, Greenhalgh, Chris, Rodden, Tom, Pycock, James (2001). Collaborative virtual environments. *Communications of the ACM* 44 (7): 79-85.
4. Canter, D. (1997). The facets of place. In G. T. Moore and R. W. Marans (Eds.), *Advances in environment, behavior, and design*, Vol. 4: Toward the integration of theory, methods, research, and utilization. New York: Plenum, 109–147.
5. Charitos, D. (1997). Designing Space in Virtual Environments for Aiding Wayfinding Behaviour. *Proceedings of the fourth. UK VR-SIG Conference, 1997*.
6. Ciolfi, L. and Bannon, L. J. (2005). Space, place and the design of technologically enhanced physical environments. In P. Turner and E. Davenport, Eds. *Space, Spatiality and Technology*, Springer, London.
7. Clark, Steve and Maher, Mary Lou (2001). The Role of Place in Designing a Learner Centered Virtual Learning Environment, *Proceedings of the Ninth International Conference on Computer Aided Architectural Design Futures* [ISBN 0-7923-7023-6] Eindhoven, 8-11 July 2001, pp. 187-200.
8. Clark, S. and Maher, M.L. (2003). The Effects of a Sense of Place on the Learning Experience in a 3D Virtual World. In Cook, J. and McConnell, D. (Eds). *Communities of Practice. Research Proceedings of the 10th Association for Learning Technologies Conference (ALT-C2003)*, pp 82-101.
9. Colle, H.A. & Reid, G.B. (1998). The room effect: Metric spatial knowledge of local and separated regions. *Presence: Teleoperators and Virtual Environments*, 7 (2), 116-128.
10. Corbit, M. & DeVarco, B. (2000). SciCentr and BioLearn: Two 3-D implementations of CVE science museums. In E. Churchill and M. Reddy (Eds.), *Proceedings of the Third International Conference on Collaborative Virtual Environments*, 5-71. New York: Association for Computing Machinery.
11. Darken, R. P. and Sibert, J. L. (1996). Wayfinding Strategies and Behaviors in Large Virtual Worlds. In *Proceedings of CHI '96: ACM conference on Human Factors in Computing Systems*, 142-149.
12. Davis, A., Owens, D., Murphy, J., Khazanchi, D. and Zigurs, I. (2009). Avatars, People, and Virtual Worlds: Foundations for Research in Metaverses. *Journal of the Association for Information Systems*, Volume 10, Issue 2 , Article 2, pp. 90-117.
13. Dede, C. (2003). No cliché left behind: Why education policy is not like the movies. *Educational Technology* 43, 2 (March-April), 5-10.
14. Dickey, M.D. (2003). Teaching IN 3D: Affordances and constraints of 3D virtual worlds for synchronous distance learning. *Distance Education* 24(1).
15. Dickey, M.D. (2004). An architectural perspective for the design of educational virtual environments. *The Journal of Visual Literacy*. 24(1). pp 49-66.
16. Erickson T. (1993). From Interface to Interplace: The Spatial Environment as a Medium for Interaction. *Proceedings of the COSIT'93*, pp. 391-405, LNCS 716, Springer.
17. Erickson, T. (2000). Towards a Pattern Language for Interaction Design. In *Workplace Studies: Recovering Work Practice and Informing Systems Design*. (ed. P. Luff, J. Hindmarsh, C. Heath). Cambridge: Cambridge University Press.
18. Fitzpatrick, G. (2003). *The Locales Framework: Understanding and Designing for Wicked Problems*, Kluwer Academic Publishers.
19. Graetz, Ken A (2006). *The Psychology of Learning Environments*. In Oblinger, D.G. (Ed.) *Learning Spaces*. EDUCAUSE, USA.

20. Gustafson, P. (2001). Meanings of place: Everyday experience and theoretical conceptualizations. *Journal of Environmental Psychology*, 21, pp. 5–16.
21. Harrison, S., & Dourish, P. (1996). Re-place-ing space: Theroles of place and space in collaborative systems. *Proceedings of the 2006 20th anniversary conference on Computer supported cooperative work* pp. 299-308. ACM Press.
22. Hirose, M., Takahashi, K., Koshizuka, T., Morinobu, T., & Watanabe, Y. (1996). An Alternate Way to Generate Virtual Worlds: A Study of Image Processing Technology for Synthetic Sensations. *Presence: Teleoperators and Virtual Environments*, 5 (1), pp. 61-71.
23. Jennings, N. and Collins, C. (2007). Virtual or Virtually U: Educational Institutions in Second Life. *International Journal of Social Sciences* 2(3) pp. 180-186.
24. Jorgensen, B. S. & Stedman, R. C. (2001). Sense of place as an attitude: Lakeshore owners attitudes towards their properties. *Journal of Environmental Psychology*, 21, 233–248.
25. Lainer, Rüdiger, Wagner, Ina (1998). Connecting Qualities of Social Use with Spatial Qualities, Proceedings of the First International Workshop on Cooperative Buildings, Integrating Information, Organization, and Architecture, pp.191-203.
26. Lippincott, Joan K (2006). Linking the Information Commons to Learning. In Oblinger, D.G. (Ed.) *Learning Spaces*. EDUCAUSE, USA.
27. Mason, R. and Rennie, F. (2008). *E-learning and social networking handbook*, New York: Routledge.
28. Marsh T. and Wright, P. (2000). Using cinematography conventions to inform guidelines for the design and evaluation of virtual off-screen space. *In AAAI 2000 Spring Symposium Series Smart Graphics*, pp. 123-127.
29. Meyrowitz, J. (1986). *No Sense of Place: The Impact of Electronic Media on Social Behavior*, Oxford University Press Inc., New York.
30. Minocha, Shailey, Kear, Karen, Mount, Nick and Priestnall, Gary (2008). Design of Learning Spaces in 3-D Virtual Environments. *Proceedings of the Researching and Learning in Virtual Environments (Re-LIVE08)*, 20th-21st November, 2008, Open University, UK.
31. Nesson, R. and Nesson, C. (2008). The case for education in Virtual Worlds. *Space and Culture*, 11(3): 273-284.
32. Nova, N. (2005). A review of how space affords socio-cognitive processes during collaboration. *PsychNology Journal*, 3, 118-148.
33. Peck, M. Scott (1993). *Meditations from the Road* (New York: Simon and Schuster, 1993).
34. Relph, E. (1976). *Place and placelessness*. London: Pion.
35. Relph, E. (2007). Spirit of Place and Sense of Place in Virtual Realities. *Technè* 10:3 Spring 2007.
36. Rinalducci, E.J. (1996). Characteristics of Visual Fidelity in the Virtual Environment. *Presence: Teleoperators and Virtual Environments*, 5 (3), 330-345.
37. Salvesen, David (2002). The Making of Place from ULI MAGAZINE July 2002.
38. Sheingold, K., & Frederiksen, J. (1994). Using technology to support innovative assessment. In B. Means (Ed.), *Technology and education reform: The reality behind the promise* (pp.111–132). San Francisco, CA: Jossey-Bass.
39. Strange, Carney C. and Banning, James H. (2001). *Educating by Design*, San Francisco: Jossey-Bass, 2001.
40. Swor, Julie (1987). Site Design: Meeting of the Minds. *Training*; Dec 1987; 24, 12.
41. Tuan, Y.-F. (1977). *Space and place: The Perspective of Experience*. Minneapolis: University of Minnesota Press.
42. Tuan, Y.-F. (1998). *Escapism*. Baltimore and London: Johns Hopkins.
43. Turner, P., & Turner, S. (2003). Two phenomenological studies of place. *People and Computers XVII-Proeedings HCI Conference*, 21–35.
44. Turner, Phil and Turner, Susan (2006). Place, sense of place, and presence. *Presence: Teleoperators and Virtual Environments*, v.15 n.2, p.204-217, April 2006.