The Birth of the Virtual Clinic: Game Spaces in "The Virtual Practicum" and *The Virtual Terrorism Response Academy*

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ABSTRACT

The Interactive Media Laboratory at Dartmouth Medical School produces computer games and multimedia programs for public health preparedness. With Department of Homeland Security funding, the IML is developing the *Virtual Terrorism Response Academy*, which uses game technology to prepare first responders for rescue efforts in which hazardous materials may be involved. This paper looks at the history of the "Virtual Clinic" concept and the original rationale for creating what Max Boisot calls "epistemology space." It also offers an account of the VRTA designers' responses to potential criticism from learning specialists in game studies who object that the game is too didactic and discourages trial-and-error by restraining the learner in the narrative conceit of a "simulation of a simulation."

Keywords

Education, first responders, computer game, risk communication, digital experience

INTRODUCTION

Risk communication involves the transmission of vital information to the civilian population before, during, and after emergencies to forestall panic, distrust, or disregard for the rule of law. As governments respond to anxieties from the public about the likelihood of another catastrophic terrorist attack or a global flu pandemic, risk communication receives more public funding, and risk communicators pursue opportunities to use digital media. At the same time, medical education and public health training is following the lead of the aviation industry by integrating computer-generated learning scenarios that use simulation technology, 3-D rendered digital art assets, and computer game engines. As educational institutions begin to recognize the importance of identities of the screen and computer-mediated social actors [11], the training of emergency first responders for potential crises is moving to embrace the use of new technology.

Pedagogical rhetoric and the rhetoric of public health intersect in several digital media projects at Dartmouth's Interactive Media Laboratory, which has pioneered providing training materials to first responders and other medical professionals via educational videogames and story-based interactive CD-ROMs that repurpose conventions from commercial platforms. Using project documents, interviews with members of the IML's software development team, and conference presentations and papers by the principal investigator, a different model of risk-tasking and initiation into a community of professional expertise appears to be embodied and dramatized, which mediates between the need for continuity with traditional didactic education from the podium – and the chain of command and lessons of authority that it represents – and the promise of learner-directed experimentation and play.

The IML's most recent projects, funded by the United States Department of Homeland Security, employ videogame and simulation technology to educate first responders about proper procedures in the event of a nuclear, radioactive, chemical, biological, or explosive attack. Although these programs can be understood in the larger genre of "risk communication" in government rhetoric, the interactivity of digital game play presents that risk fundamentally differently. As James Paul Gee and other researchers who study videogames have argued, digital learners are encouraged to experiment in ways that may result in failure, because they are always cognizant that "do-over" options exist [5]. Despite a similar do-over structure in the IML's *Virtual Terrorism Response Academy*, which uses a Quake engine to recreate a contaminated urban warehouse, the learner is actively discouraged from trial and error.

For example, mentor figures frequently intervene in game play to remind learners that they are essentially in what Noah Falstein has called a "simulation of a simulation" in which the 3-D virtual space is just a stage for a pedagogical fiction within yet another pedagogical fiction [3]. Thus, the immersive character of the digital experience is intentionally diminished, and otherwise implicit instruction is made highly explicit. References to traditional discursive practices associated with knowledge-making in the field of medicine – such as textbooks, lectures, manuals, files, and patient case studies – are important ephemera in the user's experience, because many of the titles from the IML present mystery narratives about problem-solving in radically unfamiliar scenarios.

REGIMENTAL SURGEON

Early IML titles were designed for medical personnel in the armed forces who would have to respond to complex scenarios with events that could appear initially to have too few explanatory causes and later seem to have too many, often conflicting, possible causes. In *Regimental Surgeon* (1989), a new doctor arrives at the base and must solve the mystery of a "fever of unknown origin." During the course of the interactive story, the mysterious disease is revealed to be malaria, although the statistical information is clouded by a number of heat-related casualties. The user's first-person point of view shuttles between separate characters who also introduce stock attitude about physicians. The player can look at documents, which provide the opportunity to develop certain subplots, and concoct plausible reasons to leave the base for further investigation.

THE VIRTUAL PRACTICUM SERIES

With the Virtual Practicum series, the IML began to work with a more adventurous pedagogical rationale that emphasized what Max Boisot has called "E-space" to describe "epistemological spaces" or environments closely associated with knowledge acquisition. By drawing on information-oriented theories of communication, the head of the IML, Joseph Henderson, uses Boisot to justify using video and sound in these multimedia learning materials to "convey the less coded, essential features" [6] of the chaotic clinical environment and the multiple channels of "gesture, speech, tone, clothes, movement, in the service of messages whose complexity would overwhelm the single channel" [2].

Henderson also credits commercial software with influencing his design philosophy of the Virtual Practicum, including problem-solving games, such as *Deus Ex* and *Crystal Caves* [8]. In the Virtual Practicum products a number of games that "range from easy to moderately difficult" are integrated: "categorization of challenge statements, unscrambling jumbled lists, labeling diagrams, matching challenge statements to images" [6]. Although IML designers describe them as "enjoyable and popular," these "puzzles" are not yet truly "games" in the sense that the narrative and the procedural rules for generating a right answer are not integrated in a coherent experience of play [9]. They are, however, game-like to the extent that they involve spatial exploration, problem solving, and role playing activities.

Primary Care of the HIV/AIDS Patient

In *Primary Care of the HIV/AIDS Patient* (2001) the "Virtual Clinic" is demarcated by floor plans, cutaways, and hallways and closed doors (Fig. 1). The learner adopts the point-of-view of an infectious diseases physician and engages in role-playing activities appropriate to that profession. As this physician, the learner follows the case of Laurie Matthews, a female HIV positive patient. Matthews is played by an actress, but there are also videos of real AIDS patients who tell of their harrowing experiences with disease, social ostracism, and mortal fear.

Figure 1. Virtual Clinic in Primary Care of the HIV/AIDS Patient

THE VIRTUAL TERRORISM RESPONSE ACADEMY

HIV/AIDS no longer produces the same level of public anxiety as it did in the beginning of the epidemic. Although social marketing campaigns continue to emphasize the risk of illness and mortality to the general population, it is also no longer associated with crisis conditions for medical response. Even before the attacks of September 11, however, the Interactive Media Laboratory was considering other public health threats that might cause elevated alarm and possibly panic.

Although arguably among the first, IML has not been alone in creating programs that simulate terrorist attack. *Hazmat: Hotzone*, developed at Carnegie Mellon University in collaboration with the New York Fire Department, is an instructor-based simulation with video game technology to train first responders for hazardous materials emergencies. Public Health Games at the University of Illinois at Chicago has developed a multi-user anthrax outbreak simulation that can be run in the field on laptops or cellular telephones.

The Context of the Narrative

The Terrorism Academy story begins cinematically with swelling music in blackness. Then titles announce the facts: “Capitol Region” and “September 11, 2001.” Soon the player hears the recognizable sounds of emergency transmissions and becomes aware of being situated in the story by a historical document. After this dramatic emotional appeal and reminder of a cultural touchstone in American life, the scene shifts to where the training simulation itself opens, upon the closed door of the academy, which can only open after the player enters the prescribed data into a virtual computer terminal. Although the form of contamination in this central scenario is radiation not a difficult-to-communicate disease, the cutaway plan of the Academy's built environment is used to stage the story much like the virtual clinic, which is similarly public yet private space (Fig. 2). The path of the training narrative depends on the user's occupation. Firemen, emergency medical technicians, and law enforcement officers have different professional trainers/magical helpers and move through story arcs with different social roles.

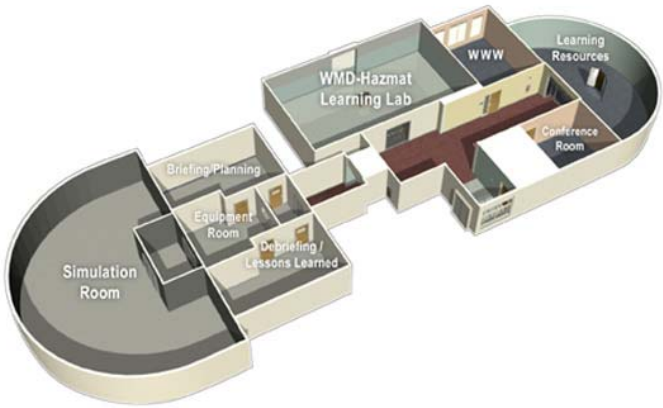

Figure 2. Virtual Terrorism Response Academy

Didactic Learning Spaces

Much of the instruction uses traditional classroom learning techniques, although the virtual manuals, screens, podiums, and other conventional materials associated with continuing education convey the rhetorical situation in which "pearls of wisdom" [6] and "war stories" [8] can be shared by experts, veterans, and mentors. However, special effects and post production techniques make these interactive videos more engaging, and periodic quizzes and electronic exercises cover basic science about radiation and other contaminants and hazards. This section of the academy puts special emphasis on lowering anxiety associated with radioactivity, and its efforts at risk communication encourage knowledgeable decision-making about equipment, policies, and procedures when victims and threats to property are involved.

Experiential Learning Spaces

In the main narrative in the game space, an unfortunate landlord, Mr. Gupta, has placed a 911 call about some suspicious characters transporting and storing what appears to be bags of fertilizer. Unfortunately, rather than wait for the authorities to arrive, Mr. Gupta uses his key to investigate their activities. The player must decide how to react after the resulting explosion: rush in to rescue Mr. Gupta or focus on the larger potential public health risk of rapidly spreading contaminants? The dilemma has "no right or wrong answer" [7], but the player has a radiation meter to assist with this decision making. The user can practice with the radiation meter in a variety of room configurations to see how turning corners and nearing objects can change exposure levels rapidly (Fig. 3).

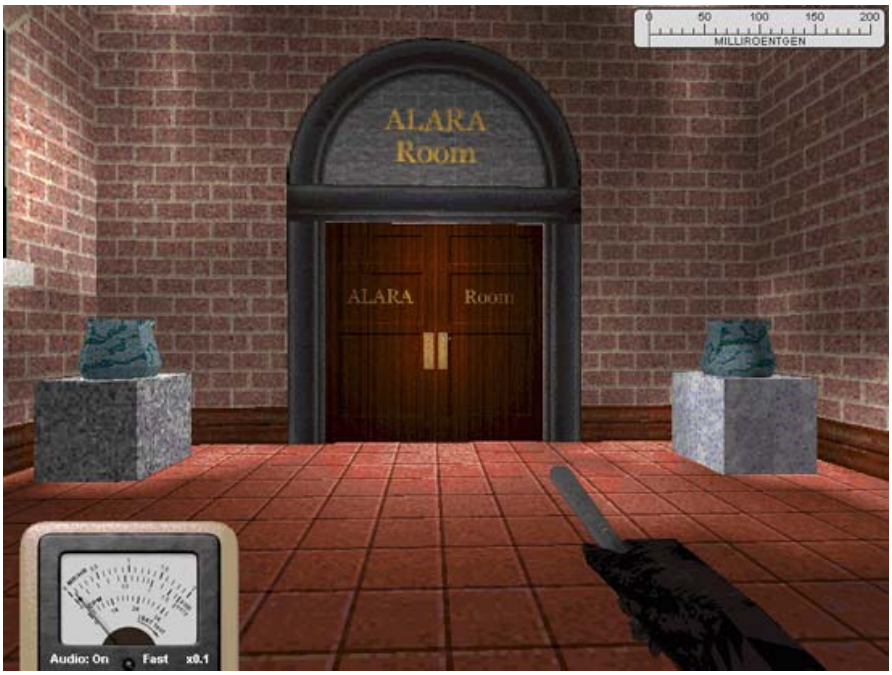

Figure 3. Simulation Space in the VTRA with Game Engine

Possible Critiques

In his work on "persuasive games" for education, health, and commerce, Ian Bogost claims that interactivity between the keyboard or controller and the screen is different from traditional persuasion through verbal or visual rhetoric [1]. However, interaction in the "play" area is often interrupted by advice from authority figures who mentor the learner. Henderson argues, however, that entirely implicit learning situations that rely on trial-and-error are frequently less time-efficient than hybrid instruction that capitalizes on the economy of learning through traditional means. He dismisses concerns that there is "too much talking" in the game and notes that pedagogical drama and experiential learning should follow "guided constructivism" advocated by education pioneer John Dewey [8] in which the learner acquires knowledge through familiar analogies rather than through unguided experimentation in an alien realm.

Furthermore, James Paul Gee has argued central learning objectives are achieved by transgressive behavior, which cannot be achieved through other means, and that questioning rules and reasoning independently ultimately achieves much more sophisticated pedagogical results, because game play is part of a larger scheme of literacy practices associated with expert discourses [5]. However, Henderson points out that in emergency situations in which there is a clear chain of command, independent actions contrary to established procedures often are subject to correction by superiors, particularly when decision making involves physical checks of contamination suits and other emergency equipment [8].

Finally, those concerned with assessment efforts involving videogame learning may be concerned by the relative paucity of independent scholarly evaluations of IML programs by learning experts. However, Henderson dismisses "ready-reference" approaches [6], on the grounds that medical practitioners often must extrapolate from pedagogical experiences "when a situation falls outside the boundaries of what we have we have learned to consider normal" [6].

CONCLUSION

From a theoretical standpoint, it is worth noting that the physical space of expertise from which the general population would normally be excluded (the virtual military base, virtual academy, or virtual clinic) is demarcated by doors, walls, and access devices like key card readers that can be navigated by referring to a master floor-plan with cutaway rooms that indicates the location of initially prohibited areas. By applying Michel Foucault 's analysis of medical communities of knowledge from *The Birth of the Clinic*, it appears that the IML also – perhaps unintentionally – reinforces disciplinary norms of knowledge-acquisition defined by space and gaze. Strangely,

these simulations often emphasize representing the *clinic* in the virtual reality environment rather than representing the actual *body* of the patient [4]. For Foucault, disciplinary space includes medical practitioners and potentially excludes the public and defines the field of knowledge through an architecture of prohibition and license. The work of the IML is intended to initiate learners in the appropriate social and discursive practices of the clinic environment by using virtual spaces that now incorporate game engine technology, so that these spaces are simultaneously more interactive and more vivid [10]. Videogame technology is a natural complement to this design strategy, although this iteration of development at the IML may not yet fully capitalize on the learner's ability to interact and move through epistemological spaces.

ACKNOWLEDGMENTS

I wish to express my gratitude to Joseph Henderson of the Interactive Media Lab at the Dartmouth University Medical School for granting me an extensive interview about his projects and the opportunity to talk to the game designers, writers, and digital artists on his staff. Dr. Henderson also showed me demo materials, game scripts, and scholarly papers that explained his pedagogical rationale.

REFERENCES

1. Bogost, I. (2007) Persuasive Games: The Expressive Power of Videogames, MIT Press, Cambridge, MA.
2. Boisot, M. (1995) Information Space: A framework for learning in organizations, institutions, and culture, Routledge, London.
3. Falstein, N (2006) Audience Comments on *The Virtual Terrorism Response Academy*, Creating Games for Simulation and Learning, 2nd Annual TATRIC West/Summit Workshop, Long Beach, CA.
4. Foucault, M. (1973) The Birth of the Clinic: An Archaeology of Medical Perception, Vintage, New York, N.Y.
5. Gee, J.P. (2003) What Video Games Have to Teach Us about Learning and Literacy, Palgrave, New York, N.Y.
6. Henderson, J. (1998) Comprehensive, Technology-Based Clinical Education: The "Virtual Practicum," *International Journal of Psychiatry in Medicine*, 28, 1, 41-79.
7. Henderson, J. (2006), Narratives, Emotions, and Media for Simulated Learning, Creating Games for Simulation and Learning, 2nd Annual TATRIC West/Summit Workshop, Long Beach, CA.
8. Henderson, J. (2006), July 31 Interview, Interactive Media Laboratory, Dartmouth, NH.
9. Juul, J. (2005) Half-Real: Video Games between Real Rules and Fictional Worlds, MIT Press, Cambridge, MA.
10. Steuer, J. (1995). Defining virtual reality: Dimensions determining telepresence, *Communication in the Age of Virtual Reality*, Lawrence Erlbaum Hillsdale, NJ, 33-56.
11. Turkle, S. (1995) Life on the Screen: Identity in the age of the Internet, Simon and Schuster, New York, N.Y.