The Nature of VRoma's Virtual Environment
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The VRoma Project (*www.vroma.org*) is a virtual community for teaching and learning Classics; the heart of the project is an online virtual place, a Multi-User Virtual Environment (MUVE) that embodies a spatial and cultural simulation of the ancient city of Rome, with a notional date of 150 CE. All MUVEs share certain basic characteristics; they "enable multiple simultaneous participants to access virtual contexts, to interact with digital artifacts, to represent themselves through 'avatars,' to communicate with other participants and with computer-based agents, and to enact collaborative learning activities of various types."[1] VRoma, however, is not a commercial MUVE created with proprietary software that must be downloaded, like the popular sites Second Life or Worlds of Warcraft; because of their business model, such sites are able to employ elaborate animated 3-D graphics and endlessly customizable, moving avatars. In contrast, VRoma is free, requires no special software or hardware beyond a browser and Internet connection, and interweaves text with static 2-D images. However, VRoma has a completely educational, non-commercial purpose; it is an example of open educational technology, what Brian Lamb and Jim Groom describe as safe, online spaces "beholden only to the scholarly communities that use them."[2] VRoma utilizes the enCore platform (*www.encore-consortium.org*), which brings the multimedia capabilities of the web to the text-based, object-oriented MOO, including a graphical user interface and many educational tools.[3]

VRoma was designed to provide a context for situated learning of the Latin language and Roman culture; the simulation of ancient Rome was built by committed Classics teachers at all levels using accurate content and authentic materials--photos of ancient artifacts, reconstructions, maps, and plans based on sound scholarship, etc. Since VRoma is a MUVE, however, we could make learning engaging, experiential, and immersive by creating a microworld, "a framework for learning through meaningful and playful interaction."[4]

Microworlds must be intrinsically motivating; to achieve its goals, VRoma must trigger a sense of presence, of being there. According to Chris Dede, "psychological immersion is achievable in MUVEs by design strategies that combine actional, symbolic and sensory factors in manipulating one's avatar to further

the suspension of disbelief that one is 'inside' a virtual environment."[5] High-production MUVEs utilize 3-D

graphical animations rendered on the computer screen from the egocentric perspective of a customizable,

moving avatar to create the illusion of sensory immersion. Without such animated avatars and sophisticated

rendering engines, VRoma cannot evoke the same feeling of sensory immersion; instead we rely on other

kinds of cues to enlist the player's imagination as an active collaborator in the process of synthesis and

representation of the virtual environment. The player's own imagination must simulate space and motion.[6]

A visit to the Circus Maximus will illustrate how VRoma employs many symbolic and actional cues

and prompts to elicit a sense of imaginative immersion.

Figure 1. Circus Maximus content

The symbolic cues in this location are designed to evoke an egocentric frame of reference, including the eye-

level photo of the circus model and the description's second-person visual perspective augmented by words suggesting sound and motion. The links provide an opportunity for self-regulated learning; the player who chooses to click on "Enclosure" will see a third-person description of the *pulvinar* in a smaller pop-up window, illustrated by images of authentic ancient artifacts which enliven the description and contribute to the imaginative sense of excitement and movement. According to Chris Dede, such combinations of egocentric (view from within, as a participant) and exocentric (view from outside, observing and reflecting) frames of reference are ideally suited to promote learning.[7]
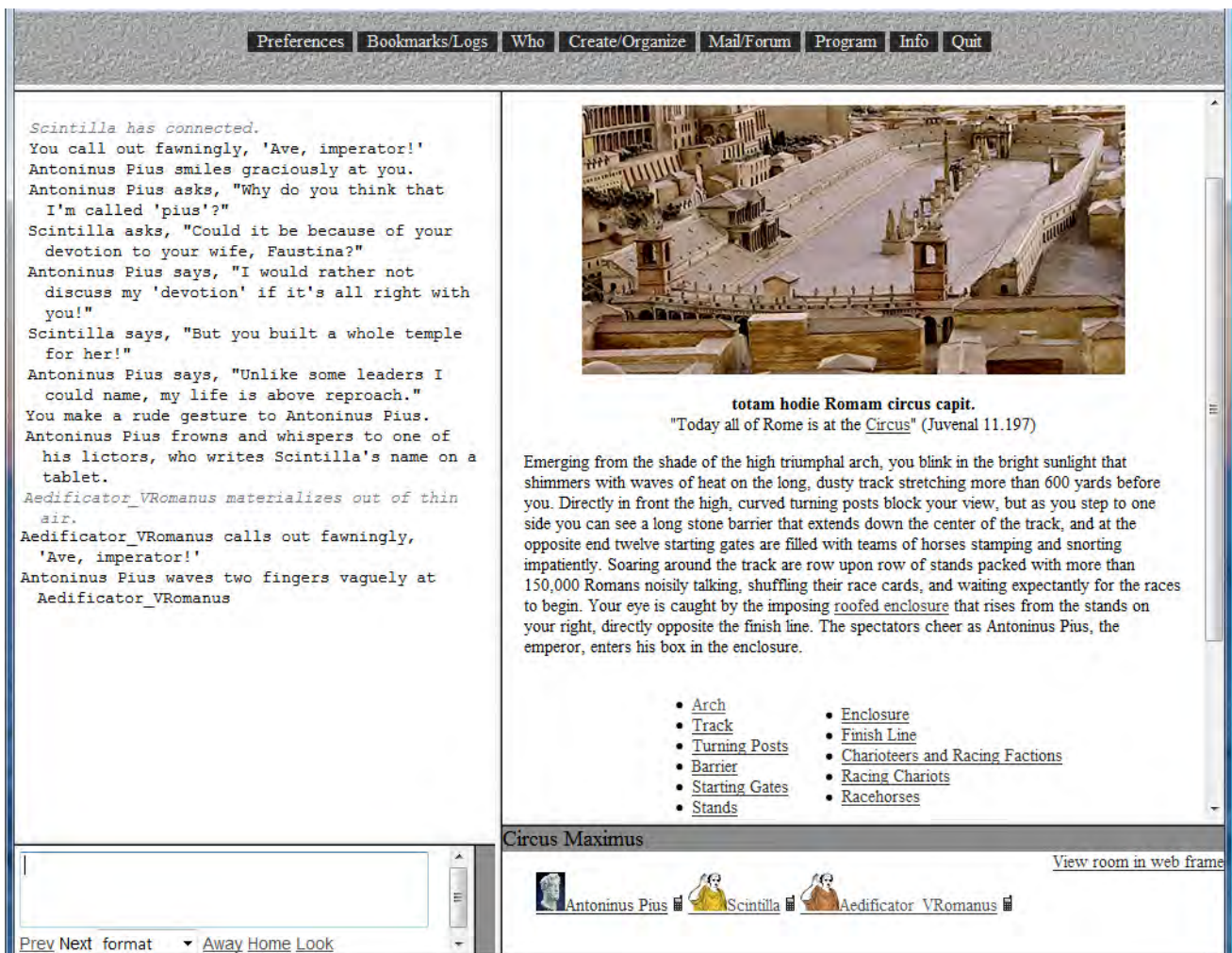

Figure 2. Circus Maximus dialogue

Figures 2 and 3 illustrate how actional factors can powerfully augment the symbolic cues. As Dede explains, "inducing actional immersion involves empowering the participant in an experience to initiate actions that have novel, intriguing consequences."[8] While content specialists can produce the symbolic cues,

the programmer's magic wand is required to enable actions and interactions. Synchronous chat and talking bots have long been a part of the MOO platform, but Daniel Jung, chief programmer for enCore version 5, has programmed a redesigned "player bot," a computer agent who will mimic a real player when activated (appearing among the list of connected players and in the player frame at the bottom right of the screen along with other players in the location, receiving and replying to SMS messages, etc). In this case, the real players Scintilla and Aedificator are able to greet Antoninus Pius and receive varying responses (emperors are notoriously unpredictable) and converse with him. When Scintilla gets exasperated and makes a rude gesture, she learns the dangers of mocking imperial authority in Rome. By clicking on a chariot, Scintilla is able to initiate a more thrilling action.
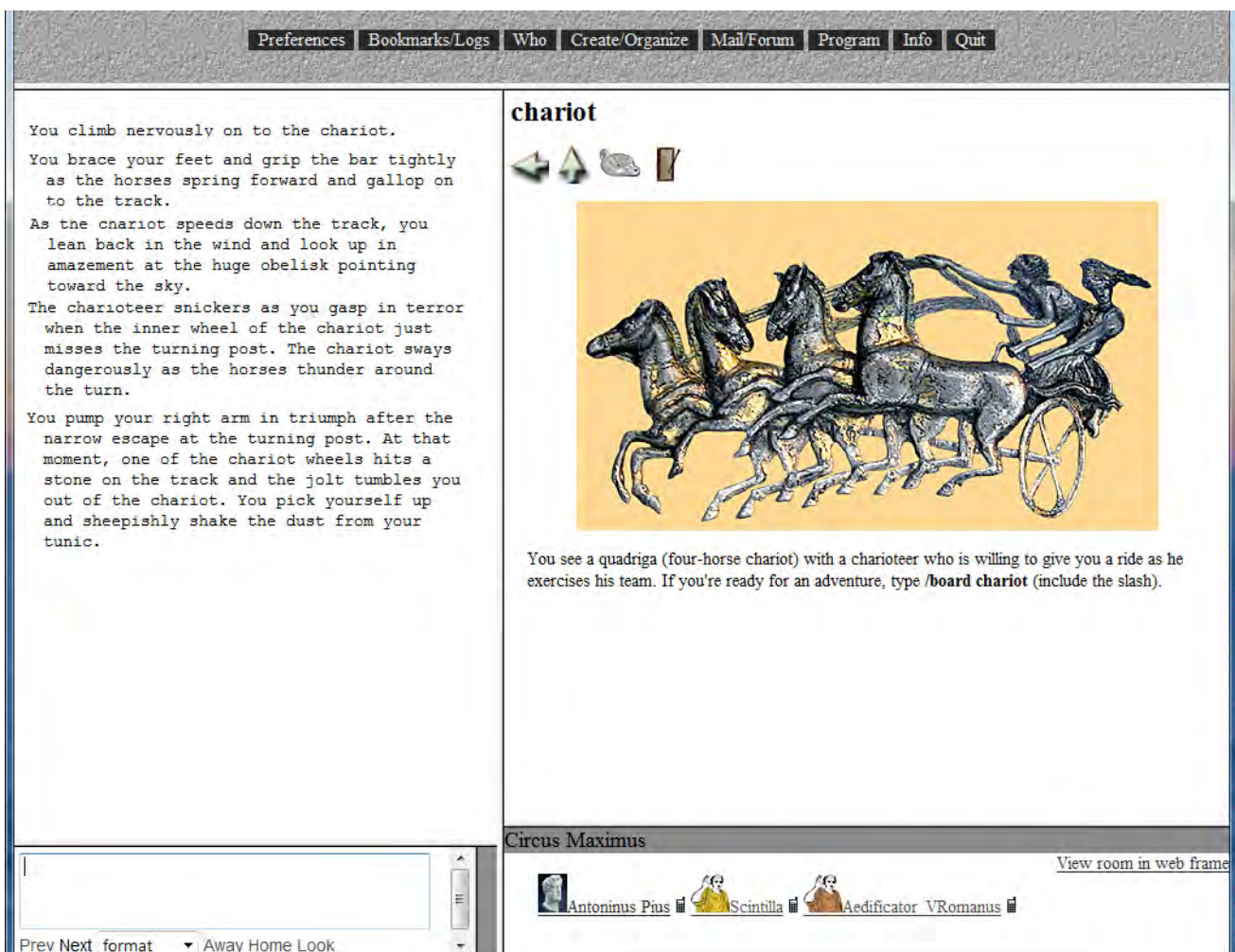

Figure 3. Circus Maximus chariot ride

Enlisting the imaginative collaboration of the player, the image (from an ancient Roman gilded silver

platter) enables the player to visualize the action, while the messages (printed sequentially in the chat frame with slight delays between each) invoke the other senses and provide a narrative with consequences that cannot be predicted, since there are a number of different options for each. The player, who sees the narrative in second-person while the other players in the location see it in third-person with the name of the player riding in the chariot, never knows whether he/she will emerge from the ride looking like a hero or a fool.

While this type of immersion may seem simplistic when compared to the elaborate 3-D animated graphical environments available today, it can have great educational potential.[9] In fact, the lack of animation and 3-D visual effects opens up more opportunities for text and language usage, fostering a different kind of experiential learning, while the less complex and expensive technology allows teachers and students to create their own spaces, objects, and games more easily.

The VRoma virtual environment combines an ancient setting and content with a very modern interface. Our emphasis on maintaining accuracy and authenticity as we recreate the context of ancient Roman society does not preclude interweaving effects dependent on the magic of modern computing (what Chris Dede terms the "Alice-in-Wonderland interface" of virtual environments).[10] VRoma is a reconstruction of ancient Rome for the twenty-first century, and we are as concerned to make modern technology work in an ancient setting as we are to give vitality to an ancient civilization through modern technology. For example, a document or file has become a scroll, a log is represented by the icon of a wax tablet, and a tape recorder has become a scribe.

The most significant blending of ancient and modern in VRoma is the ability of players to experience VRoma's computer interface in classical Latin, including all the system messages, menus, and buttons. In 2008, thanks to a grant from the Classical Association of the Atlantic States, six classicists spent a week translating all the messages and tool tips in VRoma into classical Latin. The principles of this translation, explained in an online glossary (*http://www.vroma.org/help/glossary.html*), uphold the authenticity of VRoma's ancient setting without underplaying the modern computer interface. players who know Latin can now experience Latin as a "working" language that appears constantly and naturally within the virtual world.

Latin learners come to see Latin as an actual mode of communication, with the added fun that it is a computer speaking to them in classical Latin; this reinforces the games and activities in VRoma that prompt them to communicate in Latin. They can receive help by consulting the glossary and choosing English for their tooltips.

VRoma is an online "place" where players can <u>experience</u> Rome, not just understand it. They can learn about ancient social life by enacting it, by living like a Roman within VRoma's virtual environment.

Notes

1. C. Dede, B. Nelson, D. J. Ketelhut, J. Clarke, and C. Bowman, "Design-Based Research Strategies for Studying Situated Learning in a Multi-User Virtual Environment," in *Proceedings of the 6th International Conference on Learning Sciences* (Santa Monica, CA: International Society of the Learning Sciences, 2004), 158. http://muve.gse.harvard.edu/rivercityproject/documents/dedeICLS04.pdf (accessed November 11, 2009).

2. "Ed techs like to claim that the Internet represents a revolution in human communication, one with profound effects on how we produce, consume, share, and value knowledge. If that is the case, maybe the ownership, control, and structure of these environments should be more than an afterthought. We strongly believe that higher education should embrace a mission to create cultivate, and promote 'safe spaces' that are not only open but also free from overtly commercialized interests." Brian Lamb and Jim Groom, "The Open Ed Tech: Never Mind the Edupunks; or, The Great Web 2.0 Swindle," Educause Review 45.4 (2010): 56-57. http://net.educause.edu/ir/library/pdf/ERM1044.pdf (accessed October 11, 2010).

3. For more information about MOOs and the enCore platform, see Cynthia Haynes and Jan Rune Holmevik, eds., *High Wired: On the Design, Use, and Theory of Educational MOOs*, 2nd ed. (Ann Arbor, MI: University of Michigan Press, 2001).

4. Lloyd P. Rieber defines a microworld as "a small, but complete, version of some domain of interest. People do not merely study a domain in a microworld, they 'live' the domain." VRoma manifests the

characteristics Rieber ascribes to microworlds: it matches "the learner's cognitive and affective state," creates a world that is accurate but relatively uncomplicated while making it possible for the learner to explore more deeply, and it promotes active and "self-regulated" learning. "Seriously Considering Play: Designing Interactive Learning Environments Based on the Blending of Microworlds, Simulations, and Games," *Educational Technology Research and Development* 44. 2 (1996):43–58. http://it.coe.uga.edu/~lrieber/play.html (accessed November 11, 2009).

5. Chris Dede, "Planning for 'Neomillennial' Learning Styles: Implications for Investments in Technology and Faculty," in J. Oblinger and D. Oblinger, eds., *Educating the Net Generation* (Boulder, CO: EDUCAUSE Publishers, 2005), 229-230. http://net.educause.edu/ir/library/pdf/pub7101.pdf (accessed November 11, 2009).

6. In the words of Scott McCloud, explaining how comic books work, the player must "commit closure," which he defines as "the phenomenon of observing the parts but perceiving the whole, . . . mentally completing that which is incomplete," supplying motion and change through imagination. *Understanding Comics: The Invisible Art* (New York, NY: Harper Collins Publishers, 1993), 63. For an excellent discussion of presence and various modes of mediated presence, see Carrie Heeter, "Reflections on Real Presence by a Virtual Person," *Presence* 12.4 (2003):335-45.

7. Dede, 230-31.

8. Ibid., 229-30.

9. The River City project, a MUVE very similar to that of VRoma with the addition of a simple 3-D window including minimal animation of avatars, was funded by the National Science Foundation and implemented through extensive pilot studies in schools across the United States. Numerous analyses of the pilot studies have demonstrated the positive educational benefits of this type of MUVE. A new website co-sponsored by Harvard University and Active Worlds describes the project in detail and includes links to the research publications on the project (http://rivercity.activeworlds.com/rivercityproject/index.html; accessed November 11, 2009).

10. "But what is so special about the egocentric perspectives and situated learning now enabled by emerging media? After all, each of us lives with an egocentric perspective in the real world and has many opportunities for situated learning without using technology. One attribute that makes mediated immersion different and powerful is the ability to access information resources and psychosocial community distributed across distance and time, broadening and deepening experience. A second important attribute is the ability to create interactions and activities in mediated experience not possible in the real world, such as teleporting within a virtual environment, enabling a distant person to see a real-time image of your local environment, or interacting with a (simulated) chemical spill in a busy public setting. Both of these attributes are actualized in the Alice-in-Wonderland interface." Dede, 233.