



Ancient Spaces

University of British Columbia

What is it?

Funded by the University of British Columbia (UBC), the Ancient Spaces project draws on 3D gaming technologies, the skill of student modelers, and the expertise of faculty to bring Mediterranean (Egypt, Mesopotamia, Greece, and Rome) and North American antiquity alive for faculty, learners, and the public at large. Students in UBC's Department of Classical, Near Eastern, and Religious Studies created 3D virtual reconstructions of the ancient Athenian marketplace known as the agora and were required to present a rationale for the design choices they made as they built their replicas of the agora's theater, museum, and mint. Working from forensic evidence, including data from aerial photos, satellite images, surface surveys, topographic maps, structure measurements, and what is known as the "material culture assemblage" (or the accumulation of shards—pottery, stone tools, and so on—found on the site), students "learn by doing," or, more precisely, "learn by reconstructing" key architectural and artistic environments of the ancient world.

Making it easy for students and instructors to concentrate on the science of archaeology without becoming bogged down in the intricacies of 3D computer modeling and simulation, the Ancient Spaces software gives students access to a repertoire of professionally developed 3D "primitives": fluted columns, friezes, amphorae, statuary, and so on that function essentially as Lego pieces from which an entire structure can be quickly assembled. Opening the program, students view a 3D representation of the marketplace at the heart of ancient Greek life, empty and waiting to be populated. In constructing their virtual replicas of the marketplace's key structures, students select 3D architectural shapes and elements from the object library and position them appropriately. A student can then fine-tune the proportions, surface, texture, and lighting of these primitives until they are satisfied with their reconstruction and are ready to present it to instructors and classmates for critique. Asked to defend their design choices in writing, students use the models to demonstrate their grasp of archaeological principles.

Part of the project's underlying philosophy, and a source of its sustainability, is the large role given to student modelers, who gain experience in interpolating their designs from the available data and defending their decisions when they choose one possible solution (or perspective) over another. Students are exposed to the actual research process, during which professional researchers often draw very different conclusions about a site and its inhabitants from the same archaeological evidence. Given the ease and speed with which models can be produced using Ancient Spaces, instructors are able to "teach the conflicts" within the discipline by having students create multiple versions of a single ancient structure, reflecting different interpretations of its appearance and cultural purpose.

Initially, UBC asked 20 students from a class of 100 in classical studies to pilot the Ancient Spaces tool, using it to visualize

the worlds they were studying and to demonstrate points during class sessions. The cohort of students was divided into groups of two or three, who received equal credit for their collaborative efforts in building the models. Individual students were evaluated based on the quality of a written defense, in which each learner was expected to interpret the site data and justify the design choices they made. On the basis of an overwhelmingly positive response from students during this proof-of-concept trial, the Ancient Spaces project received additional funding from UBC's Teaching and Learning Enhancement Fund to expand the scope of the instructional program. During fall semester 2006, six courses from a variety of disciplines will be using the modeling tool, and a formal assessment involving approximately 120 students will be conducted and widely shared.

What problem does it solve?

- **Active learning:** When they agreed to support the project, the head of UBC's Department of Classical Studies, Near Eastern, and Religions Studies and the director of the university's instructional support service for the Faculty of Arts saw the Ancient Spaces concept as an opportunity for active learning in the classroom, directly involving undergraduate students in the kinds of research that are required to produce reconstructed environments.
- **Collaboration:** Ancient Spaces encourages both cross-departmental collaboration and communication with cultures beyond the university by providing a tool that allows participants from multiple fields to experience modeled sites from their disciplinary perspective while critiquing and improving the reconstruction.
- **Timeliness:** The project has the potential to address a real concern within the field of archaeology—namely, the significant lag between discovery and publication. A researcher excavating a site in Egypt, for example, might have to wait months, if not years, to publish his findings in a peer-reviewed journal, while others in the field proceed without knowledge of forensic results that might affect their own research programs. Using the Ancient Spaces technologies, that same archaeologist could disseminate research results for online peer review simply by feeding the new data into his continually evolving virtual reconstruction of the site under investigation.

- **Outreach:** The Ancient Spaces team and its UBC supporters in the Faculty of Arts shared a larger vision of the way in which massively multiuser online environments might be used to bridge the divide between the academy and the general public while extending the reach of the liberal arts in the 21st century. Already UBC and its faculty have begun to use the opportunity represented by the Ancient Spaces concept to collaborate with the Nisga'a people, a First Nations community on the North Coast of British Columbia. Nisga'a elders are working with faculty researchers and student content creators to reconstruct their own ancient spaces and uncover the social structures that gave these spaces their meaning.

How did they do it?

The Ancient Spaces project was born when three UBC student workers—two recent graduates of the master's program in classical studies and an undergraduate computer science major—gained institutional support for their vision of a gaming environment in which learners, researchers, and the public could hold dialogues with Socrates, perform on the classical Greek stage, and barter for goods in an Athenian agora that had been reconstructed using credible archaeological data. Where commercial games cost tens of millions of dollars to produce, however, UBC's teaching tool would have to be developed with limited internal funding. The solution was both cost-effective and pedagogically sound: transform students into 3D content creators without expecting them to master 3D modeling techniques.

Ancient Spaces took its inspiration from social networking sites such as MySpace, which proved that people with little technical training could construct Web page profiles out of basic building blocks, 2D images, and animations. The project coordinators used \$10,000 in seed money to enlist the help of professional 3D modelers, who created more than 40 high-quality architectural shapes and interior décor objects that students use to assemble their reconstructions.

The Ancient Spaces tool is built on open source technologies for 3D modeling, animation, rendering, post-production, interactive creation, and playback. To date, the Ancient Spaces development team has concentrated on producing a basic 3D editing tool that technical novices can use to create content, which consists of high-resolution images and videos in which viewers “fly through” a reconstituted Parthenon or Acropolis according to a scripted sequence. Significant technical challenges need to be addressed, however, before the Ancient Spaces development team can realize its much larger ambition—a massively multiplayer “game of antiquity” where reconstructions of ancient cities are built by players themselves, researchers, educators, and students who join online to walk down ancient streets, perform on the classical Greek stage, or ask a question of the Oracle at Delphi.

Why is it noteworthy?

- **Student-centered active learning:** In place of the in-class, slide-show approach to the study of antiquity, art history, and archaeology, the Ancient Spaces 3D modeling program asks students to engage in investigative practices,

work with field data, interpret forensic evidence, and weigh competing theories. Students gain a better understanding of the ways in which a lost culture's architectural choices can shed light on its social dynamics and core values.

- **Teaching the conflicts:** While there will always be a need in archaeology for museum-quality site reconstructions produced with the help of expensive scanners, the Ancient Spaces approach to the production of good quality models makes it easy for students to demonstrate their knowledge of varying theories by producing different replicas of the same site reflecting interpretive conflicts in the field.
- **Institutional support for innovation:** The success of this project is related directly to the willingness of UBC's faculty and its instructional technology support organization to embrace student-generated innovation and provide the internal resources needed to bring the project to a point at which its effectiveness may be assessed (a total of more than \$100,000 plus staff time contributed incrementally over the past three years).

To learn more

The project Web site (<http://www.ancientspaces.com/>) is currently undergoing a major revision. By September 2006, visitors will be able to download a software client that allows viewing of all the 3D content on the Ancient Spaces server. Users can also create and edit 3D content, navigate the spaces provided, and engage in synchronous communication. The Web site will provide updates on technical developments and invite interested parties to contribute plans and suggestions to a community wiki.

To share your innovation

If your institution has a practice that you believe would be of interest to the EDUCAUSE Learning Initiative, please share it with us. To submit your innovation for review, please use the ELI Innovations Contribution Form on our Community Exchange page <<http://www.educause.edu/ELICommunityExchange/6797>>. A panel will review your submission and make a recommendation to the ELI staff.

About the EDUCAUSE Learning Initiative

The EDUCAUSE Learning Initiative (ELI) is a community of higher education institutions and organizations committed to advancing learning through IT innovation. To achieve this mission, ELI focuses on learners, learning principles and practices, and learning technologies. We believe that using IT to improve learning requires a solid understanding of learners and how they learn. It also requires effective practices enabled by learning technologies. We encourage institutions to use this report to broaden awareness and improve effective teaching and learning practice.