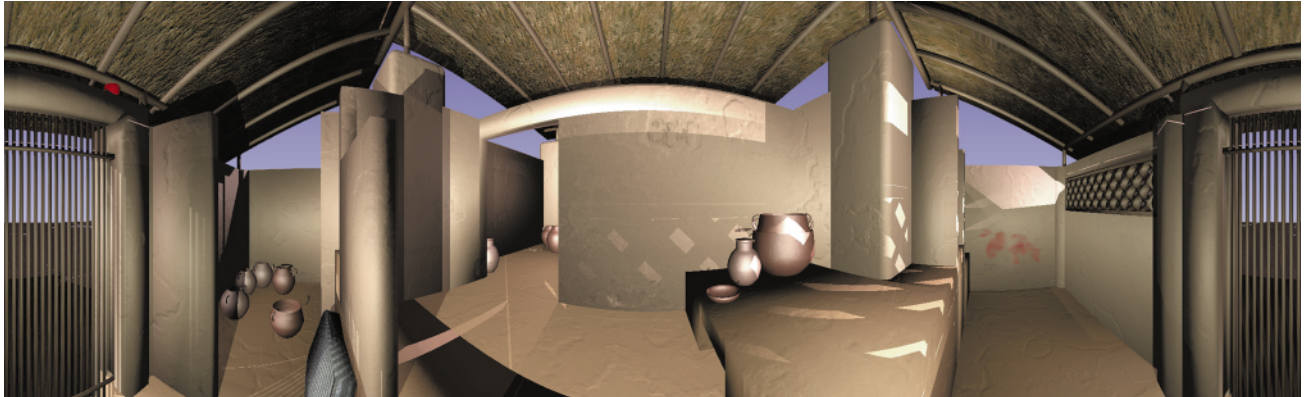


The Ceren Web Resource: Enabling Students to Become Anthropologists In A Virtual Site

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QuickTime VR Panoramic Image from the Ceren Web Site

Using content from the University of Colorado Anthropology Department and our own knowledge of multimedia system development at the College of Architecture and Planning, we are developing interesting, informative, and interactive Web learning resources. Our topic: an anthropology site called Ceren, an ancient agricultural village in western El Salvador buried by volcanic ash over 1,400 years ago. Our goal: to create a virtual anthropology site on the Web, with interactive QuickTime VR, interactive database search tools, image applets, and detailed computer renderings of what the site may have once looked like.

Currently in use by anthropology classes at the University of Colorado, the Ceren Web Resource incorporates an array of Web multimedia technology to link visual images with original excavation text, notes, and discoveries. The Ceren Web resource has attempted to lead the way in exploring the use of hypermedia tools in education. We aim to go beyond a tour of ancient buildings and enable students to begin to think and act like anthropologists. Using the Ceren site, students can participate in the excavation process as on-location anthropologists, putting together the puzzling pieces of what ancient household life in Meso-America was truly like.

The Ceren Village

Discovered in 1978 by anthropologist Payson D. Sheets and registered on the UN Heritage list, Ceren has been acclaimed the "Pompeii of the New World" [Sheets, 1992]. Due to a sudden volcanic eruption, villagers fled the ancient site leaving everything as it had been used in daily life. The volcanic ash prevented decay of all objects. Thus Ceren offers a detailed and exciting

view of ancient household life. The Ceren Web site provides a detailed understanding of the ancient structures through computer reconstructions linked to the original excavation text, notes, and data. Used as part of a hypermedia system, computer graphics go beyond static illustrations and become powerful and informative tools for teaching and learning anthropology.



Computer reconstructions of structures 6, 1, and 12 (top to bottom). Each are household living structures at Ceren.



A Shockwave slide presentation on the Web site showing an excavation image of Structure 12. Structure 12 may have been used to train a female shaman.

**Information in Context:
 Linking Images and Interpretation**

Although animation and computer graphics create exciting imagery and help students understand what the ancient structures may have once looked like, without a strong connection between an image and the field data that the image is derived from, students cannot fully understand the site. The Ceren Web site presents images in context.

For example, using QuickTime VR and interactive movies, students can navigate an interpretation of one of Ceren's many structures. Each movie presents numerous artifacts. When selected, each artifact displays text including the artifact type, specific excavation notes, dimensions, and an excavation photograph.

If students decide to study a particular subject or artifact further, they need not leave the image and movie they are in. Pop-up applets allow students to enter a discussion group, post questions, search over 300 pages of online excavation notes and reports, search an image database, or view an interactive slide show on the structure.

Clues Guide Learning Exploration

Each page in the Ceren Web site contains an instructor comment area for clues and questions that prompt

students to explore a particular subject. For example, viewing the QuickTime VR or a movie file for household 1, a student finds the following questions from the instructor:

"It was a surprise to us to find that household 1 had more than 70 ceramic vessels. Do you know of any households, in your experience, with that many containers? What is the range of uses to which ceramic vessels can be put?"

Answering this question requires a student first to browse the site, looking at interpretations and arguments made by professional anthropologists who have written about the site. This process, which requires students to do more work than if they merely looked up the answer in their textbook, engages them more seriously in questions of anthropology.

Pilot Study of Learning Effectiveness

Our pilot studies with students of anthropology and architecture revealed several advantages to the Web site over the traditional textbook. First, students are more interested in using the system. Students preferred the system for both its graphical interface (the information was easier to understand when used in conjunction with interactive images), and second for its

accessibility. Students could use the site at home and access excavation data that were in most cases difficult to find. Because anthropologists use the Ceren Web site to create archives of their current research, the Web site contains the most comprehensive and up-to-date material on Ceren.

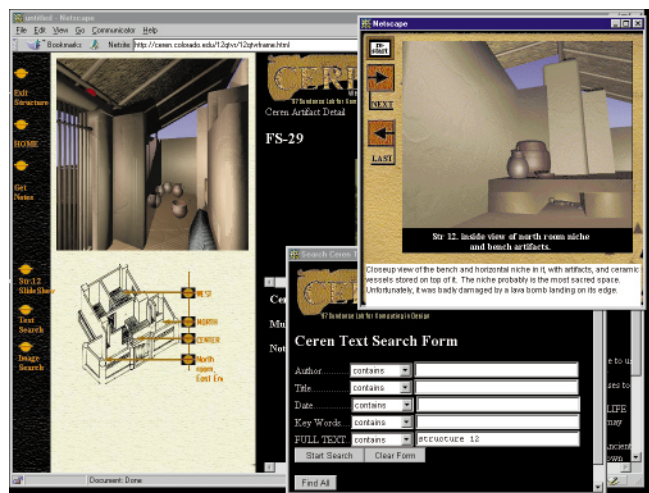
Second, students who used the Ceren Web site demonstrated a greater understanding of the spatial and architectural attributes of Ceren.

Making it Easy for Teachers to Author the Web Site

The Ceren Web site allows teachers to easily change the content of the site by filling in forms online. Thus teachers can update textual information, add new notes, add new artifacts, or add homework assignments. While students view an interactive site with movies and textual links, instructor with almost no technical expertise can log on to a back-end version to add information, update, or make changes. This allows a teacher to change the system daily to fit class needs, and avoids limiting site design to Web developers.

Reference

P.D. Sheets, 1992. *The Ceren Site: A Prehistoric Village Buried By Volcanic Ash in Central America*. Harcourt Brace College Publishers, Fort Worth.



Top left: A QTVR movie showing a different portion of the room

Below: The map of Structure 12

Top right: A pop-up slideshow on Structure 12, with notes from instructor

Below: A pop-up text search window