

## **Learner-Centered Education Grants 2002 FINAL REPORT**

### **1. Project Name and Project Director's Name. Include mailing address, phone and e-mail address.**

Project Name: Interactive Archaeology of the Grand Canyon and Colorado Plateau:  
Learner-Centered Education in the Archaeology Curriculum

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### **2. Brief Description of Project:**

The primary goal of the Interactive Archaeology of the Grand Canyon and Colorado Plateau project was to develop an educational, interactive, multimedia CD-ROM and web site that focus on the archaeology of the Grand Canyon and Colorado Plateau. Learners use the hands on, problem-based CD-ROM and accompanying web site to explore archaeology as a science, while conducting virtual archaeological research and learning Hopi, Zuni, and Hualapai views of their ancestral sites. Their mission is to create a virtual museum exhibit by exploring who lived in the Grand Canyon and how they existed. The student-centered, interactive, multimedia lessons allow students to interpret and quantify data from real sites and develop an understanding of the culture history of the Colorado Plateau and Grand Canyon. Digital video taped interviews with archaeologists and Native Americans provide multicultural voices that create an environment that is receptive to the needs of a diverse student population that learn in different ways. The project exposes students to different knowledge systems while also developing their respect for cultural diversity, values, and a sense of stewardship for archaeological resources. Learners become competent at understanding the prehistory of the Colorado Plateau and Grand Canyon. In the process, they develop important, lifelong science, mathematics, and technology skills necessary for students of the new millennium.

### **3. Progress on project toward goals:**

a. Primary Accomplishments: The Interactive Archaeology of the Colorado Plateau and Grand Canyon project is an incredible success. We completed a learner-centered CD ROM and web site. The integration of the CD ROM into our curriculum provides students with the tools to learn in multiple ways. Students with different abilities and cultural backgrounds gain from the project because the lessons incorporate a variety of learning mediums. The CD

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ROM integrates audio, digital video, animation, and graphics into the lessons ([http://www4.nau.edu/idig/htm\\_orig/projects/GCCD/gccd.htm](http://www4.nau.edu/idig/htm_orig/projects/GCCD/gccd.htm)). The web site has additional video, audio, and photos (click on “media gallery”). Besides the multimedia, student assignments are varied and include writing, drag and drop activities, and self guided projects that allow for multiple ways of learning. Students can access video clips from eight archaeologists, eight Hopi, four Hualapai, and two Zuni. The lessons include, 1) what is archaeology, 2) geography and Native Peoples of the Colorado Plateau, 3) what is a museum, 4) ceramics on the Colorado Plateau, 5) food and culture, and 6) the final presentation. Overall, we achieved the primary goal of developing a learner-centered module for undergraduate archaeology classes. We are beginning to use the model in the classroom by providing faculty with a supplemental module that creates a learner-centered environment.

### b. Outcomes and Assessment:

To understand the degree to which student learning improved as a result of our learner-centered approach, we surveyed two NAU anthropology classes that used the CD ROM. The survey contained both qualitative and quantitative questions that helped us understand several critical areas. First we measured the student’s opinion on the lesson mechanics which included the appropriateness of graphics and text, grammar, navigation, and directions. For example, 60% of the students strongly agreed that the graphics and text in the CD were appropriate and clear, and 28% agreed that most of the graphics and text in the CD were appropriate and clear. Overall, lesson mechanics were rated relatively high; however, there were a few areas and links that need to be fixed.

Next we measured the impact of the CD ROM on student learning. This assessment fell into three areas: overall learning outcomes, skills, and multicultural understanding. In the area of overall student learning outcomes we wanted to know if students gained knowledge of the archaeology of the Grand Canyon/Colorado Plateau. Who lived in the Grand Canyon? When and where did they exist? What were their lifeways? The following results indicate that students did gain a better knowledge base as it relates to the archaeology of the Grand Canyon and Colorado Plateau.

76% of the students indicated that the CD-ROM clearly helped them learn to identify with one or more cultures who lived in the Grand Canyon and Colorado Plateau.

76% of the students thought that the CD helped to deepen their understanding of the prehistoric past by learning about one or more of the Grand Canyon archaeological sites.

72% of the students strongly indicated that they could identify with one or more of the goals of archaeology.

74% of the students strongly indicated that the CD-ROM clearly deepened their understanding of how people lived on the Colorado Plateau in prehistoric times.

76% of the students learned how to identify certain aspects of the environment of the Colorado Plateau, such as life zones and cultural geography.

82% of the students strongly believed that they were able to interact with the information in meaningful ways (i.e., seeing video or pictures) to help deepen their overall understanding of the archaeology of the Grand Canyon. Several students specifically commented that the extensive use of pictures and video really aided in keeping their attention.

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We also measured the degree to which the project increased student's understanding of math, science, and technology skills. Overall, student's science skills were increased while the results suggest that the program had less success at developing student's math and technology skills. The following are some pertinent results:

76% of the students felt that they developed an increased understanding of scientific inquiry as related to archaeological research.

Only 50% of the students strongly indicated that they developed increased mathematical skills as they apply to archaeological research, while only 10% felt that they did not develop any new mathematical skills.

58% of the students felt that they developed increased technological skills as a result of the CD-ROM lesson.

In terms of multicultural understanding, our assessment indicates that the project did an excellent job of conveying multiple voices.

86% of the students strongly believed that the CD-ROM clearly presented multiple perspectives of the study of archaeology in the Grand Canyon region, including cultural beliefs, values and practices, and the ecology and geography of the tribes of the Colorado Plateau.

72% of the students strongly indicated that the CD-ROM clearly incorporated elements of contemporary life on Colorado Plateau, Native American communities, and historical and traditional aspects of Native American culture.

#### **4. Problems or Issues:**

Although the project is a tremendous success, the biggest problem was that production of the CD ROM took much longer than expected. There were many delays. Scheduling videotaped interviews with some of our Native American partners was incredibly difficult. We had numerous cancellations and postponements. Indeed, for one river trip one Hopi, two Havasupai, and two Hualapai cancelled at the last minute. Overtime, however, we were able to capture hours of excellent interviews that were made into hundreds of digitized video clips. The programming also was difficult and has caused numerous delays. We garnered additional funds to hire more programmers and graduate assistants to help in program development and video editing.

The CD ROM was used in several classes; but, the project needs to be fully integrated into the curriculum. We are looking for other faculty members across the Arizona University System who would be interested in using the CD ROM. We also provided several textbook publishers with the CD ROM and they are in the process of reviewing it. By publishing and marketing the CD ROM, the project will be readily available to anybody who wants to integrate a learner-centered module into their archaeology courses.

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### 5. Conclusions, Recommendations and Future Directions:

Our project is ideal in terms of incorporating learner-centered education into the curriculum. We situate the student at the center of education by creating an environment that is receptive to different ways of learning, different abilities, and different cultural backgrounds. Indeed, one of the project's strongest assets is the presentation of a variety of Native American voices. The hands-on, interactive use of the CD-ROM and web site actively engages the student in problem-based learning. Students make choices by addressing their comprehensive research problem and defining their questions and themes for the museum and exhibits. Furthermore, as a result of our program students are exposed to different knowledge systems, develop a respect for cultural diversity and values, and gain a sense of stewardship for archaeological resources.

Has this project led to sustainable change? Describe: The project is beginning to lead to sustainable change. It provides an interactive, learner-centered module for use in undergraduate archaeology courses. As more professors incorporate the module into their courses, we will see a large increase in the number of students reaching competency in the archaeology of the Grand Canyon and Colorado Plateau.

### 6. Impact:

a. Have other faculty been affected by this project?  Yes  No. If so, describe: A number of faculty were involved in the production of the CD ROM and Web page. One other faculty member used it in her classroom (ANT 104: Lost Tribes and Buried Cities). Although other faculty have not used it in the classroom, many have expressed interest in using it in both face to face classes and web based classes.

b. Number of courses affected/involved. The CD ROM was used in two classes (ANT 104 and ANT 101). Other courses that professors have expressed an interest in using the module include ANT 250: Exploring Archaeology, ANT 351: Southwest Archaeology, and ANT 452: North American Preshistory.

c. Number of students affected. The number of students who used the CD ROM was 140. We expect this number to increase dramatically once the CD is published and will include classes at NAU, UA, and ASU.

d. Describe impact on students:  
Many of the students who used the CD ROM commented on how the CD-ROM was very interesting and a beneficial learning tool. Many also added, that the program was "great and

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well beyond other web sites and CD-ROM programs”. Several students really enjoyed the interactive nature of the CD-ROM lessons and found that it aided in keeping their attention throughout the lessons. One student noted that “learning through this media is better than any boring old textbook.”