School/Museum Collaboration in Curriculum Design and Delivery

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Limited contact and poor communications have all too often characterized the museum/school partnership. The AAM's *Museums for a New Century* stated, "Programs in which the museum experience is a consistent, fully integrated part of the formal school curriculum are few and far between" (p. 67). Given the American Associations of Museums call for closer collaboration with our nation's schools and the current pressures on schools to fully utilize resources to increase student learning, the issue of how to obtain the maximum educational benefit for students from the museum experience is a critical one.

How do a school system and a museum get the most educational benefits for students for the time and efforts expended on a field trip to a museum? It is clear from Bitgood (1989) and others that planning is a key in obtaining the optimal benefit from a museum educational experience. The planning Bitgood refers to includes teacher and student preparation, utilization of pre- and post-visit materials, and quality museum experiences. It is also critical that museums utilize their unique resources in such a manner that classroom experiences are not replicated.

The purpose of this study was to analyze the effectiveness of a collaborative effort between a museum and a school system to build an integrated curriculum package. The theme of the package was 18th Century Medicine and the unit was designed to enhance the science, math, and social studies instruction of fourth graders. The science, math and social studies objectives were selected from the Commonwealth of Virginia's Standards of Learning Objectives for the fourth grade in these subject areas. The project was originally funded by Title II EESA Funds (1989–1990) and was a collaborative effort of the York County School System (VA), and the Yorktown Victory Center operated by the Jamestown-Yorktown Foundation.

Method

During the 1988-1990 academic years, working as a team, personnel from the Jamestown-Yorktown Foundation's education department and the Yorktown Victory Center's living history staff worked with selected fourth grade teachers. The central office staff of York County Schools selected the content objectives to be taught and integrated them into a teacher's guide for classroom lessons, a field trip to the museum, a video tape, and museum outreach program.

The teacher's guide provides a classroom teacher with the background information for classroom instruction about the science, social and medical practices and personnel of 18th Century Virginia. Highlighted are background knowledge of the 18th Century theories of science, major contributors to the science and medicine of the times, and the medical roles and practice of women, Native Americans, and African-Americans. Also in the teacher's guide are a series of school-based activities which provide the student with practice using selected math and science skills and knowledge in the context of 18th Century.

The field trip, video, and outreach program each were collaboratively designed to reinforce and extend the objectives addressed in the teacher's guide. On both the video and field trip, students observe an 18th Century doctor/surgeon/pharmacist demonstrate the tools, medicines and medical theories of the 18th Century. They also visit with a camp nurse (nurse/cook/hospital handy-person), as she describes the roles women played in colonial medicine. They also visit an herb garden and participate in the production of an herbal medicine. In the outreach program a museum educator presents these topics in the school's classroom.

The video tape and outreach program are designed to be used in place of on-site study at the Yorktown Victory Center if such a trip is not possible. The video also functions as a review of the camp doctor/surgeon/pharmacist and nurse/cook/handy woman presentation when on-site study is possible.

The collaborative team of this study took great care to be sure that the lessons planned for the school prior to visiting the museum built a solid information base that was historically correct. The information base established a context for the field trip but did not overlap the museum experience thereby robbing it of its novelty and impact. The post-field trip experiences were designed to reinforce objectives taught earlier in the unit, in the schools and through the museum experience. A video of the key elements of the museum's program which could be used to relive appropriate parts of the museum experience was developed. The video was designed to "stand alone" if a trip to the museum was impossible. Museum staff and teachers worked together to plan both the school based lesson and the museum experiences, and the video so as to provide the students with a coordinated learning package.

As is so often the case, the project's printed unit,

field trip and video were all in the final stages of development as the field test teaching of the unit began. Therefore, a formal pre-/post-test of the project's treatment of the math, science, and social studies objectives was not possible. Final adjustments were being made as the materials were being piloted in nearly final form. Yet, the evaluation of the pilot version of this project being reported in this study showed very real gains.

Results

A three part evaluation of the project was done by an independent outside evaluator. In the first component of the evaluation the teacher's guide for the classroom unit, the video and the field trip were all reviewed to determine the extent to which they reflected/taught the science, math, and social studies objectives stated in the proposal. All but two of the math objectives originally selected for inclusion in the project materials were indeed taught. The project's staff decided that two math objectives should be dropped as they were more appropriately treated in other units. Subsequent discussions of the school and Foundation staffs also resulted in reducing the number of science objectives from nine to six and the number of math objectives from six to three. The number of social studies objectives remained at six. These decisions were consistent with the fact that 18th Century Medicine is a unit with a social studies emphasis and theme which had science and math objectives integrated into the unit's content. The review showed that the social studies objectives were taught/reinforced only in very limited ways. Thus, the unit and its revised list of objectives was concluded to have content validity, i.e., it covered the objectives it was to teach and with the emphasis desired.

The second evaluation component was a twelve question multiple choice test based on the social studies objectives which was given to fourth grade classes before they began the unit on colonial medicine. They were taught the unit and took the field trip to Yorktown and reviewed the experience using the video tape. They were given the same test as a post-test. The results are shown in Table 1. The test scores showed that students experiencing the unit and taking the field trip showed significant gains at the .001 level measured by a pilot testing of the unit's social studies objectives.

The third component of the evaluation was the completion of one of the two open-ended stories. Each student was given the same instructions and one of the following scenarios after he or she had been taught the material in the teacher's guide and had taken the field trip. The student completed the story.

Directions:
Today medicine and medical care is different than it was in colonial times. Complete the following story by answering the following questions:

1. Who cared for you?
2. What medical training did the person who cared for you have?
3. What kind of medicines were you given?
4. What kind of treatments were you given?
5. Where did you stay while you were being treated?

Table 1

	Pre Test	Post Test
Mean	7.5	8.9
Range	7.0	6.0
Maximum	11.0	12.0
Minimum	2.0	6.0
Standard Deviation	2.1	1.6
Total students	58	58

DF 57
t Value = 6.242
Results Significant at .0001 Level

Student's Increased Score	45
Student's Score Remained the Same	8
Student's Score Decreased	5

Scenario A:
Hello,my name is_____. I live on a plantation outside of Yorktown, in the Colony of Virginia in 1720. Last year I got sick. I had a bad fever and chicken pox...

Scenario B:
Hello, I'm a soldier. I was wounded in the Battle of Yorktown. A musket ball hit me in my leg. The musket ball had to be removed.

An analysis of the responses to scenario A showed that 85% of the students learned that in most cases:

- Women treated sick children at home.
- Women learned their "nursing" skills from their mother if at all.
- Treatment often consisted of herbal teas.
- About 25% reported having been bled.
- About 50% incorrectly thought thermometers were common household items in the 18th Century. Nobody reported a death from fever or chicken pox, except one student whose mother died of the stress of treating him!!

An analysis of the responses to scenario B showed that over 90% of the students knew that in the 18th Century:

- No anesthesia were available.
- No x-rays were taken and musket balls were found by visual searches or probes.
- Quack doctors were common.
- Herbs were the most common medicine around.

Unrealistically all survived. Nobody died though most reported suffering a lot. One recovered patient married his nurse and moved back to England.

Even as measured in an open ended story the project succeeded in teaching the difference between modern and 18th Century medicines, though teachers will need to stress that fatality rates for wounds, infection, and fever were much higher in the 18th Century than now.

Discussion

The results of the pilot study indicate that this collaborative curriculum development effort of a museum and a public school staff was most effective in achieving student mastery of the social studies objectives which are most central to it. Based on the results reported above, the original project's co-directors and evaluator are currently engaged in a larger summative evaluation project. The final version of the project's materials will be used with approximately 24 fourth grade classrooms. The objective test has been expanded to better assess the science and math objectives as well as the social studies objectives. The open ended short stories will be retained.

The 24 classes in the extended study are divided into four groups to assess the effect of each component.

Group A: pre-test (in class unit); post-test
Group B: pre-test (in class unit); video; post-test
Group C: pre-test (in class unit); museum outreach program; video; post- test
Group D: pre-test (in class unit); field trip; video; post- test

While in some studies traditional museum exhibits have shown little impact on learning outcomes (Screven, 1975; Kearnes, 1940; deBorgyi, 1963), results of this initial study support further investigation of the effects of collaborative curriculum design among public school educators, museum educators and university based educators. In times of diminishing resources and increased demands on our educational system, educators must search for ways to avoid duplication and better utilize all existing educational resources. Interdisciplinary studies cooperatively planned, designed and delivered provide students with a better understanding of relationships among bits of knowledge previously taught in isolation and may assist educators in building learning environments imbued with meaning. Thus the two or three hours at the museum is translated into much more effective instructional time.

The results of this pilot study hold exciting promise for the interagency collaborative design of curriculum. The collaborative process developed and used by the authors produced in a pilot study achieved results which are significant. While more extensive summative evaluation results will be of great interest, there seems to be no reason to delay presentation of the findings of the pilot study for the 12 to 18 months required for more extensive collection of data, analysis and publication. The collaborative model under discussion may provide a mechanism for organizations with similar educational missions to integrate learnings which have historically been presented in parallel non-integrated formats. As C. G. Screven (1969), the noted psychologist from the University of Wisconsin wrote in *Museum News*, "The Museum as a learning environment has great potential and an exciting future but only . . . as designed around specific testable educational goals." Testable goals that are integrated into a school's instruction we would hasten to add.

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