The Computer as a Potential Evaluation Tool

by Randi Korn

The 1960s marked the beginning of a renewed interest in exhibit evaluation research. A small body of published literature provided a model and an incentive for continued evaluation work in museums. This evaluation research provides valuable information about visitor learning. (Screven 1984:147).

Several methods have been used to evaluate the educational quality and environmental variables of an exhibit, including testing, questionnaires, unobtrusive observations, and interviews. Electronic monitoring systems have also been used in exhibitions to communicate directly with visitors and to collect data to be analyzed. (Screven 1969, 1973, 1974; Borun 1977). This work indicates that interactive devices increase visitor learning and that these game-like machines are more popular than traditional static exhibits. The interactive and data collection capabilities of electronic monitoring systems provide evaluators with standard procedures for data collection. This article proposes that the computer be considered as an evaluation tool.

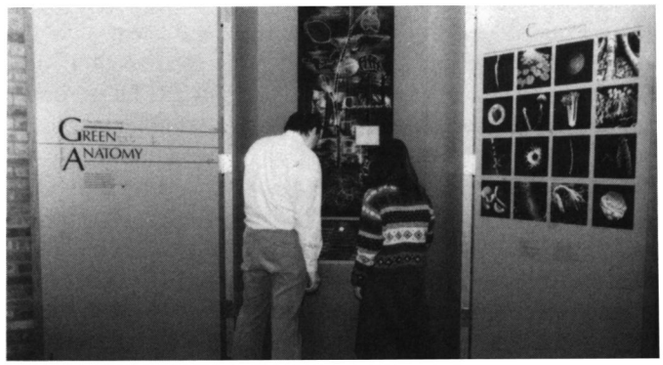
The computer, as an evaluation tool, provides the researcher with a method for obtaining detailed visitor feedback. It also supplies the means to store data and perform statistical analysis. For the visitor, the computer is still a novel addition to the museum environment and offers an interesting way for visitors to participate in the evaluation process.

The branching capabilities of a computer can function as a sophisticated method of discovering more about how visitors learn in museum environments. With branching, the visitor's response to one question determines the computer's selection of the next one. The branching technique is one characteristic that distinguishes computerized evaluations from other evaluation methods. It is also a technique that deviates from the traditional approach of measuring visitor learning in museums.

Evaluation Model

What follows is an example of an interaction between a visitor and the computer. This example is designed to explain how branching can be used to determine specific information about visitor learning. This model is hypothetical; however the content for the questions is based on a new exhibition at the Chicago Botanic Garden entitled "Plant-People Partnership." The exhibition teaches visitors about the life processes of a plant. Figure 1 illustrates the model, while the written description emphasizes a few points.

In the model, the first test question on the computer monitor would ask the visitor to name three plant parts discussed in the exhibition. If all three answers were correct, the visitor would be directed to pick one plant



Visitors in the "Plant-People Partnership" Exhibit at the Chicago Botanic Garden.

part and to describe its function. If the function was described correctly, the computer would then display on the monitor a plant part not previously named by the visitor, and ask him/her to describe its function. If this was answered correctly, a new question on a different topic would appear. In the example, the first question would actually be composed of three questions, organized from simple to difficult as well as from general to specific. The answers to all three questions were presented in the exhibition in the form of an interactive matching game.[1] It could be said that a visitor answering all three questions correctly understood the game directions and played it to its conclusion. In addition it could be said that the game was successful in communicating information.

Of course not all visitors participating in the evaluation will answer the first question correctly. If, for example, a participant is unable to name any parts of a plant correctly, a simpler approach could be taken. A graphic of the matching game could appear on the monitor with a question asking if the visitor remembered seeing this item in the exhibition. If the visitor answered yes, he/she would be questioned as to whether he/she played the game and if not, why. If the visitor answers that someone else was playing the game, or he/she did not know it was a game, the monitor would respond by telling him/her how to play and inviting the visitor to do so.

If a participant was able to name one or two out of three plant parts correctly, or if all three were incorrect even though the visitor played the game, the plant graphic could appear on the monitor, with a statement designed

to help recall the situation. The visitor could then be given the chance to answer the question again. If he/she still was unable to answer the question correctly, the participant could be invited to visit the exhibition again and to play the matching game. This procedure is particularly useful during formative evaluations because it could provide information as to why a game was not successful in holding the visitors attention or communicating information.

If a visitor answers the first question correctly, but is unable to describe the function of a plant part, the plant graphic with a question could appear on the monitor. The question could be designed to encourage the visitor to "read" the graphic to try to decipher the answer. If the visitor is still unable to describe a plant function, perhaps that level of information recall is too difficult for that visitor. The computer could also be programmed to display the plant graphic to a randomly selected group of participants. In other words, of the visitors who were unable to describe a plant function, only every third participant, for example, would be shown the plant graphic (as shown by the dashed line in figure 1) as a reminder and be given a second chance. This programming detail could be useful for determining differences in learning between those visitors who were encouraged to recall the information, and those who were not. This model describes only the first of several questions included in an evaluation. It discusses a few of the possibilities a visitor could encounter as a participant in evaluation research and illustrates the levels of detailed feedback attainable when using a computer.

Other Research Questions

In addition to questions based on the exhibition objectives, evaluation research should include inquiries about the visitor's characteristics: his/her age, sex, educational background, how many times he/she has visited the exhibition and if he/she has previously participated in the computer evaluation.

Visitor profiles are useful for monitoring who is visiting the museum and for helping determine if the exhibition is successfully communicating information to all groups of visitors. Questions about previous visits to the exhibition are useful for determining whether frequent visitors build on knowledge previously acquired (Field and Wager 1972:6). If visitors return to the computer after visiting the exhibition a second time, their test results could be tabulated separately from those who were first time testers.

Visitor characteristics, coupled with the detailed information available from the evaluation, can provide valuable data for researchers. In addition, the computer can tabulate the data and analyze it statistically. Some visitor characteristics can be grouped into category ranges such as age and educational background. Some of the branching responses can also be grouped into categories: those who correctly answered all three levels of question one; those who correctly answered only the first level; those who correctly answered levels one and two; those who answered level two correctly after seeing a graphic; or, those who did not play the game because they did not understand the directions. An analysis of the data could suggest how different groups of visitors receive and retain the information from the exhibition and which methods or techniques are associated with success or failure. For example, if data revealed that 75% of children from 10-14 years old scored poorly on the first question, researchers would ask: did they not understand the directions, or was the game unsuccessful in communicating information? The branching component is designed to reveal why visitors are scoring poorly.

This same information could also be collected using a combination of the traditional evaluation methods: written test, interviews, and observations. The advantage of the computer is that it expedites and simplifies the data collection and tabulation processes. The visitor spends less time participating in the evaluation, and the researcher has access to detailed information quickly.

Social Factors

Researchers might be concerned about visitors' willingness to use computers. In 1983 the Smithsonian Institution conducted a study on using touch-screen computers as orientation devices at the National Museum of American History (Sharpe 1983). The results indicated that touch-screen computer users generally reflected the museum audience, but there were more male users (65%) than female users (35%). In addition, those under the age of 18 used the computers slightly more than others (Sharpe 1983:24-25). A nationwide poll of 17-year-olds indicates almost twice as many boys as girls are enrolled in computer programming classes, and a study by the California department of education shows that only 37% of the students in high school computer classes are girls (Kolata 1984:24). This data suggests that different age and sex groups do not have equal exposure to computers, and if visitors are expected to voluntarily approach the computer, their comfort with the technology itself will affect the sample. This problem might be solved by randomly asking visitors to participate in the evaluation. This procedure is commonly used in other kinds of evaluation research.

Computer assisted instruction in the classroom has been the subject of continued study since the mid 1960s. Research results show that students have a positive attitude toward computers because only the computer knows when an error is made and there is immediate feedback (Clement 1981:28). Museum visitors could have a similar reaction to computerized evaluations. Museum education researchers need to continue developing methods for objectively monitoring museum visitors and what they are learning (Screven 1974:68).

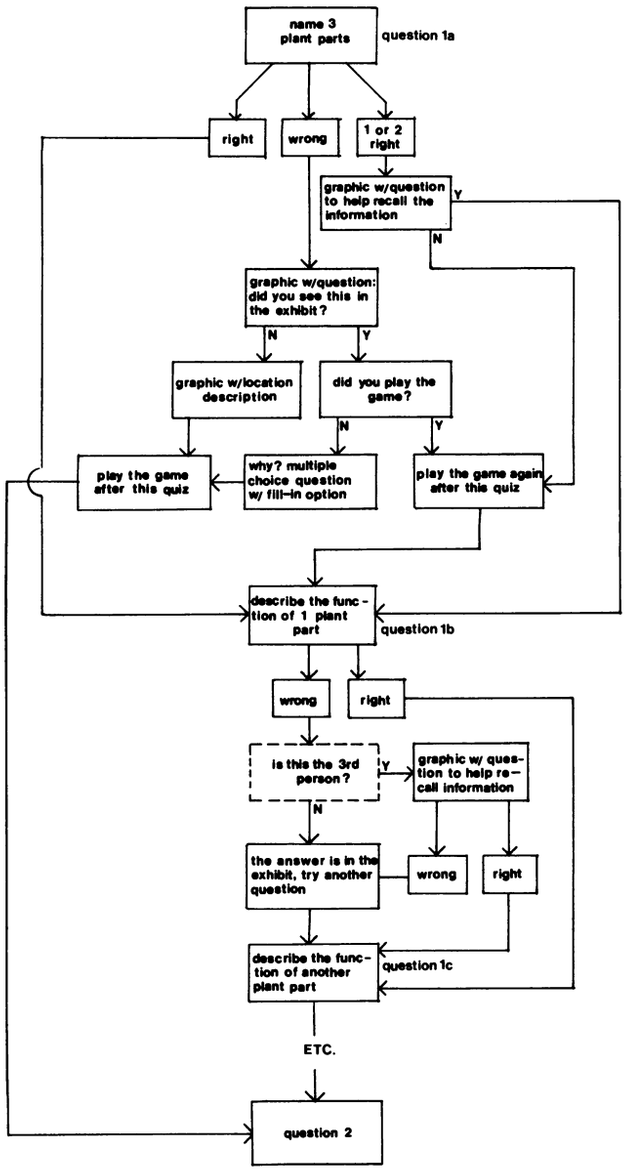


Figure One

Conclusion

Museums that use an in-house minicomputer to facilitate their administrative duties or curatorial and membership records, can use the same computer for evaluation procedures. An additional monitor and key board will be needed so visitors can interact with the computer. The most difficult and costly part of a computerized evaluation will be the development of a computer program that will effectively communicate with the visitor and provide the researcher with tabulated data. The computer is worth considering as an potential evaluation tool because it is efficient, objective, and interactive. It can help identify how visitors interact with exhibition components and whether visitors grasp the exhibition and, if not, why. It can determine whether information in the exhibit is too complex or too simple for museum visitors and whether there is a saturation point among visitors. In addition, the analysis of the computer stored data will reveal techniques that are most successful with specific visitor groups.

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Note

1. The exhibition contains an interactive computer matching game. To avoid confusion between this and the computer evaluation activity, the game is always referred to as a game while the evaluation is referred to as a test, an evaluation, or questions.

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