Self-Guiding Brochures: An Evaluation

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The question of whether visitors learn during a museum visit has been under investigation since the late 1920s. Pioneer researchers, however, restricted their studies to the behavior of museum audiences: how visitors traveled through the museum; how much time was spent viewing various exhibits; and how many labels were read. It was not until the late 1960s that education researchers started to question the educational value of museum exhibits. Variations in color, type, style, visual complexity, quantity of labeling, and instructional technology were tested to ascertain whether the educational quality was altered with different exhibition methods and techniques. Basically, these studies evaluated the use of labels and interactive devices as teaching tools in museum exhibits (Screven, 1974a, 1974b; Shettel, 1973; Borun, 1977; Lakota, 1976; Rennes and Mark, 1981). Only a few researchers (Porter, 1938; Loomis, 1982; Jones and Ott, 1983) have evaluated the self-guiding brochure as a method for interpreting museum exhibits.

The number of published research studies concerning the use and effectiveness of self-guided brochures is small when compared with the number of National Parks, outdoor living museums, nature centers, and botanic gardens which rely on that method of communication. Self-guiding materials usually include directional information so that visitors can sequence their movements and a general theme that is consistent throughout the tour (Dunmire, 1976, p. 238; Lakota, 1976, p. 260). This type of teaching program and other teaching methods used in museums share the same goal: to communicate information to the visiting public. Just as exhibit techniques are subject to evaluation research, so should be the printed self-guiding brochure. This study evaluates the effectiveness of two

different styles of written interpretive self-guiding brochures. One brochure uses a traditional declarative technique, while the other uses an inquisitive approach.

In the context of an indoor exhibit, the question approach has demonstrated instructional effectiveness (Parsons, 1968; Lakota, 1976). It tends to motivate the reader, direct attention, and promote exhibit interaction and learning. Lakota found that question-asking labels (placing a question before the label that has the information) are as effective for learning as declarative labels (1976, pp. 264–265). Question-asking labels suggest to visitors where to direct their attention. A very specific question may encourage visitors to be selective as they approach each display (Lakota, 1976, p. 266).

DESCRIPTION OF SELF-GUIDING BROCHURES

Both self-guiding brochures used in this research are alike in overall appearance and content. Both have 18 stations that are numbered, subject headings in bold typeface, and 14 illustrations. The difference, however, is the manner in which the station headings are presented. The declarative-style brochure presents a title (subject heading) with each station number that names the object or scene the text describes. These headings average two words in length. The inquisitive brochure uses questions rather than statements as station headings. The headings average 14 words in length. There is also an additional question, inserted in either the middle or end of each descriptive label.

Each question is designed to encourage the visitor to observe and think about the object or scene described in the text. The subject headings for each station, whether questions or statements, match in concept; the key words in the subject headings for each station of the declarative brochures are used in the questions for the question brochure. The text for each station in both brochures was identical except for the insertion of additional questions in the inquisitive brochure.

A SMOG readability formula (McLaughlin, 1969, pp. 639–649), which counts the polysyllabic words in a fixed number of sentences, tested the reading level of each brochure. The SMOG grade for each brochure is 10. This is the reading grade level a visitor needs to ensure *complete comprehension* of the text.

METHODOLOGY

The testing site for this study was the Japanese Garden at the Chicago Botanic Garden. The conditions and variables that guided the data

collection procedures followed an experimental model (Weiss, 1972, p. 61) as shown in the matrix in Figure 1. This model uses two experimental groups (one for each brochure) and a control group. The experimental groups received a treatment, in this case a self-guiding brochure, and the control group did not receive any treatment. The cells A–L were used for organizing and analyzing the data.

A post-test-only control-group design (Popham, 1975, p. 210) was used to measure and compare the effectiveness of the two self-guiding interpretive brochures. A test was prepared and given to all the groups participating in the study.

The test was distributed to the control group (cell C) prior to visiting the Japanese Garden. It measured entering knowledge or how much visitors knew prior to touring the Japanese Garden (Screven 1973, 1974a, 1976; and Borun 1977). Tests were given to both treatment groups after they finished touring the Garden with one or the other self-guiding brochure. The difference between the mean test scores of the control group (cell C) and cells A and B provided a measure of learning resulting from use of the self-guiding brochures.

The test was also designed to collect demographic characteristics and relevant background information such as how many times individuals had visited the Japanese Garden, how much knowledge they had of Japanese gardens and culture before their tour, and whether the brochure was helpful. Observers collected behavioral data and the average time spent in the Garden by each treatment group.

The development of the test/questionnaire included several steps to evaluate the validity of the test. First, a technical word pool was developed to use as the three incorrect alternatives for each question. This procedure helped maintain the internal consistency of the test (Shettel, 1968, p. 29). Second, content validity was increased by giving the brochures and test items to three persons knowledgeable about Japanese gardens. They checked the test items against stated objectives for possible ambiguities, errors, and inconsistencies. They also checked the three alternatives to the multiple-choice questions to ensure that they were incorrect.

Finally, the test was pre-tested by a group of 10 randomly chosen visitors; 5 used the declarative brochure, and 5 used the inquisitive brochure. The answers to each test item were analyzed to determine if any one question was consistently answered incorrectly. The changes made as a result of the pre-test included rewriting two of the questions to increase their level of difficulty.

Figure 1. Design matrix.

Measures	Declarative	Inquisitive	Control
Learning Score	A	B	C
Demographic variables			
1. Sex			
a. M			
b. F			
2. Age			
a. 16–24			
b. 25–34			
c. 35–44			
d. 45–54			
e. 55+			
3. Educational background	D	E	F
a. In high school			
b. Finished high school			
c. Finished college			
d. Advanced degree			
4. Occupation			
a. Professional			
b. Homemaker			
c. Student			
d. Retired			
e. Other			
Background variables			
1. Visits to Japanese Garden			
a. First time			
b. 2–3			
c. 4+			
2. Prior knowledge			
a. None			
b. A little	G	H	I
c. Some			
d. Much			
3. Was the brochure helpful?			
a. Not at all			
b. A little			
c. Some			
d. Very			
Average Time in Garden	J	K	L

The target population for this study was visitors to the Chicago Botanic Garden during specified sampling times. Samples were collected on 13 weekday afternoons, 2 weekend afternoons, and 2 weekday mornings. A visitor survey (1984) provided the necessary information about the typical Garden visitor to justify using a stratified random sampling procedure for obtaining the research

sample. The participants in the control and treatment groups were randomly selected from visitors who were 16 years or older and who were alone or in a group of four or less.

The data was analyzed with the SAS statistical package. The t-test (Popham, 1975, pp. 237–238) and Somers' D correlation coefficient statistical procedures (Loether and McTavish, 1974, p. 229) were used to analyze the data.

RESULTS

The mean learning score for the inquisitive group was 1.88 (the highest score was 3, the lowest, 1) with a standard deviation of .7691 in comparison to a mean learning score of 2.00 for the declarative group with a standard deviation of .804. The control group had a mean learning score of 1.14 with a standard deviation of .3765. A t-test analysis did not identify a statistically significant difference, at a .05 probability level, between the mean test scores of the two experimental groups.

The t-test identifies a significant difference, at a .05 probability level, between both experimental groups and the control group. Table 1 shows the t-test results of the control and the declarative groups, and Table 2 shows the t-test results for the inquisitive and control groups. The statistically significant difference indicates that with either one of the experimental self-guiding brochures there is an increase in knowledge about Japanese gardens after the tour.

With the exception of a few subtle variations, the result of Somers' D showed a low correlation between the demographic variables of sex, age, educational background, and occupation and learning score, with the learning score as the independent variable.

Table 1. T-test results for the declarative and control groups.

	Declarative Group	Control Group
Mean	2.0	1.14
Standard Deviation	.8040	.3765

t = 9.739
degrees of freedom = 99

Table 2. T-test results for the inquisitive and control groups.

	Inquisitive Group	Control Group
Mean	1.88	1.14
Standard Deviation	.7691	.3765

t = 8.665
degrees of freedom = 99

A mean was calculated for each occupational category for both experimental groups. The higher means were combined and separated from the combined lower means for each experimental group and applied to a t-test. Both groups showed a statistically significant difference between the low scores and high scores at the .05 probability level. The mean learning scores indicated that both brochure types are successful in teaching professionals and students and unsuccessful in teaching retired participants.

There was an insignificant correlation between the following variables and learning score:

- the number of times an individual visited the Japanese Garden;
- visitor's knowledge of Japanese gardens and culture;
- a visitor's rating of the brochure as a teaching tool;
- amount of time spent in the Garden.

Of the visitors who rated themselves as having no prior knowledge (category 1) of Japanese gardens and culture, those using the declarative brochure scored higher than inquisitive-brochure users. The mean scores in category 1 in each experimental group were compared by a t-test. At a .05 probability level, there was a significant difference between the two scores, indicating that the declarative

Observations indicated that most visitors opened the self-guiding brochure only after they crossed the bridge. They were unaware that they were bypassing stops 1 and 2, the lantern and arched bridge.

brochure is more effective than the inquisitive brochure in reaching participants who had no knowledge of Japanese gardens.

OBSERVATIONS ANALYSIS

Observations were collected at 8 of the 18 stations in the Japanese Garden. A total of 68 observation sheets were completed (25 inquisitive and 43 declarative) with recordings of when and how participants were using the brochures. The recorded information was then analyzed and categorized into two behaviors: reading and activity. The number of times a visitor was seen reading the brochure was tabulated along with the number of times the visitor was observed interacting with the objects mentioned in the text.

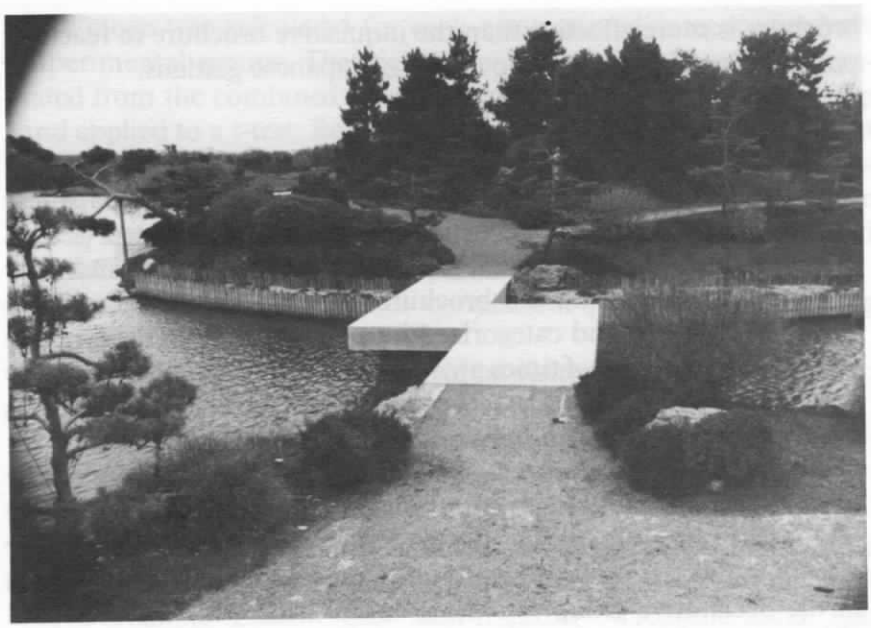
Although the total percentage of reading on some level was nearly equal for each group, a higher percentage of visitors in the declarative group was observed reading the brochure more times during their visit than did the inquisitive group. A higher percentage of visitors in the declarative group interacted more times with the described objects than did question-brochure users.

CONCLUSIONS

The results of this study provide data that do not support existing views held by museum evaluators and educators regarding question use in interpretive materials (Parsons, 1968; Lakota, 1976). They believe question use in exhibit labels attracts and motivates visitors to learn and encourages interaction with the ideas presented in exhibits. The findings of this research indicate that the increase of knowledge in a nontraditional outdoor learning environment is not dependent on using questions in interpretive text.

Successful question writing for self-guiding brochures in an outdoor environment calls for a set of criteria different from those for exhibit-hall labels because of the difference in interpretive mediums. The underlying principle of a self-guiding brochure as a medium for interpretation is that it presents information in an order that coincides with a designated path in a given environment. Visitors carry the brochure with them and travel the path in the suggested sequence.

In contrast, exhibit labels are strategically placed in exhibits, near objects; visitors choose to read or not read the labels. Brochure users essentially have a choice, too. But cased museum objects accompanied by labels are inherently different from objects integrated into an environment with labels presented in a booklike arrangement. A study by Munley (1982a) on label placement in relation to objects



The zigzag bridge captured much attention from visitors. They were often observed reading the brochure before crossing the bridge. (Photograph by Stan Zoller.)

reported that visitors most often read the label that was placed closest to an object and tended not to read those labels that are not near any object. There is no physical relationship between labels in self-guiding brochures and objects in the environment. Whether a brochure contains questions or not does not alter these major differences between self-guiding brochures and labels in an exhibit hall.

Research must be done to determine how to best use questions in self-guiding materials; specifically, how to write effective questions and how to present them in brochures so that the visitor experiences them in a positive and productive manner. Controlled experiments evaluating different interpretive methods for the same exhibit will determine which methods are best in specific educational environments.

The location and position of an object on the self-guiding path may be a factor in determining how much attention the visitor pays to that object. The observational data recorded during this study indicated that some stations held the visitor's attention for long periods of time, while other stations were consistently bypassed. A reason for this could be a lack of interest on the part of the visitor, or perhaps some stations were inconveniently located. Preliminary

observation research, tracking visitors as they tour a garden, would help determine what parts in the landscaped environment are natural stopping points and therefore appropriate places in which to display one or several objects.

Perhaps one of the most unfortunate problems facing botanic gardens today is the discrepancy between perceptions of the public that visits botanic gardens and garden administrators concerning their value (Foulger, 1979, p. 35). From a visitor's point of view, botanic gardens provide a relaxing, quiet, and recreational outdoor environment in which to spend an afternoon, breaking the monotony of urban and suburban living (Foulger, 1979, p. 14). Administrators, on the other hand, believe botanic gardens provide information for the amateur gardener and horticulturalist through plant collections, research, and educational programs (Foulger, 1979, p. 36).

Although many visitors go to botanic gardens for recreation, some are there for educational reasons. According to the 1984 visitor survey, a correlation can be made between the number of people who come to the Garden to learn and the number who score high on the questionnaire. Of the visitors surveyed, 38 percent said they came to learn; 24 percent of the inquisitive groups and 32 percent of the declarative group scored high on the questionnaire. The brochure is successful with that segment of the visitor population. Those who visit with the intention to learn are able to use the available information successfully. Reaching the other segment of the visiting public is the essence of the problem. Should museum educators be concerned with those visitors who do not want to learn? Different goals and objectives should be developed to accommodate different segments of the visiting population. Learning may not be a realistic goal for all visitors.

In summary, the findings of this research show that both styles of brochures, the inquisitive and declarative interpretive styles, were equally effective as teaching tools in a botanic garden environment. The implications are discussed with attention toward the self-guiding brochure as a very different kind of interpretive tool and botanic gardens as unique learning environments. Though botanic garden exhibits (outdoor) and museum exhibits (indoor) share the goal of educating the public, the circumstances under which they both try to achieve that goal are different.

Educators in botanic gardens and other outdoor museums must develop an understanding of these differences and how they affect visitor behavior, expectations, and learning. This study has been designed to provide insight into some of those differences and be an

incentive for educators to evaluate current and future programs, particularly in outdoor learning environments.

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