Can an Exhibit Cause Environmentally Responsible Behavior?
Three Methods of Evaluating a Behavior Change Exhibit

Using a combination of three methods, University of Michigan researchers evaluate the effectiveness of a behavior change exhibit at the Brookfield Zoo, near Chicago, Illinois.

1. Theoretical Analysis - The theoretical evaluation uses experts to assess if an exhibit contains features that encourage behavior change. Using a framework based on exhibit theory and principles from environmental education and environmental psychology, evaluators identify the exhibit’s strengths and make recommendations for improvement.

Framework Criteria
- Information - introduces visitors to environmental issues and behaviors
- Presentation - exposes visitors to concepts in a manner sensitive to their needs
- Engagement - helps visitors feel excited about and interested in conservation behaviors
- Motivation - develops visitors’ sense of responsibility to take environmental action
- Participation - offers visitors opportunities to physically and cognitively explore environmental behaviors
- Physical space - provides visitors with an environmental conducive to family interactions and learning

Results from the Bog of Habits Study
Evaluators from the University of Michigan evaluated the Bog of Habits individually. Results were analyzed using mean scores and through content analysis.

The mean scores from the evaluation show that the Bog of Habits meets at least half of the criteria for each category. As seen in Figure 1, the exhibit was rated strongest in terms of what information it contains and the manner in which the information is presented.

Evaluators also found it to engage visitors, particularly those in groups, whereas it was weakest in its physical layout.

Table 1 - Theoretical evaluation categories scores

<table>
<thead>
<tr>
<th>Category</th>
<th>Information</th>
<th>Presentation</th>
<th>Engagement</th>
<th>Motivation</th>
<th>Participation</th>
<th>Physical Space</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bog Group</td>
<td>3.97</td>
<td>4.14</td>
<td>3.08</td>
<td>3.23</td>
<td>3.47</td>
<td>3.91</td>
</tr>
<tr>
<td>Control Group</td>
<td>3.92</td>
<td>4.12</td>
<td>3.11</td>
<td>3.12</td>
<td>3.38</td>
<td>3.88</td>
</tr>
</tbody>
</table>

The evaluators identified specific strengths and weaknesses of the Bog of Habits within each of the criteria in the framework. Content analysis identified the common themes; the most frequently repeated comments are listed in Table 1.

2. Attitude Assessment - Visitors assess their environmental attitudes, past environmental behaviors, interest in new behaviors, and provide demographic information through an on-site survey. A subset is then contacted by phone at a later date for a follow-up survey. Analyzing the surveys shows if an exhibit influences how visitors think about environmental behaviors.

Results from the Bog of Habits Study
Visitors to the Brookfield Zoo filled out surveys in the summer of 2001. Those who played the Bog of Habits were called the Bog group while those who had never visited the Bog of Habits were referred to as the Control Group. Four to six months later, sections of the original survey were re-administered to a subset from each of these groups. Statistical analyses on all survey data were conducted using SPSS including factor analysis, t-tests, and Chi-squared tests.

On-site Survey
The Bog group demonstrated a significantly higher level of interest in performing environmental behaviors that require an investment of time than did the Control group (see Table 2).

Table 2 - On-site survey scores for interest in increasing environmental behaviors (scale of 1-5). Asterisk indicates a significant difference between the Bog and Control groups (p<.05).

<table>
<thead>
<tr>
<th>Factors</th>
<th>Bog</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Savings in the Home</td>
<td>4.14</td>
<td>4.02</td>
</tr>
<tr>
<td>Energy Conservation</td>
<td>3.69</td>
<td>3.49</td>
</tr>
<tr>
<td>Time Commitment*</td>
<td>3.23</td>
<td>2.87</td>
</tr>
</tbody>
</table>

Since the results also indicated that the Bog group had older children, and were more likely to be members and visit the zoo more often than the Control group it was thought that one or all of these factors might account for the higher levels of interest. However this did not prove to be the case, for when the two groups were standardized statistically the Bog group continued to score significantly higher.

Follow-up Survey
The Bog and Control group reported identical levels of interest, which matches the level of interest among the Control group in the summer (see Figure 2). This suggests that the Bog group’s higher interest in the summer was a direct result of playing the game.

Figure 2 - Change in interest in performing time commitment behaviors from on-site to phone survey

3. Behavior Experiment - The experiment measures whether visitors who played the Bog of Habits exhibit would take immediate pro-environmental action. Including an experiment in study design provides an objective compliment to the more subjective self-assessment surveys.

Results from the Bog of Habits Study
Survey respondents were given a coupon and told that if they would like more information on how they could help the Earth, the coupon could be redeemed for a brochure at the main information kiosk. The coupons were numbered and color-coded. Return rates of the coupons were recorded and analyzed using Chi-squared tests. Visitors who played the Bog of Habits were more likely to seek out information about how to help the Earth than the Control group. As seen in Table 3, the Bog group was nearly four times as likely to redeem their coupon than the Control participants (χ² = 9.29, df = 1, p = .002).

Table 3 - Coupon return rates for brochure pick-up experiment

<table>
<thead>
<tr>
<th>Returned Coupon</th>
<th>Bog Group (n = 194)</th>
<th>Control Group (n = 205)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>8.7%</td>
<td>3.4%</td>
</tr>
<tr>
<td>No</td>
<td>91.3%</td>
<td>96.6%</td>
</tr>
</tbody>
</table>

Summary

Benefits of a Multiple Method Study - The three study methods allows for a comprehensive analysis of an exhibit. The addition of the theoretical analysis to the traditional surveys strengthens and explains the findings from the surveys and experiment. Conducting an experiment provides a measure of behavior that can otherwise be difficult to attain and allows researchers to see if visitor’s actions match their intentions stated on the survey.

Conclusions from the Bog of Habits Study
- Taken both individually and together, the three parts of the study indicate that the Bog of Habits successfully encourages visitors to incorporate environmentally responsible behaviors into their lives.
- Zoo visitors are receptive receiving environmental messages while visiting the zoo.
- An exhibit can influence visitors’ interest in environmentally responsible behaviors.
- Behavior change cannot be expected without follow-up interventions.
- Behavior change exhibits could be replicated at other sites.

This study has implications not only for zoos but also for other sites that seek to promote environmentally responsible behavior; exhibits like the Bog of Habits can motivate visitors to adopt new behaviors.