Knowledge Gain, Memory, and Evaluation: Are We Using Appropriate Measures?

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This article reviews two studies (Peart, 1984; Peart & Kool, 1988) that assessed knowledge gain in addition to other measures of exhibit effectiveness. These studies are similar to many others that use tests of semantic knowledge as a measure of exhibit effectiveness. The main argument in the current article is that, by using incomplete measures of knowledge, researchers restrict themselves to semantic knowledge and fail to assess other types of memory (e.g., visual and episodic).

In a systematic comparison of conditions, Peart (1984) gave recall tests to groups exposed to different combinations of exhibit elements: (1) label only; (2) picture with label; (3) object only; (4) object with label; and (5) object, label, and sound. His measures included: attracting power, holding power, knowledge gain, and attitude change. One of the obvious results was that only when the label was present did participants show knowledge gains compared to the control condition. The recall performance of the object-only condition was similar to the control subjects who were not exposed to any exhibit. While this study shows that semantic knowledge gains require text, they fail to indicate that concrete visual experiences may also have resulted in learning. Had Peart used a visual test (e.g., recognition of a photo of the object), it is certain that visitors would have shown that they acquired visual knowledge. The point is that by restricting measures exclusively to semantic knowledge, there is danger of concluding that very little knowledge acquisition occurs, although the range of possible knowledge outcomes are not being assessed.

In another report, Peart and Kool (1988) described an evaluation of an exhibition called *Living Land/Living Sea* at the Royal British Columbia Museum in Victoria, British Columbia. The exhibition includes open dioramas of forest and seashore settings, closed dioramas of Ice Age mammals and river delta habitats, and small didactic (primarily text) exhibits. Researchers measured attracting power, holding power, knowledge gain, and attitude change in a control group of 56 visitors before they entered the exhibition and an experimental group of 56 visitors as they exited the exhibition.

As part of their analysis, they divided the 46 exhibits in the *Living Land/Living Sea* gallery into "concrete" and "abstract" exhibits. The 17 concrete exhibits were three-dimensional and contained objects and dioramas; and the 29 abstract exhibits were two-dimensional text panels. A Concrete Index was formulated based on size of the exhibit, whether the exhibit was open (without glass), or closed and the presence-absence of graphics, sound, motion, small specimens or models. The assumption was that larger exhibits are "more concrete (or real) than small ones, that open dioramas are more concrete than ones with glass in front of them, and that the stimulation of other senses such as smell and sound will increase the concreteness of an exhibit." (Peart & Kool, 1988; p. 119).

In terms of behavioral outcomes (attracting and holding power), the concrete exhibits were more successful. Even when size was removed from the correlation, the concrete exhibits (e.g., dioramas) were still highly related to attracting and holding power. Knowledge gain measures, on the other hand, showed a different pattern. There was an inverse correlation between knowledge gain and exhibit type (although this trend was not statistically significant). The higher the Concrete Index, the less knowledge gain. There was no significant difference in attitude change between concrete and abstract exhibits.

The authors conclude that:

> "Those exhibits judged to be the most successful in behavioral terms, i.e., the larger concrete exhibits, were not the most successful in educational terms. The negative relationship between knowledge gain and minimum viewing time, and the implied negative relationship between knowledge gain and Concrete Index scores, leads us to conclude that dioramas are not the best vehicle for communicating ideas. This finding reinforces the concept that large diorama-type exhibits be used to 'wow' visitors, but if we want to teach them anything, we should probably go for the small exhibit whose message can be gleaned in a relatively short time." (Peart & Kool, 1988; p. 127).

The implication that dioramas 'wow' but do not teach is unwaranted given the measures used. Since dioramas involve primarily visual experiences, a visual test of knowledge would have been more appropriate to assess impact than a test of semantic knowledge. The visual test might include: having the respondent choose an illustration from among several others that shows Ice Age species or asking the respondent to identify which photo shows a river delta habitat.

While concrete, visual experiences may not be the best vehicle for communicating semantic knowledge, their role for comunicating other kinds of knowledge (e.g., visual and other sensory impressions) should not be ignored. Bitgood and Cleghorn (1994) provide one alternative for studying some of these other types of knowledge.

References

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