

## Experience, Inquiry, and Making Meaning

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### Introduction

Museums are, above all, places which provide experiences. Yet as they have fashioned themselves more consciously as *educational* institutions, a split has developed over the way their exhibits are expected to lead to educational outcomes. On one side museums focus on traditional information-based outcomes, similar to schools, and view exhibits primarily as a medium for communication. On the other side, they tout learning directly from interaction with the exhibit and have adopted phrases such as “constructing knowledge” and “making meaning” to describe how visitors derive value from that experience. These two positions parallel a division in the schools, with a long history, between those who believe that education is delivered to the individual from the outside and those who believe that it is development from within.

For a museum, no less than a school, if the underlying educational approach is not thought through, the result is likely to be disagreement among staff over exhibit goals and content and a product that combines elements of both approaches but is effective at neither. In the hope that it may lend some clarity to the discussion, this article presents a model for experience-based learning, derived from ideas of John Dewey<sup>1</sup> and both an interpretation of “making meaning” and implications for exhibit development that the model leads to.

### Experience-Based Learning

When we hear the word “education,” most of us think of school, and when we think of school we think of the traditional “teaching is telling” model. The teacher (or text) delivers information and knowledge to the students whose job it is to “learn” it—which usually means memorize. Even though the appearance of knowledge—repeating the right words—may be achieved, there is little understanding and the individual’s own experience and thinking are not engaged. Many museums in seeking to become more educationally effective have ended up, perhaps unwittingly, following the school model. Although they may differentiate themselves as being informal, or as making learning more fun and accessible, underneath they are still practicing a version of “teaching is telling.” Their basic goal is to transmit information to visitors.

There is an alternative approach to teaching and learning, however—one that is particularly appropriate for museums—that recognizes the individual’s own experience as the key element in learning, as both the

means *and* end of education.<sup>1</sup> This experience-based model is shown in the diagram of Figure 1.

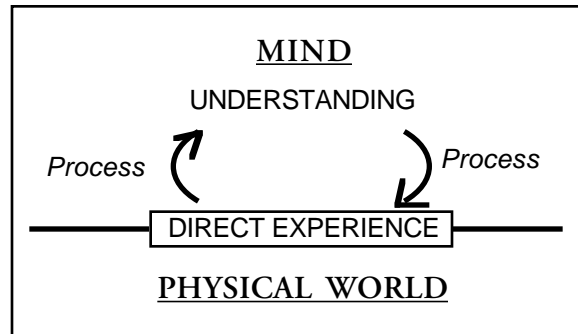


Figure 1. The experience-based learning model

The model starts with the assumption that our “universe” can be divided into two realms: the *physical world* where objects exist and events happen, and our *minds* which are capable of memory and conscious thought. What we see, hear, touch, taste, smell, and do—the interface between the physical world and the mind—is called *direct experience*. We are having these experiences throughout our lives, and from birth onwards we naturally set about extending them through exploring and manipulating our surroundings.

It also seems a part of human nature to seek to understand our experience. *Understanding*, in this context, means using our minds to find regularities and relationships among the experiences—generalizations that gather individual bits of experience together under a larger umbrella. The fundamental *process* the mind employs is to compare new experiences to what is already in the mind, and to compare what is in the mind with what can be experienced in the physical world. This *inquiry cycle*, from experience to understanding and back to experience, continues in a branching spiral, reaching ever larger and more general understandings. This same cycle is used unconsciously by children in their first explorations of the world and, in its most rigorous form, is used consciously by scientists as they continue that exploration.

There are two insights from this experience-based model which are of key importance to developing educational exhibits. The first is that knowledge and understanding cannot be delivered whole into people’s minds. Much as traditional schooling may try to do this, the fact is that whatever is delivered to the student or visitor can only be at the mind-world interface as direct sensory experience. To achieve understanding, an individual *must* engage in his or her own inquiry cycle.<sup>2</sup>

The second insight is that the inquiry cycle followed by each individual will be unique. It depends upon both the individual's previous experiences and the level of his or her process skills, and the range of these two factors in museum visitors can be large.<sup>3</sup>

**Making Meaning**

**The Words.** The model of experience-based learning just described has three elements, which were called *direct experience*, *process*, and *understanding*; and the whole model was called the *inquiry cycle*. These names mean something to the reader (it is hoped) because the actions and outcomes to which they refer have been sufficiently described. But there are other words that can and do serve as labels for experience-based learning. One of these is "making meaning," which I take to be roughly equivalent to "engaging in inquiry," both broad labels for the whole experience-based learning process.

But this is *my* meaning for "making meaning," it is not *the* meaning. Each reader will have to wrestle with the words on these pages and in doing so come to his or her own meaning of "making meaning." Following are some of the words used to describe the processes and outcomes of experience-based learning:

<u>Process</u>	<u>Outcome</u>
Making meaning	Meaning
Inquiring	Understanding
Learning	Learning
Constructing knowledge	Knowledge
Reasoning	Conclusions
Assimilating	Change of cognitive structure
Doing science	Laws and theories

These words are not synonymous; they have different connotations and imply more or less intellectual application and rigor, but they all refer to the same experience-based learning cycle.

*Meaning* is perhaps the broadest of the outcome terms. It is not precisely defined, and can refer to whatever results from comparing new experience input with what is already in the mind. This can be feelings as well as cognition. For example, *meaning* for a visitor could be things like:

- That reminds me of .... or That's a lot like .... (Something similar is already in the experience bank.)
- I never saw anything like that before. (New data has been added to the experience bank.)
- I didn't expect that .... (You thought at first it was similar to some previous experience, but it surprised you and it turns out not to be.)

*Understanding* is close to *meaning*, but leans a bit more towards the cognitive. *Learning* is the most commonly used term, but is also the most troublesome, for two reasons. First, the same word is used for both

the process and the outcome, which can lead to confusion. Second, museums tend to interpret the word broadly as any change in an individual's knowledge, skills, attitudes, beliefs, feelings, and concepts; while others may hear it in its more restricted meaning of acquiring skills and knowledge. This can and does lead to miscommunication. *Assimilating* puts the emphasis on the comparing of new experiences to existing understandings, and finding either a fit or a discrepancy. *Doing science* is the most formal and rigorous form of experience-based learning, and its outcome of laws and theories represents our best understanding of the physical world.

But it is not the particular words used that are important for exhibit development, it is the recognition that whatever level or form of understanding a visitor reaches, it must involve the processing of experience by his or her own mind.

**Misunderstandings.** There are two misunderstandings that the term "making meaning" often carries with it which can be cleared up by seeing it as a form of experience-based learning.

- To recognize that visitors make their own meaning does *not* imply that all meanings are equally good or correct, or that all knowledge is relative and "anything goes." It does say that the meaning an individual makes is valid for that individual, but it also says that people with larger bases of experience and with better process skills can be expected to pursue inquiry to higher levels and with greater rigor.

- The fact that people make their own meanings does not mean that they have to do it all by themselves. A teacher's setting up an environment to facilitate particular experiences and then coaching the inquiry process, for example, does not diminish the meaning that the student makes. It is critical, however, that the teacher is coaching and not imposing predetermined outcomes. Seeking information in order to benefit from what other people have experienced and understood also can be a valuable part of the inquiry process. But it makes all the difference that the information is integral to the self-motivated inquiry cycle and is not imposed as an end in itself.

**Implications for Exhibit Development**

**Focus on Experience.** Putting the experience-based learning model into practice brings about major changes in teaching. The classroom goal shifts from having students acquire cognitive content to actively engaging them in the process of learning, and the teacher's role changes from transmitting information to facilitating and coaching that process. The implications for exhibition development and design are just as profound. The goal is shifted from the learning outcomes to the museum experience itself, and the designer/developer role changes from communicator to creator of an environment to facilitate that experience.

To put the model into practice for exhibits, it is useful to recast the inquiry cycle as a two-step sequence.

- 1) Visitor + Exhibit → EXPERIENCE
- 2) Visitor + EXPERIENCE → Outcome

In (1) the plus sign is the interaction of the visitor (what the visitor sees and does) with the exhibit (the physical world) to yield a direct experience. In (2) the plus sign indicates “making meaning” (the mental processing) which leads to an outcome—meaning, understanding, learning, etc.—and to continuing the inquiry cycle. This formulation emphasizes that whatever the outcome of visiting an exhibition, it is a function of the *experience* at the exhibition. More commonly, the exhibit process has been thought of as a single step, Visitor + Exhibit → Outcome, leapfrogging over the experience and diminishing its role.<sup>4</sup>

Two essential points emerge here. The first is perhaps obvious, but is worth emphasizing—namely, that the only thing the developer/designer has direct control over is the physical exhibit. The second is that each visitor will interact with the exhibit in his or her own way, so the designer has only indirect control over the experience. The museum has no control over the visitor’s mental processing of the experience, which depends on the individual’s prior experiences and processing skill. One conclusion from this is that expecting uniform outcomes from an exhibit is an impossible goal.

**New goals and roles.** Typically, when exhibits are seen as a medium of communication, goals are written in terms of the desired outcomes (cognitive, affective, and performance). The job of the developer and designer is then to create an exhibit that will serve as the means to those ends, and success is judged by the extent to which the outcomes are realized. In contrast, the experience-based approach sets the immediate exhibit experience as a goal in its own right, on a par with the long-range outcomes. Success is judged by the extent to which visitors engage with the exhibit. This shift in goals is the major consequence of adopting the experience-based approach, and it requires a major shift in the frame-of-mind of all persons involved in exhibition development as well.

- Exhibit *development* becomes figuring out what things you would like visitors to be able to see and do, and anticipating how they can be linked together to form inquiry cycles.
- Exhibit *design* becomes creating an environment, as well as individual exhibit units, that will allow and encourage those things to happen.
- Exhibit *evaluation* becomes observing to see if they do happen.

One result of these shifts is that the overall exhibition plan now *starts* by finding the specific experiences that will be most engaging, meaningful, and memorable to visitors and makes these the core of the exhibition, and then builds outward from these to integrate them into a coherent overall theme. This can be called the “inside-out” approach in contrast to “outside-in” development that starts with a broad statement of a theme or topic, then breaks it down into sections much in the manner of textbook chapters, and lastly looks for exhibit units that will illustrate the content of each section.

Another result is to recognize the value of creating *rich* experiences for visitors. This is not the same as layering in more informational content, but means building in many possible paths that the inquiry cycle might take. This contributes to making the exhibit engaging and helps in accommodating the range of interests, prior experiences, and skill levels that visitors bring with them. For example, an exhibition of old firefighting equipment has a pumper wagon on display as one exhibit unit. In addition to the artifact and factual information about it, the exhibit could be enriched with a hands-on working model of the pump itself, so that visitors could feel the effort required to pump the water or could examine the mechanics of the pump; a display or pictures of fire helmets and their emblems leading on to the social role of volunteer fire departments; pictures of the pumper wagon being drawn through the streets by men (why not horses?) leading on, perhaps, to further inquiry into transportation, energy sources, roles of technology; etc.

This focus on the exhibit experience does *not* mean that the outcomes are no longer of consequence. On the contrary, developers must not only have outcome goals as well as experience goals, they must now be able to show the connection between the two. Thinking through those connections will involve assumptions on the part of the developer, assumptions based either on known research results or the developer’s experience and intuition. Validating those assumptions—determining if a particular experience does lead to some particular outcomes—is a difficult job that belongs to the field of educational research.

**Analyzing Experience.** The detailed, step-by-step description of what visitors can see and do at an exhibit, the *direct experience* part of the total inquiry cycle, becomes the basic tool both for creating exhibits and evaluating the outcomes. This is what the developer can specify, the designer can bring into being, and the evaluator can observe. The developer also must have in mind the mental processes that connect the actions into a meaningful sequence, but these are beyond direct control and can only be speculated on. Likewise, in evaluating the exhibit it is the visitor’s actions which can be observed, while the mental processes can only be inferred (and perhaps verified through interviews).

Below is a brief example, taken from a children’s museum, of how this step-by-step analysis might look. The exhibit is a large waterwheel, about six feet in diameter, with three water spouts above it that can be operated by visitors pulling on ropes connected to valves. The center column of the table is a sequence of things that the developer would like visitors to be able to do, while the other two columns are the developer’s guess at a visitor’s mental processes and the *meanings* he or she might make.

Although the example is a “hands-on” exhibit, this kind of moment-by-moment analysis can be applied to all exhibits. The actions do not need to be physical manipulation; simply looking from one part of a painting to another, for example, also constitutes an action. And actions certainly can include such things as reading labels and talking with other people.

**Labels.** The role of labels for experience-based exhibits also changes. (*Label* is used here to mean all words and pictures, presented through any medium—print, graphics, electronic, audio, or in person—that go together with the physical exhibit.) For information-based exhibits, the purpose of labels is to strengthen the “message” of the exhibit by conveying information. Often the *only* way the exhibit’s outcome goals can be met is by writing the information into the labels, and sometimes, in effect, the label becomes the exhibit.

For experience-based exhibits, the purpose of labels is to encourage, facilitate, and enrich the visitor’s engagement in the inquiry cycle. To this end, they may instruct how to use or do something, identify what is in

the exhibit, suggest actions to take, point out things to notice, pose questions that visitors can answer through further inquiry at the exhibit, or suggest things a visitor might wonder about or think about. Most importantly, they can help connect the exhibit experience with a visitor’s other experiences. Docents, guides, explainers, etc. in the exhibit serve the same function as the labels—facilitating the visitor’s experience. In being able to adapt to each individual, however, they have a huge advantage over fixed labels, and their presence can greatly increase the effectiveness of experience-based exhibits. Staff training is critical, however.

**Conclusion**

Designing exhibits which recognize the reality that visitors do indeed *make* meaning from their experience is more difficult than designing to communicate messages, but it is essential if visitors are to have engaging, meaningful, and memorable visits to our museums. A danger is that “making meaning” will join the collection of catch phrases—“hands-on,” “interactive,” “constructivist,” “visitor centered,” etc.—which have lost much of their meaning through overuse verbally and under-use in practice. To avoid this, exhibition development staff not only must think through their underlying exhibits philosophy and apply it consistently, they also must articulate it convincingly to others in the museum and outside world who think of “educational” as meaning only the traditional, information-based approach of the schools. It is hoped that the framework provided by the model of experience-based learning will help them to achieve this.

<b>INTEREST →</b>	<b>DO &amp; SEE/ACTION →</b>	<b>UNDERSTANDING/ → MEANING</b>
<i>What's this all about?</i>	Looks over water wheel, ropes, pipes	<i>I see. The ropes control valves that let water flow onto different parts of the water wheel.</i>
<i>So, what happens if I pull on a rope?</i>	Pulls on a rope; looks at valves and wheel	<i>The water does flow out, after a pause, and the wheel starts to turn.</i>
<i>I wonder if the other one will stop it or change its direction?</i>	Pulls on rope for other side; looks at valves and wheel	<i>The wheel does slow down, stop, and reverse direction.</i>
<i>What about the middle one? That shouldn't have any effect.</i>	Pulls on middle rope; looks at valves and wheel	<i>The wheel keeps going; in fact, speeds up. I didn't expect that.</i>
<i>Why did the wheel speed up when water dumped in the middle?</i>	Looks again at wheel and pipes set up	<i>I see. The water at the top has to go one way or the other; so it goes in the direction the wheel is already turning, and adds to the motion.</i>
<i>Will it do the same thing if the wheel is going in the opposite direction?</i>	Etc.	Etc.

Table 1. An analysis of the experience and possible meaning made at a children’s museum waterwheel exhibit. (Read left to right across the columns and continue down the rows.)

## Notes

1. John Dewey (1859-1952), perhaps America's greatest educational theorist of this century, developed a philosophy of education based on the principle that all genuine education comes about through experience. For further reading, see Dewey, 1938, and for applications of his thought to museums, see Ansbacher, 1998. The ideas presented in this paper and the call for museums to give more thought to underlying educational theory are not new (see for example Feher, 1996), but they are put in a new perspective by relating them to the model for experience-based learning.
2. This is also the idea that broadly defines the educational theory known as *constructivism* (see for example Hawkins, 1994). Although the term is widely used, a common definition is hard to pin down; and to avoid adding just more *words*, I chose not to introduce "constructivism" in this article.
3. For an extensive discussion of the role of previous experience in the exhibit experience, see Roschelle, 1995
4. This point has recently been reinforced in a study by Beverly Serrell (Serrell, 1998) in which she concludes, "Before we do any more research on how visitors learn ..., we should create exhibitions that visitors choose to experience thoroughly."

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