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## Introduction

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Wander through the Exploratorium on a Free Day in the spring, crowded with people of all ages and from all walks of life, and you will see evidence of the power of an experience-driven philosophy of education. People interact energetically with the exhibits, pressing buttons and pulling levers, and talk excitedly as they move from one active element to another. But it's not until you work at the Exploratorium—until you are immersed in the behind-the-scenes conversations with exhibit developers, scientists, artists, and the mix of creative and quirky individuals who actually *make* the museum—that you really experience the engaging pedagogy and ideas of the place, and the depth and breadth of the science and art behind the exhibits.

In watching visitors' dynamic and animated interactions with exhibits, staff often assume that visitors' experiences are as generative, reflective, and inquiry-driven as the staff's. But when exhibit developers and evaluators talk systematically to visitors, we find that, in many cases, visitors are not having the depth of experiences that staff hope for and are not making the kinds of connections staff expect. Visitors repeatedly tell us they enjoy the exhibits and think they are "cool"

and "fun," and some think that the exhibits are great gizmos for kids. But many people don't perceive clear connections among exhibits, or to relate their exhibit experiences to the rest of their lives or the world beyond the walls of the Exploratorium. Clearly, there is still much to learn about exhibit design supportive of deeper visitor experiences.

One of my main interests in joining the staff of the Exploratorium was to extend the experimental nature of the organization to include visitor research on the exhibits. The *Finding Significance* project grew from conversations about how we might take the richness of the behind-the-scenes interactions and explorations of staff—filled with stories about initial inspirations, the beauty of phenomena revealed, how and why exhibits are built, what individual developers, artists, and scientists experience at the exhibits—and share these stories, observations, and questions with visitors out on the exhibit floor. We had a hunch that providing multiple perspectives and modeling the inquiry process might help visitors find more diverse points of access to exhibits, possibly stimulating curiosity and enhancing understanding. And we hoped to learn more about the roles of narrative and inquiry in enhancing personal meaning-making.

The concern for visitor meaning-making is not new to museum professionals; even 17th-century notions of museums as places of "public instruction" provoked considerations of visitor learning. But it was not until the 1960s, with increasing pressures of social democratization, that a palpable shift in museum education and exhibit practice began to take place. Recognizing the need to reach more diverse audiences and to provide greater museum access of all



kinds—intellectual, cultural, social, and educational—museum practitioners began to experiment with new styles of exhibit presentation and interpretation and new ways of supporting visitor learning. Exhibit designers, developers, and educators increasingly realized that conventional methods of museum presentation, interpretation, and teaching were not adequate for a more diverse visitorship—that visitors had a wide variety of interests, starting points, comfort levels, and ways of understanding, many of which were not being addressed in traditional museum offerings. By the mid-1970s, a few forward-thinking exhibit designers and developers were beginning to employ newly emerging evaluation techniques in order to better understand how and what visitors learned at museum exhibits and programs.

Although museum practitioners, like classroom teachers, have a wealth of experience with real-life learning situations, they have rarely articulated their findings in a theoretical context, and their accumulated body of knowledge has only occasionally intersected with the field of formal educational research. Indeed, while the work of learning theorists like Piaget, Dewey, and Vygotsky has informed museum exhibition and education practices, much of the work of educational researchers has often seemed unrealistic or inapplicable to the real-life experiences of practitioners. Arguably one of the most powerful influences from the domain of educational research was Howard Gardner's 1985 book *Frames of Mind*. Exhibit designers, developers, and educators embraced Gardner's theory of "multiple intelligences" wholeheartedly, since it mapped seamlessly onto practitioners' understanding of visitor behavior in museums. Concurrently, Bernice McCarthy's work on learning styles added more support for the understanding that people learn in a diversity of ways.

By the mid-1990s, Lois Silverman's research on adult meaning-making, John Falk and Lynn Dierking's research on the museum experience, and George Hein's articulation of a "constructivist museum" helped practitioners to frame their work in more theoretical terms. Hein described an experience-based constructivist model of learning that has stimulated a wide range of articles, conference sessions, and conversations among museum professionals, including Jay Rounds, Ted Ansbacher, Michael Spock, and others. But while the theory of constructivism has resonated with some exhibit practitioners, its practical applications make others uneasy. What are the roles of designers and interpreters, since visitors construct their own meanings? How much "construction" of the experience should practitioners take responsibility for, and how much room should be left for visitors to construct their own experiences? Today, these conversations continue as we grapple with design strategies for exhibits and programs that support truly meaningful visitor experiences.

When we started the *Finding Significance* project in 1999, the researchers, designers, and developers on the team were primed and ready. This was an exhibit research project at the intersection of theory and practice, combining the experiences and perspectives of exhibit practitioners and educational researchers to create an experiment that contributed to both domains. Theory and practice informed all aspects of the *Finding Significance* project, from conceptual design to final implementation and through all of the decision-making cycles and iterations that took place over the four years of experiments. This grounding was due, in great measure, to Sue Allen's leadership and to her commitment to incorporating the expertise of exhibit designers and developers throughout the project.

As communities,  
museum practitioners  
and researchers are  
farther apart than  
we often realize.  
What we need  
are more genuine  
ongoing partnerships.

*Alan Friedman (2003)*



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The collaboration was exciting and rewarding for everyone on the team, but it was also frustrating at times. We struggled with an inherent tension between theory (the articulation of generalizable principles and methods) and practice (the design and implementation of unique experiences), which sometimes led to compromises between the rigor of the research on the one hand and the quality of design and presentation on the other. There may be as much to learn from our process of working together as from the resulting data. Most importantly, we learned a great deal about each other's domains. We all grappled with the rigor of the research design and the richness of the exhibit design. And together we worried about authentic visitor experiences and creative interpretive strategies.

In retrospect, I think it is very difficult—and perhaps imprudent—to retrofit fully designed and complete exhibits. It seems much more reasonable to put our energies into new exhibits designed specifically to offer multiple entry points and to model the process of inquiry. Today, as the project comes to a close with the writing of this book, we are left with some larger questions: Are there really generalizable ways to make exhibits more meaningful to our visitors, or is this a hit-or-miss proposition, more dependent upon the particulars of the situation, the creative vision of the designer, and the perceptiveness of visitors? How can we properly assess meaning-making in museums, and what is its relationship to learning? Are museum exhibits and programs appropriate media for providing deep, meaningful learning experiences, or should we be satisfied if they simply have the capacity to stimulate visitors' curiosity and spark their imaginations? These are questions that cannot be answered by either research or exhibit development practice alone.

Only with more work by designers and researchers together will we learn how to create museum environments, exhibits, and programs that are deeply significant for visitors.

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