

Learning Theory in the Museum Setting

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This chapter provides an introduction to some of the key learning theories that have guided and influenced museum and classroom education. Particular attention is focused on learning theories that pertain to settings where learners encounter "real" objects. The aim is to help educators think critically about the underpinnings of their instructional strategies, and to provide a shared vocabulary about learning theory to use when talking with classroom teachers.



The education world is teeming with theoretical frameworks for how people learn. For museum educators creating museum-school partnerships, it can be valuable to grasp the commonalities and distinctions of each theory and how to apply or adapt these ideas to their work. There is also much about learning that museum educators know from their practice and research. We know that people learn from and with objects; we know that people create their own learning.

This chapter examines the major learning theories cited by many museum educators. It is by no means exhaustive; it is intended to foster exploration of this challenging topic.

Why Theory?

Why should museum educators care to articulate the learning theory behind their programs? Theory substantiates the value of programs to educators and funders. Classroom educators seek proven work, not just "show and tell" examples of teaching. Increasingly rare is the casual field trip to the museum; teachers and students are coming to the museum with purpose. Funders want to be assured that their investment will have the highest possible pay-off.

Theory substantiates why and how learning occurs by identifying the attributes that assure successful learning. Theories that are field-tested and vetted by other educators show that a successful educational encounter can be repeated in different disciplines, contexts and cultures, and over the course of time. Just like classroom teachers, museum educators can isolate the successful attributes of teaching strategies. This allows museum educators to say more assuredly that a selected teaching process will contribute to learning, whether using a theory developed within a school or one suggested by museum work. Theories become not only explanations, but ideas or principles for ways to work.

Fortunately, school and museum educators seem to understand the same fundamental

concepts about learning. Much of education philosophy in schools and museums today is based upon the theory of constructivism, that is, learners construct knowledge for themselves individually and/or socially as they learn. In teaching, the focus changes from being about a specific subject to being about the way individuals think about their learning and how their experiences in the moment affect the meaning they make.¹ Popular educational phrases for this theory are "differentiated learning" and "meaning making."

Practitioners from the two arenas of school and museum education, however, sometimes are challenged by these semantics. For example, classroom teachers utilize theories from bodies of research on topics as diverse as after-school and family learning,² teacher coaching models,³ strategies for side-by-side teacher and student capacity-building,⁴ habits of mind,⁵ dispositions of successful learners,⁶ and learning strategies for at-risk learners. They learn about these theories of learning by attending regional and national conferences, conducting web searches, and more often than not, following the advice of a successful colleague.

To overcome potential miscommunication and to better understand what classroom teachers are talking about, museum educators can read these theories and ponder their relevance to museum programming. Museum educators also can work side by side with teachers to follow the changing learning climate in the classroom and track the changes in educational theories over time. The next section of this chapter, along with the Education Theory Bookshelf, provides an overview of current theories.⁷

Learning Theories in Formal Education

Formal education in the United States owes much to the writings of American philosopher and educational reformer John Dewey. He was one of the earliest to espouse the core ideas of constructivism, believing learners construct knowledge for themselves as they learn. As a proponent of Pragmatism, Dewey held that knowledge is created when learners adapt to their environment what they gain from challenging and stimulating experiences. Children, in his view, were not empty vessels to be filled with knowledge, and schools needed to engage students in active learning.

Since then, theorists have focused on the characteristics of the learner and on the contexts that make learning possible. Some of these researchers have developed systems for classifying people by these characteristics, and others have given more consideration to the contexts in which the student learns.⁸ Jean Piaget, Bernice McCarthy, and Howard Gardner are some of the well-known theorists in the first camp, creating systems for how people process information. Lev Vygotsy, Mikayli Csikszentmihayli, and John Keller on the other hand, look more at how the environment or conditions in which people learn affect the process.

Theories Focused on How People Process Information

Swiss developmental psychologist Jean Piaget devised a model of how children's learning naturally progresses through four stages of increasingly sophisticated cognitive development. Children move through this hierarchy as they age, he argued, building upon their

existing “mind maps” to understand the world. From the sensory-motor stage at birth, children grow into the preoperational and concrete operational stages of preschool and elementary school, which depend upon the presence of tangible objects to support learning. Abstract reasoning is a skill developed in later adolescence. In the 1970s and 80s, Piaget’s theory underpinned a movement in American education to make instruction more child-centered. These same ideas greatly influenced the development of children’s museums.

Bernice McCarthy’s 4MAT system, one commonly adopted by educators in schools and museums, advances four primary learning styles to describe how individuals prefer to process information. Some work more abstractly, others work concretely; in addition, people tend to process information either reflectively or actively. She identifies the following styles:

- *Innovative—the learner who observes and personalizes;
- *Common Sense—the learner who tries things out first through exploration;
- *Dynamic—the learner who designs new applications and examples and takes the extra step; and
- *Analytic—the learner who learns by gathering information, reading and research.

In 1983, Harvard education professor Howard Gardner questioned the notion that children’s abilities develop in a straightforward fashion. He outlined a contrasting theory of humans possessing multiple intelligences. Heavily influential in museum circles, Gardner described seven intelligences in his book *Frames of Mind*: linguistic, mathematical, musical, spatial, kinesthetic, interpersonal and intrapersonal. Today he continues to add to this list, including spiritual, moral, existential, and naturalist intelligences.

Two other theorists provide fodder for museum programs. In art education, Viktor Lowenfeld’s analysis of children’s drawings identified common, hierarchical stages of artistic development. In his 1947 book *Creative and Mental Growth*, he wrote about the social, aesthetic, intellectual and emotional growth in the art of children. Children, he observed, move from making scribbles at age two or three to producing highly realistic, representational drawings in their early teenage years. His stages of artistic development continue to help us understand how children see, respond to, and make images—skills that are analogous to learning from objects.

Edmund Feldman’s visual analysis theories also apply to the process of looking critically. He identified two objective processes: Description (taking an inventory) and Analysis (thinking about the critical decisions that makers of objects consider). From this base, he suggests that learners move into the more subjective processes of Interpretation and Judgment. Viewers consider the formal properties, expressive properties and instrumental properties of objects and construct meaning.

Theories Focused on How Environment Affects Learning

While heavily influenced by Piaget, the theory of Russian psychologist Lev Vygotsky stresses the context beyond the individual. He found that learning happens within the

everyday social interactions that children have with the people, objects, and events in their environments. While talking and playing with children, adult caregivers unconsciously teach the conventions of their culture. Vygotsky also argued that these adult-child interactions promote learning, as parents adjust their discussions to challenge their child to a level just beyond his or her previous understanding. He coined the term “zone of proximal development” to describe the learning that children can achieve with the help of a skilled and caring teacher—or in a museum with a guide or a label.

Theorists Mikayli Csikszentmihayli and John Keller also looked at context to understand the role of a challenging environment, which for some children could be a museum. Csikszentmihayli linked learning to situations where people are challenged just beyond their usual experience or ability. When a balance is struck between a person’s skill, motivation and the task at hand, and when he becomes fully absorbed in what he is doing, he experiences a satisfying state Csikszentmihayli called “flow.” For these learners, time, space, everyday concerns—even a sense of self—simply melt away. Keller, drawing upon research into the amount of effort a person is willing to exert in pursuit of a goal, argued that by understanding the four components of motivation (attention, relevance, confidence and satisfaction), educators can tailor teaching to student needs and provide appropriate levels of challenge.

Learning Theories from Museums

After almost half a century of visitor studies in museum settings, museum researchers and practitioners have theorized about visitor learning too. While learning is not the goal of each visitor to a museum, neither is learning the sole vision of each museum.⁹ Still, affective and cognitive changes can be observed with most visitors. These changes can be defined by current neuroscience as learning, that is, neurons fire and memories and meanings are made.¹⁰ Though some of the museum research has been undertaken with school children, most has been done with the general adult and family audience. The findings, nonetheless, influence work with children in museums and, in some ways, parallel and support traditional educational psychology.

One important way in which these studies are particularly useful for developing museum-school partnership programs is their emphasis on how people learn from objects, a primal way that humans learn¹¹ and the foundation for museum education.¹² One set of museum researchers, like educational theorists, identifies qualities within visitors that may affect how people learn in the museum environment, while another considers context.

Based upon extensive visitor research done with adult art museum visitors, the Denver Art Museum described visitors as either “novices” or “advanced amateurs,”¹³ similar to the hierarchical systems laid out by Piaget and Lowenfeld. Novices have moderate to high interest in a subject but low to moderate knowledge, while the advanced amateurs have a higher knowledge base. Novices look for a positive experience where they see and emotionally experience something new, particularly while visiting with others. Advanced amateurs more often are interested in content rather than experience, often planning

their visit in advance and spending more time in visual inspection of the art or object.

By contrast, when educators at Winterthur conducted research with people from age five to 95, they created a model more similar to Gardner's. The study examined the ways in which visitors innately thought about decorative arts or historic objects.¹⁴ Because age and prior knowledge did not seem to affect visitors' thinking strategies after the age of seven, the categories were not seen as hierarchical, like Denver's two. Instead the responses were compared to a circle where visitors might utilize four different thinking strategies at varying points in their visit. A majority of people began by associating the object with a person in the present or the past. Other visitors, however, began by describing the physical characteristics of the object or classifying the object into categories, such as style periods or function. A fourth group judged or evaluated the object aesthetically or monetarily. Some visitors, on their own, utilized multiple strategies during the course of a response, but others benefited from modeling provided by a label or a guide.

Study of museum visitors' interactions with objects also supports constructivist theory in acknowledging highly personal outcomes. The Center for Learning In Out-of-School Environments at the University of Pittsburgh tries to define learning in "informal" settings, such as museums. In their work they determined that the use of objects or artifacts themselves categorize the learning that occurs in museums differently from that in classrooms, libraries, or other educational settings.¹⁵ It is a more primal form of learning than from books, for example, as human beings understand how to learn from objects as soon as they begin to see.¹⁶ In addition, these objects are presented in a designed environment that alters the physical context for learning.

The effect of physical context of the museum setting is of particular importance in designing museum-school programs. Museum researchers in the Philadelphia/Camden Informal Science Education Collaborative posited that by studying how people engage with exhibits, they can use observed behavior to determine if learning has occurred. In its study, families learn more from exhibits that are multi-sided, multi-modal, intellectually and physically accessible, relevant to the visitors' existing knowledge and experience, and that allow for multiple outcomes.¹⁷ School groups may benefit from similarly designed, group-friendly environments.

In attempting to create a holistic model, John Falk and Lynn Dierking suggest that educators consider three contexts: the personal context of how a person learns, prior experience, and motivation; the socio-cultural context that puts learning within the culture and the community in which a visitor moves; and the physical context of the museum surroundings.¹⁸ Lisa Brochu also believes that visitor experience needs to be explained through time and space.¹⁹ She considers five time frames that together define the visitor's experience: the decision-making process to visit, the moment of entry into the museum, the times of connections between the visitor and the museum's messages, the moment of exit from the museum, and a later commitment where the museum experience is turned into a lasting difference in the visitor's life. These models illustrate how important it is to consider more than just the museum lesson in planning for and assessing learning in museum-school programs.

Learning Theory and Museum-School Programs

There are many exemplary instances of instructional practice in traditional schools and museum galleries that museum educators can adapt in designing their own programs, but there also is room for improvement in both. Museum-school partnerships offer a chance to capitalize on and learn from the best teaching practices, and also become laboratories for exploring which theories have the most potential to help all students learn.

As the constructivist learning that began with Dewey and Piaget blossoms in classrooms, formal education has already begun to look like the best of museum gallery teaching. More and more teachers today create cultures and values that address the ways students shape meaning in social groups, use community resources, and place the teacher as learning facilitator. With the current emphasis on making exhibits and programs visitor-centric, museum-school programs also acknowledge the variety of ways in which people learn. Museum educators can create ways for all students, not just some, to learn and voice their ideas through social working groups. This can be done with pair-sharing activities and small study groups in the gallery—groups that write and reflect together, that draw in the galleries and even move kinesthetically in response to objects. These strategies can offer students with different learning preferences a variety of opportunities during the museum visit. In working closely with teachers, museum educators can better understand the prior experiences of students and help to shape the pre- and post-visit experience to sustain learning from the museum experience back in the classroom.

To make museum-school partnership programs as successful as possible, museum educators must make time for theory. Melinda M. Mayer poses a question applicable across museum disciplines. "On what basis, therefore, should (art) museum educators decide the theoretical foundation of their teaching? Once having made that choice, what are the difficulties involved in translating that theory into good practice?"²⁰ Too often museum educators rush to develop programs and believe they are successful because they see the work resonate with the learner. In fact, these programs may very well be successful, but this information cannot be used to develop future programs unless the learning theory behind the success is considered carefully.

In planning programs, museum educators have an opportunity to stop and consider: What learning theory informs our daily practice? How do we use it as we plan programs? One way to ferret this out is to conduct audits of programs against the basic tenets of multiple theorists.²¹ The best program leaves no learner behind—it uses a complement of theories. For example, does the program take into account the cognitive age development of the child *and* does it have elements that reach different intelligences *and* does it consider the various contexts of learning? In reflection, museum educators also may discover and articulate what they are bringing to the theory table out of applied research conducted with student and teacher visitors.

As the future unfolds, crossing the line between strict pedagogical divides in traditional and museum education can only enhance both fields. Researchers from both arenas can work together to create dialogues, conduct research together, make presentations to all types of conferences and continue to enhance each others' efforts for all students.²²

In the end, all educators, no matter their setting, are looking for ways to create enduring understanding in their students.



NOTES

1. George E. Hein, "The Museum and the Needs of People," International Committee of Museum Educators Conference (1991), <http://www.exploratorium.edu/ifi/resources/constructivistlearning.html>.

2. S. Bouffard, B. Bridglall, E. Gordon, and H. Weiss, "Reframing Family Involvement in Education" (Research Report, New York: The Campaign for Educational Equity, May 2009). <http://www.hfrp.org/family-involvement/publications-resources/reframing-family-involvement-in-education>.

3. For an overview of teaching coaching models, see Bruce Joyce and Beverly Showers, "The Evolution of Peer Coaching," reprinted from "The Evolution of Peer Coaching." *Educational Leadership* 53, no. 6 (1996): 12–16 at [http://www.sflqi.org.uk/online/materials/02%20Embedding%20SfL/06%20Working%20in%20Partnership%20\(2.6\)/06%20Working%20In%20Partnership%20-%20Resource%20Joyce%20and%20Showers%20Article%201.pdf](http://www.sflqi.org.uk/online/materials/02%20Embedding%20SfL/06%20Working%20in%20Partnership%20(2.6)/06%20Working%20In%20Partnership%20-%20Resource%20Joyce%20and%20Showers%20Article%201.pdf).

4. For an example, see "Teacher Moderation: Collaborative Assessment of Student Work," *The Literacy and Numeracy Secretariat Capacity Building Series*, Special Edition #2, http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/Teacher_Moderation.pdf.

5. Arthur L. Costa and Bena Kallick, ed., *Learning and Leading with Habits of Mind: Sixteen Essential Characteristics for Success* (Alexandria, Va.: Association for Supervision and Curriculum Development, 2009) and K.I. Boyess and G. Watts, *Learning and Living with Habits of Mind: The Habits of Mind Learning Tool: Elementary and Secondary Editions* (Alexandria, Va.: Association for Supervision and Curriculum Development, 2009).

6. U.S. Department of Health and Human Services, Administration for Children and Families, "Why Children's Dispositions Should Matter to All Teachers," <http://eclkc.ohs.acf.hhs.gov/hslc/ecdh/eecd/Domains%20of%20Child%20Development/Science/WhyChildrensDi.htm>, and Andrew Littlejohn, "Digging Deeper: Learner's Disposition and Strategy Use" in *Strategies in Language Learning and Teaching*, ed. G. Cane (Singapore: RELC, 2008), downloaded from www.AndrewLittlejohn.net.

7. See "Education Theory Bookshelf" in the Appendix.

8. We understand that the theory is not as cut and dry as this chapter makes it appear. The theorists have influenced and responded to each other. This chapter, however, emphasizes the major differences in how the theorists approach learning theory as a way to help museum educators think more easily about their own work.

9. Karen Knutson and Kevin Crowley, "Museums as Learning Laboratory: Developing and Using a Practical Theory of Informal Learning," *Hand to Hand*, 18, no. 4 (2005): 4–5.

10. Stephen M. Kosslyn and Oliver Koenig, *Wet Mind: The New Cognitive Neuroscience* (New York: Free Press, 1992).

11. Steven Pinker, *How The Mind Works* (New York: W.W. Norton and Company, Inc., 1997).

12. John Henniger Shuh, "Teaching Yourself to Teach with Objects," in *The Educational Role of the Museum*, 2nd ed., ed. Eilean Hooper-Greenhill (New York: Routledge, 1999), 80–91.

13. Melora McDermott-Lewis in consultation with Patterson Williams, *The Denver Art Museum Interpretive Project, Winter, 1990*, http://www.denverartmuseum.org/files/pdf/DAMIntProj_1.pdf.



14. Tracey Beck, Pauline Eversmann, Rosemary Krill, Edwina Michael, and Beth Twiss-Garrity, "Material Culture as Text: Review and Reform of the Literacy Model for Interpretation," *American Material Culture: The Shape of the Field* (Winterthur, Del.: Winterthur, 1997), 135-176.

15. Karen Knutson and Kevin Crowley, "Museums as Learning Laboratory: Developing and Using a Practical Theory of Informal Learning," *Hand to Hand*, 18, no. 4 (2005): 4-5; and Karen Knutson, "Expertise and Experience: Museums, a Place for Talk,"

<http://upclose.lrdc.pitt.edu/publications/pdfs/Knutsonfuture.pdf>, July 23, 2009.

16. Paul Gabriel, "Visual Gateways to Memory: How the Brain Makes Visual Sense," (paper presented at the annual meeting of the American Association of Museums, Chicago, IL, May 13-17, 2007).

17. Minda Borun et. al., *Family Learning in Museums: The PISEC Perspective* (Philadelphia: Philadelphia/Camden Informal Science Education Collaborative, The Franklin Institute, 1998).

18. John H Falk and Lynn D. Dierking, *Learning from Museums: Visitor Experiences and the Making of Meaning* (Walnut Creek: AltaMira Press, 2000).

19. Lisa Brochu, *Interpretive Planning, the S-M Model for Successful Planning Projects* (Fort Collins, CO: The National Association for Interpreters, 2003).

20. Melinda M. Mayer, *Bridging the Theory-Practice Divide in Contemporary Art Museum Education* (Reston, Va.: National Art Educators Association, 2005).

21. See "Planning For A Variety Of Learning Styles" in Appendix.

22. Examples of this movement are historically grounded as illustrated in an article in *Museum News* by Mihaly Csikszentmihalyi & Kim Hermanson, "Intrinsic Motivation in Museums: Why Does One Want to Learn?" *Museum News* (May/June 1995): 35+; and by the AAM *Learning in Museums* seminars that sustain a practice of seeking speakers and establishing conversations with experts from outside the museum realm.