

Project Explore: How Children Are Really Learning in Children's Museums

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Introduction

Are children really learning in children's museums or are they simply being entertained? If children are learning, what is it that they are learning? What engages and enhances children in the learning process? With these questions in mind, a new research initiative (Project Explore) embarked on a journey to explore learning in children's museums.

Project Explore is a collaborative effort of two organizations, Please Touch Museum in Philadelphia and Harvard's Project Zero in Cambridge. Using a dual research approach, Please Touch Museum researchers investigated exactly *what* it is that children are learning and how to best enable or *enhance* their learning process; while the Project Zero team studied how children *engage* in exhibits by looking at the Entry Points approach to learning. A monograph on this research project is planned for completion in the Spring of 1997.

Methods

Observations

After realizing that many years could be spent determining what learning is, the Project Explore research team agreed that *learning* would be defined as *knowledge or skill acquired by experience with museum activities*. The research at Please Touch Museum occurred in three phases. Phase I consisted of open-ended observations of 101 children to discover what kinds of observable learning occur at exhibits and what is the role of accompanying adults in that learning. Much learning was observed in the form of factual, small motor, cause and effect, procedural, and script or role playing. Initial research revealed that the types of learning having

the most depth and value for the research were *factual*, *procedural*, and *conceptual cause and effect*. *Factual* learning is clear-cut and readily understood by people as learning, and includes category and script learning (learning life skills through role-playing or acting the part). *Procedural* learning involves processing procedural information, a skill which is useful outside the museum context. Lastly, *conceptual cause and effect* learning was found to be valuable as it requires a conceptual understanding of the relationship between two items. In addition to uncovering types of learning, Phase I data indicated that learning is more likely to occur when adults are actively interacting with the child.

Phases II and III of Please Touch Museum's research focused on one of the types of learning: *conceptual cause and effect*. In these phases, researchers concentrated on one museum component, the Maxi-Rollaway. This component consists of a vertically mounted grooved board, accompanied by small balls and a box of slats (of different sizes and colors). Signage encourages children to use slats to build pathways for balls to roll down the slatted board. After making observations, researchers tested two hypotheses about the relationship between adult involvement and learning: (1) higher amounts of adult interaction of any kind positively correlate with more learning at the exhibit, and (2) a type of adult interaction called *vague guidance* (guiding learning through open-ended, reflective questions) positively correlates with learning.

The experimental design consisted of setting up impasses along two pathways of the Maxi-Rollaway. The child's task was to correct these barriers in order to allow the ball to flow smoothly from the top of the board down all ramps to the bottom. An adult museum staff member trained by the researchers guided the child using one of three different interactive methods to help him/her to solve the problem. In the control situation, the adult gave encouragement but no guidance. Then, in one interactive method the adult aided the child using *precise guidance*. Here, she helped the child solve the problem by explaining exactly what to do or by physically manipulating the components herself. "Put the slat here." "Let's take this one out." For the other interactive technique, the adult utilized *vague guidance*. Using reflective questions, she supported the child in solving the problem on his/her own. "Uh-oh, what happened to the ball?" "Why won't the ball go down?" "Is there something you can do to help the ball go down?" "Is there something else you can try?" In each situation after wrestling with the first problem, similar but different obstacles were set up requiring the child to solve the problem on his/her

own without any guidance. The results of this experiment revealed that the children who received *vague guidance* had an advantage over the children who received no guidance or who received *precise guidance*. Also, it was found that children who received *precise guidance* were more likely to learn than children who received no guidance at all.

In order to make the results about the learning research study at Please Touch Museum more generalizable to other children's museums, this research team also conducted limited observations at Indianapolis Children's Museum, The Children's Museum of Boston, and Chicago Children's Museum. As in Phase I at Please Touch Museum, researchers observed and recorded the kinds of learning and the role of the adult in that learning. Results on these limited observations revealed the amount and quality of learning matched that which occurred in Philadelphia.

To complement the work of the Please Touch Museum, the Project Zero team focused its study on how children participate in learning at children's museums. They set out to describe the learning processes in which children *engage* with exhibits. To do this they applied Howard Gardner's Entry Point theory, which follows from his theory of Multiple Intelligences that children have more intelligences than what is traditionally referred to as their IQ, or verbal and quantitative intelligence. In meeting the needs of all gifts, Gardner (1991) proposes that any rich nourishing topic, any concept worth learning, can be appreciated in at least five different ways, or through at least five Entry Points:

- *foundational* or philosophical approach applicable for people who like to pose questions;
- *narrational* view appropriate for persons who learn through a story;
- *logical-quantitative* helpful for those who approach a concept by invoking numerical considerations or deductive reasoning processes;
- *experiential* appropriate for individuals who learn best with a hands-on approach; and
- *aesthetic* for those who favor an artistic stance with an emphasis on sensory or surface features

Project Zero conducted its own research in three phases at Boston Children's Museum and The Discovery Museum in Acton, using a sample of 180 children. Phase I focused on researching the Entry Point approach

and its development as a research tool. Through open-ended analysis and observation they developed their coding framework in this phase. In Phase II open-ended observations were conducted using the Entry Point framework. This data was coded for Entry Points to study and describe the range and nature of children's and adult companion's engagement at exhibits.

Focus Groups and Interviews

In Philadelphia, to further support the research and ascertain the perspectives of Please Touch Museum visitors, focus groups of roughly 12 participants each were held for parents, teachers and alumni children (visitors who have outgrown the Museum). Parents stated that children enjoy the Museum for the exploration opportunities it affords and that children learn "better" when their personal or developmental style is considered. Also, they reported that children can be affirmed in their learning by adults who engage in supportive behavior. Indeed, the children themselves stated that they preferred going to museums with parents and friends as opposed to school groups. In their focus group, teachers indicated that the Museum enhances learning by providing opportunities for role playing, hands-on activities, and multiple ways to learn. They further expressed an appreciation of the Museum as a place to gather ideas for their classroom.

Project Explore interviewed 15 directors of education in museums across the country to determine if their beliefs and observations concur with the research findings, and to seek a broader view of learning in museums. These educators responded to such questions as: Do you view your institution as a *learning center*? What does learning look like for four and five year olds? What adult behavior best enhances and enables learning? All the directors mentioned learning as critical to their mission. This learning they explained should be an extension of school learning. Museum educators observed children learning through such behaviors as: role-playing, concentration, enthusiasm, cooperative play, queries, and expressions of obvious discovery. When asked which adult behavior best encourages children's learning, museum educators overwhelmingly stated that adults who ask questions and become involved in interactive, participatory play best facilitate children's intellectual growth.

Project Zero in their Phase III also developed a plan to interview educators and designers in both of the museums where they collected

data (Boston and Acton). Having established some understanding of Entry Point engagement from children and their adult companions, researchers wanted to compare the observed learning and scaffolding behaviors with those that were intended by museum educators and designers.

Summary of Findings

What has this project discovered about learning in children's museums? How can this knowledge be applied to exhibits? Project Explore concluded that young children are learning in children's museums. It was shown that the most effective learning embodies something novel, cognitively complex, and generalizable outside the museum walls. Furthermore, adult supportive interaction in the form of developmentally appropriate, open-ended questions is critical to a child's learning within the museum context. To increase adult engagement in the learning process, it was shown to be important that the exhibits be enjoyable and playful to adults as well as children and contain subject matter that is comfortable and familiar to the adults.

Project Zero's results manifested that the Entry Point concept is a promising way to view learning processes in children's museums. Adults and children in the sample engaged in all five Entry Points across most areas of the museums, although the *experiential* Entry Point was the most observed Entry Point for both adult support and child behavior. From this research, keeping Entry Points in mind when planning exhibits, programs, and activities appears to be important for a successful learning experience.

The overall findings of Project Explore continue to support the conceptual framework suggested in its initial literature review. The research supports the Piagetian view (Dierking, 1991) that children learn best through active involvement with their environment and first-hand concrete experiences. Vygotsky's concept of learning as a social and shared experience (Kropf and Wolins, 1989) was also shown to be important in the museum context with the research verifying an expressed and visible need for positive social interaction and scaffolding for the enrichment of children's learning. Gardner's view that children's museums are a valuable resource for providing contexts for children to learn through multiple modalities or Entry Points (Davis & Gardner, 1993) was also substantiated in Project Zero's research.

Therefore, while children's museums have always been viewed as special places, formal research has demonstrated that YES, children are really learning in children's museums. To quote two museum educators:

"The future of all museums is going to be interesting. Children's museums have pioneered a new way to educate families. We're going to see a huge change."

(N.T. Haas, personal communication, July 1, 1996)

"What I would like to have happen is for youth museums to be viewed as viable learning institutions. We don't work hard enough to make people realize that this experience can be fun and [educational]. We don't have to compete with schools. We can complement them."

(N.T. Haas, personal communication, June 27, 1996)

This study is just a beginning, a start towards documenting how and what children learn in museums. We still have many questions. For example:

1. Can school groups have a meaningful experience without a lot of adult involvement?
2. How can we teach inexperienced museum goers to interact and effectively support their children at the museum?
3. How can aspects of museum learning be transferred to school, daycare, and family settings?

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Author Note

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Project Explore

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