

Young Children's Interaction with Science Exhibits

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Young children interact with an exhibit at a science center in many ways. Sometimes they use the exhibit in the way it is intended; we observe and we think they are learning. Other times children use the exhibit in unintended ways. Are they learning then? or just playing? Our research into how young children use interactive exhibits designed for 3 to 7 year olds prompted us to find a structure to think about play and its relationship with learning.

Play has a large research literature, with roots in psychology, sociology, anthropology and ethology, as well as education, but there are some commonly agreed characteristics. Garvey (1991) suggests that play is pleasurable and enjoyable, intrinsically motivated, spontaneous and voluntary, and involves the player in active engagement. Thus far, learning is not a necessary consequence of play, but Garvey (1991, p.5) notes:

"Play has certain systematic relations to what is not play ... [It] has been linked with creativity, problem solving, language learning, the development of social roles, and a number of other cognitive and social phenomena."

It is this last characteristic which links play and learning. Diamond (1996) reviewed this relationship and concluded that play provides experiences from which learning occurs and that museums are contexts which can encourage play and its benefits. Our interest is how children interact with particular exhibits and we want to elaborate a point made by Diamond, that is, "Play is not the same as exploration" (p.2). Psychologist Corinne Hutt studied this point extensively and distinguished between exploratory activities, which she called investigation, and play: "[T]he implicit question in the child's mind during investigation seems to be what can this object do? whereas in play it is What can I do with this object?" (Hutt, 1970, p. 70).

Hutt (1981) used this distinction to classify young children's activity into two major divisions: epistemic and ludic behavior.

Epistemic behavior (what can this object do?) concerns knowledge and information, and is goal or end-product oriented. It requires concentration and children don't like to be interrupted. Hutt divides epistemic behavior into problem-solving, exploration, and productive activity such as constructing something or acquiring skills, such as throwing a hoop. Epistemic behavior is promoted by new and novel things and is associated with new learning.

Ludic behavior (what can I do with this object?) concerns self-amusement. Hutt suggests two categories: sym-

bolic or fantasy play, and repetitive play. Ludic behavior is fanciful, imaginative and enjoyable, it occurs only when the child is relaxed and the surroundings familiar. Any new learning from ludic behavior is accidental; it may include some innovative elements but mainly, it consolidates skills.

Hutt's framework suggests that all playing is not learning, but that much learning is associated with play. Further, it helps interpret the findings of other research with young children in museums. For example, the nature of epistemic and ludic behavior is consistent with Gallagher and Dockser's (1987, p. 44) conclusion (from research at the Please Touch Museum) that "balance between the familiar and the novel is required in designing exhibits in children's museums."

Hutt's terminology has not become commonplace in the literature, but if we paraphrase her two questions as 'What can this exhibit do?' and 'What can I do with this exhibit?', we have a useful way of thinking about children's activities in museums. We have investigated the cognitive learning of young children at a large exhibit comprising conveyors, elevator, auger, ramp and bins for moving balls around a system. Our videotape of young children shows one girl carefully inspecting all parts of the system but touching it only briefly. Her later drawing of the exhibit showed all but one of the parts correctly sequenced. In contrast, another girl who simply placed balls repeatedly on one conveyor drew a very limited representation of the exhibit. The first girl displayed exploratory epistemic behavior and considerable learning while the second girl's repetitive ludic behavior resulted in less learning.

The very different behavior of these two same-age children has prompted our current research into identifying typical patterns of use of interactive exhibits and what makes an exhibit successful for young children. We suspect that engendering both epistemic and ludic behavior is important and should be encouraged, the former because of the greater potential for learning and the latter because it is fun.

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