

Discussing the role of conversation in learning at informal science institutions

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The body of work that examines conversation in learning environments continues to grow seemingly exponentially. At the heart of much of this work is a sense that learning and conversation are somehow linked. This idea can be connected to the theories of Vygotsky (1978), which suggest that people learn by participating in social situations using tools like language. People then internalize the ideas that are expressed in interaction, inserting these ideas into complex networks of knowledge. What we would like to be able to do is identify how people learn in conversations so that we may plan for maximally effective informal learning environments that generate the kinds of conversation most likely to aid learning.

Though we have discovered a great deal about conversation over the past several decades, we still struggle with just what the relationship is between learning and conversation. Some research suggests that conversation in classrooms that is less teacher-centered and more student-centered leads to improved learning. Ways of shifting the center of attention from teacher to student include leading a discussion by asking open-ended, thought-provoking questions (Dillon, 1989; Wells, 1999) and creating an atmosphere where students feel safe enough to generate their own questions (Dillon, 1989). However, very little research in either formal or informal settings looks at whether such situations really stimulate learning.

The value of questions and explanation in conversation

Callanan and Oakes (1992) looked at the 'why' questions young children ask in conversations with their parents. They noted that 3- to 5-year-old children asked many causal questions and parents often responded with explanations of social and physical causality. Here the importance of children's questions can be seen in eliciting help from their parents in gaining knowledge about the world around them. Other work has found that parents' questions can vary depending on the family dynamics in a museum setting (Ash, 2004b). In her study, some parents used many questions that they knew the answers to in an 'initiation, response, evaluation' format; whereas others tend to use questions as an invitation to further dialogue. A recent study looked at links between children's self-report of learning, their definitions of science, and their parents' use of questions (Hohenstein, Callanan, & Ash, 2005). They found that parents who used open-ended questions that invited further dialogue and reflection tended to have children who said they learned more and had more sophisticated definitions of science than parents who did not use open-ended questions at a marine science center. In addition, some work has looked at pupil conversation on school trips to informal learning institutions. Gilbert & Priest (1997) noted that museum explainers sometimes asked questions to help focus children's conversations on the concepts conveyed in a particular exhibit.

Other research has shown that very young children (i.e., 3.5 years) recalled objects and scenes from a museum visit with their mothers when there was mutual conversation (not just mention by one party or the other) about that item (Tessler & Nelson, 1994). These findings may relate to those with older children that suggest that having to explain a phenomenon to oneself improves understanding of a topic (Chi et al., 1994). Furthermore, in a museum-like setup Crowley and Jacobs (2002) found that 4- to 12-year-olds who heard their parents explain fossils, particularly in ways that connected to previous experience, were more likely to remember the fossil's name. Thus, though we have some preliminary understandings about how conversation can enhance cognitive learning in museums, we still have far to go in terms of discovering exactly how those relations play out and what the relation between conversation and affective learning in museums might be.

Challenges and aspirations in measuring conversation

One of the strengths of informal learning environments is that people may feel more engaged when involved in conversations that are less explicitly teaching-oriented (Bowker, 2004; Falk & Dierking, 1992). That is, though teaching and learning may be happening in these environments, participants may be less aware of the need to teach and learn than they are in traditional classroom environments where there is an explicit emphasis on learning as an activity. It may be the case that participants approach informal learning activities with a more relaxed attitude toward knowledge acquisition than is present in more formal learning situations. In contrast, one of the challenges that researchers and practitioners face in informal situations is evaluating the learning that occurs. Additionally, it is not always easy to identify what constitutes learning in

an informal situation because the learning goals are usually not as clear as in formal learning environments. To add to the difficulty, most researchers would agree that the kind of learning that museums hope to inspire (e.g., long term and/or islands of expertise) does not take place in the course of a single museum visit, but rather is built up over the course of multiple conversations, museum visits, and other experiences (Crowley & Jacobs, 2002). Importantly, it may be that a museum visit, or part of a museum visit, inspires conversations or other experiences that are 'out of range' of the normal researcher's project. That is, we tend to monitor what people say while they are at informal science institutions (or even at a single exhibit) rather than what they say on the ride home or in the café. Just what is it then that we can capture in conversations of single visits or even multiple visits to museums?

Numerous past studies point to various aspects of the situation as being important for learning conversations. One such aspect involves the relative status of the different participants. For instance, if one wants to convey a set of facts about a particular object, event, or phenomenon, the level of authority of the voice (be it personal or label text) could make a difference in what information is retained at a later time (Rowe, 2002). It is also evident that the context in which a conversation takes place is important in determining the development of the conversation. For example, the amount of personal relevance present in an exhibit will tend to influence the extent to which families explore the topic verbally and non-verbally (Ash et al., in press). When people feel a topic has an impact on their own lives, they are more likely to engage with it. Moreover, looking at the discussions people have is one way of examining the types of participation of different group members (Rogoff, 2003), which is an experience that people engage in that is mutually formative. In other words, the individuals' experiences both shape and are shaped by the same conversation (among other things). Furthermore, typical patterns of conversation tend to vary culturally. As such, it shouldn't be expected that all groups who have valuable experiences at a museum would engage in the same ways with the exhibits or with each other. Learning conversations may take different forms, depending on the previous experiences people have had with learning environments and conversations (Ash, 2004a).

Particularly relevant for museums is the finding that different types of exhibits tend to inspire different kinds of conversation (Allen, 2002). Whereas conversation at live animal exhibits (and perhaps other 'object' exhibits) tends to demonstrate some content and conceptual thinking in visitors, the talk at hands-on exhibits is mainly limited to procedural discussion about how to use the exhibit. This research illustrates the need to coordinate expectations for conversation to the appropriate exhibit types. That is, it is not necessarily appropriate to suggest that less learning takes place at a hands-on or computer exhibit because users talk less. Our methods for evaluating the effectiveness of these different types of exhibit must be further refined when using conversation as an index of learning.

It is apparent that museums and other places of informal learning are places that provide ample opportunities for parents and other 'knowledgeable' individuals to offer explanations to children and other 'less-informed' people. For instance, Kevin Crowley's work often investigates the kinds of explanations people use in museum settings. In one study, his group found that parents tended to explain more to boys than to girls in a discovery center (Crowley et al., 2001). Interestingly, exhibits can be designed such that the same material inspires adults to explain to girls as well as boys (Callanan et al., 2002; Callanan & Martin, 2003).

Labels and learning conversations

Additionally, despite the myriad studies on visitors' use of labels in museums, there is still relatively little research about the effect of label text on people's museum conversations. Assuming that conversation and learning are relatively closely linked in many instances, it seems surprising that there is not more information available about how the specifics of label text help to generate or hinder visitor conversation. That is, attempts have been made to examine the types of labels that exist (e.g., Bradburne, 2000) and even to check how much conceptual change takes place in the presence of different types of labels (e.g., Falk, 1997). However, few studies have investigated the relationship between a relatively accessible indication of thought at an exhibit (conversation) and the types of labels in a museum (see Humphrey & Gutwill, 2005; McManus, 1989, for an exception to this).

Applying our knowledge

It is worth considering whether research can somehow develop a system of classifying conversation that could be easily used by staff at informal learning centers to evaluate how effective their programs are with respect to the generation of conversation. There are several problems associated with this idea. The first is that it is imperative that research and evaluation be paired appropriately with the aims of a particular

program. Some programs may have goals that are affective or attitudinal in nature. A general classification of conversation would need to be sufficiently broad to cover the various needs of evaluators. The second problem stems from the problem outlined at the outset of this paper: We have not yet identified a way to pinpoint how conversation and learning are related definitively in such a way that others may take this information and apply it to an evaluation of a museum exhibition or other informal learning program. Therefore, in order for such classifications to be developed, there is a need for academic researchers and museum (or other) staff to coordinate their efforts, a process that will no doubt require a lengthy commitment to complete.

Meeting the challenges that face research and practice in examining conversations in informal settings could potentially change the way museums and other informal institutions think about their roles in designing informal environments, training staff who interact with visitors, and assessing the effectiveness of programming. One question that arises through pondering the relation between learning and conversations is what implications there would be on practice once there is more understanding about the nature of learning conversations. Research is needed to inform both our understanding of learning in conversations but also for how best to apply these understandings.

Summary

- Research suggests conversation, particularly explanation and question-asking, is important for learning.
- Finding the exact relationship between aspects of conversation and learning requires further investigation (and may never have a definitive solution).
- Conversations at informal learning institutions (and perhaps learning) tend to vary according to the relative status of the participants, the relevance of the topic to interests and prior knowledge, cultural affiliation of the participants, and type of exhibit.
- The relation between label text and conversation requires further exploration.
- Informal learning institutions stand to benefit in the facilitation of learning if a system of classifying conversation according to value for learning can be formed. That way they may evaluate their exhibitions/galleries on this basis.

Roundtable Attendees:

Doris Ash, Maureen Callanan, Andy Aichele, Diane Alderoqui Pinus, Valerie Bontrager, Alex Burch, Sam Dean, Wendy Derjue-Holzer, Kayla Dove, Sally Duensing, Kathy French, Alan J. Friedman, Ben Gammon, David Goudy, Megan Luce, Ellen McCallie, Leslie Moore, Shawn Rowe, Maija Sedzielarz, Debbie Siegal, Katie Silva, Judy Stanley, Lara Triona, Tracey Wright

References

- Allen, S. (2002). Looking for learning in visitor talk: A methodological exploration. In G. Leinhardt, K. Crowley, & K. Knutson (Eds.), *Learning conversations in museums* (pp. 259–303). Mahwah, NJ: Lawrence Erlbaum Associates.
- Ash, D. (2004a). Reflective scientific sense-making dialogue in two languages: The science in the dialogue and the dialogue in the science. *Science Education*, *88*, 855–884.
- Ash, D. (2004b). How Families Use Questions at Dioramas: Ideas for Exhibit Design. *Curator*, *47*, 84–100.
- Ash, D., Crain, R., Brandt, C., & Tellez, K. (in press). Realia and other rabbits: Artifacts, ambiguities, and acquiring the language of science.
- Bowker, R. (2004). Evaluating teaching and learning strategies at the Eden Project. *Evaluation and Research in Education*, *16*, 123–136.
- Bradburne, J.M. (2002). Museums and their languages: Is interactivity different for fine art as opposed to design? Paper presented at the Interactive Learning in Museums of Art conference. London, May.
- Callanan, M., Esterly, J., Martin, J., Frazier, B., & Gorchoff, S. (2002). Family conversations about science in an 'Alice's Wonderland' exhibit. Paper presented at the meetings of the American Educational Research Association, New Orleans, LA, April.
- Callanan, M., & Martin, J. (2003). Family conversations about science in an 'Alice's Wonderland' exhibit. Presented at the meetings of the Association of Science and Technology Centers, Charlotte, NC, October.
- Callanan, M., & Oakes, L. (1992). Preschoolers' questions and parents' explanations: Causal thinking in everyday activity. *Cognitive Development*, *7*, 213–233.
- Chi, M., de Leeuw, N., Chiu, M., & LaVancher, C. (1994). Eliciting self-explanations improves understanding. *Cognitive Science*, *18*, 439–477.
- Crowley, K., Callanan, M., Tenenbaum, H., & Allen, E. (2001). Parents explain more often to boys than to girls during shared scientific thinking. *Psychological Science*, *12*, 258–261.
- Crowley, K. & Jacobs, M. (2002). Building islands of expertise in everyday family activity. In G. Leinhardt, K. Crowley, & K. Knutson (Eds.), *Learning conversations in museums* (pp. 333–356). Mahwah, NJ: Lawrence Erlbaum Associates.
- Dillon, J. T. (1989). *The practice of questioning*. London: Routledge.
- Falk, J. (1997). Testing a museum exhibition design assumption: Effect of explicit labeling of exhibit clusters on visitor concept development. *Science Education*, *81*, 679–687.
- Falk, J. & Dierking, L. (1992). *The museum experience*. Washington, D.C.: Whalesback Books.
- Gilbert, J., & Priest, M. (1997). Models and discourse: A primary school science class visit to a museum. *Science Education*, *81*, 749–762.
- Hohenstein, J., Callanan, M., & Ash, D. (2005). Family questions and children's ideas: An explanatory link? Paper presented at the biennial meeting of the European Association for Research in Learning and Instruction. Nicosia, Cyprus.
- Humphrey, T., & Gutwill, J. (2005). *Fostering active prolonged engagement: The art of creating APE exhibits*. San Francisco: the Exploratorium.
- McManus, P. (1989). Oh, yes, they do: How museum visitors read labels and interact with exhibit texts. *Curator*, *32*, 174–189.
- Rogoff, B. (2003). *The cultural nature of human development*. Oxford: Oxford University Press.
- Rowe, S. (2002). The role of objects in active, distributed meaning-making. In S. Paris (Ed.), *Perspectives on object-centered learning in museums* (pp. 19–35). Mahwah, NJ: Lawrence Erlbaum Associates.
- Tessler, M. & Nelson, K. (1994). Making memories: The influence of joint encoding on later recall by young children. *Consciousness and Cognition*, *3*, 307–326.
- Vygotsky, L. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- Wells, G. (1999). *Dialogic inquiry: Toward a sociocultural practice and theory of education*. Cambridge: Cambridge University Press.