

The Nature of Interaction Between Zoo Docents and Visitors and the Use of Inquiry

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Abstract

Zoo docents influence how visitors engage with zoo exhibits and programs and develop their own scientific thinking. This study explored the nature of interaction between docents and visitors at Woodland Park Zoo located in Seattle, WA in the context of inquiry based teaching and learning. Results show that increased use of open-ended questions can lead conversations between docents and visitors to a greater level of visitor inquiry, engagement, and cognition.

Editor's Note: *The term 'docent' is widely used in the North American context. Elsewhere the role of docents may be most closely that of 'volunteers', however this may also include: 'presenters' and/or 'explainers'*

Introduction

Docents are one of the best attributes a zoo has to build a connection between guests and zoo animals (Fraser and Wharton 2007). These front-line educators influence guest experiences by modeling desirable science learning behaviors, helping guests to develop and expand scientific explanations, and shaping how guests interact with science, with one another, and with educational programs and materials (National Research Council 2009). As the body of research grows on how learning occurs in free-choice institutions, it is important for zoos to keep their docents up to date with current ways of teaching and interacting with visitors.

An important strategy for learning in a free-choice institution is the use of inquiry. This type of learning promotes the asking of questions and is designed to encourage guests to delve deeper into their questions and come to their own conclusions. Inquiry also helps visitors to make connections to events in their own lives and gives them ownership of their learning (Llewellyn 2007).

The objective of this study was to obtain a clearer understanding of the nature of interaction between docents and visitors at Woodland Park Zoo in the context of inquiry based teaching and learning. The primary method was to analyze subtle docent/visitor conversations in order to characterize the content and nature of learning taking place, referred to as "learning-talk" (Allen 2002). Rather than focus on the outcomes of docent/visitor interaction this study focused on the interaction itself. Specifically, this study examined the extent to which the tools of inquiry are being used in these interactions and the

impact of the use of inquiry on the interaction when used or not used. The following research questions were developed.

1. What is the nature of conversation between zoo docents and zoo visitors?
2. To what extent is inquiry being used during these interactions?

Methods

This study was designed as an unobtrusive observation of docent interactions with visitors at Woodland Park Zoo from November 2013 through February 2014. The study focused on the zoo's docent-run Animal Encounter Program (AEP), which provides guests with an up-close, hands-on, interpretive experience with the zoo's live collection of education animals.

A coding scheme was used to record instances of learning talk, modeled from Sue Allen's work "Looking for Learning in Visitor Talk: A Methodological Exploration" (2002). This coding scheme presents a hierarchical approach to coding conversation with six main categories and 12 subcategories of learning talk (Figure 1). Categories and subcategories with an asterisk were added or adjusted to Allen's (2002) original scheme in order to fit this study's particular situation as well as research questions.

Categories of perceptual, conceptual, and connecting were ranked in level of cognition. The category of perceptual can be thought of as a basic level of cognition, such as simple naming of animals. The next level of conceptual represents a slightly higher level of cognition including utterances that are

<u>Perceptual</u>	<u>Conceptual</u>	<u>Connecting</u>	<u>Affective</u>	<u>Open-ended Question*</u>	<u>Close-ended Question*</u>
Identification	Simple	Life-connection			
Naming	Complex	Knowledge connection			
Feature	Prediction	Inter-exhibit connection			
Quotation	Metacognition				
Instructions*					

Figure 1

simple interpretations of animals (e.g., where they live or what they eat), or more complex levels of interpretation such as generalization about animals or relationships between objects and animals. This category also includes the act of metacognition or reflection on one's own state of knowledge. The third and highest category of connecting includes explicit connections between an aspect of the AEP and some other knowledge or experience beyond this activity, for example, the act of using the program as a stimulus to share a personal story, previously learned information, or a link to another exhibit (Allen 2002).

Categories of open- and close-ended questions were added in order to capture a key aspect of inquiry that occurs during docent/visitor interactions. Open-ended questions were defined as questions that constituted an answer that included an explanation more than a "yes" or "no." Close-ended questions were defined as those answerable by a simple "yes" or "no" reply. The subcategory of "instructions" that falls under the category of perceptual talk was also added into this study because of the nature of the AEP program, which includes hands-on participation. For example, instructional talk might represent talk such as "touch with two fingers only" or "make sure to wash your hands after touching."

This study recorded the frequency of instances of learning-talk from both the docent and the visitor. During the study period a total of 16 docents were recorded, which represents approximately half of the 34 docents trained in the AEP program. A total of 49 groups of visitors were recorded which totaled 120 individual visitors.

Results

Results were first looked at separately between docents and visitors. Docents did most of the talking during conversations recording a total of 894 utterances (59.48% of total talk by docents and visitors). The most common categories of talk by docents were conceptual, perceptual, and close-ended questions (Figure 2). The least common categories were connecting, affective, and open-ended questions.

Next the categories of perceptual, conceptual, and connecting were broken down into their subcategories to take a closer look at the frequency of talk by docents (Figure 3). Within the subcategory of perceptual talk docents had the highest frequency of instructional utterances, followed by feature, naming, identification, and quotation. Within the subcategory of conceptual talk the highest frequency of talk was in the simple category, followed by complex, with prediction and metacognition both not occurring. In the subcategory of connecting the highest frequency of talk by docents was in the subcategory of inter-

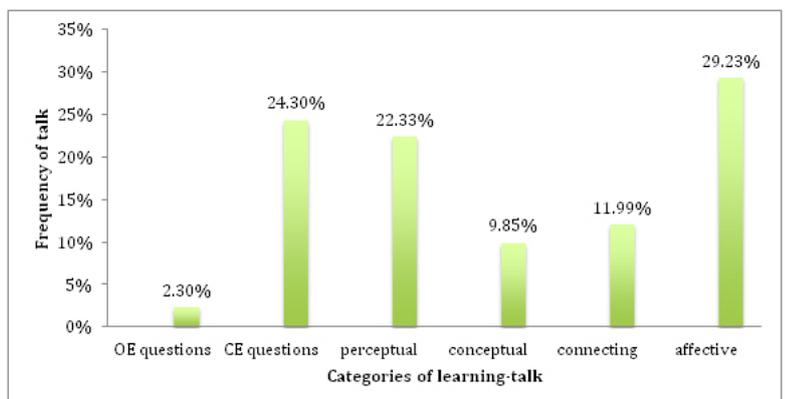
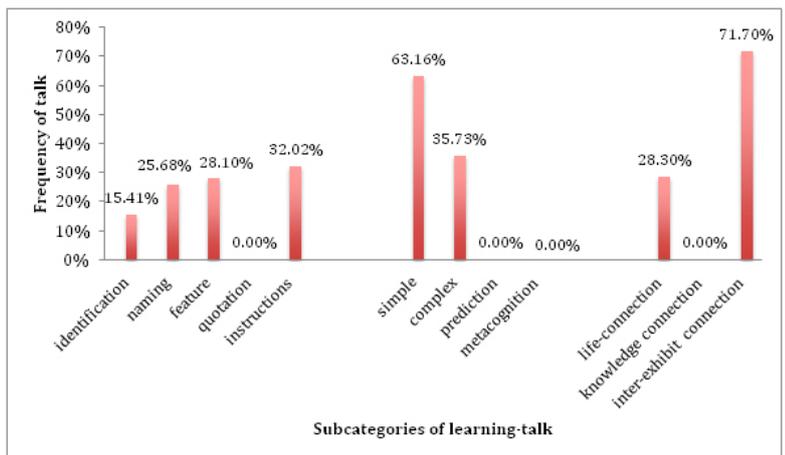
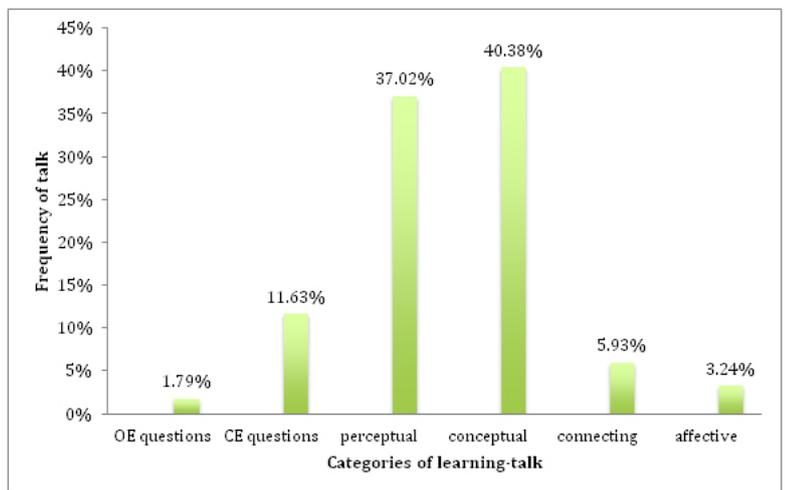


Figure 2. Frequency of talk in each main category of learning-talk for docents; **Figure 3.** Frequency of talk by docents within subcategories of learning-talk; **Figure 4.** Frequency of talk in each main category of learning-talk for visitors.

exhibit connection followed by life-connection, with knowledge-connection nonexistent.

Of the total number of questions asked by docents, 86.67% were close-ended and 13.34% were open-ended.

Next this study looked at frequency of talk in the same categories of learning-talk by visitors (Figure 4). Visitors recorded a total number of 609 utterances of learning-talk (40.52% of total talk by visitors and docents). The most common categories were affective, close-ended questions, and perceptual. Least common categories were connecting, conceptual, and open-ended questions.

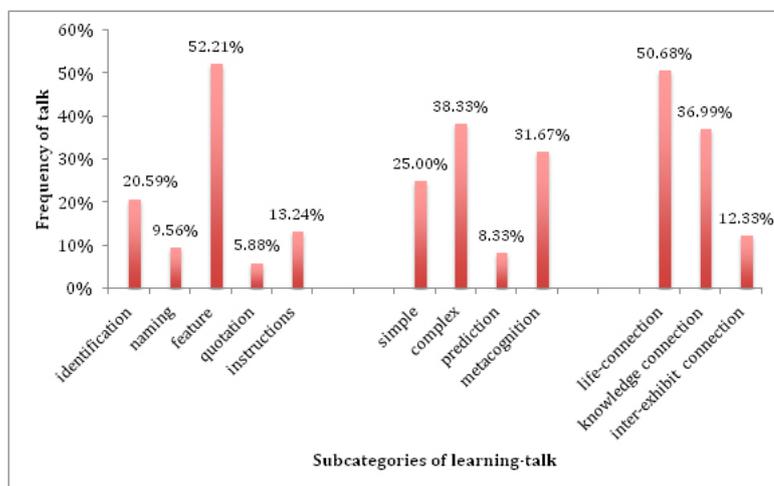


Figure 5. Frequency of talk by visitors within subcategories of learning-talk

To provide a closer look at the frequency of talk by visitors, the categories of perceptual, conceptual, and connecting were again broken down into their subcategories (Figure 5). Within the subcategory of perceptual talk visitors had the highest frequency of feature talk, followed by identification, instructional, naming, and quotation. Within the category of conceptual talk visitors engaged most in complex talk, followed by metacognition, simple, and prediction. Within the category of connecting the highest frequency of talk was in the life-connection subcategory, followed by knowledge-connection, and inter-exhibit connection.

Of the questions asked by visitors, 91.35% were close-ended and the remaining 8.64% were open-ended questions.

Using SPSS statistical software, a cross-tabulation analysis by question type showed that when open-ended questions were asked by either docents or visitors, significantly more utterances in the following categories of learning-talk occurred: conceptual ($p=.001$), complex (subcategory of conceptual) ($p=.001$), and connecting ($p=.041$). When close-ended questions were asked, there were significantly more utterances in the identification subcategory of perceptual ($p=.003$). Confidence levels for tests of statistical significance were set at 95% ($p<=.05$).

Discussion

Docents observed as part of this study engaged most in conceptual talk, but within conceptual talk most utterances were in the subcategory of simple interpretation usually in response to close-ended questions. This can be expected of docents, as most conversation is about where the animal lives, what it eats, and how old it is, for example. Docents also spend a lot of their time engaging in perceptual talk with the highest frequencies in instructional and feature talk. This can also be expected of docents due to the nature of the hands-on program and the importance of visitor and animal safety. Most of the

feature talk done by docents was an attempt to engage the visitor in a specific animal, such as drawing their attention to a certain physical or behavioral aspect of the animal.

Subcategories that had frequencies of 0.00% by docents were quotation, prediction, metacognition, and knowledge connection. Although these categories are possible for docents to engage in, they are not likely to do so because of the nature of the subcategories. Docents are not likely to read from a sign, reflect on their knowledge, make a prediction, or make a connection about something they already know.

These subcategories are more likely to occur within visitors while learning new information.

Visitors engaged most in the affective category. This kind of utterance was observed most in response to a docent talking with expressions of surprise, laughter, or sympathy, for example. The second category of visitor engagement was close-ended questions. This is also very typical of visitors who ask simple questions about the animal. Another subcategory noted was the high frequency of feature talk by visitors. This was seen most when visitors pointed out a specific aspect of an animal. The subcategory of life-connection also had a high frequency of utterances as visitors often told stories about how they had a pet or knew someone who had a pet that was similar to an animal featured in the AEP program.

Although the category of affective was present in both docent and visitor utterances, because of the complex nature of affective feelings, this category was not broken down into subcategories and was only recorded in order to record completion of the conversation. In order to further investigate the category of affective in the context of inquiry, the order in which utterances occurred would need to be recorded to determine what specifically provoked the affective utterance.

Results of this study indicate that in order to engage visitors as well as docents further in inquiry it is important to increase the frequency of learning-talk in the higher levels of cognition. Realizing that inquiry as well as learning in general is a continuous process, it is important to include all of the required steps in order to create an effective learning experience. Key to this process is to increase the use of open-ended questions. It was found that docent or visitor use of open-ended questions was more likely to increase the frequency of conceptual and connecting categories of thinking which are the second and third highest levels of cognition. More specifically, open-ended questions were found to increase the likelihood that the frequency of the complex subcategory occurred which engages in drawing inference beyond simple interpretation.

Another interesting aspect of this study is that the one category that both visitors and docents engaged in the least was open-ended questions. Yet, even with such a small frequency of open-ended questions we are still able to see the significant positive impact on learning-talk. According to Edwards and Bowman (1996), improving questioning strategies may lead to the development of higher cognitive skills.

It is also important to note that no significant difference was found between whether a docent or a visitor asked the open-ended question. While teaching docents how to ask open-ended question can improve their interaction, teaching them how to get visitors to ask open-ended questions is equally important. When people ask and answer their own questions it helps them clarify their thinking, construct ideas, and form theories about the world around them (Astor-Jack, Keihl Whaley, Dierking, Perry and Garibay 2007).

Conclusion

Overall, the visitors and docents at Woodland Park Zoo engaged the most in the basic level of cognition and had a downward trend for the next two levels of cognition. This is a typical expectation of learning-talk as the ease of talk is seen most in lower level thinking and becomes more work as the level of cognition increases. The cross tabulation results demonstrated that asking close-ended questions results in lower level cognitive learning-talk, but when open-ended questions were asked by either party the level of cognition jumped to the next two highest levels of cognition. The process of engaging in improved questioning can lead conversations between docents and visitors to a greater level of inquiry. It is important to note that although the use of close-ended question resulted in more basic level cognition, this level of cognition should not be viewed as undesirable. Inquiry is a process of thinking and requires the basic level of cognition to build upon in order to achieve the higher thinking.

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References

- Allen, Sue. 2002. "Looking for Learning in Visitor Talk: A Methodological Exploration." Pp 259-303 in Learning Conversations in Museums: A Methodological Exploration, eds. Gaea Leinhardt, Kevin Crowley, and Karen Knutson. Mahwah, NJ: Lawrence Erlbaum Associates.
- Astor-Jack, Tasmin, Kimberlee L. Kiehl Whaley, Lynn D. Dierking, Deborah L. Perry, and Cecilia Garibay. 2007. "Understanding the Complexities of Socially-mediated Learning." Pp. in In Principle, In Practice: Museums as Learning Institutions, eds. John H. Falk, Lynn D. Dierking, and Susan Foutz. Lanham, MD: AltaMira Press.
- Edwards, Sandra, and Mary A. Bowman. 1996. "Promoting Student Learning Through Questioning: A Study of Classroom Questions." Journal On Excellence In College Teaching 7(2): 3-24.
- Fraser, John, and Dan Wharton. 2007. "The Future of Zoos: A New Model for Cultural Institutions." Curator: The Museum Journal 50(1): 41-54.
- Llewellyn, Douglas J. 2007. Inquire Within: Implementing Inquiry-based Science Standards in Grades 3-8. Thousand Oaks, CA: Corwin Press.
- National Research Council. 2009. Learning Science In Informal Environments: People, Places, and Pursuits. Phillip Bell, Bruce Lewenstein, Andrew W. Shouse, and Michael A. Feder, eds. Washington, DC: The National Academies Press.



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