



BUILDING COMMUNITIES OF PRACTICE IN INFORMAL SCIENCE EDUCATION



By Kristin Evans, Eric Simms, David Bader, Benjamin Hunt and Lynn Tran

The Need

The theory and research on teaching and learning in zoos and aquariums has progressed significantly within the past few decades, as has the broader professional field of informal science education. This advancement has implications for the practice of educational professionals in zoos and aquariums. We believe that greater understanding of why people visit, and how people learn in, informal science education (ISE) institutions has the power to positively affect our teaching approaches and help us fulfill our missions.

Educators have a longstanding and essential presence in informal learning environments, and play a significant role in the visitor experience [1]. We argue that educators' understanding of learning and pedagogical skills directly affect the quality of that experience. But the professional preparation of informal educators can be particularly diverse and inconsistent, and research suggests that there may often be disparity between what educators value as ideal ways to support learning and what they do in practice. It has been proposed that the ISE field needs a shared body of knowledge to support educators' practice [2]. In particular, common constructs that identify the commitments, core practices, and knowledge of the field for outsiders and newcomers are critical for the growth of the profession [3].

The Program

During the past two years, a number of AZA member organizations have participated in, and contributed to, a program that is designed to build professional learning communities and improve the practice of informal educators. Known as Reflecting on Practice (ROP), the program was developed at the University of California, Berkeley's Lawrence Hall of Science (the Hall). The focus of the program is not on teaching informal educators how to teach, but on establishing opportunities for them to reflect upon why they teach the way they do in light of current research and thinking on how people learn. The ideas and tasks in the program create a shared knowledge base and professional language among educators within and across institutions. There are three primary goals for the program:

1. Connect practitioners with literature in the learning and teaching field to inform and ground their practice and build a shared language among professionals.
2. Engage practitioners in habits of reflections through observing and discussing their own teaching, as a means to develop their practice and make it public.
3. Nurture a tradition of continued professional learning among participants, and build a professional learning community.

The program engages institutional staff and volunteers in professional learning and reflection through exemplar group activities and discussions grounded in research on learning and teaching, and the use of video to observe and constructively critique individual practices. It also builds capacity and community from within because leadership teams from institutions learn the program and then implement it with their colleagues and staff over the course of six-to-14 months. This design is informed by research reporting that for professional learning to be meaningful and effective, it needs to be continuing, intensive, social, active, related to practice, and positioned within a community [4]. Moreover, reflection (a critical aspect of many professions – e.g., nursing, medicine, law, science) develops practitioners' sense of understanding how they do their work, and is necessary to foster effective professional judgment [5].

The Outcomes

Since 2009, nine ISE institutions nationwide field-tested the ROP program, providing valuable feedback and establishing the foundation for a national community of practice for informal science educators. In several instances, institutions have partnered to conduct workshops to promulgate the program with their regional colleagues. Here we provide a brief summary of some of the realized outcomes of implementing the program, based on evaluation of the experiences by the authors and other participating institutions:

- **Institutional investment in ROP supports and validates the profession of informal science education.** Individual educators are provided with a broader, research-based context in which to evaluate, compare, and elevate their practice and shape their professional identities. For some educators the theories and concepts are new, while others more familiar with them are challenged to reflect upon and discuss them in new ways. Involving a broad spectrum of staff allows for a rich dialogue among professionals with different levels of experience and perspectives in their careers.
- **The program supports the development of a culture of practice and reflection within and across institutions.** Staff and volunteers are provided with shared vocabulary and experiences that allow them to communicate about, and evaluate, the educational strategies and paradigms being used within their institutions and by colleagues elsewhere. Workshops involving multiple organizations within a geo-

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graphical region (e.g., Southern California) have led to the development of cross-institutional communities of practice that had not otherwise precipitated.

- **Identifying available time to implement the program can be challenging, but the inherent flexibility of the materials and approach provide opportunities to customize the experience.** Each institution can determine how the program best dovetails with their existing organizational structure, personnel, and program schedules. Regardless of the specific program schedule, dedicating time and other resources for effective professional development reinforces that value is placed on the individual and collective role of educators within the organization, and provides a foundation for the establishment of systemic reflective practice.

The Future

Reflecting on Practice continues to grow and evolve to meet the needs of the ISE field. The program is currently used in 20 ISE institutions nationwide, including the Monterey Bay Aquarium, California Academy of Sciences, Chabot Space and Science Center, New York Hall of Science and Brookfield Zoo. Some of these institutions are helping to pilot a variation of the program for use with volunteers, while others will help to develop a toolkit of resources to facilitate observation and reflection activities. Participants connect with one another inside and outside their institution through the program's website. To learn more about the program, contact Lynn Tran (lynn.tran@berkeley.edu) or visit our website, <http://COS-ROP.net>.

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KRISTIN EVANS IS THE EDUCATION DIRECTOR
AT BIRCH AQUARIUM AT SCRIPPS

ERIC SIMMS IS THE SCIENCE EDUCATION SPECIALIST
AT SCRIPPS INSTITUTION OF OCEANOGRAPHY

DAVID BADER IS THE EDUCATION DIRECTOR
AT THE AQUARIUM OF THE PACIFIC

BENJAMIN HUNT IS THE COORDINATOR OF OUTREACH
PROGRAMS AT SHEDD AQUARIUM

LYNN TRAN IS A RESEARCH SPECIALIST
AT LAWRENCE HALL OF SCIENCE

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1. **HOOPER-GREENHILL, E.**, Museum and Gallery Education 1991, Leicester: Leicester University Press.

2. **NATIONAL RESEARCH COUNCIL, ED.** Learning science in informal environments: People, places, and pursuits. ed. P. Bell, et al. 2009, National Academies Press: Washington, DC.

3. **TRAN, L.U. AND H. KING**, The professionalization of museum educators: The case in science museums. *Museum Management and Curatorship*, 2007. 22(2): p. 129-147.

4. **DARLING-HAMMOND, L., ET AL.**, Professional learning in the learning profession: A status report on teacher professional development in the United States and abroad, 2009, National Staff Development Council: Texas.

5. **LOUGHRAN, J.J.**, Effective reflective practice: In search of meaning in learning about teaching. *Journal of Teacher Education*, 2002. 53(1): p. 33-43.

