

# Inclusion, Disabilities, and Informal Science Learning

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A CAISE Inquiry Group Report

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## Executive Summary

Informal science education (ISE) experiences can provide powerful opportunities for people with disabilities to experience and learn about science. When designed to be inclusive, such experiences can lead people with disabilities to feel competent and empowered as science learners, generate excitement and enthusiasm for science, and be equitable learning experiences that promote learning for all. When such design considerations are not taken into account, however, the result can be feelings of disempowerment, frustration, discomfort, and alienation from science.

This report provides a summary of the investigations and inquiries of the Center for the Advancement of Informal Science Education Access Inquiry Group (CAISE AIG), which was commissioned in 2008 to survey the ISE field in order to answer the following questions:

- 1) In what ways has the ISE field worked to include people with disabilities in informal science learning?
- 2) What does prior work tell us about actions that should be taken in the future?

The group explored current practices of ISE professionals that promote the inclusion of people with disabilities in informal science learning and then developed a framework for refining future practices. The resulting report is intended for funders of informal science learning programs, future proposal writers, peer reviewers, evaluators, and professionals who design and implement ISE programs, exhibits, and technologies. It also addresses the multiple venues through which informal science experiences are provided, including science museums, youth and community programs, and media and technology.

### A framework for inclusion

According to the social model of disability, inclusion is more than simply gaining access into a physical structure—it is also about gaining equal access to the policies, practices, and systems that civil society affords (Barnes, 2003). Inclusion in ISE, therefore, goes further than ensuring that people with disabilities can enter the buildings or use the exhibits, programs, and technologies that deliver such experiences. It also requires that people with disabilities be able to learn from such experiences and participate as a part of, and not separate from, the larger social group and community. Similar to definitions of inclusion from the field of formal education (Blamires, 1999), inclusion in ISE experiences has physical, cognitive, and social dimensions. Inclusion in ISE requires that learners be able to:

**Physically interact with/perceive the space**—Key design questions include: Is the space set up so that a diversity of individuals can move around the space comfortably and safely? Is the information in the space conveyed in a variety of formats so that a diversity of individuals can perceive it? Can a diversity of individuals manipulate or cause things to happen within in the space?

**Cognitively engage with the materials**—Key design questions include: Is the information conveyed using a range of media to allow a diversity of individuals to engage with the materials? Do the materials take into account a diversity of individuals with a range of learning and cognitive skills? Do the materials take into account a diversity of individuals with ranges of experiences and sets of background knowledge?

**Socially interact with one another**—Key design questions include: Is the environment generally safe and welcoming for a diversity of individuals? Is the space set up to comfortably and safely foster and facilitate encounters and engagement among a diversity of individuals? Are the materials designed to provide meaningful reasons to foster and facilitate interactions and discussions among a diversity of individuals?

These three requirements around inclusion echo what is known about learning in informal settings. According to the National Research Council report on informal science learning (2009, pg. 1), learning in informal settings is “...learner motivated, guided by learner interests, voluntary, personal, ongoing, contextually relevant, collaborative, nonlinear, open-ended...”. If learning is to be guided by learner interests, then learners must be able to *physically* navigate through and perceive the space so that they are aware of the available learning opportunities from which they can choose. Learning that is “contextually relevant...non-linear, [and] open-ended” requires that learners be able to *cognitively* engage with the learning materials and that the context framing these learning materials reflect a variety of lived experiences. Finally, learning that is “collaborative” requires *social* interactions among a group of learners.

The physical, cognitive, and social inclusion of all learners, including people with disabilities, needs to be considered by all ISE professionals, especially those who design, implement, and evaluate informal science learning experiences. This report provides descriptions of exemplary inclusive experiences, with the hope that physical, cognitive, and social inclusion will become the norm and not the exception—and ISE will become open, accessible, and inclusive for all.

## Status of the field

CAISE AIG investigations suggest that the lack of systemic and accepted professional standards for approaching the inclusion of all individuals—especially those with disabilities—presents the greatest challenge for making inclusion a routine and commonplace practice in the field of ISE. While CAISE AIG investigations located a number of projects, initiatives, and organizations that have sought greater inclusion of people with disabilities in ISE, these efforts are still the exception and not the rule.

This investigation recommends a number of key areas for leveraging change in informal science learning to move forward towards more inclusive practices. These areas are:

- Changes to the standard design of informal learning experiences
- Changes in knowledge of and attitudes toward inclusion among ISE professionals
- Changes in the way the issue of inclusion is framed, with a greater emphasis on the physical, cognitive, and social dimensions of inclusion
- Generation of new understandings of inclusive practices through the study of inclusion and informal science learning
- Development of new designs through cross-pollination within and across different segments of the ISE field.

Combined, these recommendations lay the groundwork for a systemic change in the practices and culture of ISE professionals.