Science Centers Inspire Lifelong Interest In Science

NEW STUDY HIGHLIGHTS NEED FOR GREATER ATTENTION AND SUPPORT FOR INFORMAL/FREE-CHOICE LEARNING

Science Centers are clearly vital to creating a STEM literate society.

OVERVIEW

The Multi-Institutional Science Center Effects Study (MISCES), conducted by John H. Falk, Scott Pattison, and David Meier, Institute for Learning Innovation, was a multi-institution, national research effort to advance understanding of the contributions science and technology centers make to public science literacy. [1]

This study builds on previous research that examined the effects of science centers on perceptions of and interest in science and found that science center visits play a critical role in science learning throughout life.[2, 3]

The study represented a joint effort by California Science Center, The Franklin Institute, and Arizona Science Center to better understand what influences youth and adult science interest. It was based on a sample of more than 4,500 youth and adults living in three U.S. metropolitan areas (Los Angeles, Phoenix, and Philadelphia).

MISCES measured the current science interest of youth and adults and attempted to determine how different types of educational resources contributed to that interest. Specifically, the research analyzed current youth and adults' science interest to determine if it could be predicted by the quality of five types of past and current science learning experiences:

1. **Visiting a science center (out of school)**
2. **Attending science classes (in school)**
3. **Using the internet for science (not for school)**
4. **Watching science television (at home)**
5. **Reading science-related books and magazines (not for school)**

KEY FINDINGS

Of the five types of science learning experiences, visiting Science Centers was the ONLY one that consistently affected both youth and adults' science interest in both the present and the past.

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Out-of-school as opposed to in-school experiences emerged as critically important for predicting youth and adult interest in science.

- Positive experiences visiting a science center as a child was one of only two types of science learning experiences that significantly predicted interest in science in early adolescence—as well as visits in early adolescence predicting interest in adulthood.
- In contrast, there was no evidence that having positive experiences in school science classrooms significantly affected the science interest of either pre-adolescent children or adults.

People learn about science through a wide variety of experiences; school is just one part of the equation.

- Science centers, broadcast media, print media, and the Internet were used by 75-80% of the adult public to learn about science.
- Out-of-school, free-choice learning experiences, both in childhood and adulthood play pivotal roles in both youth and adults' sustained interest in science.
- Overall, frequent, positive science-related experiences of all kinds, including in- and out-of-school, both early and later in life, lead to strong interest in science as an adult.

Science Centers are valuable resources for learning.[4, 5, 6]

- Roughly 75 million people visit science centers and museums in the US annually.
- The impact of science centers grows as individuals visit more frequently—interest in science amongst youth and adults roughly doubles for every extra visit, before leveling off at around 5 or more visits.
- 2/3 of adults and 7/8 of all youth in the three metropolitan areas of this study visited these institutions.
- Non-white visitors constitute between 55% and 72% of visitors to these institutions. These are perceived as the premiere resource for quality science education by minority and low-income visitors.
- Science centers emphasize a hands-on approach that allows learners to choose and control what they learn and encourages experimentation and exploration.

WHAT WE CAN DO

Support and improve science learning.

- Employ a holistic, ecosystem approach to science learning where informal education opportunities are as equally valued and maximized as formal ones.
- Provide all learners the support they need to explore science across their lives.
- Secure sustained public and private funding and support for science centers and other free-choice learning opportunities.

Support science centers.

Visit. Science centers are places where students, parents, teachers and the entire community can learn, experiment and bring science to life. Science Centers bring national exhibitions that inspire and engage visitors of all ages in the wonders of science in everyday life.

Partner. Academic research departments, businesses, and formal and informal educators are encouraged to partner with science centers to identify opportunities to conduct research, build community engagement, and communicate science content.

Fund. Science Centers rely on the funding support of government entities, corporations, foundations, and individuals to meet annual operating costs and to expand educational outreach initiatives that positively impact their communities.

As we seek to enhance interest and skills in science among all Americans, it is essential that we strengthen support for science centers and the unique learning opportunities they offer.

- John Falk

ABOUT US

This study is the result of a collaborative effort by Arizona Science Center, California Science Center, The Franklin Institute, and the Institute for Learning Innovation.

Arizona Science Center works to ensure that Arizona improves science teaching and learning at all ages and is seen as a state that values science and science learning. Our mission is to inspire, educate and engage curious minds through science.

www.azscience.org

The California Science Center aspires to inspire science learning in everyone because it values science as an indispensable tool for understanding our world, accessibility and inclusiveness, and enriching people's lives.

www.californiasciencecenter.org

In the spirit of inquiry and discovery embodied by Benjamin Franklin, the mission of The Franklin Institute is to inspire a passion for learning about science and technology.

www.fi.edu

The Institute for Learning Innovation believes that a broader definition of learning, one that is lifelong and free-choice, can offer solutions to many of the critical problems that institutions and communities face in today's rapidly changing world.

www.instituteforlearninginnovation.org

Citations:

[1] Falk, J.H., Pattison, S., Meier, D., Livingston, K. & Bibas, D. (2018). The contribution of science-rich resources to public science interest. Journal of Research in Science Teaching, 55, 422-445.

[2] Falk, J.H. & Needham, M. (2011). Measuring the impact of a science center on its community. Journal of Research in Science Teaching, 48(1), 1-12.

[3] Falk, J.H., Dierking, L.D., Swanger, L., Staus, N., Back, M., Barriault, C., Catalao, C., Chambers, C., Chew, L.-L., Dahl, S.A., Falla, S., Gorecki, B., Lau, T.C., Lloyd, A., Martin, J., Santer, J., Singer, S., Solli, A., Trepanier, G., Tyystjärvi, K. & Verheyden, P. (2016). Correlating science center use with adult science literacy: An international, cross-institutional study. Science Education, 100(5), 849–876.)

[4] ASTC. (2014). 2013 Science Center and Museum Statistics. Washington, DC: Association of Science-Technology Centers.

[5] Falk, J.H. & Needham, M. (2011). Measuring the impact of a science center on its community. Journal of Research in Science Teaching, 48(1), 1-12.

[6] Falk, J.H., Dierking, L.D., Swanger, L., Staus, N., Back, M., Barriault, C., Catalao, C., Chambers, C., Chew, L.-L., Dahl, S.A., Falla, S., Gorecki, B., Lau, T.C., Lloyd, A., Martin, J., Santer, J., Singer, S., Solli, A., Trepanier, G., Tyystjärvi, K. & Verheyden, P. (2016). Correlating science center use with adult science literacy: An international, cross-institutional study. Science Education, 100(5), 849–876.