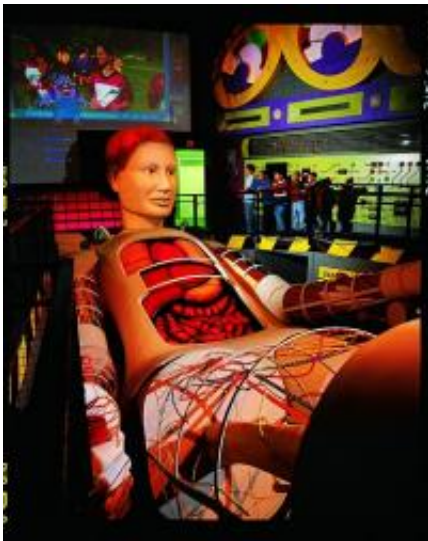


Surveys confirm enormous value of science museums, 'free choice' learning

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The Science Center's BodyWorks exhibit features Tess, a 50-foot anatomically correct transparent human model or body simulator. Animatronics, animation and special effects bring the BodyWorks show to life. It is here that visitors learn how organs work together to keep the body in balance or in homeostasis.

One of the first studies of its type has confirmed that a science museum can strongly influence the public's knowledge and attitudes about science and technology, and to a surprising degree can cut across racial, ethnic, educational and economic barriers.

The study focused on the California Science Center in Los Angeles, and offers profound support for the value of such institutions. It also

reinforces the emerging concept of "free choice" learning, which holds that people get most of their knowledge about science from someplace other than school or formal education.

The comprehensive, multi-year analysis was one of the first of its kind ever done, researchers said, based on extensive surveys of thousands of adults in the past decade by scientists from Oregon State University. The findings were recently published in the *Journal of Research in Science Teaching*.

"The holy grail of science museums is not to provide someone all the knowledge they need, but to inspire them, to become a launching point," said John Falk, an OSU professor of [science education](#) and national leader in the free-choice learning movement. "Many people have believed that such institutions could do this, but this study provides some of the first definitive evidence that it works.

"Overall, these results were staggering, much more positive than I could have imagined," he said.

According to the survey findings:

- More than half of the residents in Los Angeles County, over one million a year, have visited the Science Center since it opened in 1998, and say it strongly improved their understanding of science issues.
- Residents who visited the Science Center were among the most knowledgeable Los Angeles residents about science and technology, and their visit significantly contributed to this.
- The makeup of visitors was broadly representative of the general

population, including all races, ethnicities, ages, education and income levels.

- More than a quarter of visitors were Hispanic, and some of the strongest beliefs about positive impacts were expressed by minority and low-income individuals.
- While other leisure activities were decreasing in the past decade, adult use of the Internet, watching educational programs on television, and listening to educational programs in other formats increased.
- Nearly all adults who said their children had visited the Science Center reported an increase in their children's knowledge of science and technology, and large majorities said the visit raised their long-term interest level.
- The attraction to the museum was amazingly broad – no one zip code accounted for more than 2 percent of the visitation.

"There is a growing appreciation that Americans learn most of what they know about science outside of school," Falk said. "Institutions like science museums can play an important part in that."

According to Mark Needham, an assistant professor in the OSU Department of Forest Ecosystems and Society and co-author on the study, these surveys were unlike almost all done previously. They did not just sample visitors to a museum or science center, but sought out and interviewed a representative cross-section of the general public, he said.

The institution that is now the California Science Center has a long history, tracing its roots to the State Exposition Building constructed about a century ago. It underwent a total reconstruction that was

completed in 1998, and three major surveys were conducted since that time – one in 1997, one in 2000 and the results of this study from a survey in 2009. The work has been supported by the Noyce Foundation of California, and some earlier studies by the National Science Foundation and James Irvine Foundation.

The Science Center itself is a remarkable, 245,000-square-foot facility with many outstanding exhibits, and it's free. But other cities have similar facilities and attendance despite charging fees, Falk noted. And it seems to be working.

"Can you define homeostasis?" Falk asked. "Most people can't. But in Los Angeles, nearly half of the public say they've heard of the term, and 20 percent of them can now give you a decent definition. There was an exhibit on homeostasis at the museum after it re-opened, where a 50-foot-tall animatronic woman named Tess explained it."

Researchers used this exhibit and the concept of homeostatis as a "marker" to demonstrate that what was presented at the Science Center was actually learned. And lest you feel out-of-touch or uninformed, homeostasis is the balance that organisms or cells try to maintain.

Anyway, that's what Tess says. And apparently in Los Angeles, when Tess talks, people listen.

"It has long been assumed that formal schooling is the primary mechanism by which the public learns science," the researchers wrote in their study. "But in recent years there has been a growing appreciation for the fundamental role played by the vast array of non-school science education institutions."

"Large numbers of the general public have benefited," they said.

Provided by Oregon State University

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