Advancing Informal STEM Learning Program

Center for Advancement of Informal Science Education

2014 AISL PI Meeting
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Education and Human Resources

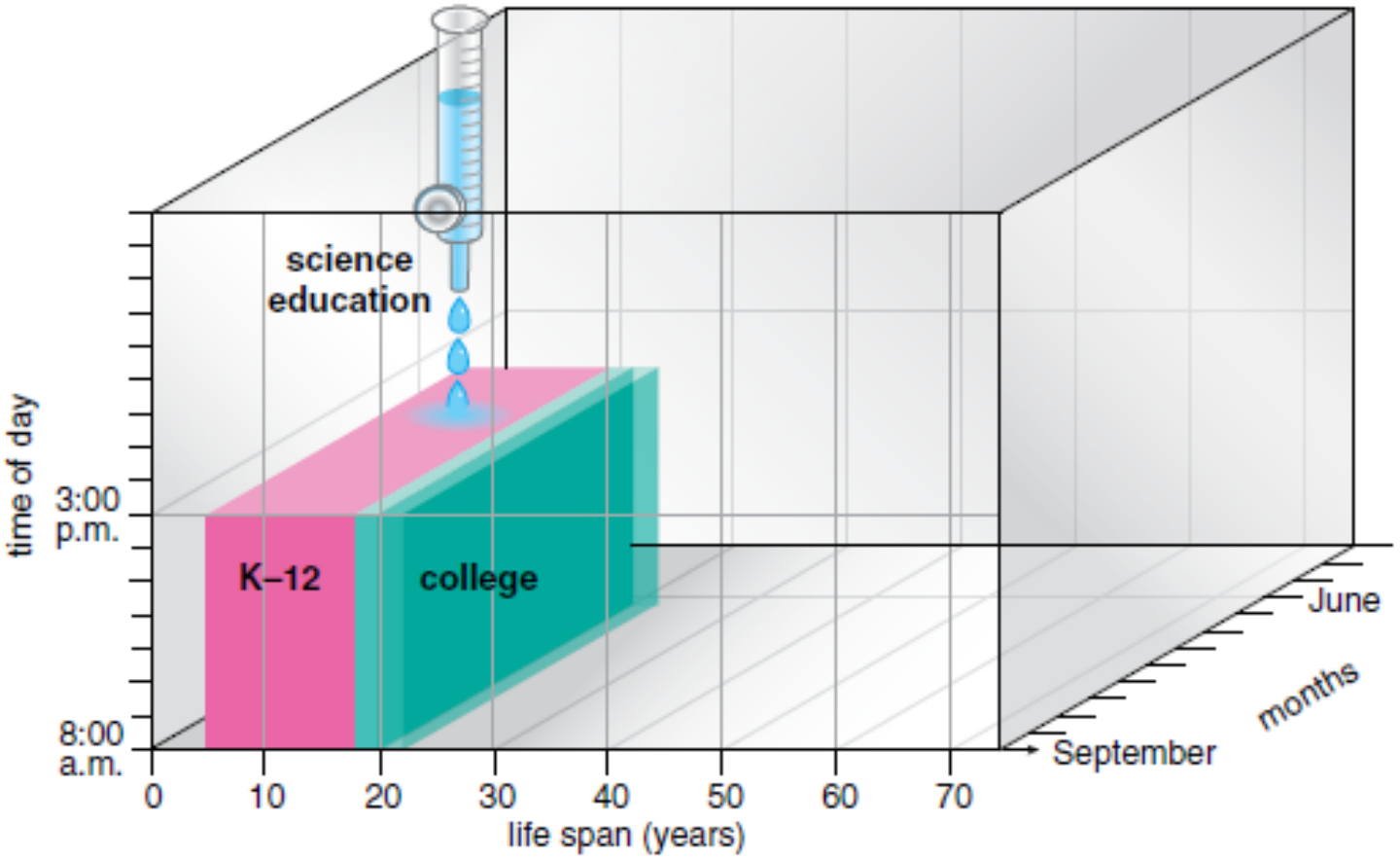

Figure 2. On average, only about 5 percent of an American's lifetime is spent in the classroom, and only a small fraction of that is dedicated to science instruction. Emerging data suggest that the best way to increase the public understanding of science is to reach people during the other 95 percent of their life.

"Basic scientific research is scientific capital…How do we increase this scientific capital? First, we must have plenty of men and women trained in science, for upon them depends both the creation of new knowledge and its application to practical purposes."

-Vannevar Bush, *Science: The Endless Frontier*

EHR Vision

A healthy and vital national science, technology, engineering, and mathematics (STEM) education enterprise.

EHR Mission

To support research and development on STEM education and learning and to engage and grow a diverse, STEM-literate citizenry ready to advance the frontiers of science and innovate for society.

Focus Areas

Learning and Learning Environments

Broadening Participation

Workforce Development

NSF Invests in Research from the Sea Floor to Kindergartens to Museums to Outer Space

Directorate of Education and Human Resources

- ***Deepening Informal STEM Learning Partnerships***
- *Growing Reach of the Community*
- *Continued Dedication to Innovation*
- *A Look Forward*

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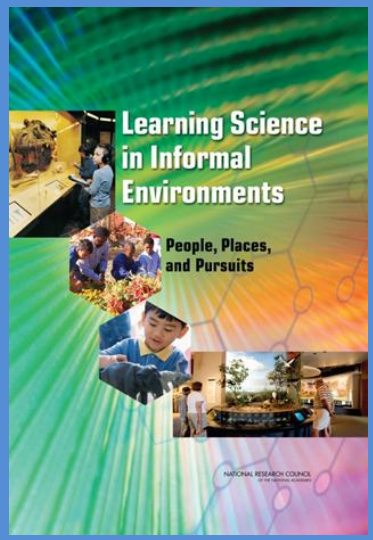
SCIENCE LEARNING+



NATIONAL ENDOWMENT FOR THE ARTS
A great nation deserves great art.

NATIONAL ENDOWMENT FOR THE Humanities

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Expansion of the Education Portfolio

1960s	Undergraduate instructional equipment, college science improvement
1970s	Improving education for minorities
1980s	Awards for great teaching, undergraduate research, research on teaching and learning, public understanding of science
1990s	Educating technicians, community colleges, evaluation and assessment, systemic reform
2000s	Digital libraries and cyberlearning
2010s	Cybersecurity, big data, research, and experiences

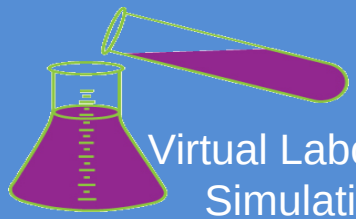
Expansion of informal learning environments and in the diversity of organizations offering opportunities and environments for informal STEM learning and engagement

"High tech" in the 1980s

Augmented reality sandbox (DRL #1114663)

The Future of Cyberlearning:
A vision of the year 2015…

School **Home**

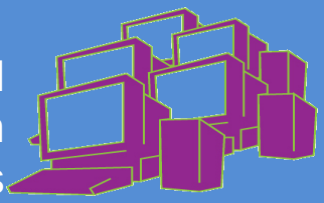


Virtual Laboratory Simulations

Mobile technology access to school materials and assignments

Students

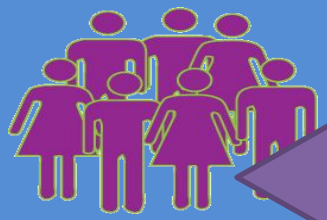
Visualizations of real-time data from remote sensors



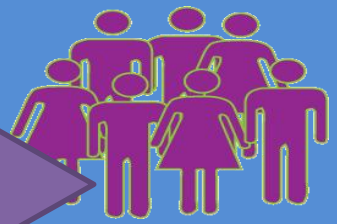
Virtual interaction with classmates

Supplemental content

Teachers



Parents



Lifelong “Digital Portfolio”

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- *Connecting individuals with the building blocks they need to understand cutting-edge science and their world*
- *Building theoretical and empirical foundations for effective learning in informal environments*
- *Furthering the assessment of such learning*
- *Supporting the use of innovative methods to address questions of importance to those who work in informal STEM learning settings*

Working with Cutting-Edge Science

- *Addressing sustainability issues*
- *Nanoscale informal science network*
- *Future Earth Institute and the impacts of humans on the environment*

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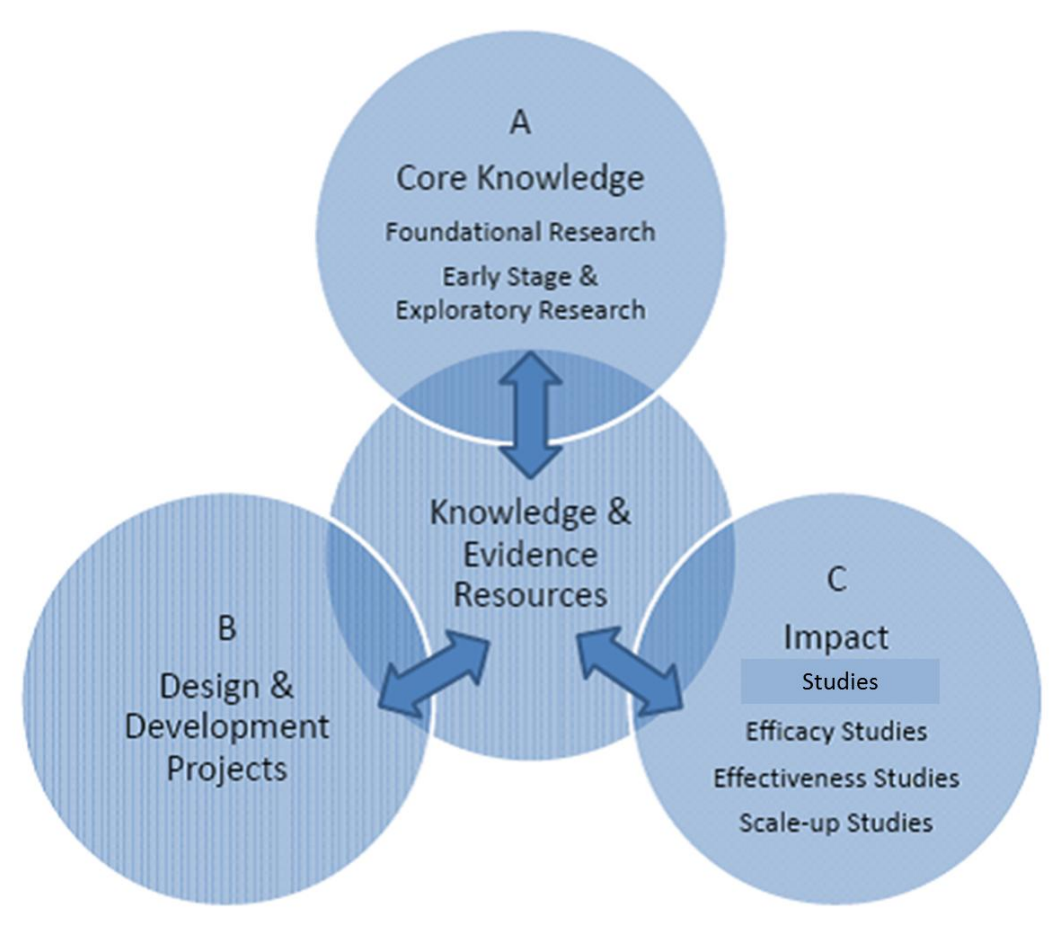
Research, Development, and Model-Building for STEM Learning

Investments where questions inform development and model-building and, in turn, model building and development give rise to new questions.

Common Guidelines for Education Research and Development



- Portfolio concept
- Big data ubiquity
- Finding the most compelling science and building learning through it
- Growing ability to measure “non-cognitive” skills

The future? Looks great!

- Social media builds awareness and excitement about informal STEM learning
- Online communities and information clearinghouses connect ISE providers with leading practices
- Using the growing body of work to communicate the ISE story and lessons learned

Thank you for your continued support and innovative, dynamic, and compelling efforts!

QUESTIONS?

Sources

Slide I

Figure: http://informalscience.org/research/ic-000-000-008-653/The_95_Percent_Solution

Slide 2

Vannevar, Bush. *Science: The Endless Frontier* (Washington, D.C.) accessed April 19, 2012 at http://www.nsf.gov/about/history/vbush1945.htm#transmittal

Slide 10

Left Figure: Adrian Pingstone, Wikimedia

Right Figure: Jim Markle, National Science Foundation

Slide 19

CAISE website, screenshot taken August 19, 2014