Nanoscale Informal Science Education Network

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Museum of Science, Boston
CAISE ISE Organizational Networks Convening, Nov. 17, 2011
Why we chose a network structure:
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It was in the solicitation - NSF 05-543

“This effort is intended to foster public awareness, engagement, and understanding of nanoscale science, engineering, and technology through establishment of a Network, a national infrastructure that links science museums and other informal science education organizations with nanoscale science and engineering research organizations.”
Core Partners

Collaborated to win the award and have the field-wide impact required

- Museum of Science, Boston
- Exploratorium, San Francisco
- Science Museum of Minnesota, St. Paul
Why we chose a network structure

Goals

• Create a **sustainable service-oriented infrastructure** that supports long-term efforts to **educate the public about nanoscale science, engineering, and technology**, as well as **builds capacity in the field and within participating institutions**.

• Strategically plan, develop, implement, and disseminate **educational deliverables of all kinds** that **foster greater engagement with and understanding of nanoscale science, engineering and technology** in a comprehensive way by the general public, as well as K-12 school groups.

• Stimulate **educational research and evaluation** that add to the **nanoscale informal science education knowledge base**, inform continuous improvement of both products and processes, and **guide the development of future deliverables**.
Inverness Research Associates identified four major challenges at the outset:

- The content and pedagogy of nano science education is just now emerging.
- The field is just now learning how to design resources that will effectively communicate nano science to public audiences in informal science education settings.
- At the ISE institutional level, there is little expertise, experience, or incentive to do nano education for the public.
- At the field level, there is limited experience in developing and working with a national supportive network.
Inverness Research Associates identified four major challenges at the outset

• We don’t know what it is

• We don’t know how to do it.

• Nobody wants to do it.

• And we don’t know how to get anyone to do it.
NISE Net Launch

Solution to:
Don’t know what it is
Don’t know how to do it
First NISE network diagram
Educational Programs and Exhibits
Educational Programs and Exhibits

GIVEN WHAT WE DIDN’T KNOW FORMATIVE EVALUATION WAS KEY
Hands on Science and Technology!

Thursday, April 3, 11 AM - 1 PM
NSF Atrium

Participate in activities developed to engage the public in learning about nanotechnology during NanoDays
March 29 - April 6, 2008

Developed by the Nanoscale Informal Science Education Network with funding from NSF.
200+ NanoDays Participants
Network Community Tiers

- **Core Partners**
  - Tier 1
  - ~14

- **Nano-infused Partners**
  - Tier 2
  - ~100

- **Broad Reach Partners**
  - Tier 3
  - >300
NISE Network Simplified Logic Model

**Inputs**

- NISE Network
  - ISE organizations
  - Research centers

**Outputs**

- Network community
  - partnerships
  - practices and knowledge
  - resources and materials
  - workshops and training

- Educational products/knowledge
  - programs, exhibits, media
  - tools and guides
  - research and evaluation

**Outcomes**

- Increase capacity in the field to engage the public in nano

- Engage the public, increasing awareness and understanding of nano
Evaluating NISE Net

- Refining and defining the network structure
- Measuring public impacts
- Informing the work of NISE Net
Studying NISE Net structures

- New study examines communication flow within NISE Net as a way to refine and define our image of the network structures
- Existing mental model places people as the connecting nodes
- Possibility of non-human forms of communication
  - NanoDays kit as a boundary object?
  - Meetings as a potential structure?
  - Nisenet.org?
Measuring public impact directly

• Studies directly measuring NISE Net **products** demonstrate impact
• Studies measuring NISE Net **activities** are inconclusive
• Possible reasons:
  – Do “modifications” change the impacts?
  – Are the experiences too varied to be measured against narrowly defined goals?
  – Is there only a narrow range of experiences that are successful?
Measuring public impact indirectly

- Counting participation

- Professional impacts
  - Theory of action articulates ISE professionals/university affiliates as pathway for reaching the public
  - Hard to link professional to public impacts as little is known about how ISE professional actions influence public learning
Informing the work of NISE Net

• Early in NISE Network
  – Inverness evaluated network impacts
  – Multimedia evaluated public impacts
  – In-house evaluators conducted formative evaluation on educational products

• Challenges
  – Divisions were not always clear
  – Evaluators were less “networked”
  – Capacity exceeded demand
  – Products were being formatively evaluated, but the broad range of implementations were not
Informing the work NISE Net

• Current model
  – Multi-institutional, collaborative team
    • Three evaluation departments
    • Committee of visitors
    • Targeted studies of the Network
  – Team-based inquiry
    • Practitioners conduct own studies
    • Aimed at product/practice improvement and professional learning
    • Already launched in Tier 1
    • Discussions of a Tier 2 launch
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