Nanoscale Informal Science Education Network
Professional Impacts Summative Evaluation

This document is an executive summary of the Nanoscale Informal Science Education Network (NISE Net) Professional Impacts Summative Evaluation. **Sections 1–4 below correspond to the points in the report's** *Summary of Findings and Discussion* (Goss et al., 2016, pp. 86-100). The icons displayed to the left of each finding indicate the related section(s) in the report. This page includes a description of the study, and the final two pages include graphs and quotes that are meant to highlight major findings; much more detail is included in the complete report.

Background of the NISE Network

The Nanoscale Informal Science Education Network is a national community of researchers and informal science educators dedicated to fostering public awareness, engagement, and understanding of nanoscale science, engineering, and technology (nano). Funded by the National Science Foundation through two consecutive grants totaling over $40 million that extended over 10+ years, NISE Net is one of the largest informal science education initiatives ever undertaken in the United States.

NISE Net Goals for Professionals

- Identify with a broader community that includes scientists and museums

- Value local research-ISE collaborations

- Understand and appreciate key concepts in nanoscale science, engineering, and technology and its relationship with our lives, society, and environment

- Understand theories, methods, and practices for effectively engaging diverse public audiences in nano

- Utilize professional resources and educational products for engaging diverse public audiences in nano

Background of this Study

This study was a longitudinal examination of individual professionals over the final three years of the NISE Network (Goss et al., 2016). Based on the NISE Network's goals for professionals, this study explored how involvement with NISE Net impacted an individual professional's sense of community, learning about nano, and use of nano educational products and practices.

This evaluation primarily included professional partners who were:

Informal Science Educators (ISE): Professionals from science museums and children's museums implementing informal science education

University professionals: Individuals from large and small universities and colleges throughout the United States including researchers, scientists, education outreach coordinators, and others
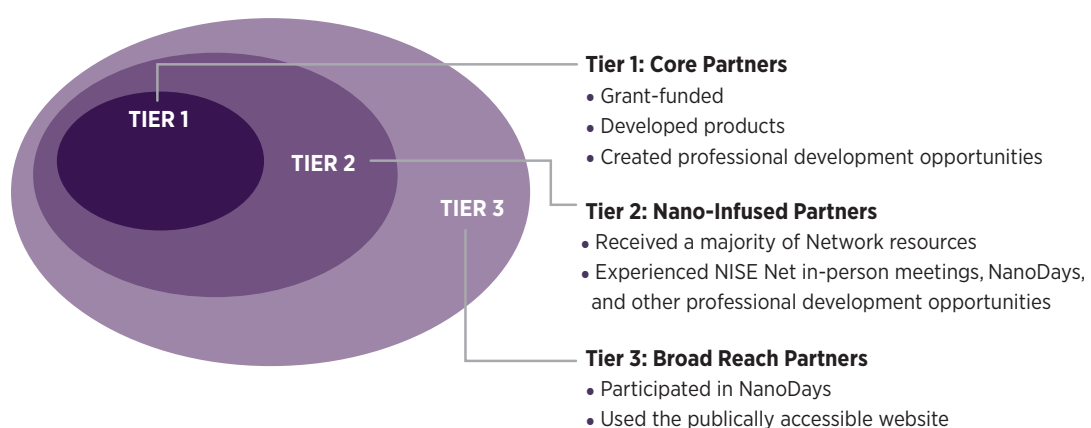
Methods

This study employed two data collection methods over three years:

- An **Annual Partner Survey** which involved a total of 597 professionals in Tiers 1-3

- **Yearly interviews** with a representative subset of 21 professionals from Tiers 2 and 3
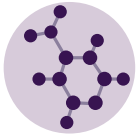
The survey presented a broad view of how professionals were impacted by participating in the NISE Net as well as how their sense of community, learning about nano, and use of nano educational products and practices changed over time. Interviews provided a deeper understanding of professional involvement in the Network.

NISE Network Tiers of Involvement

NISE Network partners were categorized into tiers based on the roles and responsibilities of the partner institutions, their level of involvement in the Network, and the amount of NISE Net support they received. Descriptions of typical involvement are below.


TIER 1
TIER 2
TIER 3

Tier 1: Core Partners
- Grant-funded
- Developed products
- Created professional development opportunities

Tier 2: Nano-Infused Partners
- Received a majority of Network resources
- Experienced NISE Net in-person meetings, NanoDays, and other professional development opportunities

Tier 3: Broad Reach Partners
- Participated in NanoDays
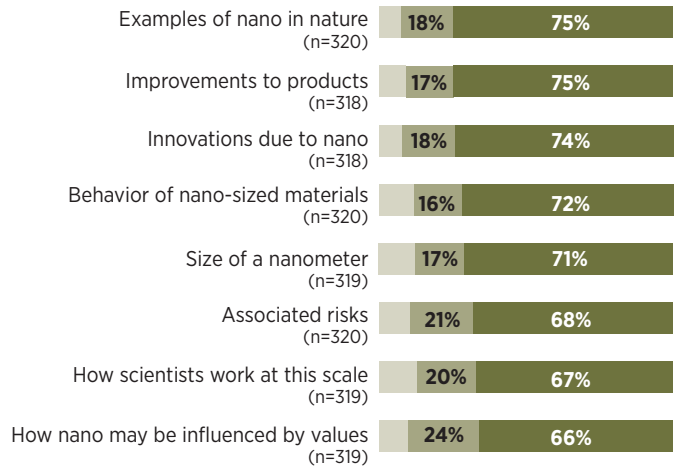- Used the publically accessible website

COMMUNITY & COLLABORATION

UNDERSTANDING NANO

1 NISE Net professional partners reported that their **sense of community increased** after they became involved with the Network and that **NISE Net affected their understanding of nano**.

To what extent did you identify with a broader community that includes both scientists and museum professionals? (n=321)

Before getting involved with NISE Net
45% | 38%

Now that you are involved with NISE Net
21% | 77%
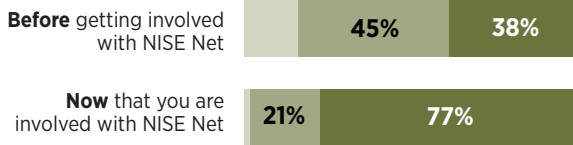
How much has NISE Net affected your confidence in explaining the following nano concepts to another adult?

Examples of nano in nature (n=320) — 18% | 75%
Improvements to products (n=318) — 17% | 75%
Innovations due to nano (n=318) — 18% | 74%
Behavior of nano-sized materials (n=320) — 16% | 72%
Size of a nanometer (n=319) — 17% | 71%
Associated risks (n=320) — 21% | 68%
How scientists work at this scale (n=319) — 20% | 67%
How nano may be influenced by values (n=319) — 24% | 66%

Not at all/Very little | A little/Somewhat | A lot/A great deal

> "I think what it's done is kind of give a catalyst to come together. Like this new person in engineering—I never would have met him. We actually put out a little news brief on campus that just said, 'Hey, are you into nano?' and he came out of the woodwork because he saw that [flyer]."
>
> –Tier 2 University professional, Year 8 interview

> "I didn't even know what nano was. Pretty much everything I know about nano, I know from NISE Net. And if you look at those concepts, I'm certainly able to talk about those concepts, but it is pretty much solely because of NISE Net."
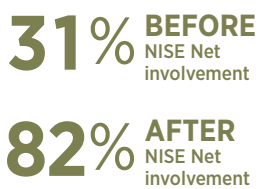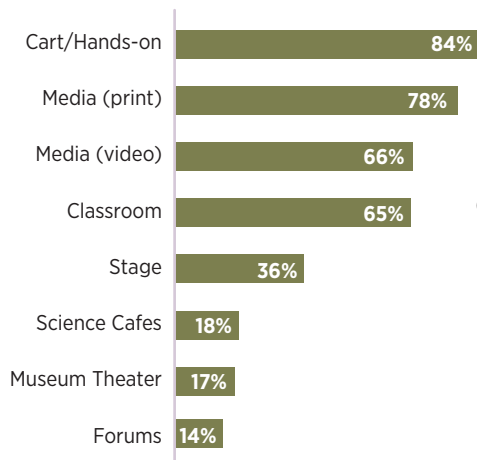>
> –Tier 2 ISE professional, Year 10 interview

PRODUCTS

PRACTICES

2 NISE Net professional partners reported **engaging the public with all types of Network products and practices**, though some were used less than others.
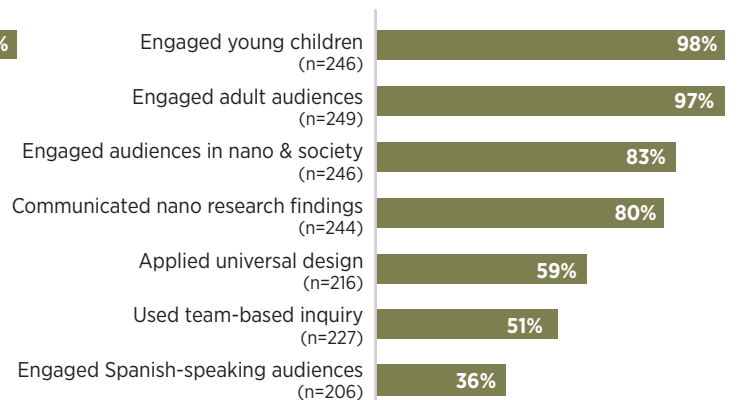
What percent of NISE Net professional partners engaged the public in nano? (n=320)

31% **BEFORE** NISE Net involvement

82% **AFTER** NISE Net involvement

Did you personally implement any of the following NISE Net educational products with the public? (n=264)

Cart/Hands-on — 84%
Media (print) — 78%
Media (video) — 66%
Classroom — 65%
Stage — 36%
Science Cafes — 18%
Museum Theater — 17%
Forums — 14%

As part of your nano education efforts, have you done any of the following?

Engaged young children (n=246) — 98%
Engaged adult audiences (n=249) — 97%
Engaged audiences in nano & society (n=246) — 83%
Communicated nano research findings (n=244) — 80%
Applied universal design (n=216) — 59%
Used team-based inquiry (n=227) — 51%
Engaged Spanish-speaking audiences (n=206) — 36%

> "I think one of the things that's really great about NISE Net is that they have different iterations [of activities] with different lengths of times, different set ups, for different aged people… we were just so impressed that [the kit] had everything, including the little plastic standup stand and the tablecloth!"
>
> –Tier 3 University professional, Year 8 interview

> "[W]hen we're thinking about signage or something big or small, we have focused on [universal design]… I think [in] the 2012 kit there was a nice guide to universal design [and] we've used that."
>
> –Tier 3 ISE professional, Year 8 interview

PRODUCTS

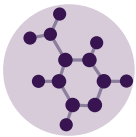**PRACTICES**

COMMUNITY & COLLABORATION

UNDERSTANDING NANO

3 While the majority of NISE Net professional partners reported gains related to the Network's goals, **Tier 2 and ISE professionals specifically reported positive change over time from their NISE Net involvement**, especially concerning nano and society content.
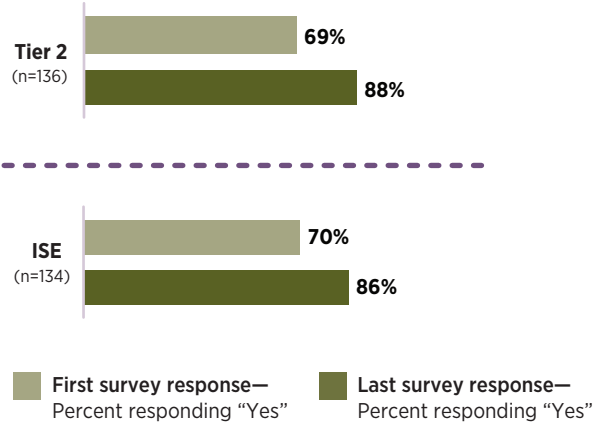
As of Year 10, what percent of NISE Net professional partners engaged the public in nano and society content? (n=246)

83% OF ALL PARTNERS

Across Years 8–10, as a part of your nano education efforts, have you engaged audiences with nano and society content?

Tier 2 (n=136)
- 69%
- 88%

ISE (n=134)
- 70%
- 86%

■ First survey response—Percent responding "Yes"
■ Last survey response—Percent responding "Yes"

❝I think that the activities and kits help create a broader understanding of how it's affecting society and what research is being done in the field.❞
–Tier 2 ISE professional, Year 9 interview

❝It's just my go-to place for knowledge… if I want to talk about nano and society, science and society, [NISE Net is] the first place I'm going to go.❞
–Tier 2 ISE professional, Year 10 interview

BEYOND NANO

4 Evidence indicates that a range of NISE Net professional partners **integrated aspects of NISE Net into their work that is unrelated to nano**.

To what extent has NISE Net increased the amount of ANY partnerships or collaborations between your organization and another? (n=248)
- 48%
- 47%

To what extent has NISE Net helped you communicate ANY science, technology, engineering, and math with the public? (n=274)
- 22%
- 75%

■ Not at all/Very little   ■ A little/Somewhat   ■ A lot/A great deal

❝I don't know if I'd be working with the library [if it wasn't] for the mini-exhibit and NanoDays. [These opportunities have] probably opened the door [for us] and that's [going to] be a fruitful partnership I see for years to come.❞
–Tier 2 University professional, Year 10 interview

❝[NISE Net materials have] guided the amount and kind of information that we give to the public because I think NISE Net resources are very good at giving the facilitators an appropriate amount of background information and then boiling that down to the appropriate amount of information to share with the public.❞
–Tier 2 ISE professional, Year 10 interview

NISE network
NANOSCALE INFORMAL SCIENCE EDUCATION

nisenet.org

NSF