

Findings from the NISE Net Professional Impacts Summative Evaluation

Monday, September 28th - Today's presenters are:

Liz Kollmann, Marta Beyer, and Leigh Ann Mesiti from the Museum of Science, Boston

As we wait to get started with today's discussion, please:

Introduce yourself! Type your name and institution into the chat box.

Call into the phone line (optional) at (877) 898-0037 (if using the phone line please make sure to mute your phone when not talking and also your computer's microphone).

Questions? Feel free to type your questions or comments into the chat box at any time.

Today's discussion will be recorded and shared on nisenet.org at:

<http://nisenet.org/events/online-workshop>



Findings from the NISE Net Professional Impacts Summative Evaluation



The

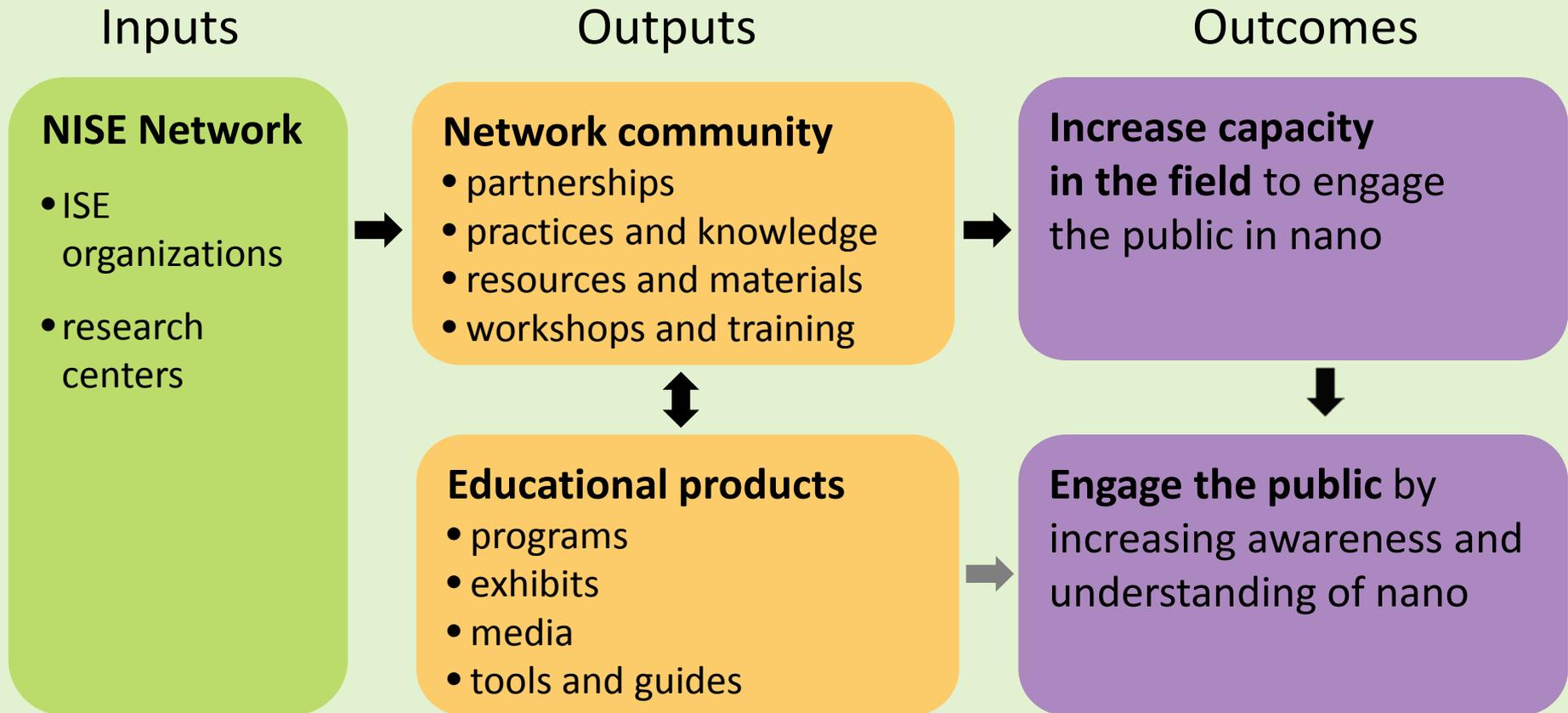


Nanoscale Informal Science Education Network

The NISE Net is a national community of researchers and informal science educators dedicated to fostering public awareness, engagement, and understanding of nanoscale science, engineering, and technology



NISE Network Logic Model



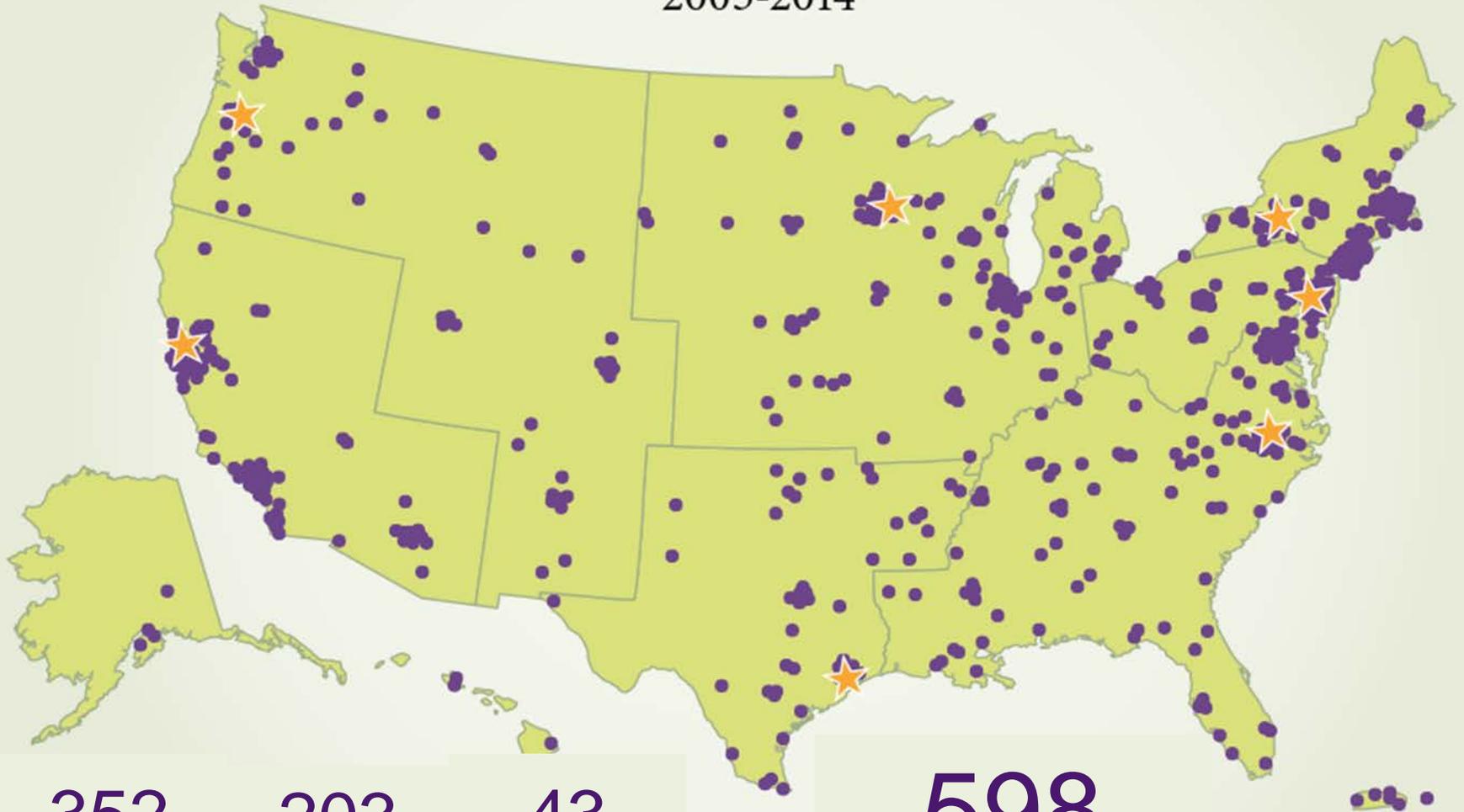
Unique Characteristics of NISE Net



- Size
- Timeline
- Content
- Open-source philosophy

NISE Network Partners

2005-2014



352

Museums
and ISE

203

University
Groups

43

Industry
and Others

598

PARTNERS

Unique Characteristics of NISE Net



- Size
- Timeline
- Content
- Open-source philosophy

NISE Net Timeline



Years 1-5: (2005-2010)

- Building the network

Years 6-10: (2010-2015)

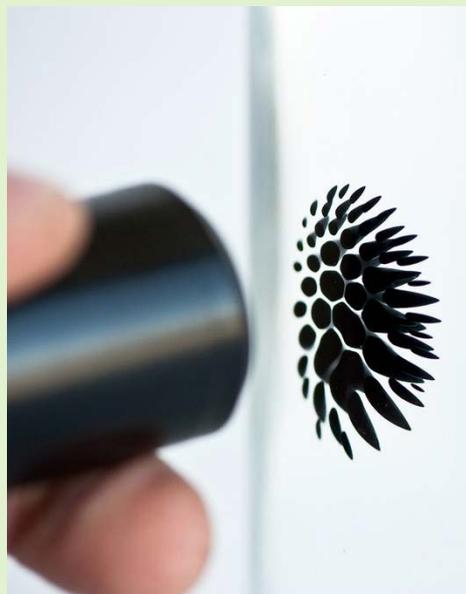
- Engaging the public through the network

Unique Characteristics of NISE Net



- Size
- Timeline
- Content
- Open-source philosophy

NISE Net Content



Unique Characteristics of NISE Net



- Size
- Timeline
- Content
- Open-source philosophy

NISE Net Open-Source Philosophy





NISE Net Professional Impacts Summative Evaluation



Presentation overview

- Context
 - Network
 - Study
- Findings
 - Related to professionals' **sense of community, learning of nano concepts, and use of NISE Net products and practices**
- Discussion breaks
- Final Q&A

Getting to know you

Before we get started,

- Poll #1: Who is the room?

Getting to know you

Before we get started,

- Poll #2: How many of you have heard of the NISE Network?

NISE Net Context





Organization types

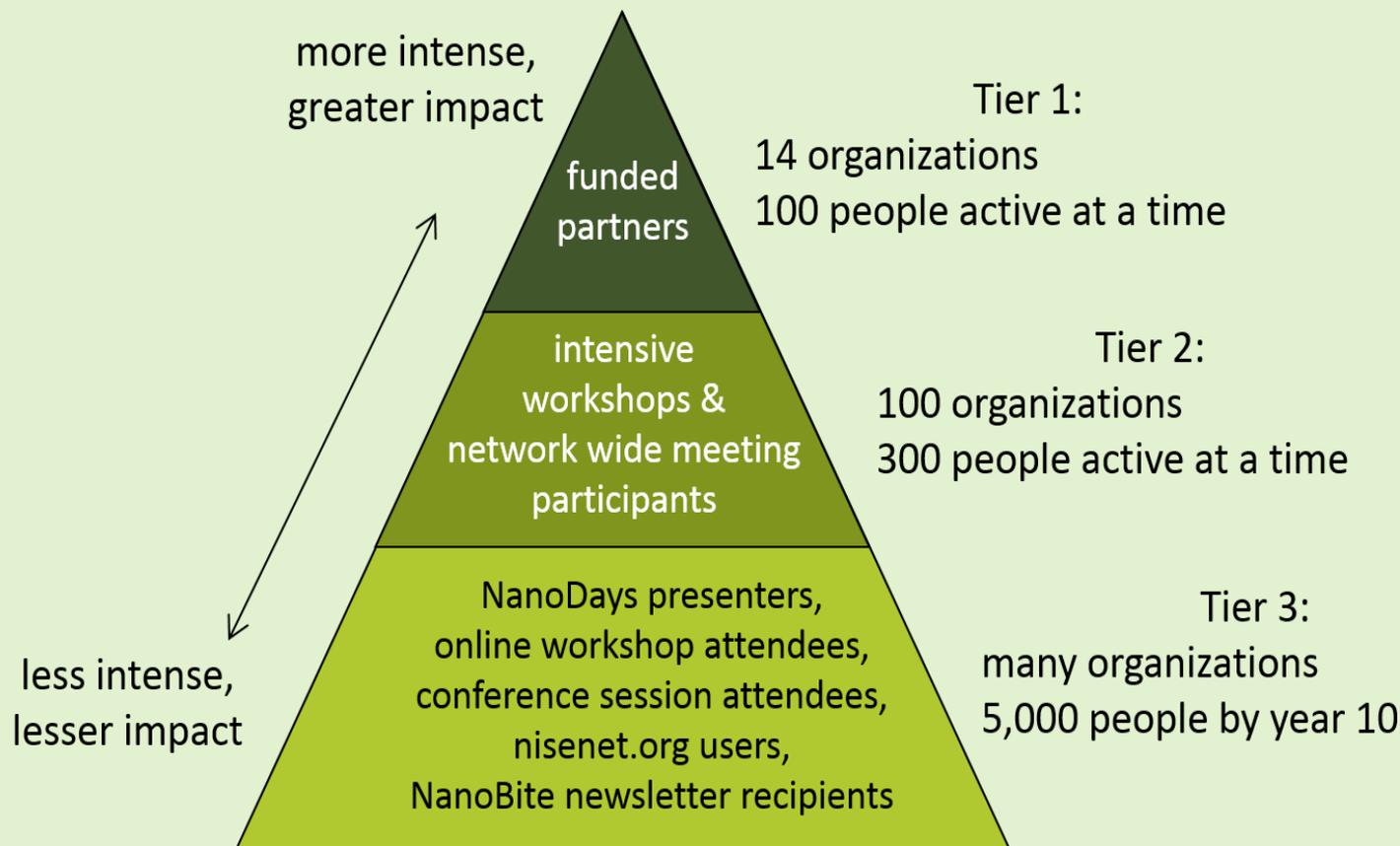
Informal Science Education (ISE) partners

- Museums and science centers
- Include educators, directors, and outreach coordinators

University partners

- Large and small universities and colleges
- Include educators, scientists, researchers, and outreach coordinators

Description of NISE Net Tiers



Study Context

About this 3-year study

Based on the Network's goals for professionals

- Sense of community
- Learning about nano
- Use of NISE Net products and practices

Methods: Survey

Annual Partner Survey

- 2012 (Y8): 296 responses
- 2013 (Y9): 354 responses
- 2014 (Y10): 324 responses

Analysis

- Complex analytical approaches
- Findings for Year 10
- Findings across Years 8-10



Methods: Interviews

Interviews

- 21 professionals interviewed yearly
- Represent a range of Network experiences
 - Selected based on individual and institutional characteristics

Analysis

- Inductive and deductive coding
- Often used to support survey findings
- Case studies exemplifying findings



Study limitations

- Timing of this study
- Accuracy of the NISE Net database
- Limited view of effectiveness of individual components



Upcoming report

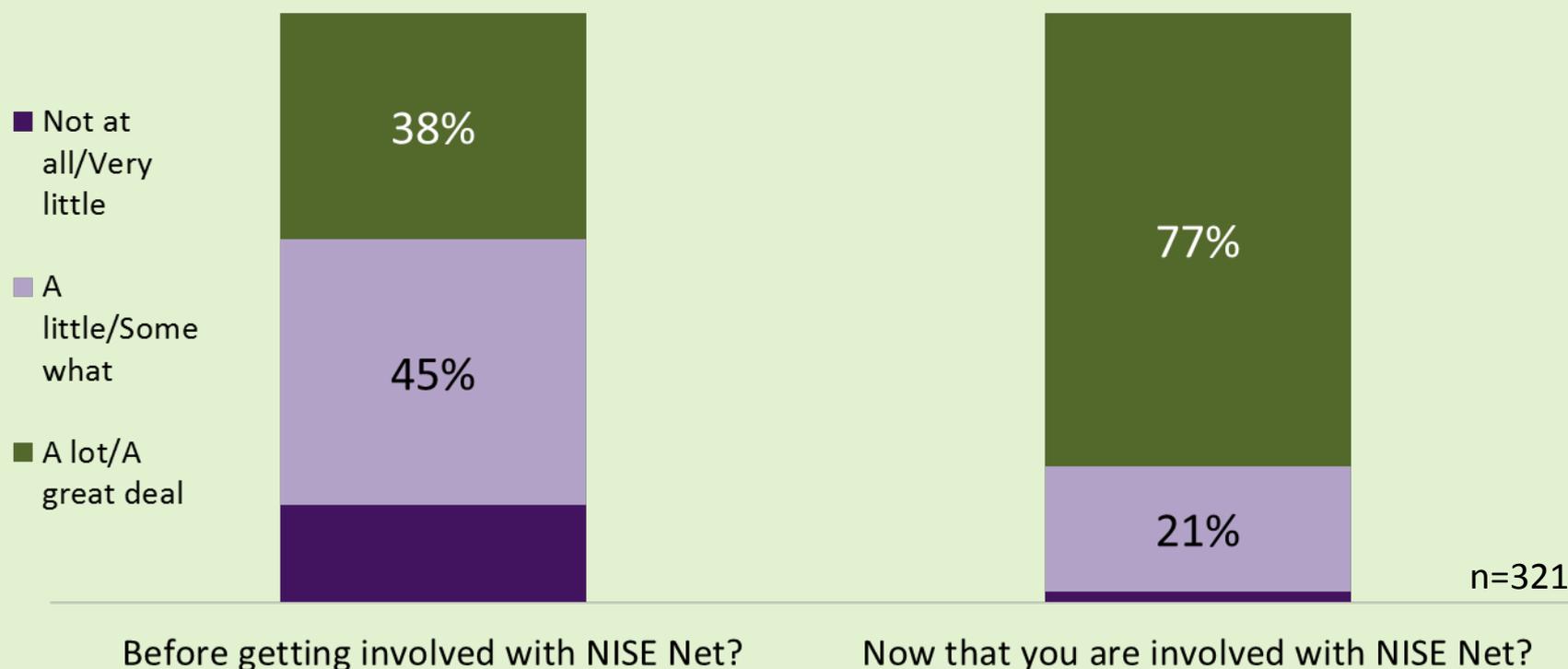
- Visual executive summary
- Overall findings
 - End of 3 years
 - Changes over time
- Illustrative vignettes
- Technical appendix



Community and Collaboration

Community and collaboration

Did you identify with a broader community of scientists and museum professionals...



*statistically significant increase for all involvement levels and organization types
Wilcoxon signed-ranks T test, $p < .05$

Community and collaboration

When describing how their community had shifted, professionals said NISE Net...

- Expanded the types of organizations with whom they connected
- Helped them focus collaboration with a nano-themed event
- Made them aware of national connections

Community and collaboration

“I always identified with a community of scientists. But never had any interactions with people associated with the museum side of things. Through NISE Net, I became involved with our local children’s museum. But also at the local conference, I was able to see what some other museums are doing. Became aware of other science museums and what they do. And that would not have happened without being exposed to NISE Net”

- University partner

Community and collaboration

Partners described the NISE Net community as **welcoming, supportive, and thorough**

Partners felt they played diverse roles within the Network as

- **Sharers** of knowledge
- **Liaisons** between organizations
- **Users** of resources

Community and collaboration

“It’s a **community of educators** who all seem to be very passionate about education, hands-on learning, and wanting to bring new things to their institution, **open to other ideas and willing to share their ideas**”

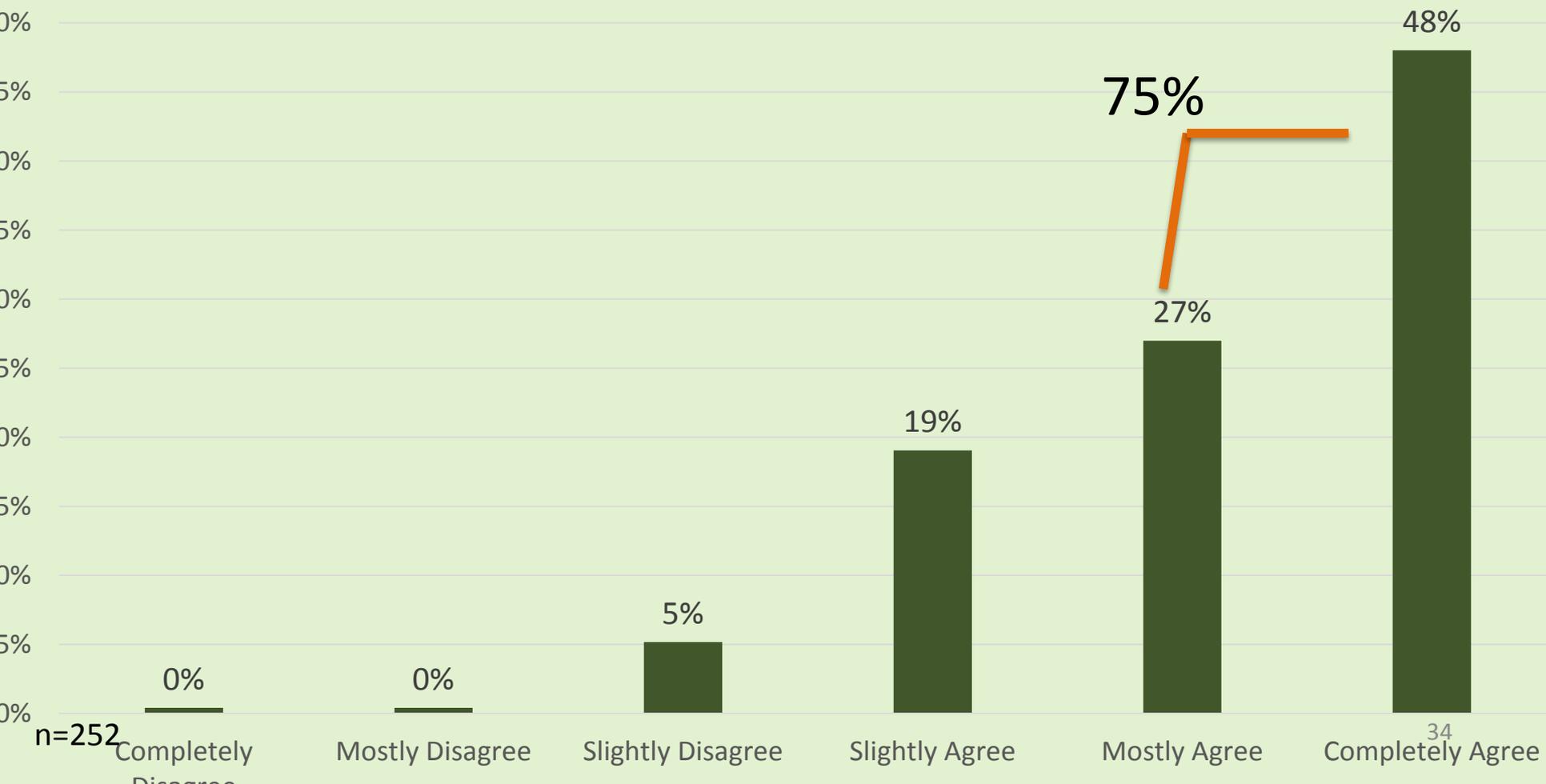
– ISE Partner

“I got invited to the **conference** this year. That was huge, so I **met a lot of other people**. I would say that was a very valuable experience for me to see the Network that way. And becoming **more aware of all of the other resources** out there, [and] **different ways they’re using them**. That was a very, very powerful experience”

– ISE partner

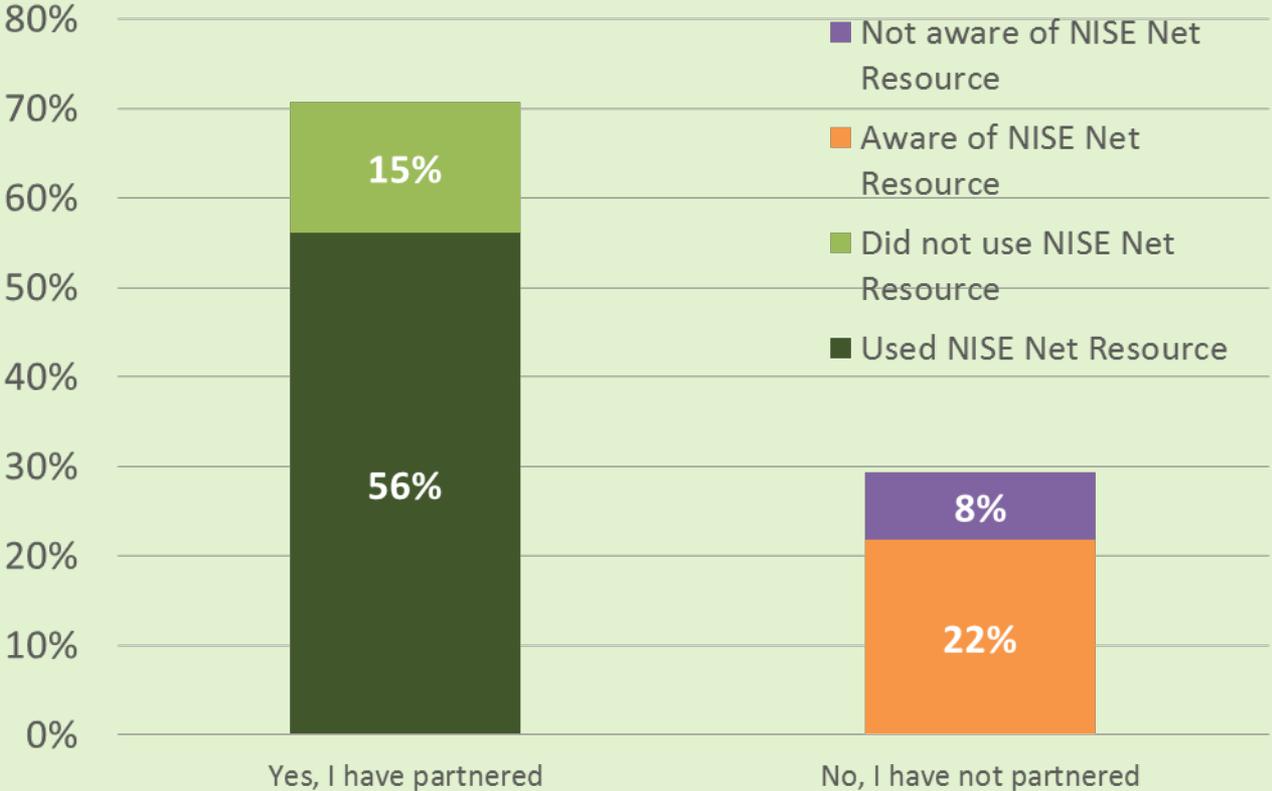
Community and collaboration: Partnerships

The majority of professionals agree they feel confident initiating a partnership with an informal learning or research organization



Community and collaboration: Partnerships

The majority of professionals are using NISE Net resources to initiate partnerships



Overview of findings: Community and collaboration

Professionals

- Increased sense of community
 - Identified with a broader community
 - Valued opportunities provided by NISE Net
 - Felt confident initiating partnerships and often used NISE Net resources
-

Example connections for other projects

- Even professionals who likely received less direct contact (Tier 3) felt a sense of community in NISE Net
- Partners were collaborating with institutions that might be unlike their own (ex: ISE-University partnerships)

Learning about Nano Concepts

Learning about nano concepts

- a. The **size** of a nanometer
- b. How nano-sized materials **behave** compared to macro-sized materials
- c. How scientists **work at the nanoscale**
- d. Examples of **nano in nature**
- e. **Innovations** that are possible because of nanotechnology
- f. Ways that nanotechnology **improves existing products**
- g. **Risks or potential risks** of nanotechnology
- h. How the **future of nanotechnology may be influenced** by political, economic, and personal values

Learning about nano concepts

All respondents felt confident about their understanding of nano, but some groups attributed more of this learning to NISE Net

- Tier 2 partners attributed more to NISE Net than Tier 3 partners
- ISE partners attributed more to NISE Net than University partners

Learning about nano concepts

“Pretty much **everything** I know about nano I know from **NISE Net**”

- ISE partner

“I learned a lot about **how to communicate the idea of a nanometer** to these students and not only just about the idea of a nanometer, but also how nano affects what we do in real life”

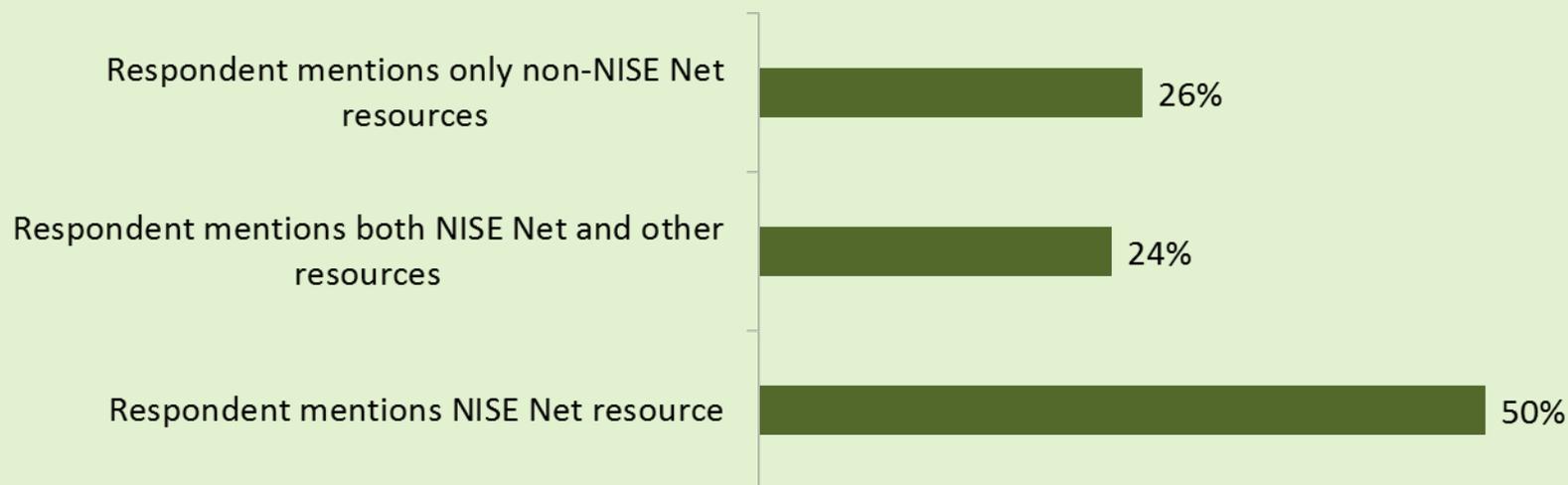
- University partner

Learning about nano concepts

Professionals reported that NISE Net resources were useful for their own learning of nano concepts. They also reported learning about nano through other methods

For the nano concept(s) from the table above that you feel the most confident about, what has helped you reach this level of confidence?

This could be a NISE Net resource or something outside of NISE Net.



N=145

Overview of findings: Learning nano concepts

In terms of learning:

- Network affected professionals' understanding of nano
- NISE Net kits, meetings, and website were useful
- Outside resources also used by partners

Example connections for other projects

- When discussing what they had learned, many university partners talked about how NISE Net affected their ability to communicate science to the public

Using Public Engagement Products

Using public engagement products

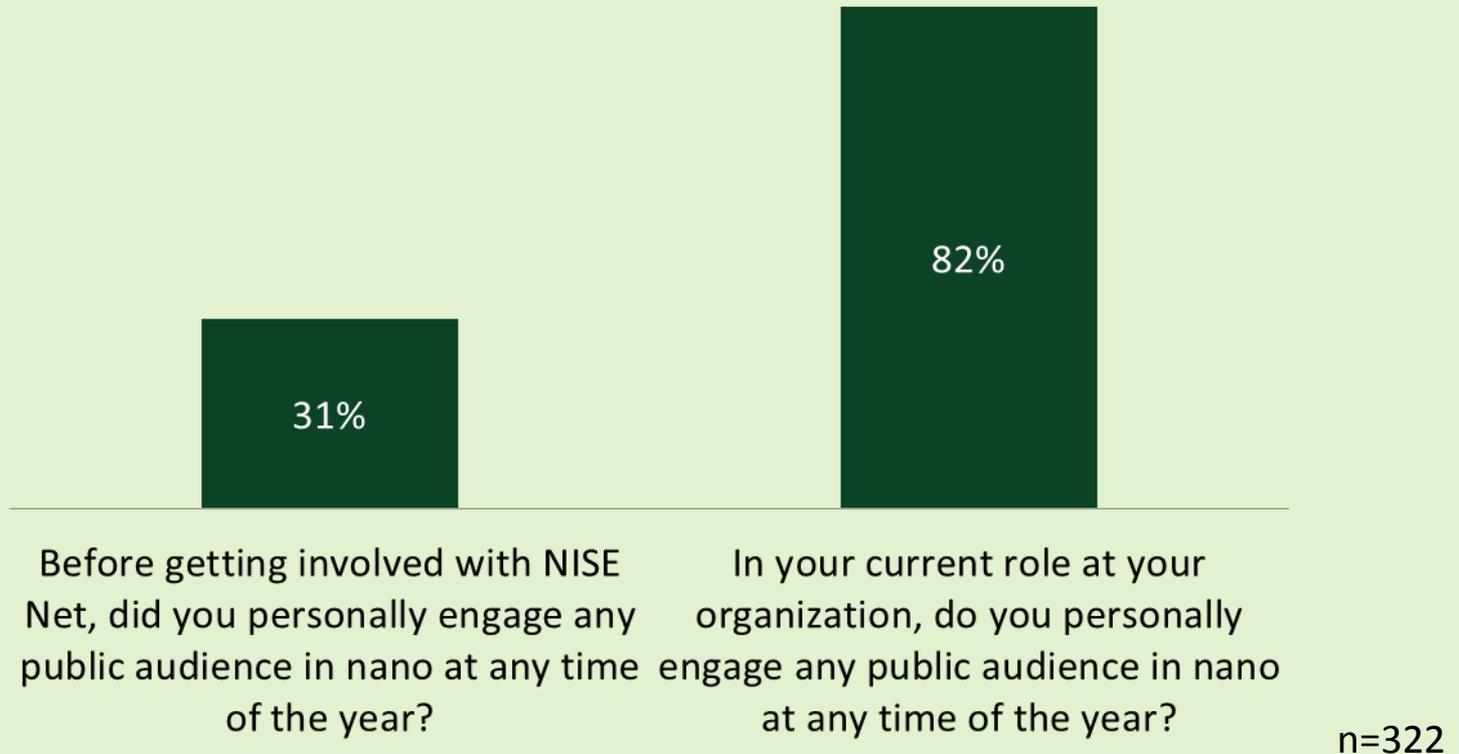
Types of NISE Net products offered to professionals:

- Cart/Hands-on
- Media (print and video)
- Classroom
- Stage presentations
- Science cafes
- Museum theater
- Forums

Disseminated primarily through NanoDays kits and the NISE Net website

Using public engagement products

Did you personally engage any public audience in nano at any time of the year...



*statistically significant increase for all involvement levels and organization types
McNemar's test, $p < .05$

Using public engagement products

Used by 60% or more	Used by less than 60%	When choosing products, professionals considered...
<ul style="list-style-type: none">• Cart demonstrations and hands-on activities• Media (print, posters)• Media (videos, multimedia, images)• Classroom activities	<ul style="list-style-type: none">• Stage presentations• Science cafes• Museum theater• Forums	<ul style="list-style-type: none">• Connections to existing content• Age/audience appropriateness• Delivery format• Ease of use• Quality of materials• Space availability• Staff capacity• Visitor enjoyment• Staff preferences

Using public engagement products

The majority of respondents feel confident in their ability to modify and adapt products for their audiences

- This was similar across involvement levels and across organization types

The most frequent modification was “incorporating a NISE Net product into an existing program”

Overview of findings: Using public engagement products

- More professionals were engaging the public with nano after becoming involved
- NISE Net cart demonstrations, media, and classroom activities were used most frequently
- Professionals felt confident modifying NISE Net products

Example connections for other projects

- Professionals reported that the hands-on activities were the types of products that they used the most
- NISE Net products were easily adapted and modified by professionals

Public Engagement Practices

Public engagement practices

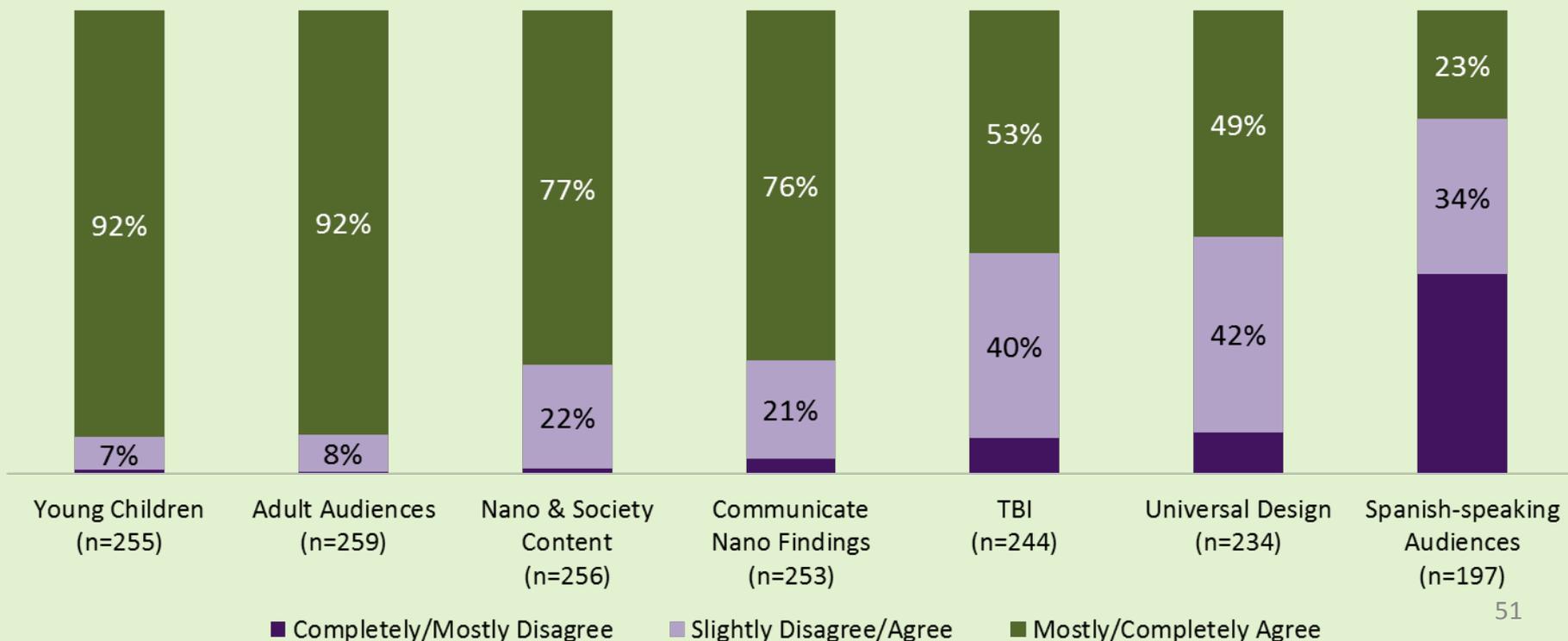
- Engage **adult** audiences
- Engage **young** children
- Engage audiences with **nano and society** content
- **Communicate to a public audience findings** from the field of nano research
- Use **team-based inquiry** to incorporate evaluation into my work
- Apply principles of **universal design**
- Engage **Spanish-speaking** audiences

Public engagement practices

Professionals are confident in their understanding of many practices

- Especially engaging adults, engaging children, conveying nano & society content, and communicating nano research findings to the public

Please rate the extent to which you agree with the following.
As part of my nano education efforts, I feel confident in my ability to...



Public engagement practices

Used by 60% or more	Used by less than 60%	Professionals reported barriers to implementing practices such as...
<ul style="list-style-type: none">• Engaging young children• Engaging adult audiences• Engaging audiences with nano and society content• Communicating to a public audience findings from the field of nano research	<ul style="list-style-type: none">• Applying principles of universal design• Using team-based inquiry to incorporate evaluation into my work• Engaging Spanish-speaking audiences	<ul style="list-style-type: none">• Lack of time/resources• Lack of knowledge or misconception• Not within their professional role• Not aligned with organizational goals

Overview of findings: Public engagement practices

- Professionals were confident in their ability to engage the public in nano, especially
 - Young children
 - Adults
 - Audiences with nano and society content or nano research findings
 - Professionals used NISE Net resources to implement public engagement practices
 - Some practices were implemented less frequently than others
-

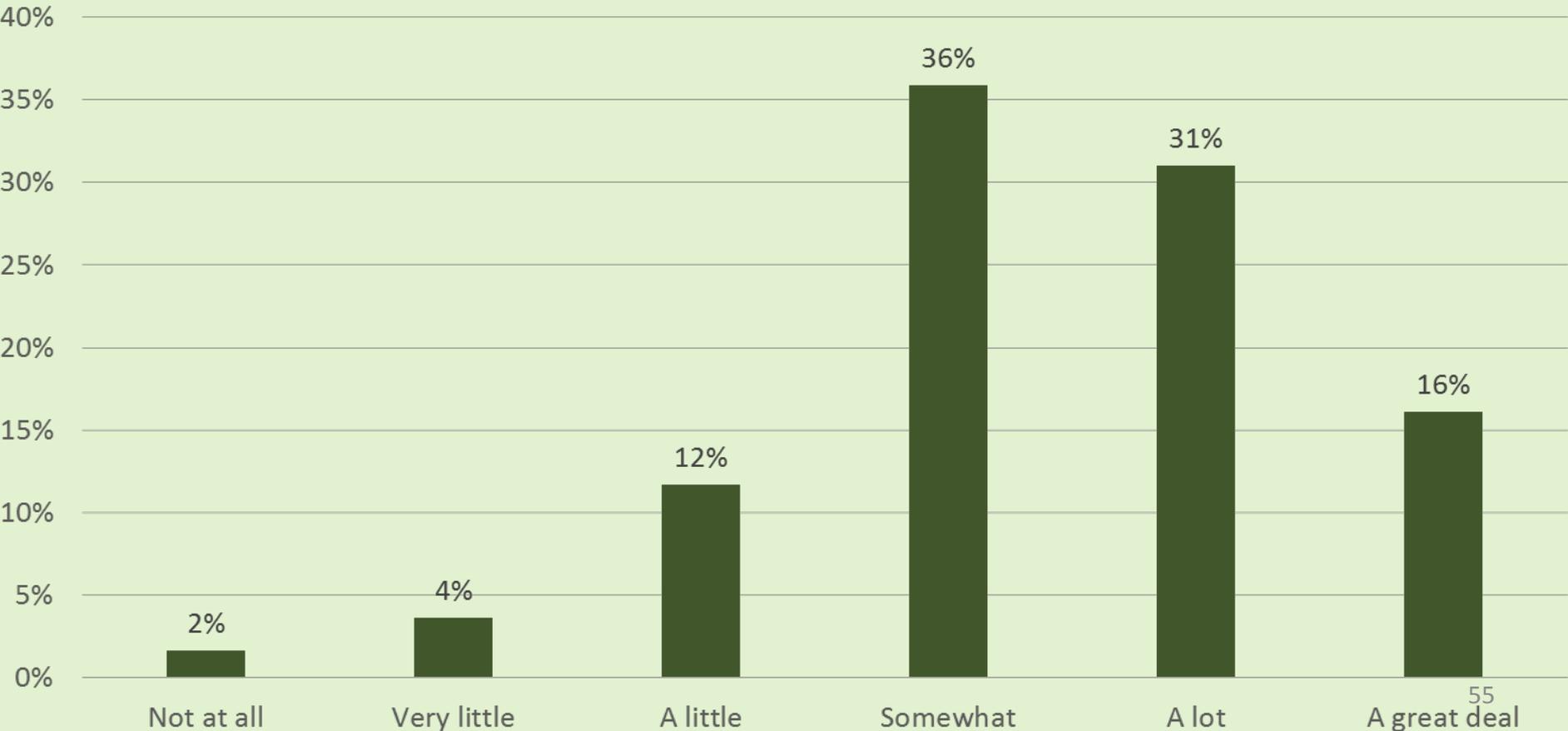
Example connections for other projects

- Professionals were engaging young children in a complex topic like nano
- Professionals were bringing in nano and society subject matter
- Some barriers still existed in regards to implementing practices

Expanding Beyond Nano Content

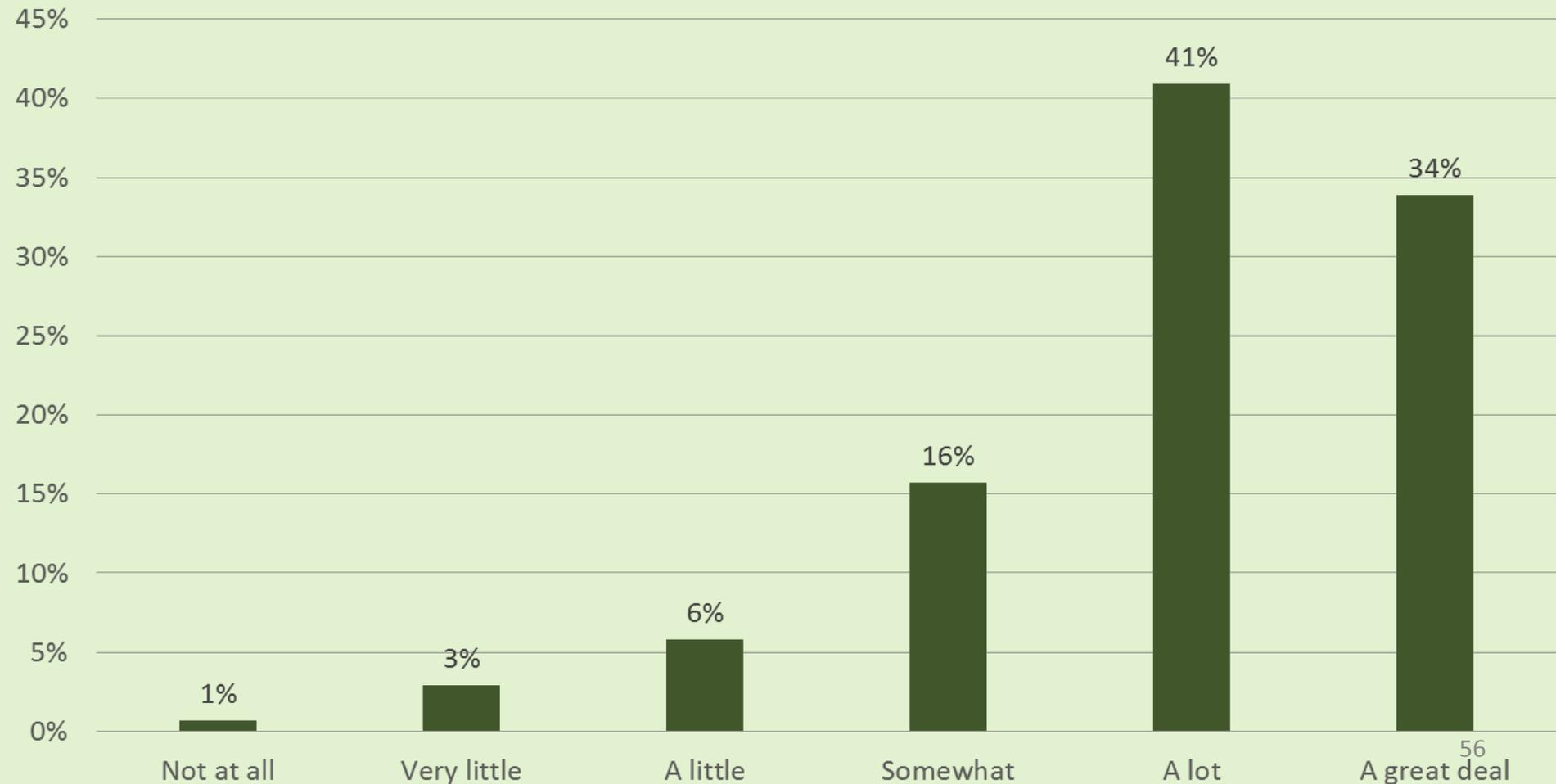
Expanding beyond nano: Partnerships

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



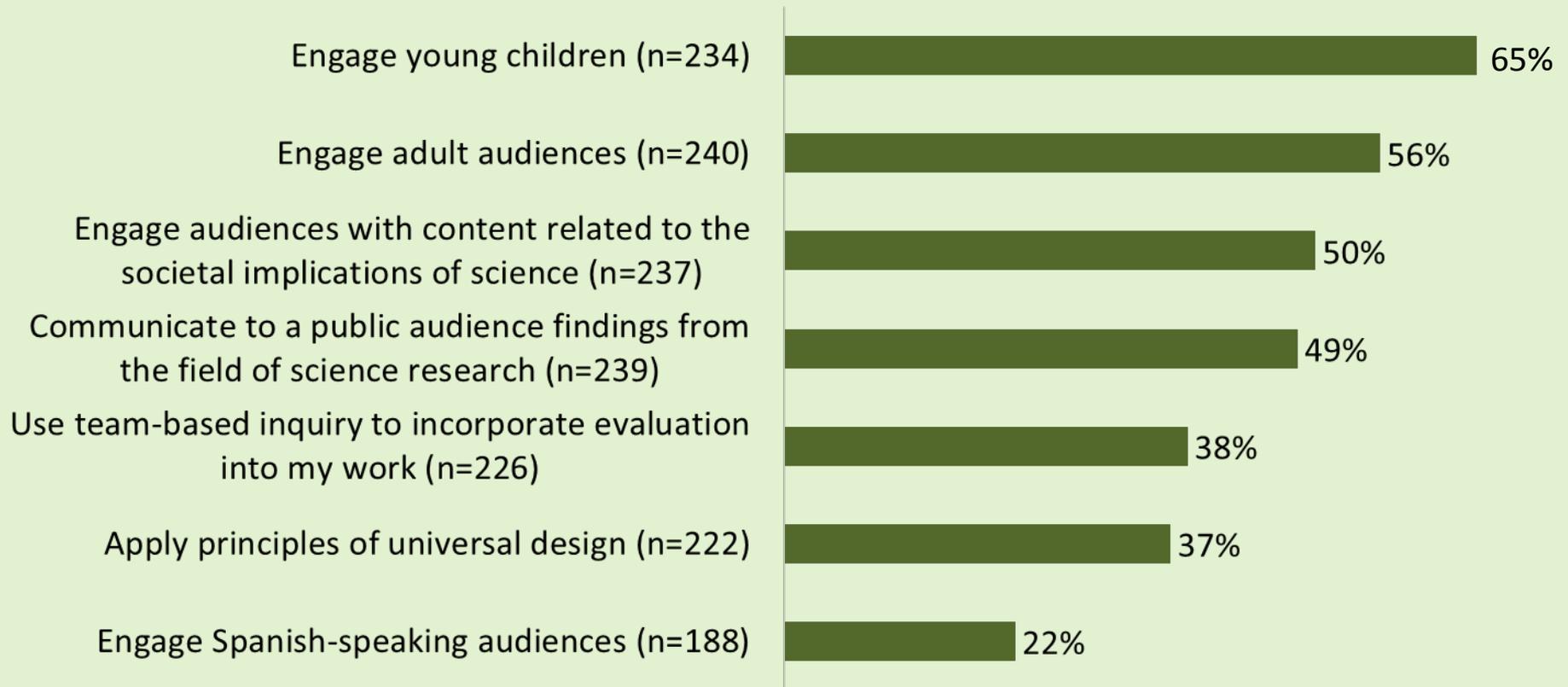
Expanding beyond nano: Communicating STEM

To what extent has NISE Net helped you communicate any STEM with the public? (n=274)



Expanding beyond nano: Using public engagement practices

Have you drawn on NISE Net information to do any of the following with *content areas other than nano*?



Expanding beyond nano: NISE Net as a model

“I think that the NISE Net activities are so well put together. I think in general we have probably **begun to emulate some of the ways the activities are put together**. But I’m not sure it’s an actual thing I can articulate or measure in any particular way, but I think it has influenced us” - ISE partner

“I relied more heavily this year on some of the NISE Net materials on how to engage visitors. ...the students each got one of the nano kits, they got some time with [the kits], and then demonstrated to the class. Then they had to do something similar but for astrobiology, **the kit was a model for teaching a concept**“

- University partner

Overview of findings: Expanding beyond nano content

- NISE Net helped organizations partner around non-nano areas
- Professionals reported that NISE Net helped them communicate STEM topics to the public
- Professionals, especially those in ISE, drew on NISE Net information to implement practices with content other than nano
- NISE Net provided a model to emulate

Example connections for other projects

- NISE Net helped professionals create collaborations beyond nano
- Professionals transferred many of the practices to other content areas
- Professionals looked to NISE Net products as examples for other work

Change Over Time

Overview of findings: Change over time

Greatest changes were seen in Tier 2 and ISE professionals

- Increased confidence in initiating partnerships
- Increased confidence in nano and society concepts and how much they attributed that confidence to NISE Net
- Increased confidence in engaging adult audiences and engaging Spanish-speaking audiences
- Increased audience engagement with nano and society content

Conclusion



NISE Net increased professionals' sense of community, learning about nano, and use of NISE Net products and practices

NISE Net supported professionals in some ways that extend beyond nano content

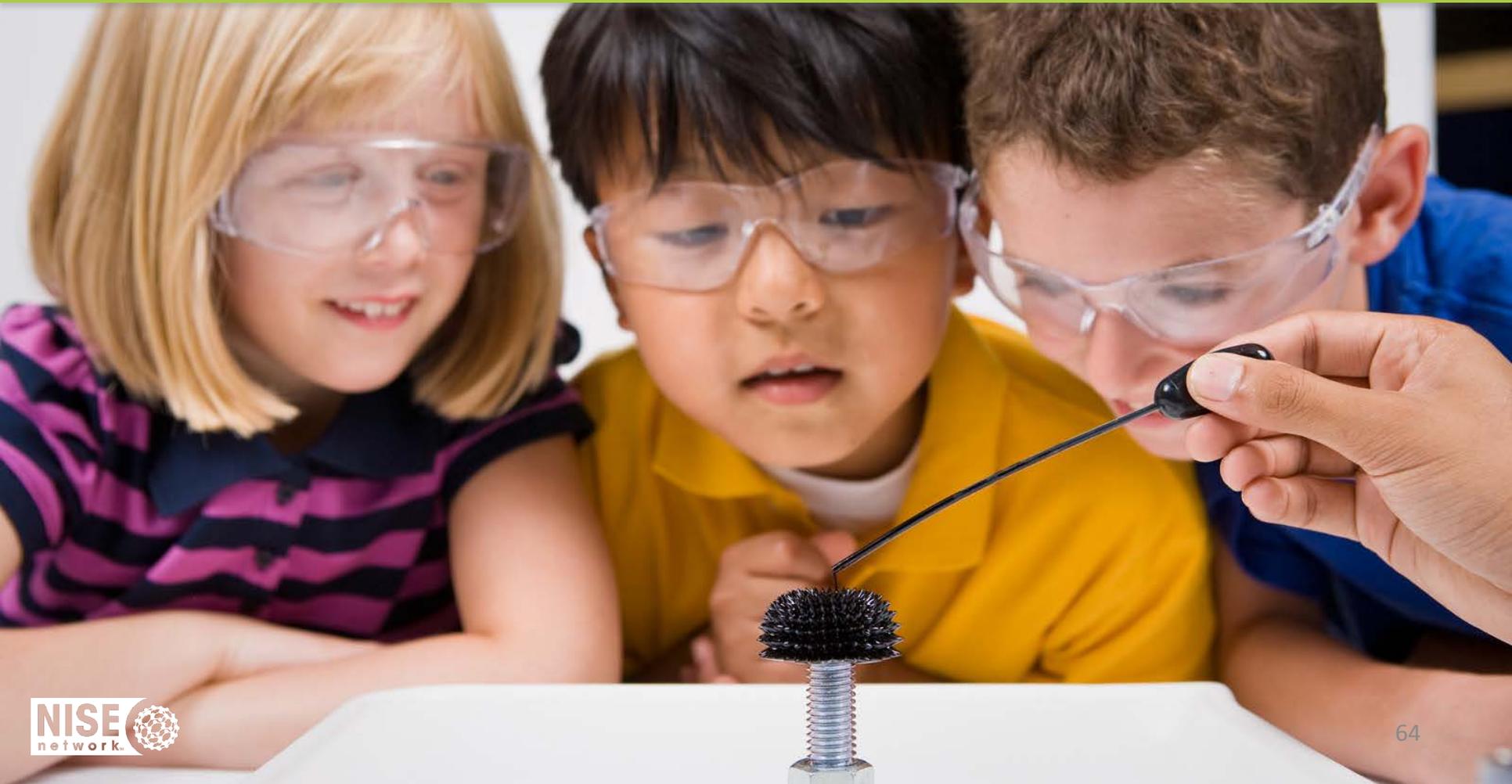
See the full results in our report available in the upcoming year



Questions?



This presentation is based on work supported by the National Science Foundation under Grant No. 0940143. Any opinions, findings, and conclusions or recommendations expressed in this presentation are those of the authors and do not necessarily reflect the views of the Foundation.



Thanks for joining us!



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brown-bag

Upcoming Online Brown-Bag Conversations:

Planning a Museum and Community Partnerships Project

Wednesday, September 30, 2015

2:00 – 3:00PM Eastern

Findings from NISE Net's Public Impact Studies

Monday, October 5, 2015

2:00 – 3:00PM Eastern

All brown-bags are archived online at <http://www.nisenet.org/events/online-workshop>