Effective Dissemination Plans – Success Strategies for Projects and Proposals

Thursday, April 30th, 2015

Hosted by:

STEM Learning & Research Center

(STELAR)

Educational Development Center, Inc.

stelar

STEM Learning and Research Center

NSF

EDC Learning transforms lives.

Overview

Introduction

- **Sarita Pillai**, Principal Investigator, STEM Learning and Research Center (STELAR)

Speakers

- **Marta Biarnes**: Advancing Informal STEM Learning (AISL)
- **Irene Lee**: Multiple programs
- **Ashley Lewis Presser**: Discovery Research K-12 (DR K-12)
- **David Reider**: Innovative Technology Experiences for Students and Teachers (ITEST)

STELAR Overview

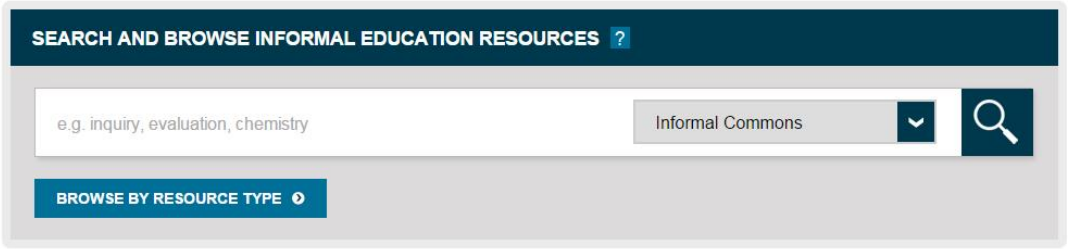
- Facilitate projects' success through **technical support** with a focus on synthesis of findings
- Inform and influence the field of STEM stakeholders by **disseminating** project findings nationally
- Deepen the impact and reach of the ITEST program by **broadening participation** in the ITEST portfolio

NSF's Innovative Technology Experiences for Students and Teachers (ITEST) Program

- To build understandings of best practice factors, contexts and processes contributing to K-12 students' motivation and participation in STEM
- Helps students to be aware of STEM careers, and to pursue formal school-based and informal out-of-school educational experiences to prepare for such careers
- **288** current and past projects across **44** states have served **247,700 students**, **9600 educators**, **3000 parents and caregivers**

STELAR Website – http://stelar.edc.org

CAISE - http://informalscience.org/



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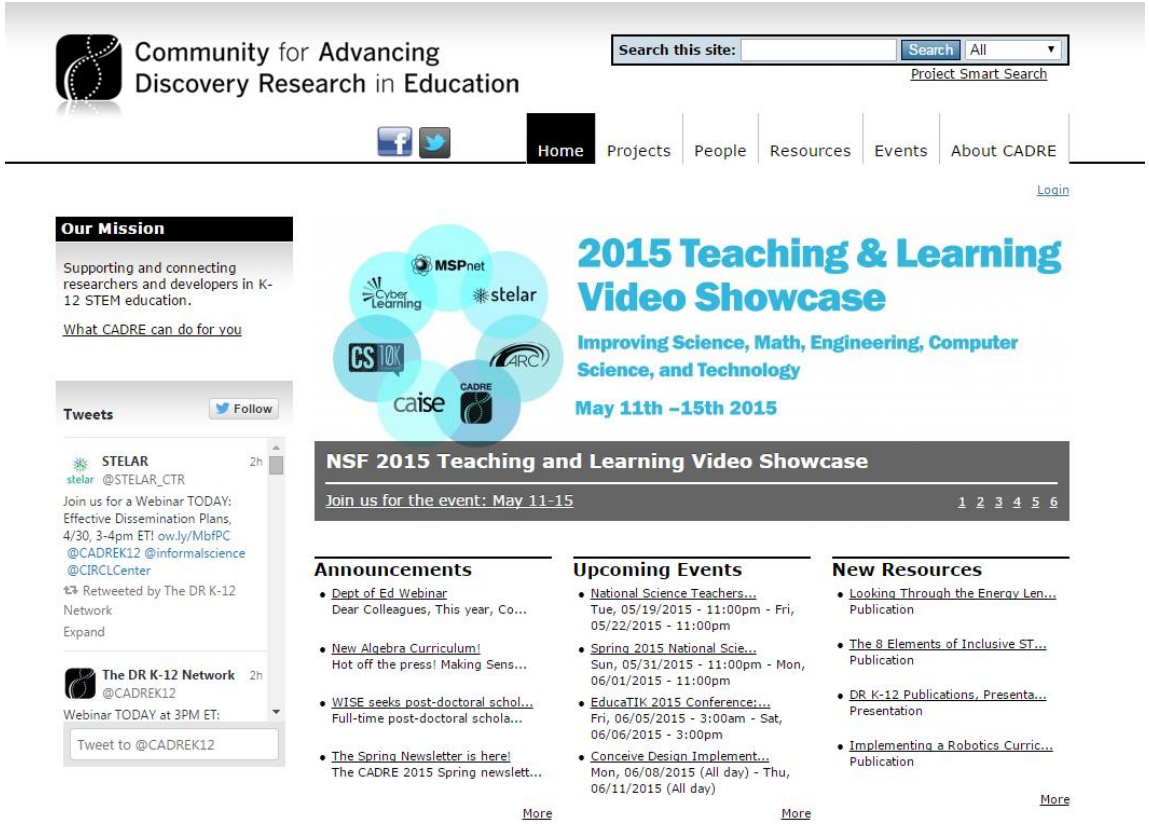
CADRE – http://cadrek12.org/



National Living Laboratory

Marta Biarnes
Museum of Science, Boston
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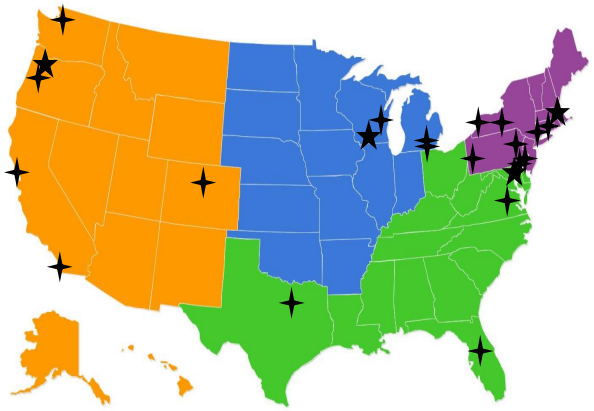
Living Laboratory
Developed at the Museum of Science, Boston

Broad Implementation: Creating Communities of Learners for Informal Cognitive Science Education (Kipling; 1113648)

National Living Laboratory Initiative

The National Living Laboratory Initiative is connecting a growing community of museum and research professionals who are interested in bringing current research in child development to informal learning settings (science centers, children's museums and others) through Living Laboratory®.



Living Laboratory®
Developed at the Museum of Science, Boston

Living Laboratory©

Model for Museum – Academic Collaborations

Living Laboratory is an educational on-site research model started in 2005 at the Museum of Science (MOS) in which museum visitors learn about the scientific process through study participation and face to face conversations with researchers

Living Laboratory Timeline

2005 – Established program to reach the adult “lost audience”
2005-2007 - MOS Rapid Prototyping
2007-2011 – NSF Grant (Kirshner, Award #0714706)
2011 -2015 – NSF Broader Implementation Grant (Kipling, Award #1113648)

Living Laboratory
Developed at the Museum of Science, Boston

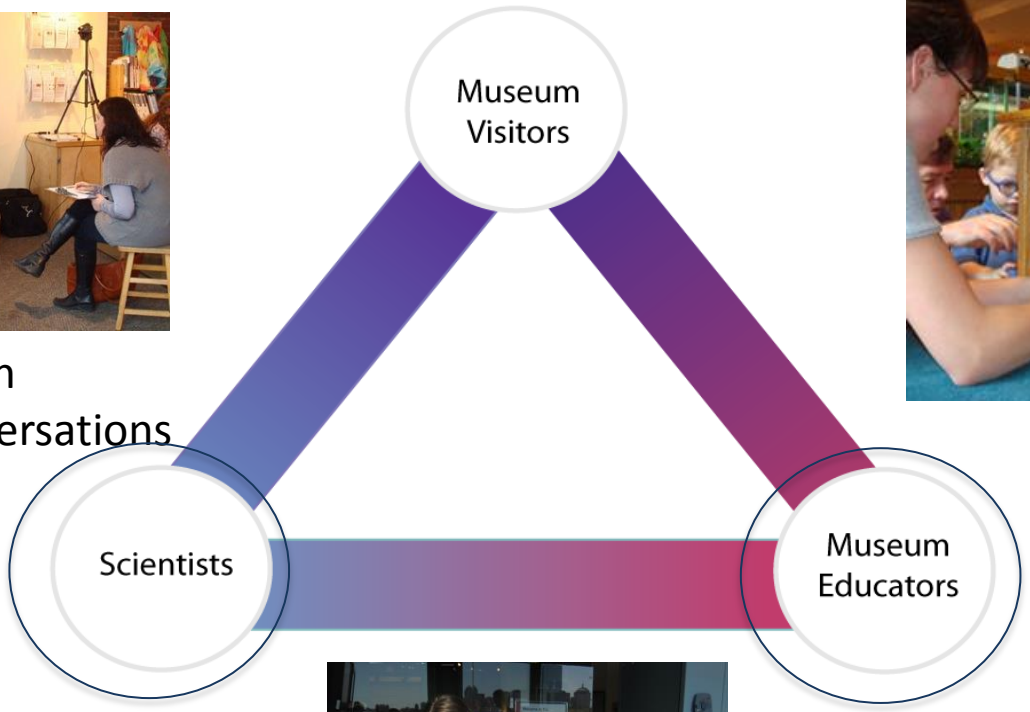
MOS Living Laboratory – Impacts

- More than **61,000 families** have participated in research activities (since 2005)
- **40+ articles** in academic journals, with many more in-prep or under review
- **600 researchers** (graduate students, post-docs, lab managers and undergraduate assistants) received science communication training from museum educators

Living Laboratory
Developed at the Museum of Science, Boston

Audiences

Study Participation
Face to Face Conversations



Research Toys

Living Laboratory
Developed at the Museum of Science, Boston

Mutual Professional Development

Deliverables for Professional Audiences

Community Membership

- Invitation to Annual Meetings
- Access to Resource Toolkit, Member Directory, Events

Resource Toolkit

- Mutual Professional Development Materials
- Visitor Engagement Strategies
- Strategies to Initiate Collaborations
- Sustainability Tools
- Exhibit Concepts and “How To’s”
- Educational Programming Guides

NLL Dissemination: Foundation

Regional Hub Model of Dissemination

Establish and Evaluate Hub Site Adoption (4)

Decentralize Expertise

Increase Personalized Communication to Tier 3 Adopters

NLL Dissemination: Foundation

Create Online Virtual "Hub" – www.livinglab.org

Currently 380+ Community Members

- 200 institutions,46 states
- 147 museums, 59 universities

Site of Resource Toolkit

Monthly enews

Identify Professionals at Various Points of Engagement

Potential Adopters

Partial Adopters

Full Adopters

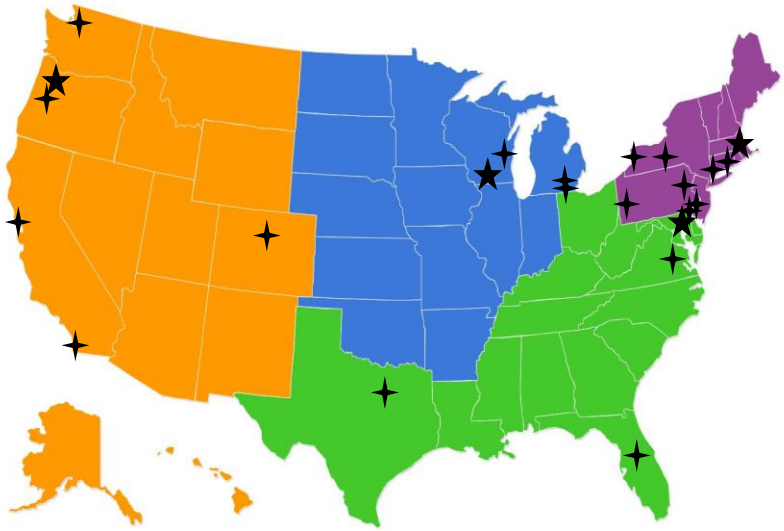
NLL Dissemination: Expansion

Professional Conferences: “Rallying” Opportunities

Exhibitor Booth and Presentations

Museum: ASTC, ACM, AAM

Academic: APA, SRCD, CDS



Annual NLL Meetings

Regional, Topical, Audience Specific

Adoption Support

NLL Stipend Award Program (Partial→Full Adopters)

2014-15: 18 Museum/Academic Stipends Awarded

Educational Assistance Opportunities (Potential→Partial)

NLL: What We've Learned

- Identify Various Points of Engagement
- Think About Dissemination Flexibly
- Know your audiences
- Face to face meetings are a powerful tool
- Identify your rallying moments

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Broad Implementation: Creating Communities of Learners for Informal Cognitive Science Education (Kipling; 1113648)

Thank you!

Marta Biarnes

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www.livinglab.org

Living Laboratory
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Broad Implementation: Creating Communities of Learners for Informal Cognitive Science Education (Kipling; 1113648)

Dissemination and Diffusion of Innovation in Project GUTS: Growing Up Thinking Scientifically

Irene A. Lee| Director, Learning Lab at Santa Fe Institute

Project GUTS

NM Adventures in Modeling (2003-2006, NSF-ITEST)
Project GUTS afterschool (2007-2010, NSF-AYS)
Project GUTS replicable model (2010-2013, various funders)
Project GUTS Code.org CS in Science during the school day (2014+)

Project GUTS Audience

- **Teachers / Administrators**
- **Students / Parents**
- **Educational researchers**
- **Curriculum developers / Publishers**
- **Scientists interested in engaging public**
- **Communities**
  - Science Educators
  - Computer Science Educators
  - Afterschool professionals
  - Complex systems / ABM community
  - NSF community
  - K-12 Educators
  - Community College Educators

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PROJECT GUTS
Growing Up Thinking Scientifically

Project GUTS "Products"

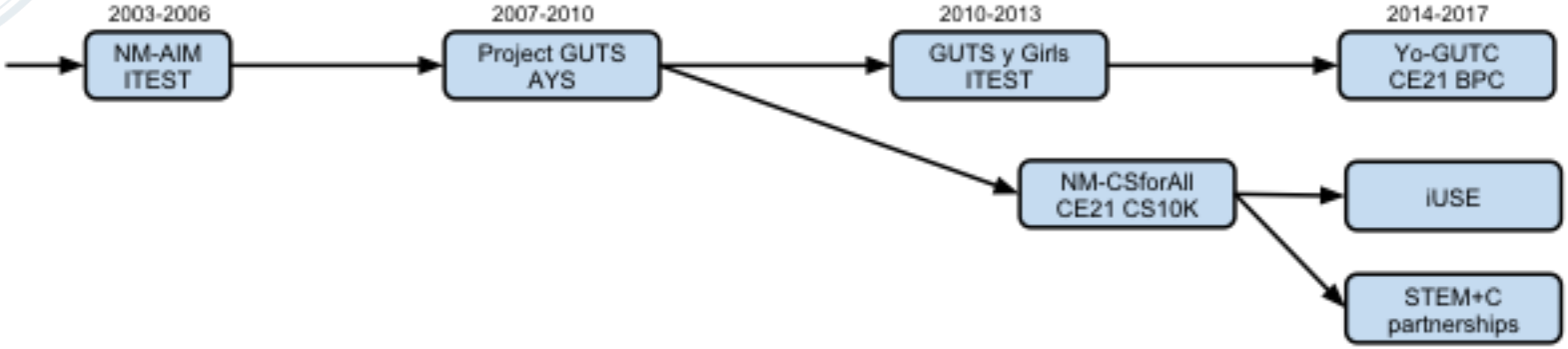
- Afterschool program model
- Professional Development program model
- Facilitator development model

- Afterschool curricular units
- In school CS in Science replacement modules
- Courses / MOOC

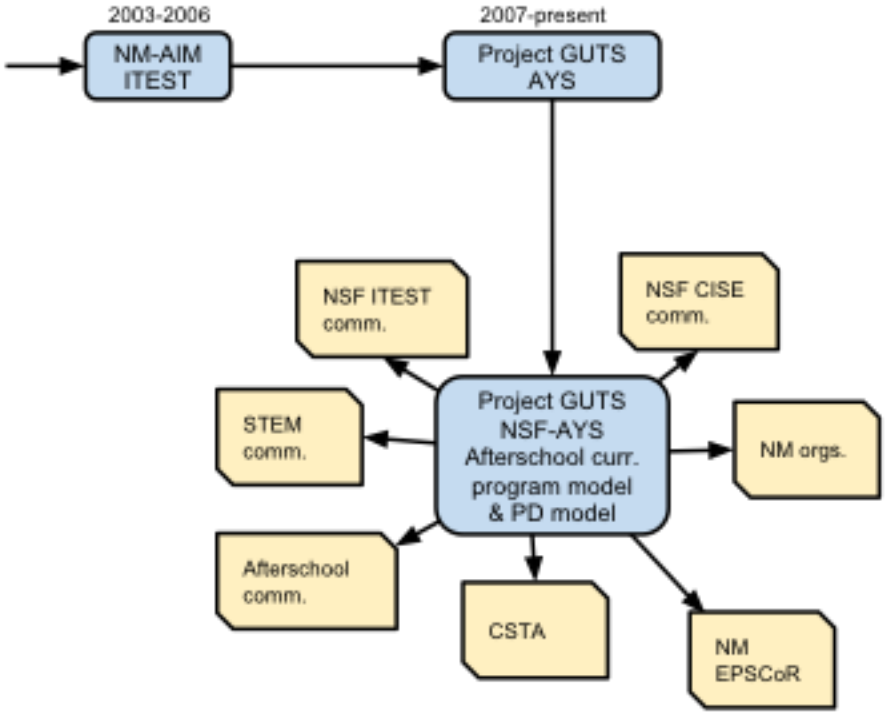
Project GUTS dissemination
"Traditional Methods"

- Research and evaluation findings
- Publications and presentations
- Websites and social media
- Blogs and editorials

Project GUTS dissemination through project spin-off



Project GUTS dissemination



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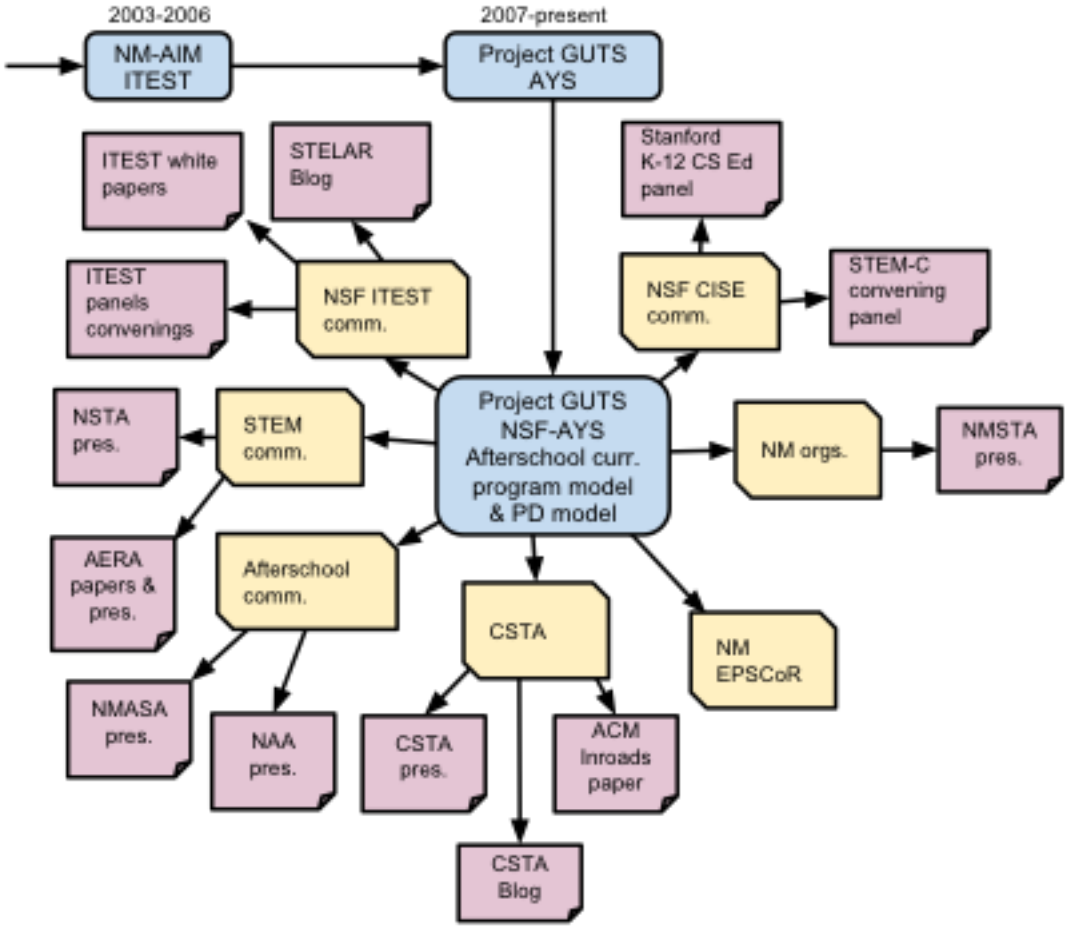

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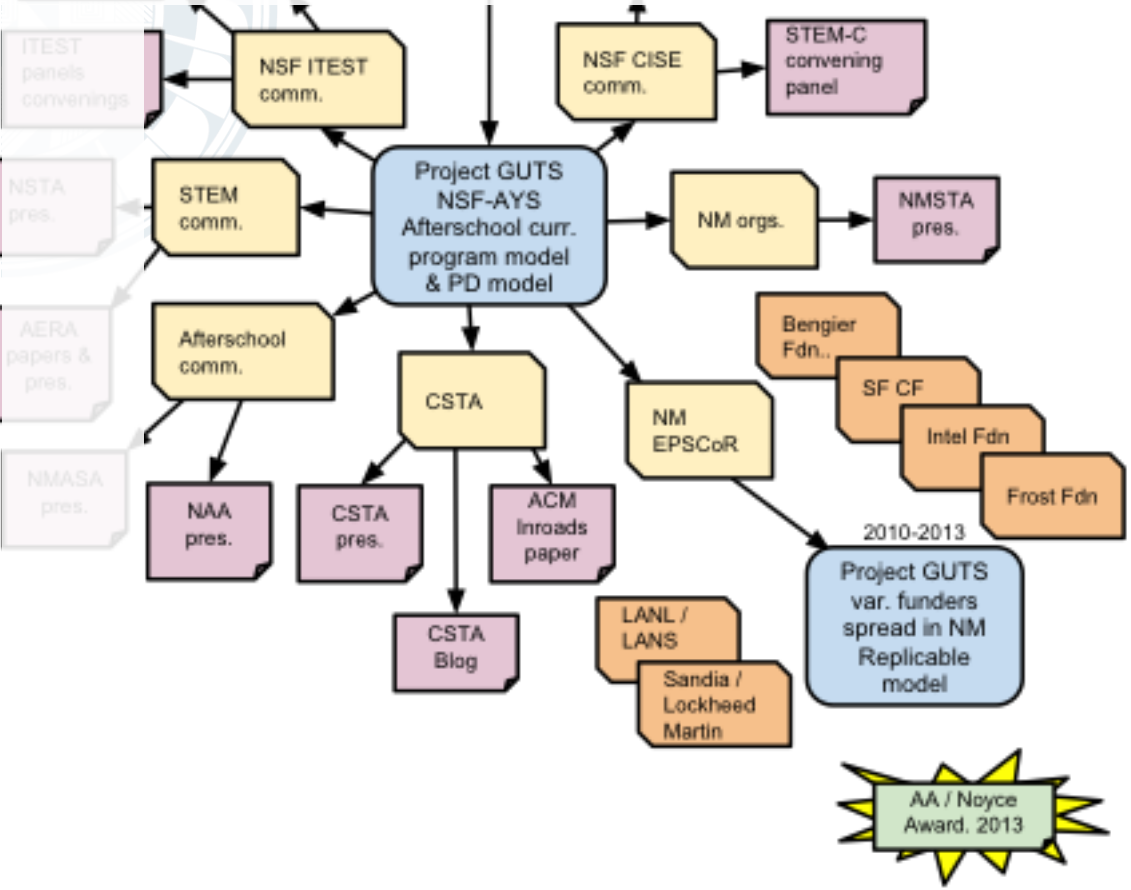

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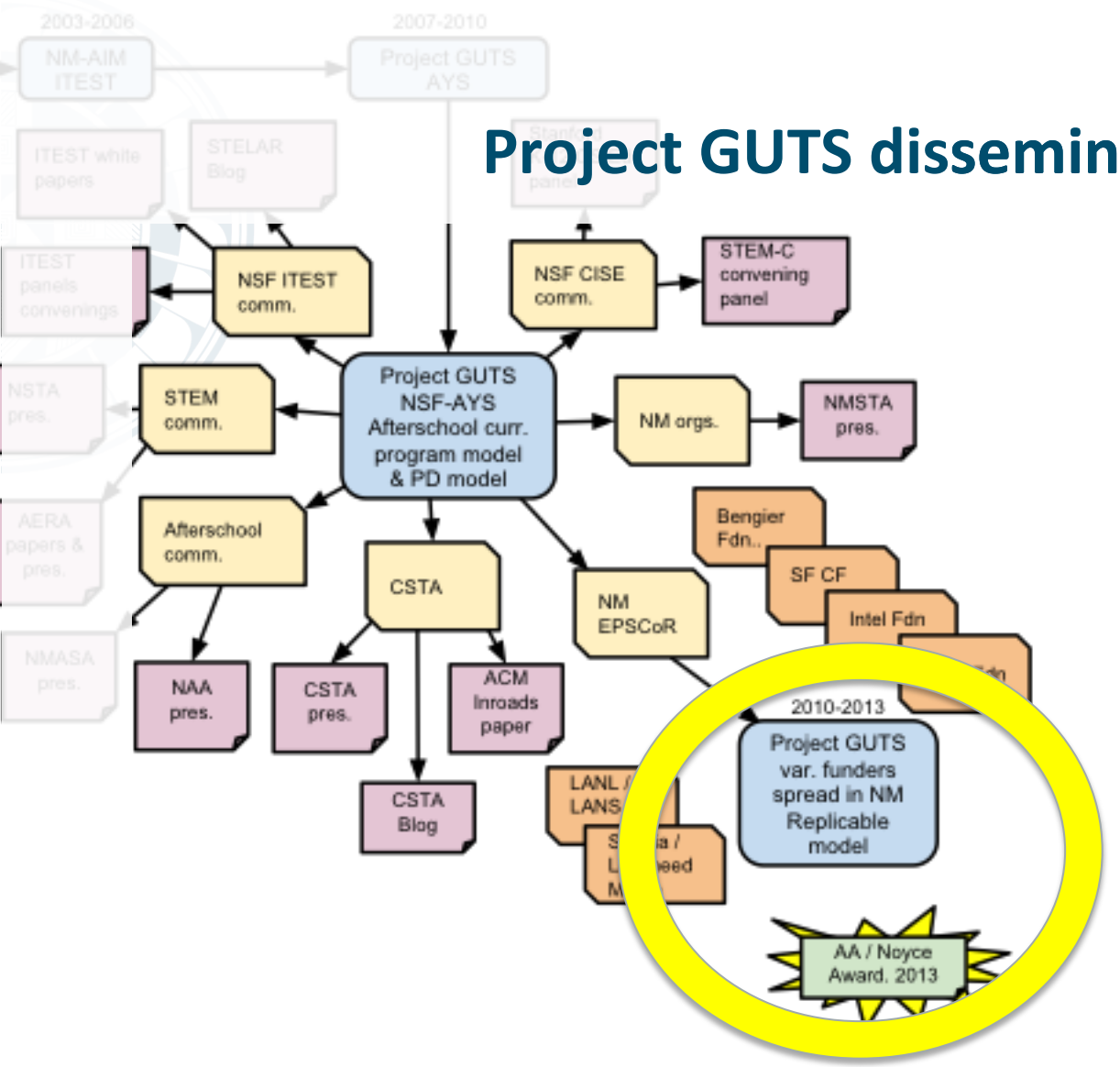

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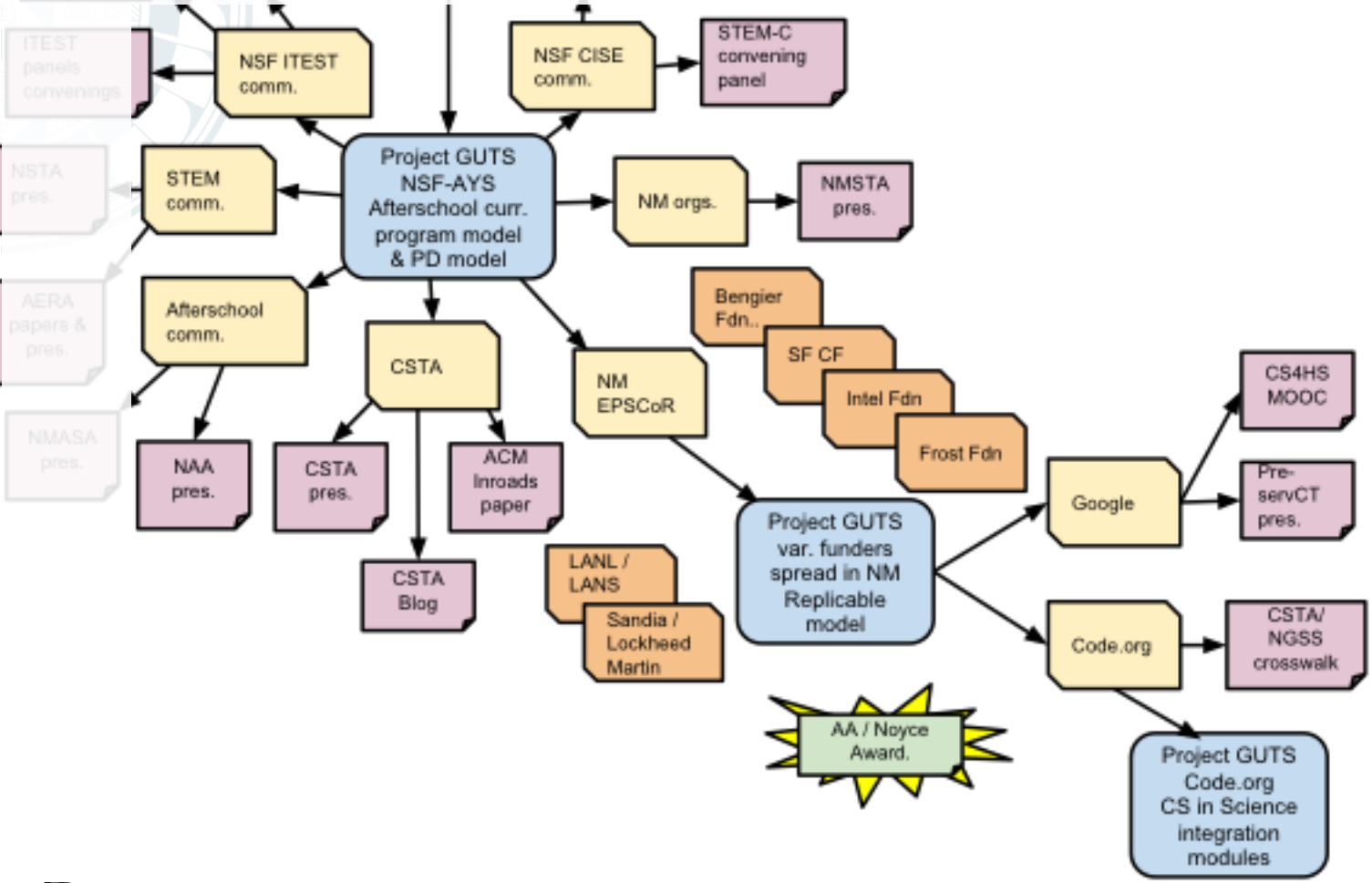

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Project GUTS dissemination

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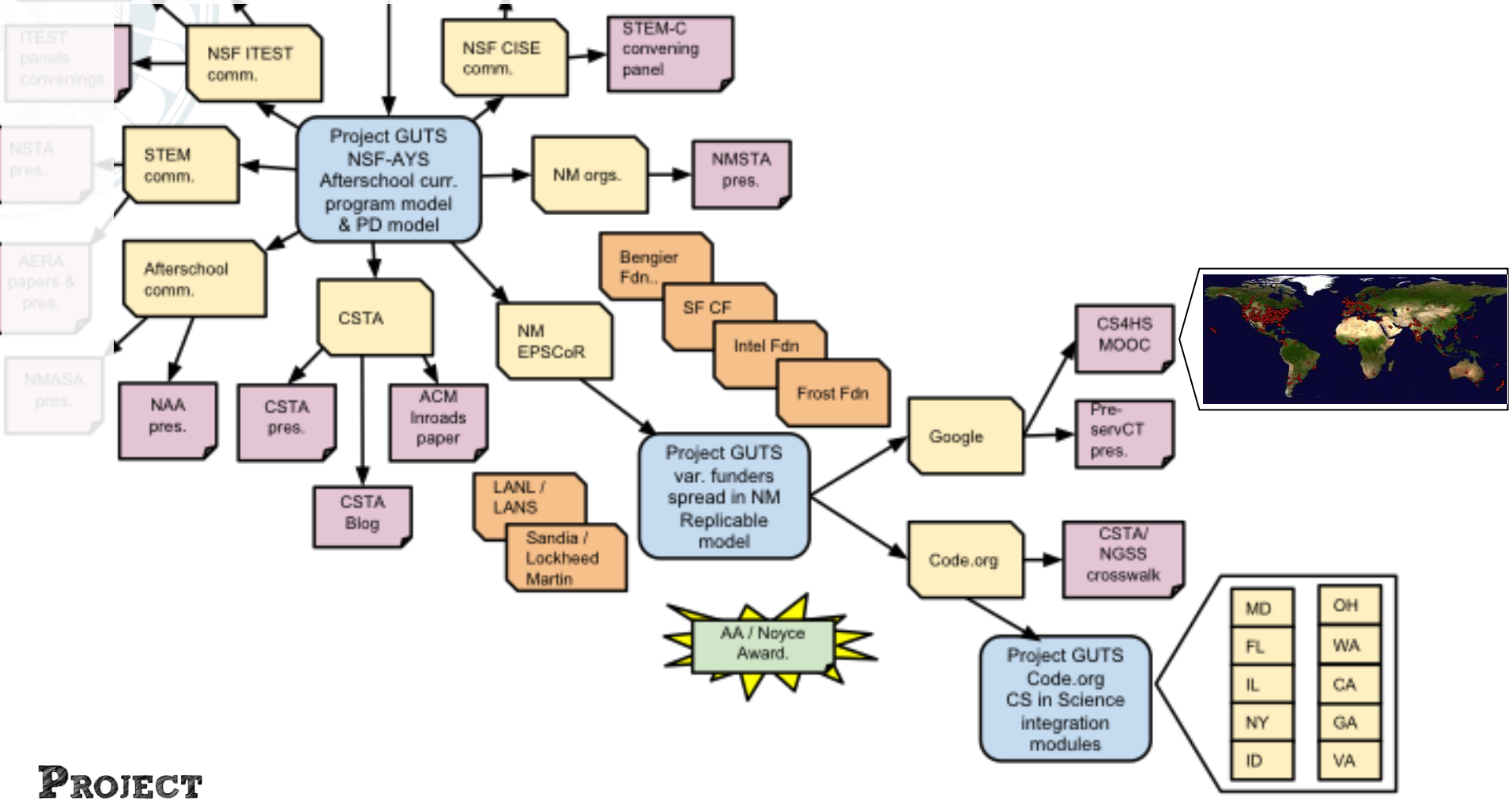

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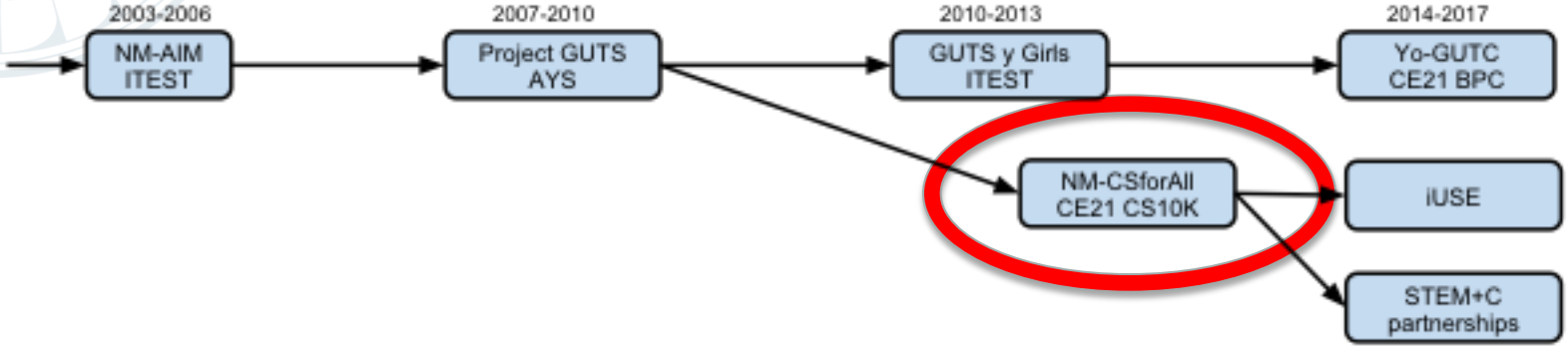

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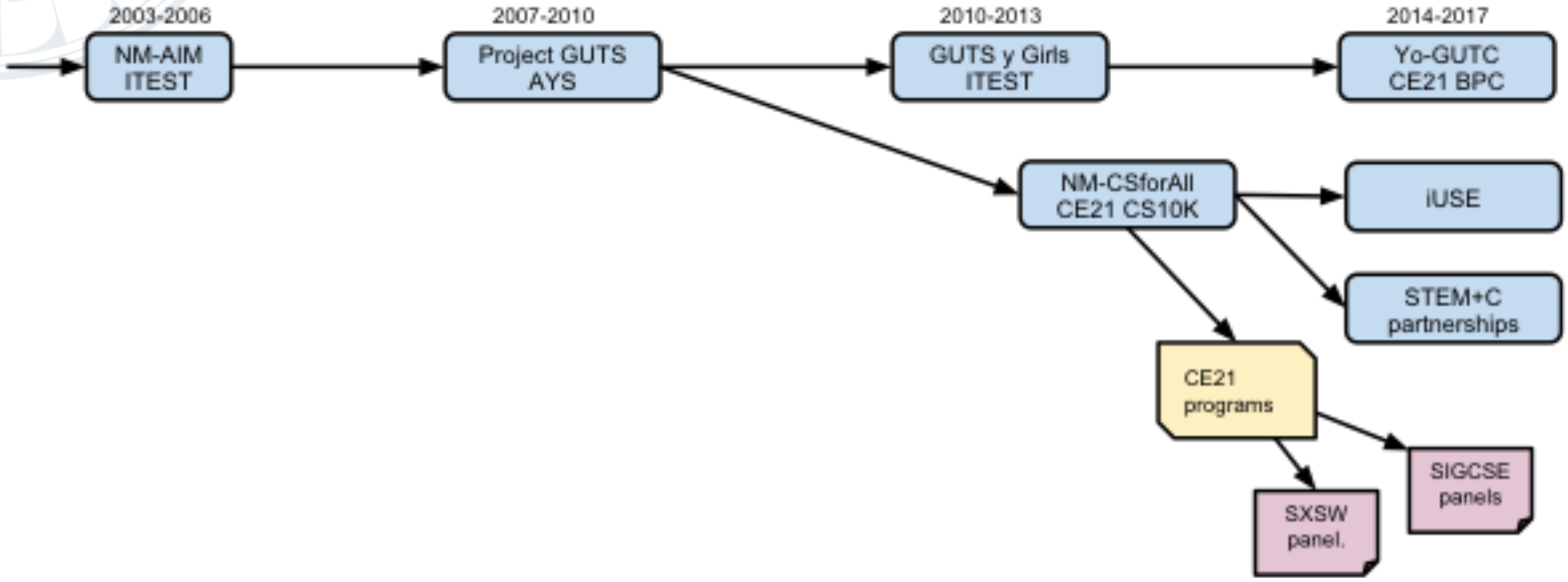

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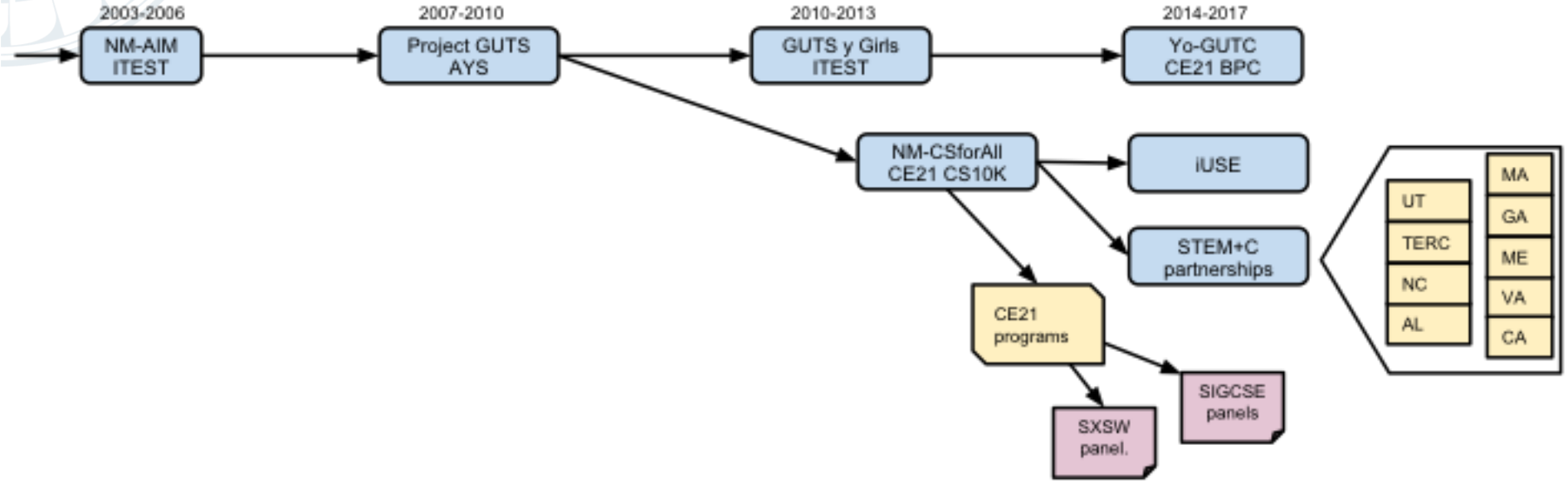

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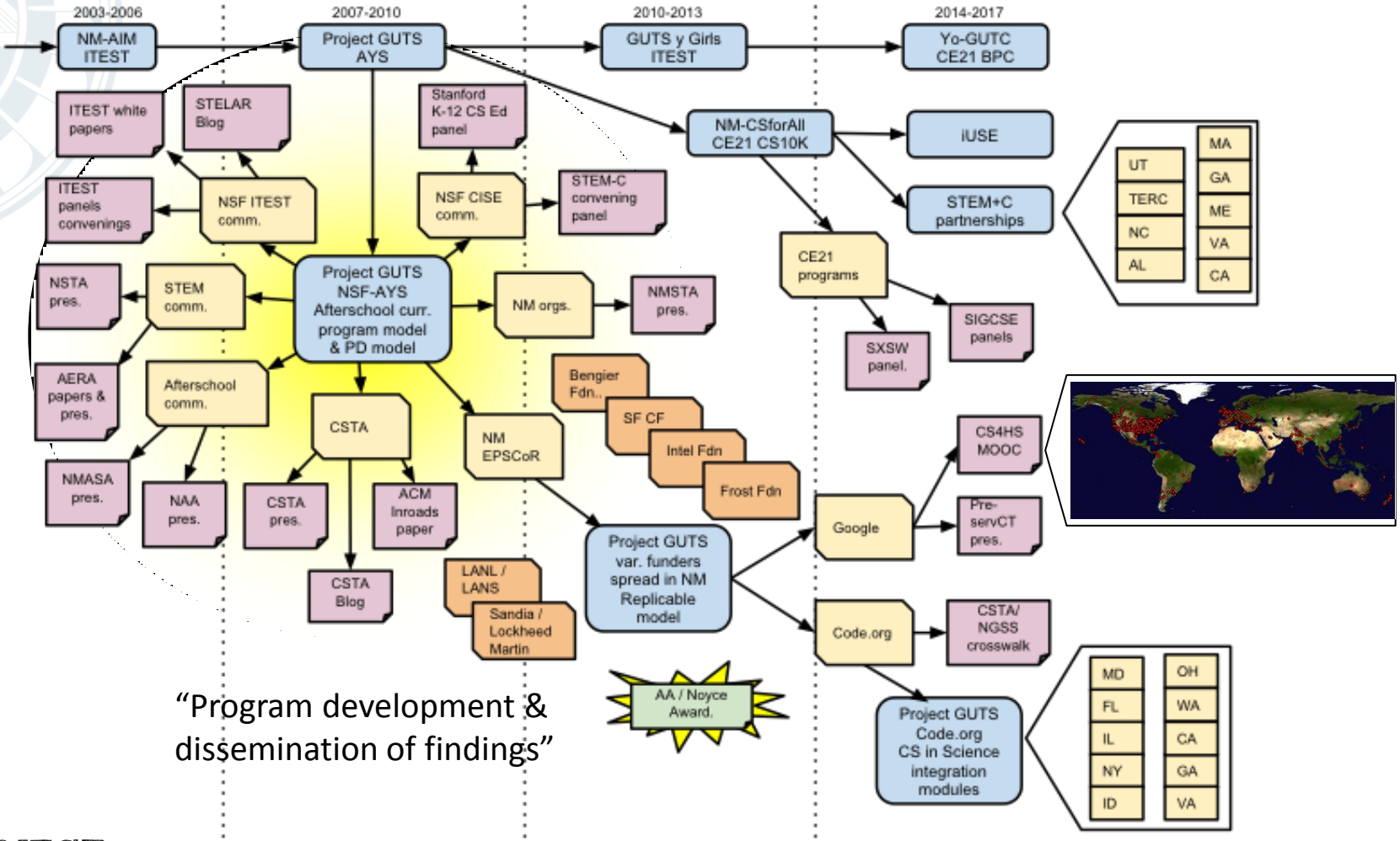
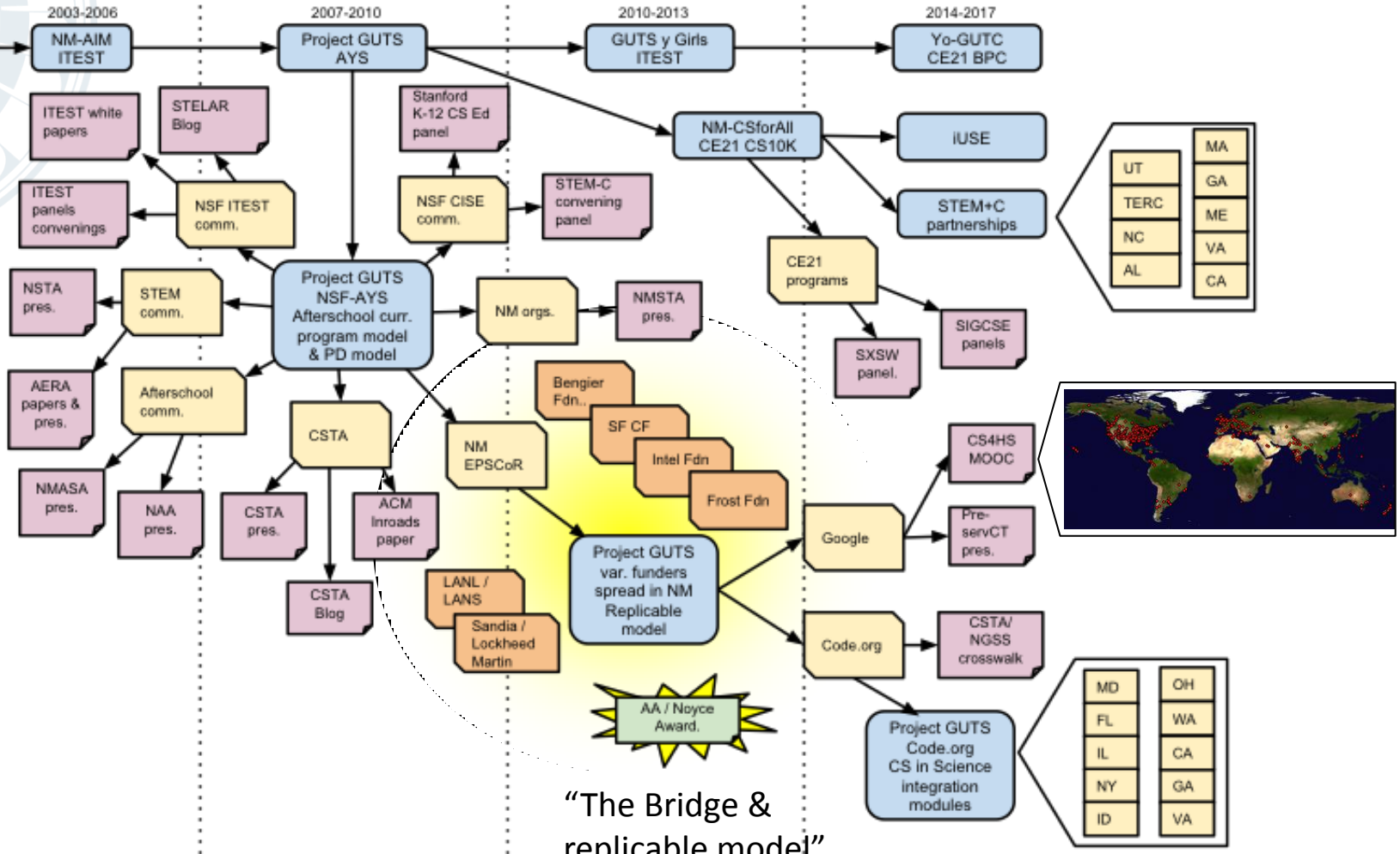


"Program development & dissemination of findings"

Project GUTS dissemination



"The Bridge & replicable model"

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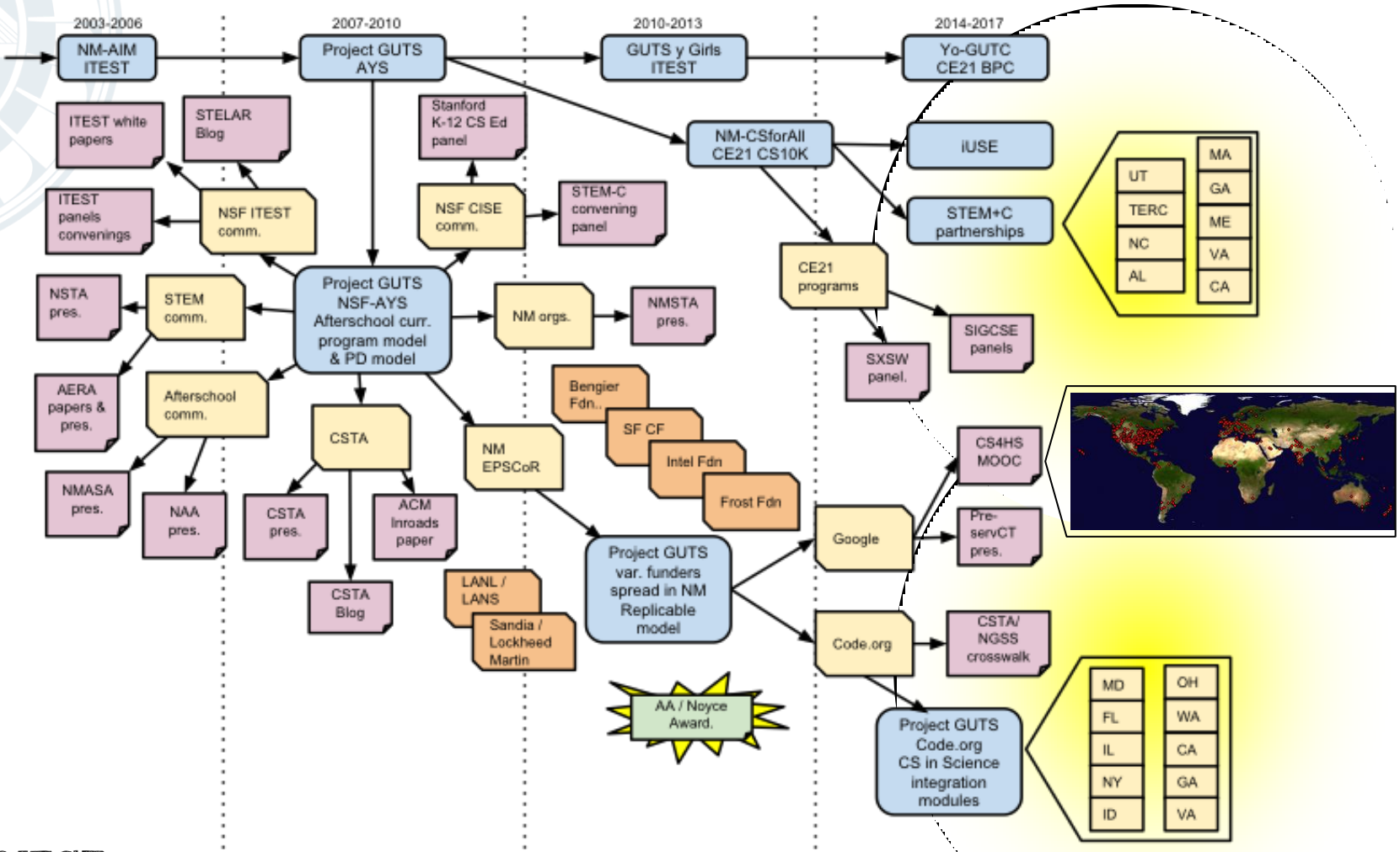
Project GUTS dissemination



"Diffusion of innovation"

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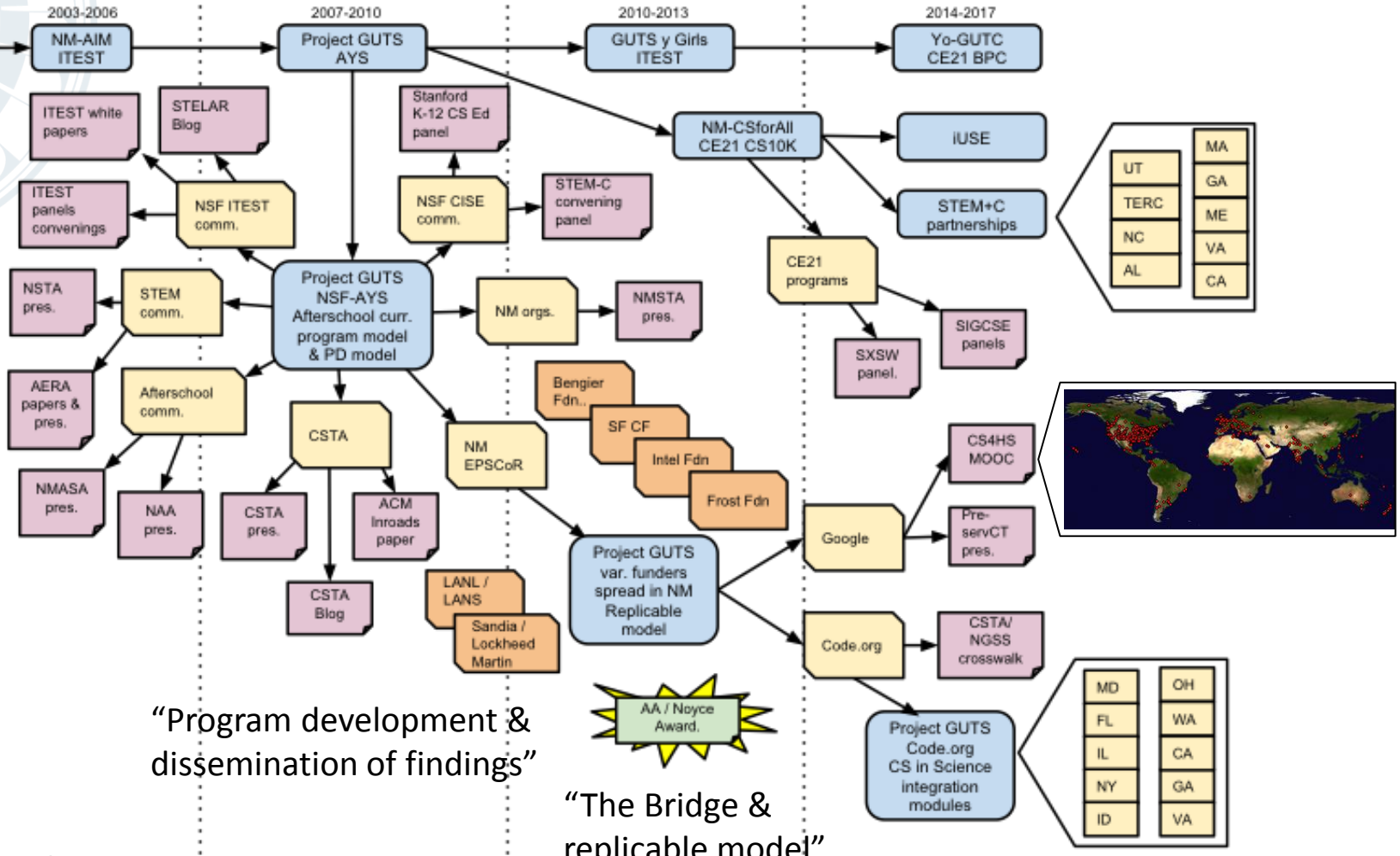
Project GUTS dissemination



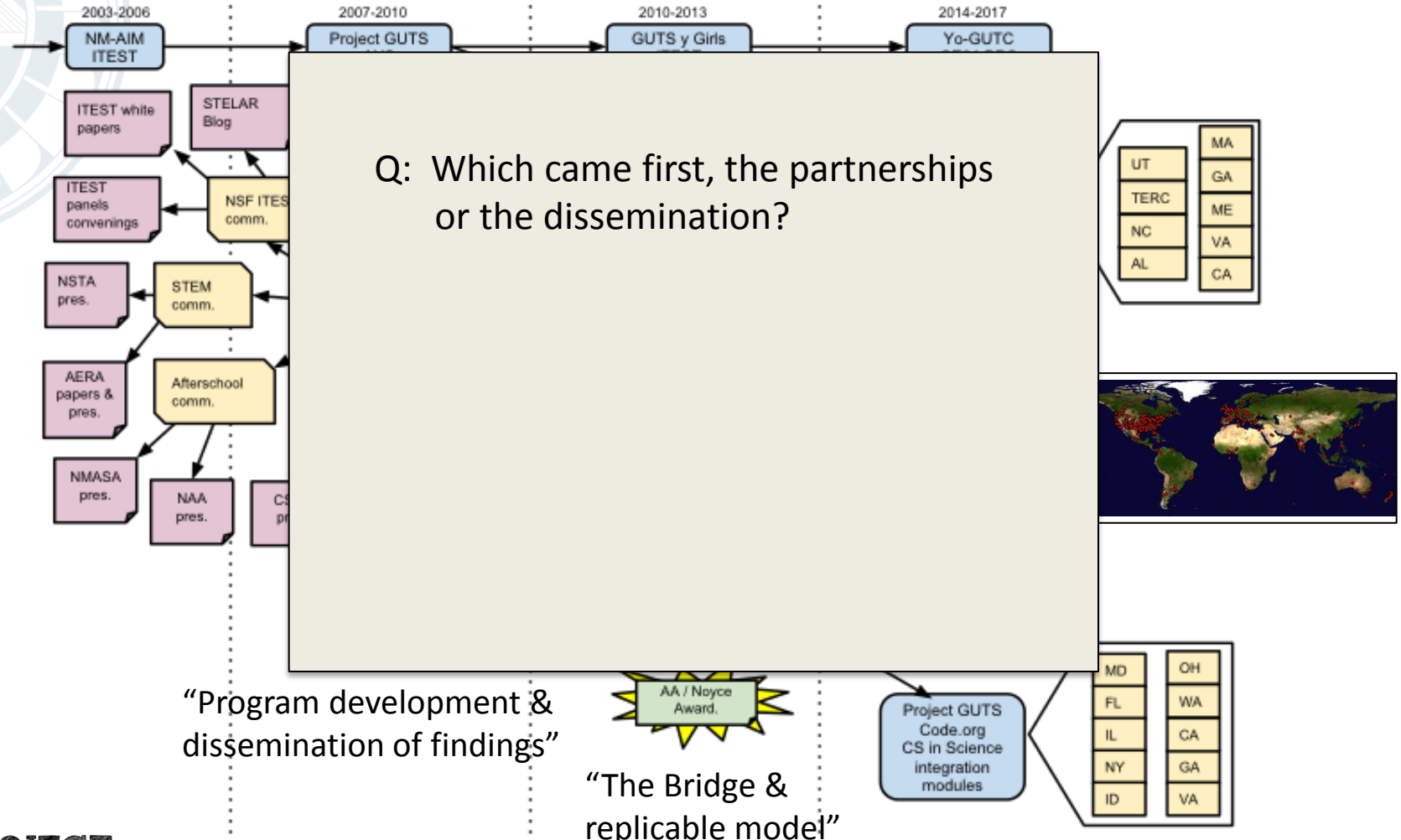
"Program development & dissemination of findings"

"The Bridge & replicable model"

"Diffusion of innovation"

PROJECT GUTS
Growing Up Thinking Scientifically

Project GUTS dissemination



Q: Which came first, the partnerships or the dissemination?

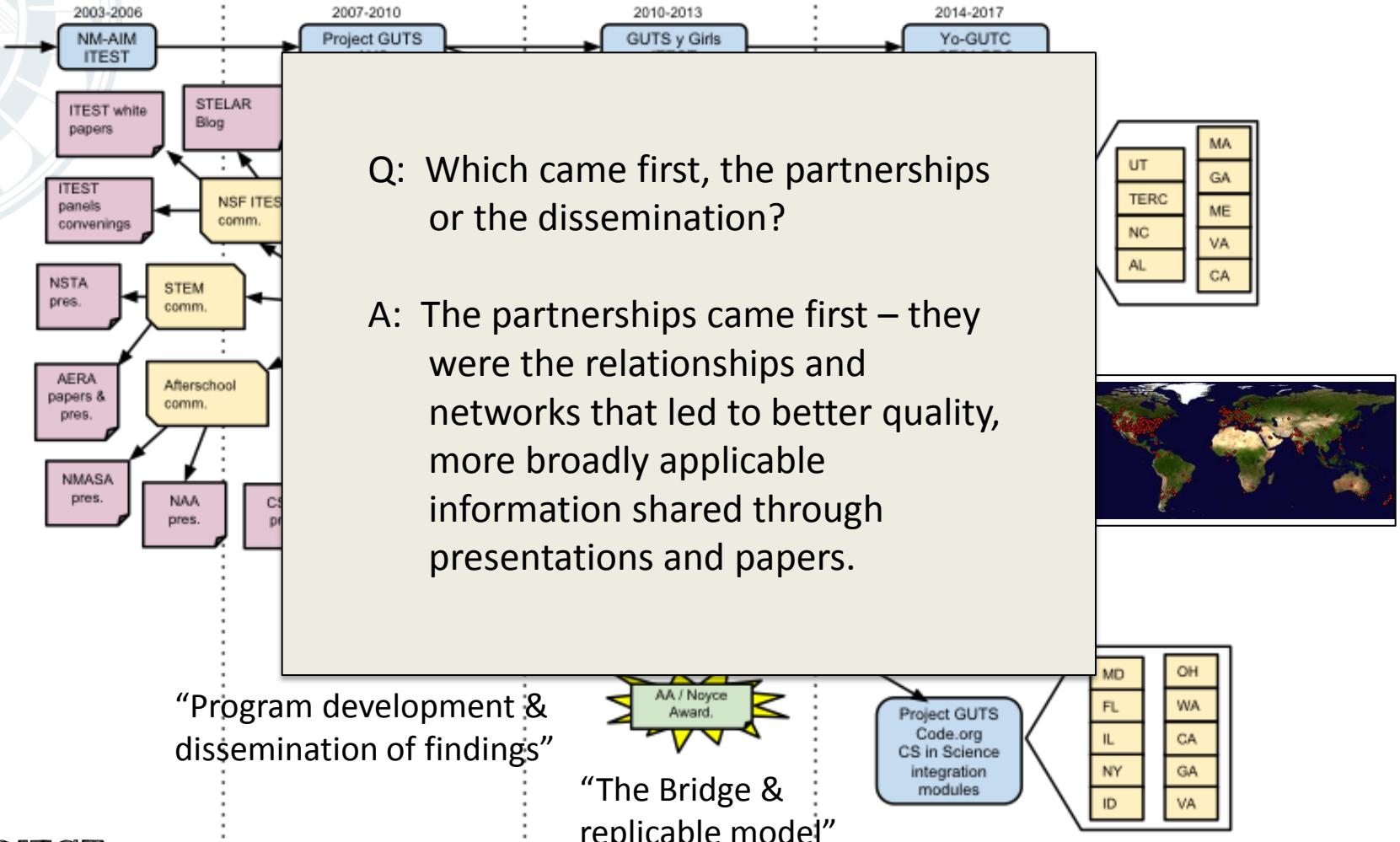
"Program development & dissemination of findings"

"The Bridge & replicable model"

"Diffusion of innovation"

PROJECT GUTS
Growing Up Thinking Scientifically

Project GUTS dissemination



Q: Which came first, the partnerships or the dissemination?

A: The partnerships came first – they were the relationships and networks that led to better quality, more broadly applicable information shared through presentations and papers.

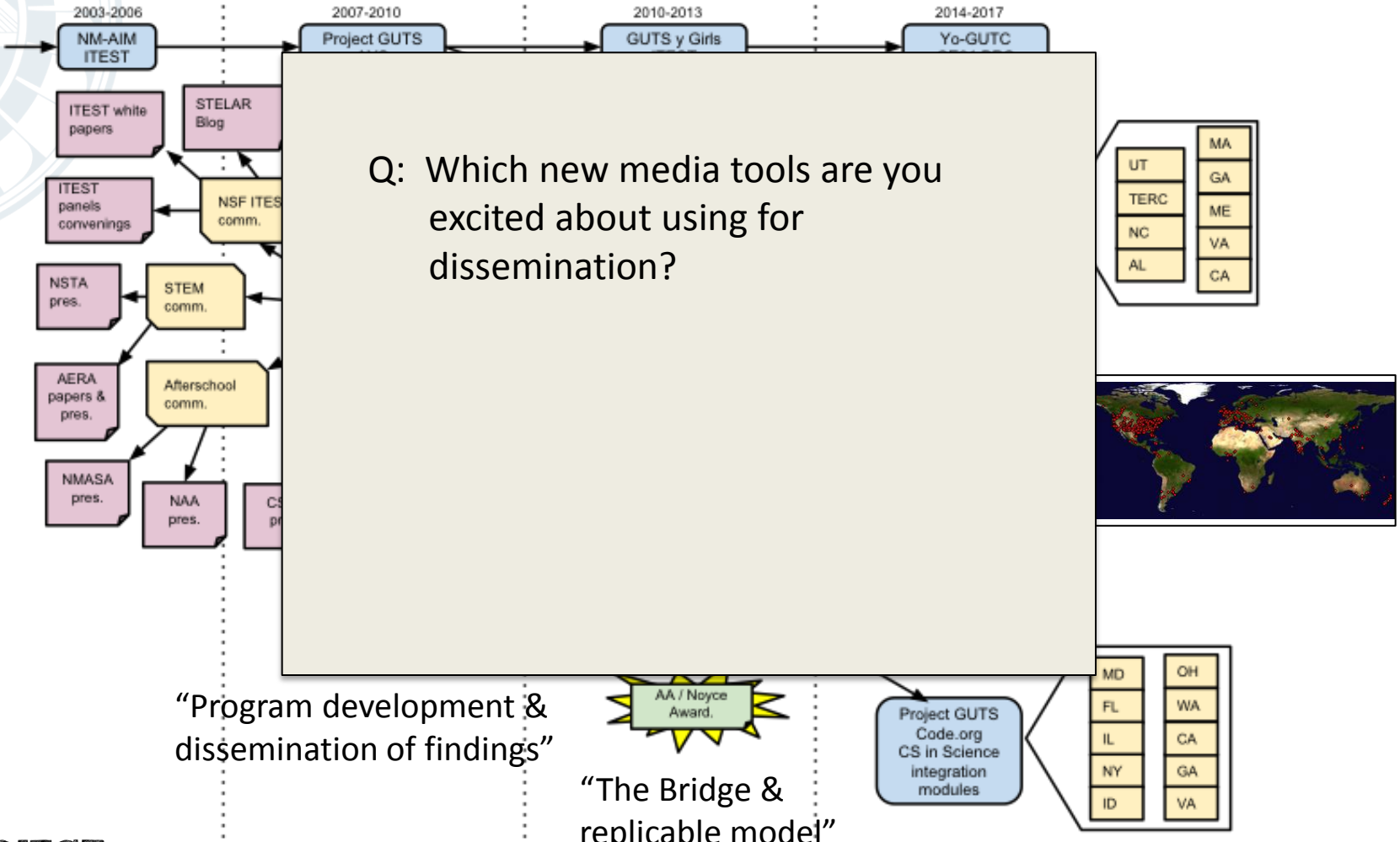
"Program development & dissemination of findings"

"The Bridge & replicable model"

"Diffusion of innovation"

PROJECT GUTS
Growing Up Thinking Scientifically

Project GUTS dissemination



Q: Which new media tools are you excited about using for dissemination?

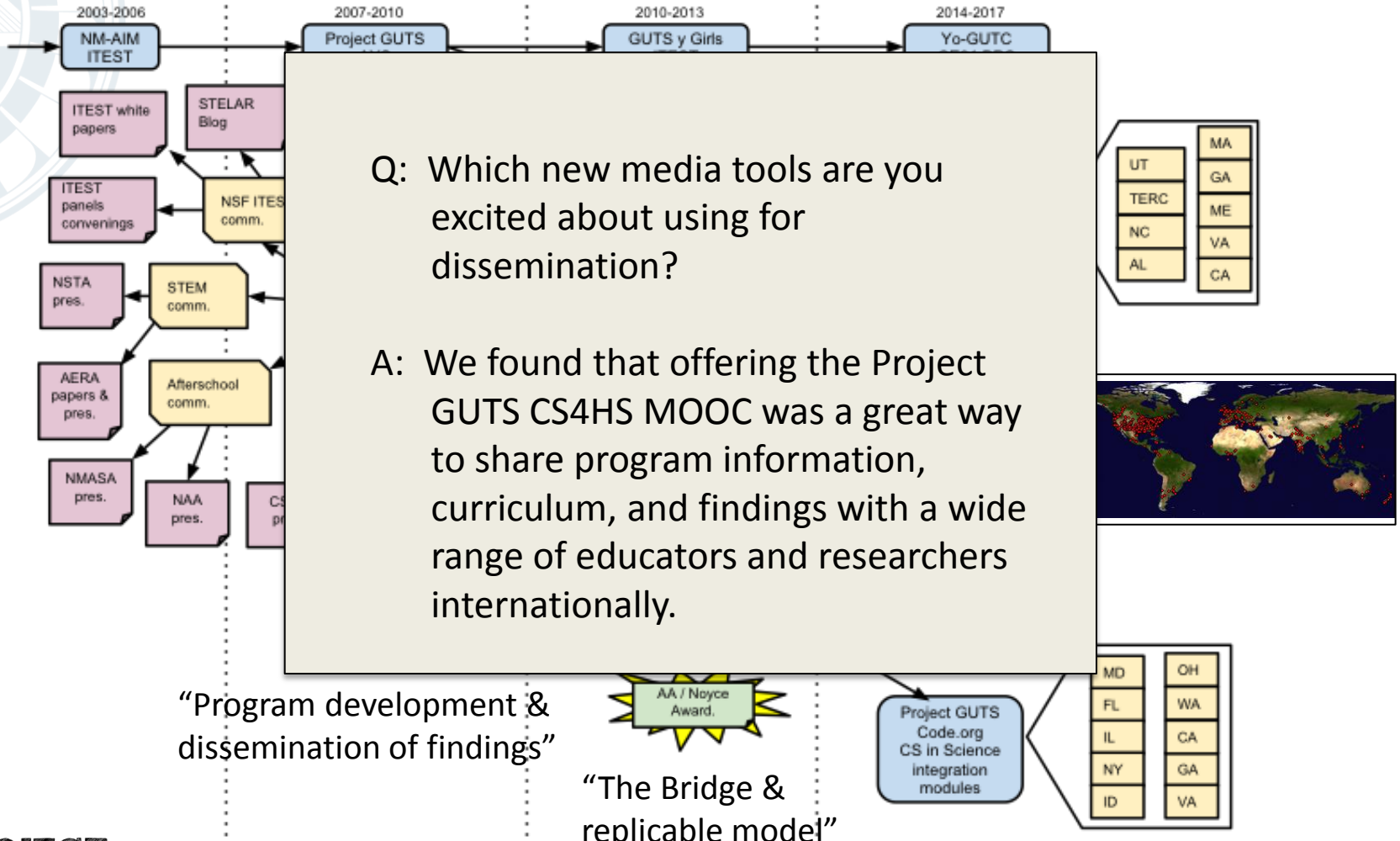
"Program development & dissemination of findings"

"The Bridge & replicable model"

"Diffusion of innovation"

PROJECT GUTS
Growing Up Thinking Scientifically

Project GUTS dissemination



Q: Which new media tools are you excited about using for dissemination?

A: We found that offering the Project GUTS CS4HS MOOC was a great way to share program information, curriculum, and findings with a wide range of educators and researchers internationally.

"Program development & dissemination of findings"

"The Bridge & replicable model"

"Diffusion of innovation"

PROJECT GUTS
Growing Up Thinking Scientifically

Project GUTS dissemination

- **Dissemination**
  - Partnerships
    - Papers and Presentations
    - Opportunities for growth and diffusion of innovation later
  - Human network (people spread the word)
- **Shift and adapt**
  - Spread from OST to IST with Code.org
  - Integrated into other program's formats
- **Diffusion of Innovation**
  - Refined, streamlined curriculum
  - Tested PD that suits teachers' needs
  - Documented coherence with Standards
  - Partners with distribution channels

Thank you!

Contact: Irene A Lee, Santa Fe Institute
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projectguts.org @projectguts
code.org/curriculum/mss

Strategies for Project Dissemination

An Example from the Next Generation Preschool Math (NGPM) Project

Ashley Lewis Presser, Ph.D.

EDC Learning transforms lives.

NGPM Project Goals

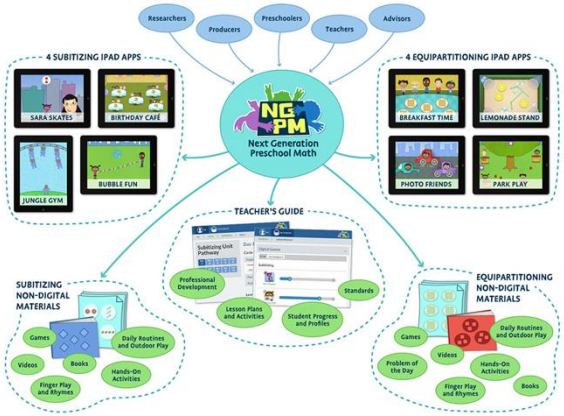
- NGPM seeks to **promote early math learning** by:
  - Supporting **children's understanding of content** in order to improve readiness for subsequent math learning, particularly for at-risk children
  - Using **tablets** in digital learning centers with a small number of devices (4-5),
  - Integrating digital **with non-digital activities** (1:5 ratio);
  - Providing **professional and technical support** materials for preschool educators.

NGPM Intervention

- Six Week Intervention
  - Two Units (3 weeks each): Subitizing & Equipartitioning
  - Based on learning trajectories (Clements & Sarama, 2009; Confrey et. al, 2009)
- Each unit includes
  - 4 Digital Games
  - Non-digital activities
  - Digital Teachers Guide

- In Person Teacher Professional Development

Consider What To Share



1. NGPM Curriculum
   - Digital iPad Game
   - Non-digital Classroom Activities
   - In Person Teacher Professional Development
2. Research Findings
3. Development of the Student Assessment
4. Lessons Learned about the Collaborative Design-Based Research Process

Consider Potential Audiences

1. Researchers
2. Teachers
3. Parents
4. Children
5. Public

Dissemination Venue by Audience

	Researchers	Teachers	Parents	Children	Public
App Stores	X	X	X	X (experience games)	X
Websites	X	X	X	X (experience activities)	X
Journal Articles	X	X			
Conferences	X	X			
Newspaper/Social Media	X	X	X		X
Other (NSF Video Competition)	X				

For Example: A Wide Variety of Conferences

- American Education Research Association (AERA)
- Society for Research on Child Development (SRCD)
- National Council of Teachers of Mathematics (NCTM)
- South by Southwest (SxSW)
- Head Start: Teacher and Research Conferences
- American Evaluation Association & Local Evaluation Associations
- Society for Research on Educational Effectiveness (SREE)
- Society for Information Technology and Teacher Education (SITE)
- International Society for Technology in Education (ISTE)
- International Design for Children (IDC)

1. Sharing the NGPM Curriculum: Digital Games

- Digital iPad Game
  - Published games in app store
  - Posted videos with game demonstrations (1 minute long) on the blog
  - Received award for one game (https://www.graphite.org/top-picks/best-edtech-of-2014)
  - One measure of success is # of downloads

FIRST 8 STUDIOS WGBH

first8studios.org

Sharing the NGPM Curriculum: Digital Teachers Guide

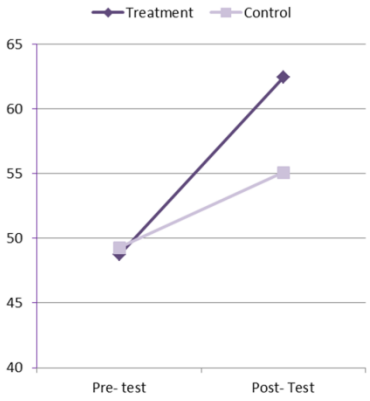
- Digital Teachers Guide Website includes:
  - Non-digital Classroom Activities
  - Math Content
  - Teaching Tips

Sharing the NGPM Curriculum: In Person Professional Development

- Hope to create videos of parts of the PD to supplement the digital teachers guide

2. Sharing Research Findings

- Researcher Audience
  - Journal Articles for experimental study
  - Short video presentation (NSF video competition)
- Teacher Audience
  - Article in Teacher Journal
  - Website with Curriculum
  - Apple store
  - PD videos
- Both Audiences
  - Conference presentations

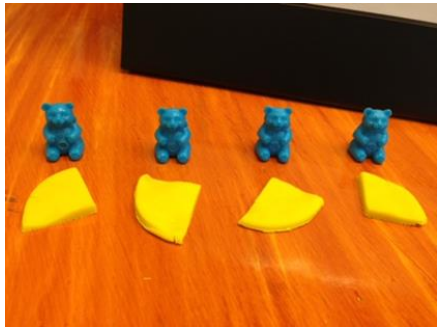


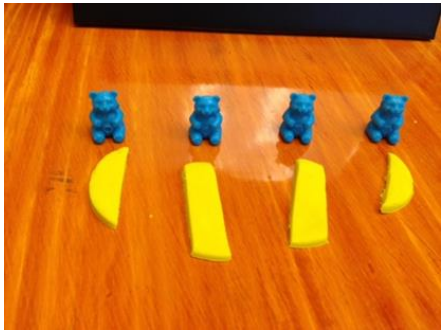
Sharing Research Findings

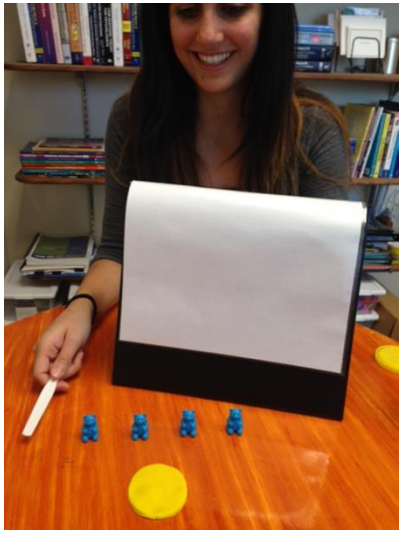
- Parent Audience
  - Apple store, blog posts
- Children
  - Experience games & activities themselves
- Public can access
  - Games & Activities
  - Newspaper article
  - Social Media
  - All published work

3. Sharing the Development of the Student Assessment

- Researcher Audience
  - Journal Articles on development and piloting
  - Conference Presentations
  - Possible blog post on an evaluation or research focused blog
  - Short video presentation
- Future area for work

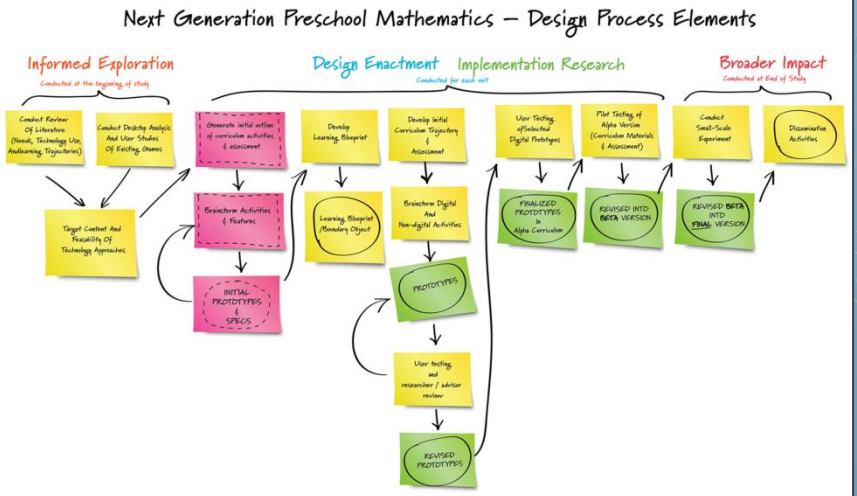






4. Lessons Learned about the Collaborative Design-Based Research Process

- Researcher Audience
  - Journal Articles on our collaborative, design-based research and development process
  - Conference Presentations
  - Possible blog post on an evaluation or research focused blog
  - Social Media
  - Short video presentation
- Future area for work



Final Notes on Dissemination

- Balance between creating something innovative and capturing that program in such a way that it can be scaled up.
  - Think about scale up early and often.
  - Have intervention documented in sharable way
- It can be a challenge to maintain websites and apps after the conclusion of the grant. Try to plan for how to sustain these types of dissemination efforts.
- Finally, dissemination plans should be flexible enough to jump in on unexpected opportunities!

More NGPM Project Information

http://first8studios.org/
http://nextgenmath.org/
http://cct.edc.org/projects/next-generation-preschool-math
http://www.sri.com/work/projects/next-generation-preschool-math

This research was funded by the National Science Foundation (DRL-1119118). Any opinions, findings, conclusions, or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

Challenges of Scaling Funded Research Projects

David Reider
Education Design, INC

www.educationdesign.biz

scalability

Ability of a system, network, or process to handle a growing amount of work or be enlarged to accommodate that growth.

-Up: Vertical; add more resources to a node

-Out: Horizontal; add more nodes to the system

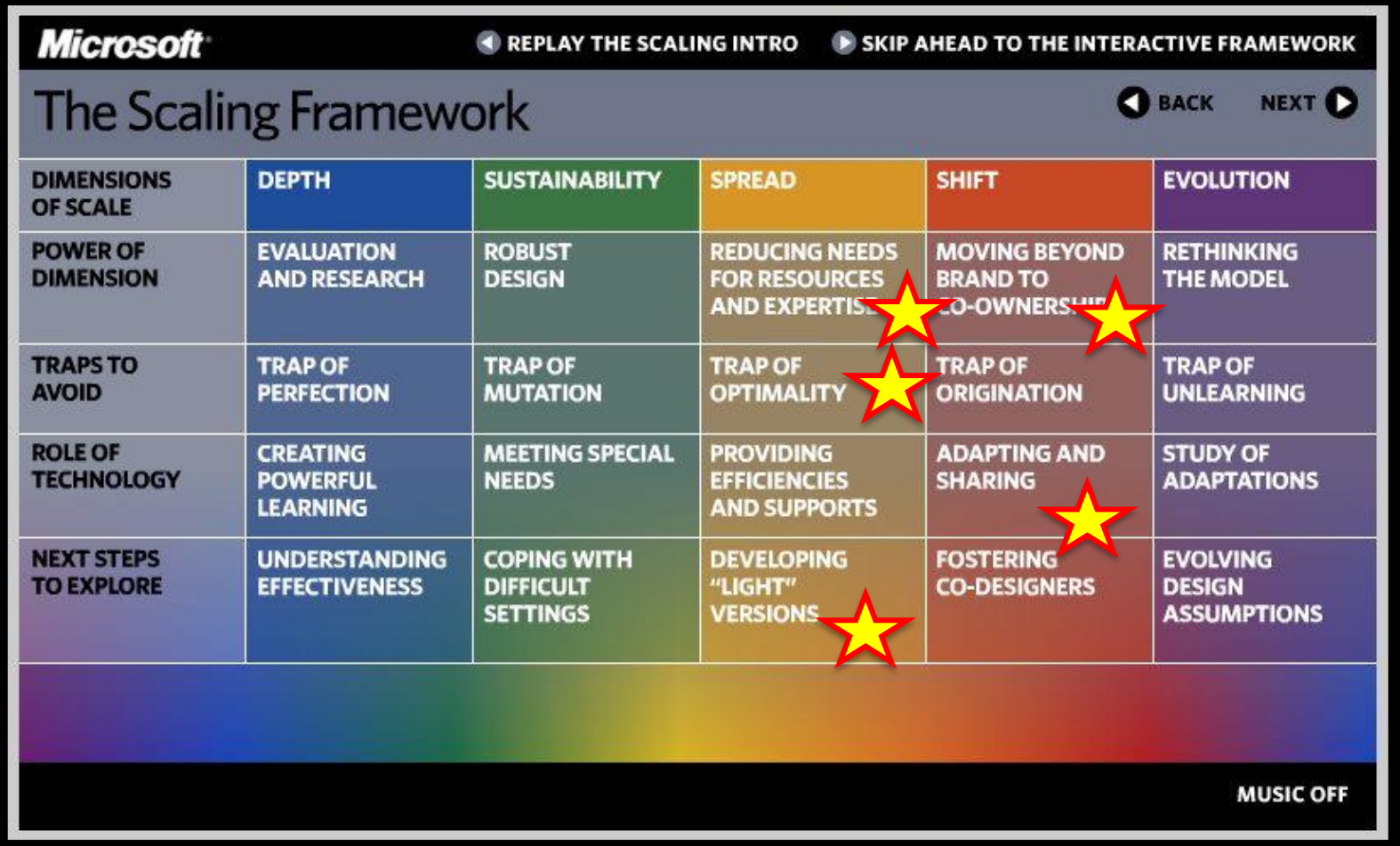
Is Scale-up the wrong way to thing about things?

three project cases to think about

- CompuGirls (ASU) Scale-Up, 2012-2017
  - AZ, CO, CA
- GRACE (EMU) (MYTC Scale-Up), 2014-2018
  - MI
- ITSI (Concord) Scale-Up, 2009-2015
  - VA, KS, IA, AK; CA, PA

scale-up framework

(Dede, et al. 2003, 2007)



scale-up framework

critical components for scale-out

DEVELOPING "LIGHT" VERSIONS

TRAP OF OPTIMALITY

MOVING BEYOND BRAND TO CO-OWNERSHIP

ADAPTING AND SHARING

REDUCING NEEDS FOR RESOURCES AND EXPERTISE

scale-up framework
critical missing components

Costs

critical missing components: costs

Costs: $

Costs: Time

Costs: Opportunity

Costs: Curricular

Costs: Personal

conflicts of design:
agency funded vs. market-based

AGENCY SUPPORTED (low scale)

market model:

- proof of concept
- singularly distributed

MARKET BASED (high scale)

market model:

- proven concept
- widely distributed

conflicts of design: participant costs

agency funded (low scale) vs. market-based (high scale)

AGENCY SUPPORTED (low scale)

- average cost: $765/student
- range of: $400/student to $8900/student

MARKET BASED (high scale)

- needs to be on par with that of a textbook or other similar costs (<$100/student)

conflicts of design: implementation costs

agency funded (low scale) vs. market-based (high scale)

AGENCY SUPPORTED (low scale)

- fully supported, $ costs absorbed
- ask participants to take stipends, equipment
- offer training for free
- participants still need to invest (cost) time, curric coverage, comfort

MARKET BASED (high scale)

- out of pocket or institutional costs (actual)
- pay for equipment
- pay for training
- participants still need to invest (cost) time, curric coverage, comfort

conflicts of design: skill sets

academic vs. business

ACADEMIC (low scale)

- school-based, educational
- value of research
- departmental scope
- non-profit or spend-down

BUSINESS (high scale)

- targeted marketing
- value of management
- organizational scope
- profit-minded

conflicts of design: program elements

academic vs. business

ACADEMIC (low scale)

- professional training
- multiple outcomes
- multiple subjects
- specialized technologies
- high research impact

BUSINESS (high scale)

- standalone training/DIY
- singular outcomes
- single subject
- existing technologies/platforms
- low research impact

conflicts of design: access

academic vs. business

ACADEMIC (low scale)

- provided technologies
- supported access (IT, help)
- provided materials

BUSINESS (high scale)

- need to own
- unsupported
- consumer acquired materials

problems identified in ITEST projects to scale out

problems

problemofgravityproblemofmessageproblemofaudience

problemofcapacityproblemoffundingproblemofaccess

case: ITSI-SU, MYTC
problem of gravity

- after one-year support and research, many classes return to business-as-usual
- evaluation findings favorable
- usage costs too high
  - prep time
  - lesson time longer than traditional model
  - shifts of practice demands: didactic toward inquiry
  - time away from test-preparation

case: ITSI-SU, MYTC

solutions to problem of gravity

- support classroom work in successive years
- support with local staff on the ground
- lessen the optimality, allow light implementations
- fewer components required
  - fewer assessments
  - improving technologies (i.e. probeware, html 5)
- master teacher network
- continue into new grants (MMW, GRACE)

TRAP OF OPTIMALITY

DEVELOPING "LIGHT" VERSIONS

case: ITSI-SU, CompuGirls

problem of message

- targeting grades 1-12, SPED
- all STEM subjects (physics, chem, gen science, math, etc.)
- computer-based simulations & modeling
- probeware data input
- inquiry-based science learning
- online PD for teachers with video documentation

case: ITSI-SU

solutions to problem of message

- lessen the need for all elements

- allow light implementations

- focus on the strongest subject area response
  - gen science, env science
- focus on the strongest grade level response (middle school)
- adapt and share, requires a retuning of the message
  - "It's about learning science with probes and real data"
- continue into new grants (MMW), more tightly targeted

case: GRACE
problem of access

- inner-city, urban population with low technology access
- access to STEM jobs and college a faraway vision
- PD difficult for teachers in urban schools
  - transportation, time, other conflicts
- schools have low access to adequate technologies
  - multiple & uneven platforms
  - underpowered
  - low bandwidth or firewalls
  - no IT support
  - tight institutional regulations on technology access and use

case: GRACE
solutions to problem of access

- entirely online technology platform, no need for individual platform specifics
- OST model using personal mobile technologies
  - (high penetration in low income populations >90% smartphone)
- GRACE project statewide: different contexts and different solutions

- Hybrid (f2f + online) PD to lessen barriers to participation

case: GRACE, ITSI, CompuGirls

problem of audience

- in-school grades or after-school?
- STEM only or social-studies (GIS)?
- girls to learn technology or girls needing to tell their stories?
- geographic tool or social-science tool?
- urban, rural, suburban contexts, who responds best?

case: GRACE, ITSI, CompuGirls

solutions to problem of audience

- partnering with professional GIS organization (mapping professionals) to identify participants and communities
- partnering with publisher (Select Media) to define audience
- different levels of participation define different audience types
  - (slight interest to internship)

- partnering with local organizations to define audience
  - (MIVU, Boys & Girls Club, Oakland Public Library)

case: GRACE, CompuGirls
problem of capacity

- many demands for implementation
- rotating staff
  - academic department: temporary positions, work study, post-docs, researchers leaving
- different contexts of implementation
  - in-school, OST, 2-week, 5-week models, etc.
- multiple different projects around the same product
  - ITEST-SU, NRI, REU, GSE, requiring different research and implementation agendas
- continued focus on research, need for operations

case: GRACE, CompuGirls

solutions to problem of capacity

- establishment of a center or institute, non-profit to address growth of program
- lessen emphasis on research, increase operations
- professionalize the staff, hire from outside
- establish regional POCs, no longer just manager or PI

case: ITSI, GRACE, CompuGirls
problem of funding

- post-project, no support
- new demands require personnel and materials
- simply maintaining a website with free materials and curriculum costs
- newly developed technologies need to be updated

case: ITSI, GRACE, CompuGirls

solutions to problem of funding

- partnership with distribution and scale organization
  - publisher (Select Media)
  - training organization (MIVU)

MOVING BEYOND BRAND TO CO-OWNERSHIP

- lessen emphasis on research, increase operations
- professionalize the staff, hire from outside

ADAPTING AND SHARING

- establish regional POCs, no longer just manager or PI

TRAP OF OPTIMALITY

to recap

- There is a body of research on bring projects to scale
  - read up, identify elements that are core to your project's scaling
  - scaling up or scaling out?
- There are multiple types of costs to scaling
- There are fundamental conflicts between the support models
  - What works for one may not (will not?) work for the other
- Our community must reference and partner with the business community

to recap

- You are way ahead of traditional business development process
  - typically you need to raise $, after proven model works
  - here you're given $1M to try out an idea, you only need endure the proposal process
  - think of scaling as a design component, not an final year activity

- Projects have been successful in negotiating several of these factors
  - Should be identified at the proposal stage
  - Should be acted on as early as Year 1

Challenges of Scaling Funded Research Projects

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Q & A

THANK YOU!

Please remember to fill out the evaluation survey:
https://edc.co1.qualtrics.com/SE/?SID=SV_3sifHzCA1UhoRNj