

Strategies for Arts + Science + Technology RE/search

A joint workshop between the National Science Foundation and the National Endowment for the Arts

Arlington, Virginia—September 15 & 16, 2010

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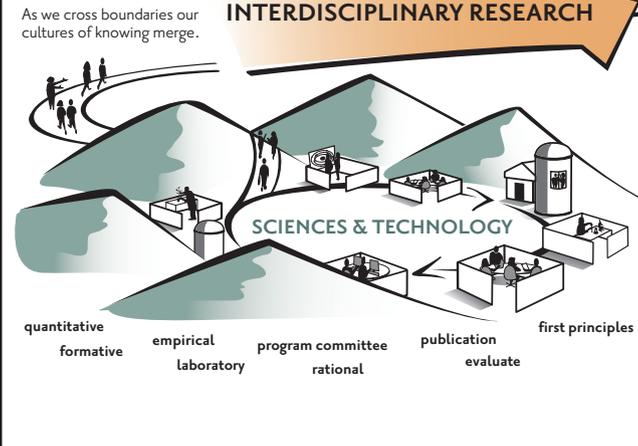
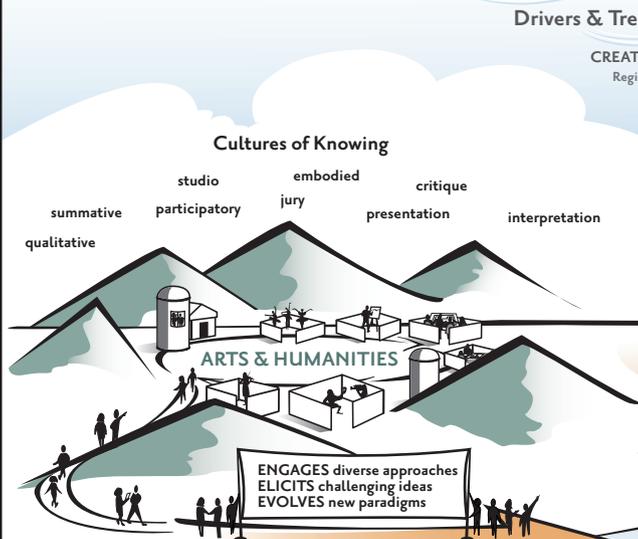
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CURRENT STATE

DISCIPLINE SILOS



GAP ANALYSIS

Drivers & Trends

CREATIVE INNOVATION ECONOMY
Regional development through transformative discoveries and innovations.

INFORMAL LEARNING FOR PUBLIC AUDIENCES

STEM aptitude through creativity-based activities, and vice versa.

OPEN-SOURCE THINKING

More creative minds inventing with new open-source tools and methods.

CHALLENGES & OPPORTUNITIES

Divergent Values
CHALLENGE
Real and perceived differences in how we validate what we value.

OPPORTUNITY
Create frameworks and forums for sharing, discussing and understanding the differences and similarities across cultures-of-knowing.

Scholarship
CHALLENGE
Demonstrating impact of AST research is hard as scholarly archives across disciplines are not linked.

OPPORTUNITY
Build a repository for citation and archiving AST research to study the history and support the future of the field.

Educational Institutions
CHALLENGE
Traditional silos and unlevelled playing fields in resources, infrastructure, support, teaching to research ratios creates disparities.

OPPORTUNITY
WRITE mission statements that emphasize interdisciplinary programs as a principle goal.
RESOLVE silo mentality with sustained dialogues across the institution.
ESTABLISH tenure review guidelines that reward experimental collaboration.
COLLABORATE with non-profit institutions to the benefit of all.

21st Century Learning
CHALLENGE
There has been enrollment decline in traditional Computer Science programs while programs that integrate computational thinking and the Arts have increased.

OPPORTUNITY
ALIGN AST pedagogies with 21st century learning skills.
SCAFFOLD skills needed for engaging STEM and the Arts from PK-12 to lifelong learning.
REWARD creativity, curiosity and problem solving with tolerance for alternative points-of-view.
BENCHMARK best practices that create critical thinkers and leaders for the ever changing job market.

Networks of Excellence
CHALLENGE
AST networks in the U.S. tend to be part of academic clusters. They are vibrant yet closed to those outside of the system.

OPPORTUNITY
CONNECT a distributed community of stakeholders.
INFORM about the impact of AST research on national STEM education priorities.
PROMOTE diversity of perspectives, approaches and people in the creative innovation economy.
FORGE partnerships between international, federal, state and local arts, research, and industry institutions.

Resources
CHALLENGE
Funding drives innovation and change. Long-term funding initiatives are needed to maintain international competitiveness in AST research.

OPPORTUNITY
FUNDING PROGRAMS FOR
• Inter-agency crosscutting initiatives.
• Multi-staged project support.
• Faculty exchange program.
• Research experiences for non-STEM students.
• Travel grants for festivals and conferences.
• Academic and non-profit partnerships.
• Scientist-in-Studio and Artists-in-Labs programs.

About the Storymap

The landscape on the left depicts two valleys that represent the worlds of Art and Science. Some of the people are content in their silos while others are moving toward the interdisciplinary space in-between. Surrounding both worlds are cultures of knowing concepts and methods that begin to merge as discipline boundaries are crossed. The ramp represents the topic areas of the workshop gap analysis exercise. Above the ramp float several drivers and trends that align the workshop topic with broader national concerns about innovation, STEM education, ingenuity and creativity in maintaining a competitive edge. Each gap analysis topic is summarized in the challenges and opportunities tabs below the ramp. Champions of AST research build the pillars and assure the structural integrity of the ramp that ushers the

field from the lower landscape of silos to the higher landscape of transformative breakthroughs. The bedrock of the future landscape is inlaid with the Big Questions that were shared by workshop participants on the first day of the event. The land of transformative breakthroughs is decorated with banners that announce the NSF and NEA review criteria—Intellectual Merit; Broader Impact; and Artistic Excellence. The global silhouettes indicate that the impact of AST research strengthens national and international communities. In this future land people who are working in interdisciplinary settings among new and revised cultures of knowing that lead to transformative breakthroughs.

About the Workshop

The program committee for the Strategies for Arts + Science + Technology RE/search workshop convened an international group of sixty stakeholders (Artists, Engineers, Computer Scientists and practitioners who defy disciplinary boundaries) for a two-day interactive discussion about the challenges and opportunities for advances in the creative innovation economy, PK-lifelong learning and the national intellectual currency that bridge the Arts, Sciences, and Technology (AST) research.

WORKSHOP OBJECTIVES

- Identify intersecting points between the Fine, Applied and Performing Arts and Cognitive Science, Human Centered Computing, and Computer Science Engineering.
- Develop a gap analysis for challenges and opportunities in AST research.
- Foster a dialogue between the National Science Foundation and the National Endowment for the Arts about the field.

WORKSHOP FORMAT

The workshop format combined structured dialogue, annotated discourse, mind maps, reflective aspirations, and multiple breakout sessions focused on identifying structural and cultural issues in the diverse AST community and ways to harness our synergistic goals. Each session was moderated by members of the workshop committee with the assistance of graphics facilitation. The workshop notes were aggregated and coded to reveal the major themes and key issues made during the two day workshop.

THE SHARING PERSPECTIVES TOPICS

- "Sharing Perspectives" roundtables—short conversations between three or four selected participants—served to introduce topics areas followed by small group discussions by all workshop participants.
- What is THE big question you are asking about your work, research, institution, why?
- Successful research, creative works and collaborations in AST work.
- Chasms and barriers to interdisciplinary research and their resolution.
- Best practices in education, pedagogy, and instruction policies.
- Technology and cultural trends that are influencing AST research.
- Best practices for inter-institutional Networks of Excellence.

THE GAP ANALYSIS TOPICS

- Attendees participated in a gap analysis exercise to identify the current, desired and future states of AST research on day two of the workshop. The following topics were discussed.
- Institutions:** What actionable steps can lead institutions in scientific research, arts practice, and resource provision take?
 - Infrastructure:** How do we identify key infrastructure needs for AST research?
 - Scholarship:** How do we demonstrate the impact of AST research on traditional disciplines?
 - Learning:** What is the role of the academic institution, and non-profit and grass roots organizations in broadening participation in STEM and Arts learning?
 - Networks:** How do we move from isolated successes to inter-organizational awareness and collaboration?



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