Assessing Performance and Developing an Accountability System for Broadening Participation: The Role of Higher Education

Report on an NSF-funded Meeting[1]

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BACKGROUND

In its 2011-2012 Report, the Committee on Equal Opportunities in Science and Engineering (CEOSE)[2] recommended that "NSF implement a bold new initiative, focused on broadening participation of underrepresented groups in STEM… that emphasizes institutional transformation and system change; collects and makes accessible longitudinal data; defines clear benchmarks for success; supports the translation, replication and expansion of successful broadening participation efforts; and provides significant financial support to individuals who represent the very broadened participation that we seek." The 2013-2014 CEOSE Report then elaborated a framework of five essential components that will be needed for realizing the grand challenge of broadening participation and for successful implementation of the bold new initiative:

1. Develop and implement an effective preK-20+ system of STEM pathways that significantly increases participation of underrepresented individuals at every stage of schooling and across all STEM fields;
2. Provide stable and sufficient direct support for individuals who represent the very broadened participation that we ultimately seek;
3. Support the further development of a science of broadening participation grounded in empirical research;
4. Conduct field experiments including assessment of interventions and outcomes to understand and mitigate the barriers to broadening participation; and
5. Recognize the field-specific nature of the broadening participation challenge by embedding and engaging the bold initiative within and across all fields and disciplines that NSF supports and across the nation.

With their 2015-2016 Biennial Report, CEOSE sought to articulate a set of recommendations for assessing the bold new initiative, with emphasis on developing an accountability system that supports the framework above. To do so, the Committee recognized the need to engage additional expertise.

Ira Harkavy and Louis Martin-Vega, who also serve as Chair and Vice-Chair of CEOSE, respectively, received a grant to host a workshop to help develop an accountability system at

[2] The Committee on Equal Opportunities in Science and Engineering (CEOSE) is a Congressionally mandated advisory committee to the National Science Foundation that advises the Foundation on policies and programs to encourage full participation by women, underrepresented minorities, and persons with disabilities within all levels of America's science, technology, engineering and mathematics enterprise. (https://www.nsf.gov/od/oia/activities/ceose/index.jsp).

three levels: individual grantees, institutions receiving awards (particularly institutions of higher education), and funding agencies.

The "Workshop on Assessing Performance and Developing an Accountability System for Broadening Participation" in October 2016 engaged 50 educators, administrators, and evaluators from all corners of the U.S. science and engineering (S&E) enterprise. A widely disseminated report was produced in March 2017 that summarizes the proceedings of the workshop at NSF.[3]

Workshop participants identified the most important aspects of an accountability system as a set of clear goals, assumptions, definitions, metrics, and a strategy for change. The general sense was that the ultimate goal is to "democratize STEM" such that (a) barriers to full participation by all groups are substantially reduced (and eventually eradicated), and (b) there is genuine participation by all. As an explicit guide, workshop participants formulated ten action steps that organizations – particularly institutions of higher education – could adapt in instituting a new accountability system for broadening participation that strengthens the STEM disciplines and the nation's workforce.

The 10 action steps outlined in the original workshop report for developing organizational accountability action plans are reiterated here:

1. Conduct a self-study that takes stock of your organization's current broadening participation portfolio and climate.
2. Construct a timeline (near- and long-term) for achieving broadening participation outcomes articulated by your theory of change consistent with the institutional mission and strategic plan.
3. Identify data and measures that are required—either extant or to be created—to gauge progress organization-wide (and within operating units) toward your broadening participation outcomes.
4. Engage stakeholders to define a common agenda and recruit partners to work toward agreed-upon outcomes, disaggregated by demographic, educational, and careers stages as much as possible.
5. Communicate gains and setbacks with national as well as local stakeholders through a variety of media, sharing information to reach out for new partners and ideas.
6. Update and revise plans and practices as new knowledge and experience (e.g., program cost, workforce turnover) reshape your organization's thinking about how to experiment, accelerate, and expand broadening participation outcomes.
7. Incorporate what has been learned from ongoing longitudinal assessments of your organization's broadening participation programs.
8. Re-examine how the roles of government, institutions of higher education, the private sector, and nonprofits are expediting or inhibiting outcomes that your organization values and report on the contributions of each role-player to broadening participation.
9. Appraise the performance of your organization in taking steps toward increasing accountability and institutionalizing a democratized science and engineering system.
10. Be ready to begin again, as accountability for broadening participation is a recursive, iterative, and ongoing process.

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[3] Chubin, D., Harkavy, I, and Martin-Vega, L. Better STEM Outcomes: Developing an Accountability System for Broadening Participation—Report on an NSF-funded Workshop, March 2017, https://upenn.box.com/v/BetterSTEMOutcomesFinal2.

CORE FINDINGS AND CONCEPTS RESULTING FROM JULY 2017 MEETING

A follow up meeting was held, at the University of Pennsylvania in July 2017 with a subset of participants from the original workshop, to focus particularly on the role of higher education in developing an accountability system for broadening participation. It was attended by fifteen individuals, including three NSF staff members (see Appendix A for participants list). The narrative below captures the meeting participants' core findings and recommendations, which reflects the discussion and expands upon central ideas raised in the original workshop report.

A central conclusion of the meeting was that effective broadening participation cannot be realized without cultural and institutional change, particularly within higher education institutions.[4] Institutional and culture change will result in and be indicated by (1) an inclusive epistemology focused on implementation research, (2) the democratization of science and engineering, and (3) shared accountability for broadening participation. Each of these is unpacked below, yet all such changes require a recursive, iterative approach, with higher education taking the lead and NSF helping to set the standard.

Note that in mathematics and linguistics, recursive refers to the repeated application of a rule, definition, or procedure to successive results. Accountability is a recursive, iterative practice, not a one-shot experiment. Measurement over time is therefore essential. Over time, the practice becomes routine, and a core part of the local organizational culture.

1. Inclusive Epistemology Focused on Implementation Research

The meeting participants concluded that an inclusive epistemology needs to be created to produce a better science and a better society. We seek to broaden the epistemology of accountability to include the knowledge possessed "on the ground" by community members. These local experts are essential to implementing an accountability system that conforms to organizational norms and practices as a means of achieving community goals. This epistemology expands the definition of expertise and knowing to include other voices, not necessarily steeped in professional credentials or academic knowledge, but in lived-experience of the conditions and actualities under examination. What is called for is a movement away from a narrow definition of expert to a community of experts, a broadening of context to include place-based or indigenous knowledge (elaborated below).

During the discussion, an approach was discussed in which theory is integrated with practice, and the test of knowledge is whether it increases the ability of human beings to contribute to the solution of universal problems (such as inequality in STEM) as they are manifested locally. It is an approach designed to produce significant change, advance intellectual work, and develop new discoveries at the frontier. This approach assumes that human beings learn from and through implementation.[5] It also assumes that science is designed to realize large societal goals through developing and implementing programs on the ground with community partners, drawing on all available talent, studying these programs, refining these programs, and

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[4] Based on NSF funding history, the key leadership segment of this universe has been research universities. We consider their role pivotal in meeting the accountability challenge posed here.

[5] This idea is powerfully expressed in a well-known maxim attributed to psychologist Kurt Lewin: "If you want to truly understand something, try to change it."

engaging in an iterative process that leads to ongoing demand for broadening participation. Such a process yields significant learning, high-level theoretical advances, and improved practice.

2. Democratization of Science and Engineering

A concept pervading the discussion was the democratization of science and engineering. There are multiple meanings to this phrase. In the context of science policy, democratization refers to the engagement of the broader public (beyond credentialed experts) in decision making.[6] Democratization in the context of broadening participation also refers to capturing the insights of a broader talent pool embedded in communities with experiences that bear on STEM discovery and innovation. Too often these students—especially women, underrepresented minorities, and persons with disabilities—are left on the sidelines of educational opportunity and deterred from participating in STEM education and careers.[7] Broadening participation denotes "more," but democratizing, for the meeting participants, means more and *better*.

For us, democratized science, a science that is inclusive, involving diverse populations in knowledge production, results in increased advances to knowledge, which, in turn, contributes to a better society. There should be an emphasis on *good* as opposed to elite science. When recognized by educators, institutions of higher education, and employers, momentum to graduate more undergraduate and graduate students who are prepared to enter a diverse workforce and innovate for organizational and societal benefit is created. This cannot be done by research universities alone. Minority-serving institutions and liberal arts colleges make significant contributions, often in partnership with graduate-degree granting programs elsewhere.[8]

The mechanism for sustaining momentum in broadening participation is accountability, which provides a protocol for and metrics of improving both processes and outcomes. But an organization must be willing to devise a protocol that both fits and alters its culture. It must embrace accountability for process and outcome, own it, practice it, and advocate its benefits to peers and partners alike.[9]

The connection between democratizing science, broadening participation, and advancing knowledge is grounded in Dewey's theories about the social nature of education and democratic learning. Research by Patricia Gurin and colleagues on the impact of diverse learning environments has refined and advanced our understanding, as has Scott Page's work on how diversity fuels innovation, which in turn enriches the intellectual environment.[10] The meeting

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[6] Guston, D.H. (2004). Forget Politicizing Science. Let's Democratize Science! Issues in Science and Technology, vol. XXI, http://issues.org/21-1/p_guston-3/

[7] For the NSF version, see Clewell, B. & Fortenberry, N. (Eds.). (Jun 30, 2009). Framework for Evaluating Impacts of Broadening Participation Projects. https://www.nsf.gov/od/broadeningparticipation/framework-evaluating-impacts-broadening-participation-projects_1101.pdf

[8] For data and discussion, see American Institutes for Research (2012) Broadening Participation in STEM—A Call to Action,
http://www.air.org/sites/default/files/downloads/report/Broadening_Participation_in_STEM_Feb_14_2013_0.pdf; and Fiegener, M.K. and Proudfoot, S.L. (2013), Baccalaureate Origins of U.S.-trained S&E Doctorate Recipients NSF 13-323,April, https://www.nsf.gov/statistics/infbrief/nsf13323/. Of course, the pathway to STEM for some starts with community colleges. Notably, both NIH and NSF have programs titled Bridges to the Baccalaureate.

[9] The definition of accountability here clearly goes beyond a narrow conceptualization that focuses merely on punitive measures, rather than one that is concerned with accountability as core to organizational mission and improvement.

[10] Satya Mohanty and Nancy Cantor, "Why Diversity is not a Luxury," ZNET, January 17, 2014,

participants, echoing Page, emphasized that diverse voices and perspectives are required to solve the most difficult problems.

3. Shared Accountability

For accountability systems to take shape and thrive, stakeholders must become stewards of such a system for broadening participation and develop a system of shared accountability. These stewards can be found in all sectors and types of organizations, particularly institutions of higher education, the federal government, corporations and small businesses, and nonprofit organizations. As described in the workshop report, each has a particular role, but the key is working in concert and sharing accountability for performance, positive and negative. Importantly, institutions of higher education, on the front line of STEM research and education, must lead the way.

What distinguishes shared accountability? If broadening participation is a cumulative result that unfolds over time, it stands to reason that multiple organizations play a role in the progress of students through a series of educational experiences demarcated by degrees. Each transition signifies the fulfillment of an accountable achievement. This is not the province of the *last* institution of record, but of those preceding it. Yet, our measurement is truncated and reduced to simple credit for the graduating institution. This is an accountability silo. It misses the stories behind outcomes: the evolution of programs, the lessons learned, and the cooperation brokered, the shared responsibility. Shared accountability captures the dynamics of performance, moving beyond pedantic disputes over rigor of methodology and static gold standards.[11]

The participants thus concluded a need to value impact along different planes of the pathway. This involves collaboration not just across different types of higher educational institutions,[12] but also across the entire educational system. A PhD is only possible if there is impact at the Pre-K, K-12, and undergraduate levels.

Indeed, there was clear agreement from the original workshop that the current approach to broadening participation must be reconsidered and reconfigured to recruit and nurture talent along many pathways, beginning in pre-Kindergarten (pre-K) and continuing into early careers. The creation of STEM pathways is crucial for STEM equity.[13] Educational pathways are

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http://zcomm.org/znetarticle/why-diversity-is-not-a-luxury-an-interview-with-nancy-cantor/. Scott E. Page, *The Diversity Bonus: How Great Teams Pay Off in the Knowledge Economy*, eds. Earl Lewis and Nancy Cantor. (Princeton, NJ: Princeton University Press, 2017). This book is part of *Our Compelling Interests* series edited by Lewis and Cantor with The Andrew W. Mellon Foundation, which illustrates that a diverse population is essential for democracy and a prosperous society.

[11] The danger is that, once declared, such standards can become limiting to ongoing progress, interpreted summatively rather than as formative guidelines.

[12] An example of shared accountability across higher education institutions is the Fisk-Vanderbilt Master's to PhD Bridge Program, which was supported by NSF's Innovation through Institutional Integration (I^3) Activity. This multi-institutional partnership connects a minority-serving institutions (MSI) to a major research university to leverage both the academic resources (from the research university) and the expertise in retaining and preparing underrepresented students (from the MSI) needed to support broadening participation in doctoral STEM programs. Stassun, K.G. et al. (2011). The Fisk-Vanderbilt Master's-to-Ph.D. Bridge Program: Recognizing, enlisting, and cultivating unrealized or unrecognized potential in underrepresented minority students. *Am. J. Phys.*, Vol. 79 (April), 374-379.

[13] David B. Spencer and Sharon Dawes, *Report of the Advisory Committee for GPRA Performance Assessment FY 2009*, NSF 09-068 (Arlington, 2009); Ira Harkavy, Nancy Cantor, and Myra Burnett, *Realizing STEM Equity and Diversity through Higher Education-Community Engagement,* January 2015.

delineated, of course, long before college. While higher education's central role in shaping schooling has long been recognized,[14] its increasing commitment to preK-12 schooling is essential to broadening participation now and in the future.[15]

An accountability system must ensure dedication to pre-Kindergarten through 20+ pathways. For broadening participation, it is crucial to create effective pathways across higher education institutions, starting with community and technical colleges, and including minority-serving institutions, for they serve many first-generation and underrepresented college students.[16]

Some efforts have impacts that are not immediate, but we should not ignore these time lags. All contributing schools and institutions of higher education—and their sponsors/partners—should share credit for the success stories of broadening participation in STEM.[17] This would highlight the entire pathway. It would celebrate shared accountability.

4. Achieving Epistemological Change, Democratization and Shared Accountability

4.1 Develop a collaborative, cross-sector, place-based approach

An approach advocated by the participants was to adapt ideas developed by Donald Campbell[18] in which he argues for "invent[ing] alternative social organizations that will permit the flourishing of narrow interdisciplinary specialties" that would fill in the gaps between disciplines. In the context of broadening participation, accountability systems represent the overlapping expertise—both individual and organizational—needed to demonstrate how such participation benefits science and the communities affected by its research and applications. This is yet another aspect of the democratization of science in which practitioners of academic knowledge can advance the STEM enterprise by collaborating with those in other communities, organizations, and sectors.

Cross-sector partnerships that involve education, government, corporations and small businesses, and nonprofit organizations offer multiple pathways that result in STEM literacy and proficiency. To get there, we need a paradigm change from zero-sum competition and conflict to

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https://www.nettercenter.upenn.edu/sites/default/files/Realizing_STEM_Equity_Through_Higher_Education_Community_Engagement_Final_Report_2015.pdf

[14] William Rainey Harper, *The University and Democracy* (Chicago: University of Chicago Press, 1899).

[15] Lee Benson, Ira Harkavy, and John Puckett, Matthew Hartley, Rita A. Hodges, Francis E. Johnston, and Joann Weeks, *Knowledge for Social Change: Bacon, Dewey, and the Revolutionary Transformation of Research Universities in the Twenty-First Century* (Philadelphia: Temple University Press, 2017).

[16] National Science Foundation. *Women, Minorities, and Persons with Disabilities in Science and Engineering: 2013.* Special Report NSF 13-304 (Published May 2014), http://www.nsf.gov/statistics/wmpd/2013/; Committee on Equal Opportunities in Science and Engineering, *2011-2012 Biennial Report*; Century Foundation Task Force on Preventing Community Colleges from Becoming Separate and Unequal, *Bridging the Higher Education Divide: Strengthening Community Colleges and Restoring the American Dream* (New York: The Century Foundation Press, 2013); Ira Harkavy, Nancy Cantor, and Myra Burnett, *Realizing STEM Equity and Diversity through Higher Education-Community Engagement,* January 2015.

[17] Recent examples include Sloan Foundation support through the Business Higher Education Forum to New York City-region undergraduates pursuing data science careers (http://www.bhef.com/news-events/releases/bhef-receives-650k-grant-alfred-p-sloan-foundation-create-undergraduate), and the Lumina Foundation designating 17 cities as talent hubs for reducing educational disparities (https://www.luminafoundation.org/news-and-views/lumina-foundation-designates-17-cities-as-talent-hubs).

[18] Donald T. Campbell, "Ethnocentrism of Disciplines and the Fish-Scale Model of Omniscience," in *Interdisciplinary Relationships in the Social Sciences,* eds. Muzafer Sherif and Carolyn W. Sherif, (Piscataway, NJ: Aldine, 1969).

cooperation and collaboration focused on real-world community problem solving. This includes decreased competition/increased collaboration among individual scientists, within institutions as well as between institutions. A measurement regime for shared accountability would reveal such a paradigmatic change.[19]

4.2 Develop a long-term commitment to project and place over time for real impact, eventually systemic change

Significant attention needs to be given to *how* to effectively expand the "community of experts." Effective interdisciplinary research cannot solely occur within the academy. Such efforts also need to be placed within real-world, not academic-only communities. If efforts are not place-based, there will be little if any impact in changing the lives of individuals in the community. University-level research will offer primarily talk, not action, theory—not theory integrated with practice, which in turn results in both improved theory and practice. Communities must also be actively involved when the problem is defined and remain involved through the development and implementation of solutions.[20]

Navigating the New Arctic, one NSF's 10 Big Ideas for Future Investments, illustrates the potential of a place-based approach.[21] Indigenous residents of the Arctic have knowledge to be contributed to the STEM enterprise. Communities are threatened by what is happening in the Arctic, which affects the everyday lives not of scientists, but of residents. Defining and addressing these problems through implementation research conducted by a diverse and expanded community of experts creates a dramatic difference.[22] It also exemplifies democratizing science.

If we argue that knowledge from the field is important, we turn the notion of expert on its head. No longer is expertise the sole province of credentialed scientists predominantly in academic settings. The need for collaboration and mutual understanding at a deep, nuanced, and experienced level becomes obvious—and indispensable.

4.3 Utilize Nonprofits as Brokers

Higher educational institutions often need intermediate or collateral support to improve the pathways. Nonprofit organizations (NPO's) can be a catalyst for ideas, help broker relationships, and also provide seed funding. Nonprofits are unique organizations that can provide a safe space for introducing ideas and fostering communication between and among others, notably institutions of higher education and corporations, which might not otherwise occur. Part of this is merely networking, but a larger part also is trust and confidence in pursuing a relationship that could bear fruit. It requires the realization, developed through interaction, that different organizational actors bring different assets—money, contacts, indigenous knowledge, specialized experience—to the table in formulating approaches to problems of mutual concern.[23]

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[19] Ira Harkavy, Nancy Cantor, and Myra Burnett, *Realizing STEM Equity and Diversity through Higher Education-Community Engagement*, White Paper supported by the National Science Foundation, Grant no. 1219996 (January 2015), available at http://www.nettercenter.upenn.edu.

[20] William F. Whyte, (September 1989) "Advancing Scientific Knowledge through Participatory Action Research," *Sociological Forum* 4, no. 3: 367-385

[21] See *10 Big Ideas for Future NSF Investments* at https://www.nsf.gov/about/congress/reports/nsf_big_ideas.pdf

[22] See NSF issues first Convergence awards, addressing societal challenges through scientific collaboration (News Release 17-082) at https://www.nsf.gov/news/news_summ.jsp?cntn_id=242889

[23] In STEM, consider what organizations play this role. The National Academies and the American Association for the Advancement of Science come immediately to mind. Certainly, professional associations—think of NCWIT in

NPO's are thus facilitators with the power to convene parties that should at least be talking, if not collaborating, given public knowledge of their convergent goals.

Broadening participation is just such a goal. But it entails developments along an educational pathway that demand investments of time and money, organizational intelligence, and guidance to negotiate cultural differences. Accountability for all of this becomes a steering mechanism, helping to correct the course, highlighting exemplary practice, and rewarding performance that contributes to the common good.

5. Moving Higher Education toward Increased Accountability for Broadening Participation

A central question of the meeting became, how can we create accountability for broadening participation in higher educational institutions? In part, this is attainable through what one participant referred to as the "tsunami power" of federal agencies working together to encourage this accountability in higher education, as well as supporting and rewarding institutions across the higher education pathway, not just research universities.

Federal agencies could use their imprimatur to move the agenda forward and reward institutions that embrace the concepts discussed in this report. This is the power of the dollar (dispensed in the distribution of grants to individuals and institutions). But it is also the power of leadership to point to new ways of executing research and education that supports broadening participation.

Participants emphasized the role of principal investigators (PI's) and individual faculty, who can push the institution where and when they can. Institutional leadership needs to support the accountability advocated here. Among other things, such leadership can trumpet the values of what institutions of higher education could and should be, especially relative to rewarding the development of human resources. They can also motivate an examination of the reward system across the university so that broadening participation becomes an indicator of institutional success. Furthermore, these institutions themselves can be conveners, along with nonprofit organizations, of conversations on how to advance broadening participation in the academic community and workplaces everywhere.

6. How NSF Could Encourage Increased Accountability for Broadening Participation in Higher Education

NSF was not named the national *research f*oundation, but the national *science* foundation. What is encompassed by the term "science" is more than research, namely, education. This implies contributions to workforce renewal, economic vitality, and national welfare.

NSF has thus had a unique historic partnership with universities in all fields of science for promoting discovery, learning, transformation, and innovation. More recently, it has partnered with universities to broaden participation in STEM as a means to many ends (often unstated). We state them here.

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computer science—do. But most work within a discipline and the employment sectors its graduates serve. Few encompass in their orbits the place-based experts outside of academe and disciplinary boundaries.

- NSF is the primary catalyst for incentivizing principal investigators and institutions of higher education to move with urgency toward the goal of broadening participation to advance research and education and serve national needs.

- NSF should be more proactive in encouraging changes to institutional climate and culture by setting parameters without being dictatorial. [24]

- More specifically, NSF should be encouraged to fund place-based activities that involve multiple partners that share accountability. This includes awarding funds not just to higher education institutions, but also to partners along the entire preK-20+ pathway, including facilitating organizations outside of higher education.

- NSF plays a pivotal role in harnessing the intelligence and resources of the non-profit and corporate sectors. Implementation on the ground, involving this broader community of experts—not just sponsors, but also local experts with personal knowledge of the specific setting and situation—should then be evaluated.[25]

- Finally, NSF has a convener role: it can harvest information of what we do know and stimulate conversations to get to a shared understanding about what success is and what broadening participation yields across a variety of dimensions valued by educators, institutions, and employers alike.

NEXT STEPS

Meeting participants in Philadelphia agreed that ongoing conversations involving rich dialogue and intellectual sharing are needed on this topic—catalyzed by NSF, but involving leaders of higher education, and of other philanthropies. "Innovations in advancing shared accountability" should be the focus, and an apt title, of the next proposal.

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[24] See NSF issues first Convergence awards, addressing societal challenges through scientific collaboration (News Release 17-082) at https://www.nsf.gov/news/news_summ.jsp?cntn_id=242889

[25] NSF could play a catalytic role for the private sector (corporations and startup companies) to move with urgency toward the goal of broadening participation in their scientific workforces. A great deal of science happens in the private sector and, at least within tech, their organizational cultures lag those of the academic computing "pipeline." No other organization funds, or is likely to fund, cultural advancement using a rigorous, empirical "scientific" approach.

Appendix A: Assessing Performance and Developing an Accountability System for Broadening Participation: The Role of Higher Education

July 14, 2017

<u>**Meeting Participants**</u>

- **Bernice Anderson**, Senior Advisor, Office of Integrative Activities, National Science Foundation
- **Nancy Cantor,** Chancellor, Rutgers University – Newark
- **Joanna Chae**, Director of Moelis Access Science, Netter Center for Community Partnerships, University of Pennsylvania
- **Daryl Chubin**, Technical Writer, Independent Consultant and Co-chair, Understanding Interventions
- **Anand Desai**, Section Head, Evaluation and Assessment Capability, Office of Integrative Activities, National Science Foundation
- **Melvin Hall**, Professor of Educational Psychology, Northern Arizona University
- **Ira Harkavy**, Associate Vice President and Founding Director, Barbara and Edward Netter Center for Community Partnerships, University of Pennsylvania
- **Rita Hodges**, Assistant Director, Netter Center for Community Partnerships, University of Pennsylvania
- **Rodney Hopson**, Professor, Division of Educational Psychology, Research Methods, and Education Policy, College of Education and Human Development; Senior Research Fellow, Center for Education Policy and Evaluation, George Mason University
- **James H. Johnson, Jr.,** Director, National Center for Environmental Research, Office of Research and Development. U. S. Environmental Protection Agency
- **Daniela Marghitu**, Faculty Coordinator and Director, Education and Assistive Technology Lab, Samuel Ginn College of Engineering, Auburn University
- **Louis Martin-Vega**, Professor & Dean, College of Engineering, North Carolina State University
- **Tom McKlin**, Director, The Findings Group
- **Cynthia Phillips**, Evaluator, Office of Integrative Activities, National Science Foundation
- **Lucy Sanders**, CEO and Co-Founder, National Center for Women & Information Technology (NCWIT) and Executive-in-Residence for the ATLAS Institute at the University of Colorado Boulder