



STEM Education Advisory Panel Committee Meeting

Friday, July 19, 2019

Host Location

National Aeronautical and Space Administration (NASA) Headquarters
300 E Street SW, Washington, DC 20546
Room 2E39

Advisory Committee Members Present

On-site: Vince M. Bertram, Arthur Eisenkraft, David L. Evans, Gabriela A. González, Jacqueline Huntoon, Aimee Kennedy, Laurie Leshin, Robert D. Mathieu, Larry Robinson, Robert Semper, William Yslas Velez, Bruce Wellman

Virtual: Doug Clements, Ray Mellado, K. Renae Pullen

8:30 am – 9:00 am

OPEN: Introductions

Gabriela A. González, STEM Education Advisory Panel Chair
David Evans, STEM Education Advisory Panel Vice Chair

The meeting of the STEM Education Advisory Panel Committee was called to order by Ms. Gabriela González, STEM Education Advisory Panel Chair and Dr. David Evans, STEM Education Advisory Panel Co-Chair. Ms. González welcomed everyone and introduced all Advisory Panel members.

Dr. Kelvin Droegemeier, Director of the Office of Science and Technology Policy (OSTP), provided welcoming remarks, thanking all members for the extraordinary work that they are doing. Dr. Droegemeier underscored the importance of STEM education.

During the welcome remarks and introductions, Advisory Panel Members referenced the 50th Anniversary of the Apollo Space Missions, sharing personal experiences and memories from the moon landing and emphasizing the role of STEM education then and now.

9:00 am – 9:30 am

OPEN: CoSTEM Leadership

France A. Córdoba, Director, National Science Foundation

Dr. France Córdoba, NSF Director and CoSTEM Co-Chair, began by welcoming panel members, noting the diverse background represented. Using NSF's recent image of the black hole to showcase the impact of new discoveries, Dr. Córdoba encouraged members to continue their important work in STEM education.

During the question period, Dr. Córdoba received questions regarding greater involvement of the nonprofit sector in the work on STEM education; the convergence of STEM with other disciplines to bridge gaps and find solutions; and how the committee can be most effective to Dr. Córdoba and other

agency heads that are dedicated to STEM education. Dr. Córdoba emphasized the need for examples of successful partnerships and the importance of continuing to build bridges between disciplines and federal agency partners. Other comments and discussion focused on inclusion and the need for a diverse, globally competitive, STEM-literate workforce. Dr. Córdoba cited NSF INCLUDES as an example of increasing diversity in STEM. She encouraged the panel to think bigger to find ways to make the US globally competitive. She cited the untapped talent in the US and expressed to the panel that anything it can do to address that will be helpful.

Ms. González congratulated Dr. Jacqueline Huntoon, Provost and Senior Vice President for Academic Affairs at Michigan Technological University, on receiving the George G. Mallinson Award for Lifetime Achievement in the Field of Science Education from the Michigan Science Teachers Association, as well as being named a Notable Woman in STEM by Crain’s Detroit Business. Likewise, Ms. González congratulated Dr. Ioannis Miaoulis, President and Director of the Boston Museum of Science, on being selected to become the 11th president of Roger Williams University in Bristol, Rhode Island.

Mike Kincaid, Associate Administrator for NASA STEM Engagement, showed a short video about what NASA is doing now.

Before opening the floor for further questions and discussion, Dr. Evans finished introductions of federal colleagues present at the Panel Committee Meeting. Ms. González shared words from Dr. Jeff Weld, who was not able to be present at the meeting: “Go beyond moving the needle. Let’s bust the gauge.”

Discussion during the question period revolved around the role of private enterprise (SpaceX, Boeing) in space exploration. Panel members and federal colleagues agreed that it is beneficial for NASA to enable that industry, noting that oftentimes in those ventures the government is an early investor, and that it is critical for the government to be involved, to examine the nature of the partnerships, and be willing to evolve them.

9:30 am – 10:30 am CLOSED: Internal Government Report Discussion

10:30 am – 10:45 am BREAK

10:45 am – 11:45 am OPEN: Introduction to Interagency Working Groups (IWG) and FC-STEM IWG Presentations

Dr. Karen Marrongelle, Assistant Director for Education and Human Resources at NSF and FC-STEM Co-Chair, opened the session, noting that FC-STEM has weekly leadership meetings, but much of the work takes place at the interagency working group (IWG) level. Dr. Nafeesa Owens, Executive Secretary to the STEM Education Advisory Panel and Senior Advisor to FC-STEM, gave panel committee members an overview of IWG structure and how it was formed, citing that there were a number of models considered before the current IWG structure was chosen. The previous IWG structure was aligned with the previous strategic plan priority areas. The new IWG structure is aligned with the pathways in the new strategic plan.

Susan Poland, FC-STEM Executive Secretary and Senior Analyst (Valador) at the NASA Office of STEM Engagement, shared lessons learned from previous IWGs with the panel members. Those lessons include lines of communication across agencies must be strong, terms have different meanings at different agencies, resources are necessary for IWG success, and alignment of CoSTEM goals with agency goals is critical. The FC-STEM also learned that clear membership and leadership support of appointed participants are important to IWG success and that IWG efforts should be aligned by topics and challenges instead of stakeholder groups to avoid redundancy.

Dr. Marrongelle introduced the IWG co-leads, who presented updates to panel members. Marlene Kaplan (DOC) provided an update for Strategic Partnerships IWG, followed by Louie Lopez (DOD) for Convergence IWG, Davina Pruitt-Mantle (DOC) for Computational Literacy IWG, Eleanor Snow (DOI) for Inclusion IWG, and Sarah-Kay McDonald (NSF) and Christina Chhin (ED) for Transparency & Accountability IWG. Most IWGs had met at least once before the STEM Education Advisory Panel Committee Meeting. IWGs were using federal agency actions as a starting point to find areas of overlap and gaps across federal agencies for each pathway and setting objectives for the year. Most IWGs have a membership of 10-15 agencies, with some members sitting across other IWGs, allowing the IWGs to keep each other informed and supporting the work for the strategic plan more generally, not just within each IWG.

Questions and discussion followed the IWG co-lead presentations. Emphasis was placed on accountability, the role of IWGs in completing specific objectives and having deliverables, and the role of the panel in helping the IWGs. IWG co-leads emphasized that the panel members' ideas, priorities, and feedback were valuable. OSTP explained that while FC-STEM has a high-level charter, IWGs have internal work plans and are tasked with outlining cohesive objectives. It would be helpful for panel members to offer specific guidance for the objectives. IWG co-leads added that panel members can also help the IWGs by referring students, educators, and others to the available federal STEM programs, resources, and opportunities.

Panel members noted that the IWGs as depicted in the structure are not all connected to one another and there was a lack of accountability for the Inclusion in STEM IWG. Panel members also inquired about the mode of communication that IWGs are using and the Panel's timely access to real-time communication of information. Federal representatives responded that IWGs have discussed regularly meeting together to ensure connectivity between groups. They also will determine the best way to effectively communicate information to the Panel in a timely manner. Panel members suggested that IWG members be more identifiable in future meetings.

OSTP announced the formation of a new joint committee on research and environment and the addition of two new staff, one of whom will be the new STEM education lead.

11:45 am – 1:00 pm OPEN: WORKING LUNCH

The panel discussed how federal agencies can better partner with higher education institutions and involve state and local entities. Panel members would like to know more about tracking activities related to dissemination and visibility of federal actions. The dialogue also included clarification on the type of information the panel is required to report out to CoSTEM and Congress.

The topic of funding fewer activities with (?) greater capacity was raised. Consensus on this topic was that the current approach allows for innovation and the one size fits all approach is not effective. The

panel also discussed metrics to measure progress and effectiveness to know whether the “needle” is moving. Utilizing collective impact and partnerships could address this and allow for tracking the success of various pipeline pathways. The panel suggested they could develop criteria on good metrics and determine whether the federal metrics meet those criteria.

Conversation about making the intended impact of focusing on US citizens be more explicit in the document ensued. Science should be included as early as possible in the US educational experience. The panel also discussed tracking students beyond the K-12 system into careers to know if efforts are working. The panel suggested that the “pipeline” concept be revamped, as there is no pipeline. Deliberation about the lack of funds to support the K-12 portion of the pipeline arose. Panel members suggested that some (?) resources be shifted from higher education to K-12 to support the competitiveness of the US. A deep analysis of programs, including a root cause of existing gaps, was suggested to reprioritize and align resources with priorities. Guidance regarding what STEM education looks like in a classroom and what constitutes good teacher development is needed. The group also discussed the type of resources each brings to the table. The creation of comprehensive, online, user-friendly open-source tools and databases was suggested to make best practices accessible. Panel members noted the challenges in doing this, including the maintenance (the type of information entered and who determines this) and marketing. Effectiveness defined by who is using the tools, how many people, and how often is also a challenge. Panel members suggested that instead the group can create guidelines about how agencies present the data on STEM education and therefore create the framework. This may be an opportunity to involve other members of the STEM community, with an intentional effort to model access, inclusion, and diversity.

1:00 pm – 2:00 pm OPEN: Discussion on Subcommittees

Dr. Evans asked panel members to think about what other information this committee should be asking for, looking for, or accessing. Other questions: What are the kinds of things you want to know or want to ask for? What’s the evidence you’d like to see or find the absence of? Other considerations relative to the subcommittees – what do they do? What do we need to do at the next meeting? What do you feel you’ve learned that will motivate the next agenda items? What are the kinds of things we should be focusing on as we break up into smaller groups for conversations?

Panel member responses included subcommittees should think about how regular communication can be more effective and suggested setting up spaces outside of email to facilitate this. The Panel also commented that there is not enough detail in the presented document to provide advice and requested clarity around the Panel’s charter, noting uncertainty on whether the panel should be reactive or proactive by gathering data on the questions it is asking.

2:00 pm – 2:15 pm BREAK

2:15 pm – 3:15 pm CLOSED: Subcommittee Meetings

3:15 pm – 3:45 pm OPEN: Report Back to Panel

The Evaluation Subcommittee reported that it spent most of its meeting time focusing on revising its charge for plausibility and value, specifically the language about “success” and “assessment”. They summarized the three bullets into learning goals, summative assessment, and formative assessment.

The members discussed how they will obtain resources and would like to engage consultants to provide insight on what's already been done and how success looks for STEM education, citing the recent National Academy report. The group would like to work closely with the IWG to access the current metrics and methods of assessment.

The Diversity and Inclusion Subcommittee reported it discussed the need for a baseline definition of broadening participation in STEM for consistency. The group also discussed the need for baseline data on minority participation at various agencies, so it can assess whether inclusion in STEM in these agencies or through its funding is increasing over time. The subcommittee noted that it is difficult to assess programs funded through the agencies but recognize that it would be useful to identify projects agencies are supporting and assess inclusion in those. The group also discussed aligning its goals and work with the IWG to ensure accountability. There was discussion about what diversity looks like and the importance of supporting those currently in the US system along with continuing to import talent. One metric the subcommittee suggested is to track K-12 students after they leave the education system to see where they end up and develop interventions to address any problems.

The Education Pathways/Best Practices Subcommittee discussed identifying promising practices to get more iterative reporting to know what is available. The group also discussed creating pathways to opportunities which would involve having IWGs determine which programs are part of a student's pathway from elementary school to the workforce. The group would like to have the IWGs identify top objectives for the subcommittee to evaluate and would like to obtain more information on how agencies disseminate information on the best practices. The group also would like to know whether best practices are scalable and what evidence exists for the outcomes of scalability. The group also noted that opportunities for those with disabilities should be highlighted.

The group was directed to send any edits to the subcommittee charges to Dr. Owens and begin subcommittee work.

3:45 pm – 4:00 pm Closing Remarks