FY 19/20 Performance Measurement Strategy, Framework, and Measures

August 27, 2018
Four key takeaways from the development of candidate performance measures:

1. Comprehensive Performance Management Strategy
2. Supports Agency Level STEM Engagement (SE) Strategy
3. Rigorous Performance Monitoring
4. Collaborative and Evidence-Based Approach
AGENDA

• Performance Assessment Strategy Development
• Office of STEM Engagement Performance Assessment Framework
• FY19 and FY20 Candidate Performance Goals and Annual Performance Indicators
Performance Assessment Strategy Development
# External and Internal Performance Measures Development Process

## STEP ONE
- **Review Past Performance**
  - A brief history of NASA’s Office of Education performance measures
  - FY 2014 – FY 2017 Performance Goals, Annual Performance Indicators, Results
  - Strategic Object Annual Reviews (SOAR)
  - OMB and BSA guidance and recommendations: Concerns, need for change/reformed measures, processes, and tools

## STEP TWO
- **Benchmark Other Federal Agencies, Literature Review, & Stakeholder Discussions**
  - Summary of guidance from literature and practice
  - NASA’s Goals and Priorities, including BSA priorities
  - Administrative Priorities and Legislative Directives
  - Literature review findings
  - Benchmarking findings
  - Internal stakeholder discussions
  - Mission Directorate discussions
  - Expert Review Panel - External stakeholder discussions

## STEP THREE
- **Finalized Candidate Performance Measures**
  - Recommended External and Internal Performance Measures
  - Recommended external and internal performance measures
  - Recommended data collection sources
  - Recommended data collection processes
  - Recommended data collection tools
  - Recommended strategies for assessing and analyzing performance data
  - Recommended strategies for reporting performance data
## External and Internal Performance Measures Development Schedule

<table>
<thead>
<tr>
<th>Performance Measures Development Milestones</th>
<th>Date of completion</th>
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<tbody>
<tr>
<td>Internal Assess of the Office of Education’s Evaluation &amp; Performance Measurement including previous APR’s, SOAR assessments, &amp; OMB guidance</td>
<td>Completed October 2017</td>
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<td>Review of relevant literature (evidence-based practices &amp; current trends in STEM education and evaluation) &amp; Benchmarking of Federal Agencies’ STEM education performance measurement strategies and tools</td>
<td>Completed March 2018</td>
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<td>Expert Review Panel</td>
<td>Completed May/June 2018</td>
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<tr>
<td>Draft External and Internal Performance Measures Document, including data collection tools and processes</td>
<td>Completed June 2018</td>
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<tr>
<td>Final External and Internal Performance Measures Document, including data collection tools and processes</td>
<td>Completed July 2018</td>
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<td>(Candidate FY19 &amp; FY20 Performance Goals and Annual Performance Indicators due to OCFO-SID (July 2018).</td>
<td>Completed July 2018</td>
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**Oct.** | **Nov.** | **Dec.** | **Jan.** | **Feb.** | **Mar.** | **Apr.** | **May** | **Jun.** | **Jul.** | **Aug.** | **Sep.** |
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- **Initial Input Requested**
- **Alignment with OSE Strategy Development**
- **Follow-Up Input Requested**
- **July FY20 APP & Revised FY19 APP Due to OCFO – SID**
Office of STEM Engagement
Performance Assessment Framework
Traditionally, the Performance Assessment Strategy involved:

- Strategic Goals
- Agency Priority Goals
- Cross-Agency Priority Goals
- Mission Directorates/Mission Support Offices
- Multi-year Performance Goals
- Annual Performance Indicators

For FY 2019 – 2022, the OE/OSE Performance Assessment Strategy includes:

- Strategic Goal 3: Address National Challenges & Catalyze Economic Growth
  - Strategic Objective 3.3: Inspire & Engage the Public in Aeronautics, Space, & Science

The Office of STEM Engagement leads the Learning Agenda:

- Strategic Performance Assessment Questions
- Success Criteria

An annually, internal stakeholders and an external education evaluation and performance assessment expert review panel will review a portfolio of evidence including performance assessment data and evaluation findings to assess progress towards achieving performance goals and annual performance indicators and make recommendations for continuous improvement and future performance assessment and evaluation efforts.
FY19 & FY20 Office of Education/STEM Engagement
Performance Assessment Model
PG: 3.3.5: Provide opportunities for students to contribute to NASA’s aeronautics, space, and science missions and work in exploration and discovery.

To what extent are NASA’s STEM engagement investments contributing to NASA’s missions and work?
PG: 3.3.5: Provide opportunities for students to contribute to NASA’s aeronautics, space, and science missions and work in exploration and discovery.

1. **Strategic Assessment Question**
   - Overarching Research Question

2. **Functions**
   - Types of activities that will be studied to answer the question.

3. **Assessment Focus Area**
   - Overarching Research Question

4. **Example Performance Measures (Internal and External)**
   - Higher Education
     - Institutions Grants and Awards
     - Design Challenges and Competitions
     - Internships and Fellowships

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*To what extent are NASA’s STEM engagement investments contributing to NASA’s missions and work?*
PG: 3.3.5: Provide opportunities for students to contribute to NASA’s aeronautics, space, and science missions and work in exploration and discovery.

**Strategic Assessment Question**
Overarching Research Question

**Functions**
Types of activities that will be studied to answer the question.

**Assessment Focus Area**
Types of information and evidence that will be collected to answer the question.

**Example Performance Measures (Internal and External)**

To what extent are NASA’s STEM engagement investments contributing to NASA’s missions and work?

- **Higher Education Institutions Grants and Awards**
  - Quality and Alignment of Student and Institution R&D Products to NASA Mission Priorities, with an Emphasis on Assessing Student R&D Products

- **Higher Education Design Challenges and Competitions**

- **Higher Education Internships and Fellowships**
  - Quality and Reach of Higher Education Student STEM Experiences
PG: 3.3.5: Provide opportunities for students to contribute to NASA’s aeronautics, space, and science missions and work in exploration and discovery.

**Strategic Assessment Question**

Overarching Research Question

**Functions**

Types of activities that will be studied to answer the question.

**Assessment Focus Area**

Types of information and evidence that will be collected to answer the question.

**Example Performance Measures (Internal and External)**

Specific performance measures that will be used to answer the question (output, outcome, or milestone)

- Number and quality of student research (peer-reviewed publications and technical presentations) and work products produced.
- Multiple case study to characterize the NASA student research experiences’ contributions to missions and positive impact to the student.
- Alignment of higher education challenges, competitions, and internships and fellowships to evidence-based effective practices.
- Number and academic level of student participants in STEM experiences.
- Geographic distribution of participants.

**To what extent are NASA’s STEM engagement investments contributing to NASA’s missions and work?**

- Higher Education Institutions Grants and Awards
- Quality and Alignment of Student and Institution R&D Products to NASA Mission Priorities, with an Emphasis on Assessing Student R&D Products
- Higher Education Design Challenges and Competitions
- Quality and Reach of Higher Education Student STEM Experiences
- Higher Education Internships and Fellowships
PG: 3.3.3: Provide opportunities for students to engage with NASA’s aeronautics, space, and science people, content, and facilities in support of a diverse future NASA and aerospace industry workforce.

1. **Strategic Assessment Question**
   - To what extent are NASA’s STEM engagement investments contributing to the diversity of the future aerospace industry’s STEM workforce?

2. **Functions**
   - Higher Education Challenges and Competitions
   - Higher Education Internships, and Fellowships
   - NASA Provided K12 Student STEM Experiences
   - Partner Delivered and Collaborator Delivered Student Experiences

3. **Assessment Focus Area**
   - Diversity of Higher Education Challenges, Competitions, Internships, and Fellowships Participants
   - Quality and Reach of K12 Student STEM Experiences
   - Strategic Alignment to NASA and External Stakeholders Needs and Priorities

4. **Example Performance Measures (Internal and External)**
   - Meet or exceed demographics for national enrollment of traditionally underrepresented audiences.
   - The average annual percentage gaps between higher education interns and fellows from groups traditionally underrepresented and not traditionally underrepresented in STEM fields decrease.
   - Results of the feasibility analysis and benchmarking study to assess the possibilities and constraints of implementing a robust longitudinal study of NASA’s Office of Education/STEM Engagement’s contributions to the aerospace industry workforce.
   - Alignment of K12 student STEM experiences and internships and fellowships to evidence-based effective practices.
   - Number and academic level of student participants in STEM experiences.
   - Geographic distribution of participants.
   - Internal and external stakeholder satisfaction survey results.
PG: 3.3.4: Enhance the effectiveness of education investments using performance assessment and evaluation-driven processes.

To what extent have enhancements to STEM engagement performance assessment and evaluation been implemented?

1. Strategic Assessment Question
   - To what extent have enhancements to STEM engagement performance assessment and evaluation been implemented?

2. Functions
   - New or Enhanced Data Management System
   - Learning Agenda
   - Outcome Evaluation

3. Assessment Focus Area
   - Quality of Performance Assessment and Evaluation

4. Example Performance Measures (Internal and External)
   - Define requirements and pilot test a performance system to align with new measures.
   - Develop a Learning Agenda that includes: a) enhanced performance assessment strategy, b) business process for third party evaluations, c) business process for evidence-based project-level decision making and d) business process for compliance with federal mandates on data collection.
   - Establish a process to refine strategic assessment questions and performance measures as a result of findings from data collection cycle and maturation of Agency SEC Portfolio.
   - Conduct a pilot outcome assessment of higher education challenges and competitions.
FY19 & FY20 Office of Education/STEM Engagement Performance Assessment Model

Programmatic Strategic Investment Areas

- Higher Education Institutions Grants and Awards
- Higher Education Design Challenges and Competitions
- Higher Education Internships and Fellowships
- Quality and Alignment of Student and Institution R&D Products to NASA Mission Priorities, with an Emphasis on Assessing Student R&D Products
- Quality and Reach of Higher Education Student STEM Experiences
- Quality and Reach of K12 Student STEM Experiences
- Diversity of Higher Education Challenges, Competitions, Internships and Fellowships Participants

Cross-cutting Operational Support Areas

- New or Enhanced Data Management System
- Learning Agenda
- Outcome Evaluation
- Strategic Alignment to NASA and External Stakeholders Needs and Priorities
- Quality of Performance Assessment and Evaluation

Six Assessment Focus Areas

- To what extent are NASA’s STEM engagement investments contributing to NASA’s missions and work?
- To what extent are NASA’s STEM engagement investments contributing to the diversity of the future aerospace industry’s STEM workforce.
- Contribute to NASA’s missions and work in exploration and discovery.
- Contribute to the diversity of the future aerospace industry’s STEM workforce.
- Enhance STEM engagement functions and operations using evaluation-driven processes.
- To what extent have enhancements to STEM engagement performance assessment and evaluation been implemented?

Quality and Alignment of Student and Institution R&D Products to NASA Mission Priorities, with an Emphasis on Assessing Student R&D Products

Quality and Reach of Higher Education Student STEM Experiences

Diversity of Higher Education Challenges, Competitions, Internships and Fellowships Participants

Quality and Reach of K12 Student STEM Experiences

Strategic Alignment to NASA and External Stakeholders Needs and Priorities

Quality of Performance Assessment and Evaluation
Assessing the Impact of NASA’s STEM Engagement Investments: Performance Assessment & Evaluation Overview

**Strategy Performance Framework**
- Broad strategic goals designed to advance NASA’s mission and address relevant national problems, needs, challenges and opportunities.
- Timeframe: 2018 - 2022

**Performance Assessment**
- Ongoing monitoring and reporting of program accomplishments, particularly progress toward pre-established goals.
- Includes outputs such as: higher education interns and fellows demographics and number of paper presentations and peer-reviewed publications; and outcomes such as developing higher education students’ science or engineering identity.
- Timeframe: Short term (Annual)

**Evaluation**
- Systematic study using research methods to collect and analyze data to assess how well a program is working and why.
- Includes outcomes such as: developing higher education students’ science or engineering identity, cognitive understanding of research processes and skills, or longitudinal study of interns.
- Timeframe: Long term
Questions