Study Introduction & Background

The IIE (Innovations to Informal Education) Study was conducted at the request of NASA's OSTEM (Office of STEM Engagement) and NGS (Next Gen STEM) leadership to support the efforts of TEAM II (Teams Engaging Affiliated Museums and Informal Institutions) to innovate grantmaking for IEIs (Informal Education Institutions). NASA TEAM II is NGS's competitive award program for non-profit organizations that identify as or have a component that meets the definition of a museum, library, or youth-serving organization.

TEAM II offers these organizations an opportunity to propose NASA mission-inspired STEM (Science, Technology, Engineering, and Mathematics) projects for K-12 students and their learning support systems of families and educators.

Full Awards (Full) are expansive projects conducted by IEIs and their learning support systems involving NASA, partnerships with regional and national networks, and independent evaluation. NGS offers two-to-four-year cooperative agreements for up to $800,000 in funding. In 2023, the agency awarded four institutions approximately $3.2 million in funding.

The Community Anchor Awards (Anchor) program supports IEIs in strengthening services to act as local NASA STEM informal education community resources. In 2021, the first cohort of 21 awardees received grant funding of up to $25,000 for projects up to two years in length. A second set of awards was made to 17 institutions in March 2023, with a maximum $40,000 in funding.

Since the start of the TEAM II competition in 2008, NASA NGS TEAM II has funded over 125 awards to over 100 organizations across 39 states, District of Columbia, and Puerto Rico. Hawaii hosts a Full Award, and Alaska a Full and Anchor Award (Figure 1).

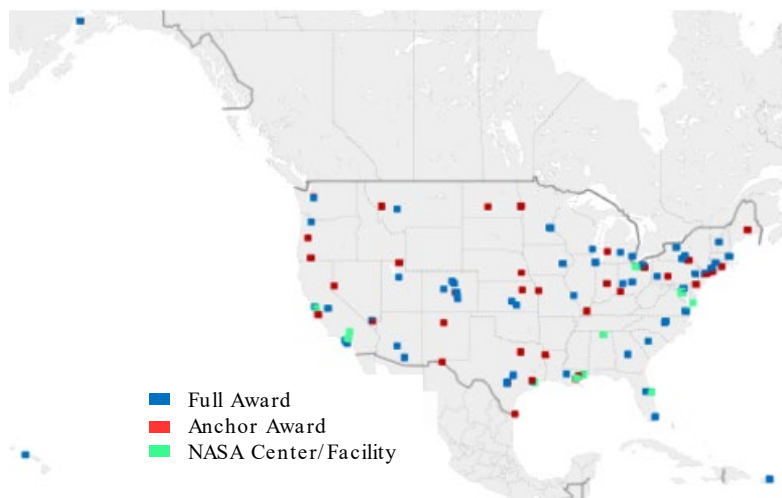Figure 1. TEAM II Awards 2008-2023

Evaluation Design

The evaluation study focused on three evaluation questions (EQs) to understand (1) reported outcomes and impacts of NASA TEAM II funding, (2) grantmaking practices for IEIs described in the literature and enacted in other federal agencies, and (3) proposer and awardee needs for future TEAM II grantmaking.

Study Findings

EQ1: What are the outcomes and impacts of TEAM II Awards?

EQ1 Methodology

Historical analysis of 42 TEAM II past award summative evaluation reports offered insights about reported outcomes and impacts of TEAM II Awards. NOFO (Notice of Funding Opportunity) documents and TEAM II project selection table documents from 2008 to 2023 were also reviewed. Evaluation reports were not available for Anchor Awards or the most recent Full Awards.

Focus group discussions (Figure 2) were conducted with five past and five current Full awardees, three FY21 and three FY23 Anchor awardees, and six Full proposers and three Anchor proposers.
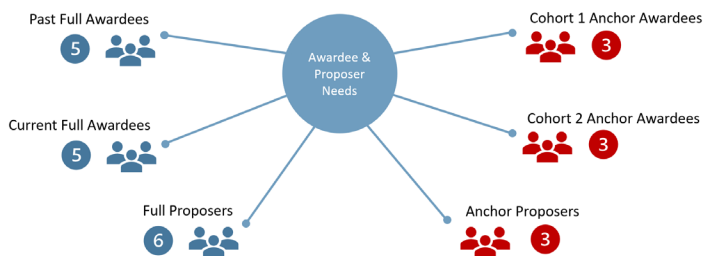

Figure 2. TEAM Awardee and Proposer Focus Groups

EQ1 Findings

ANCHOR AWARDS ENHANCE GEOGRAPHIC COVERAGE

The map of geographic locations of awardee institutions highlights the value of Anchor Awards in providing geographic coverage in areas of low population density, which are often not near a NASA center or facility (Figure 1).

NOFO ALIGNS WITH TEAM II PRINCIPLES

The NOFO includes guidance for proposers to develop projects that align with TEAM II principles, including enhancing diversity, inclusion, equity, and accessibility, using partnerships to support project efforts, attending to local and regional needs, and offering authentic STEM content and experiences. Awardees reported their work aligned with NOFO guidance.

TEAM II GRANTMAKING STRATEGY LEADS TO DESIRED OUTCOMES

TEAM II projects delivered authentic and interactive, inquiry-based, immersive STEM experiences. Impacts on learners included STEM content knowledge, STEM engagement, STEM career exposure, and personal connections to STEM. Outcomes and impacts were also noted in institutional capacity related to these principles. While most reports described forming partnerships, few described the impacts of partnership development.

EVALUATION SUPPORTS AWARDEE WORK BUT COULD BE FURTHER ENHANCED

Awardees measured reach in different ways based on project needs. Flexibility in evaluation methodology and metrics supported project improvement and documentation of progress towards goals. However, the variability in project outcomes, and the way projects measured outcomes, made analysis across projects challenging.

EQ2 METHODOLOGY

A literature review of practices around grantmaking to IEIs was conducted. Benchmarking was conducted against four federal agencies: Institute of Museum and Library Services (IMLS), National Institute of Health's (NIH) Science Education Partnership Award (SEPA), National Oceanic and Atmospheric Administration's (NOAA) Environmental Literacy Program (ELP), and National Science Foundation's (NSF) Advancing Informal STEM Learning (AISL).

EQ2 FINDINGS

TIERED GRANTMAKING ENGAGES DIFFERENT ORGANIZATION TYPES

Literature review and benchmarking study findings suggested offering two levels, or tiers, of awards was beneficial for engaging different types of organizations. Decreasing proposal requirements for smaller funding levels can expand the applicant pool and support smaller, less-resourced organizations serving underserved / underrepresented communities.

TECHNICAL ASSISTANCE SUPPORTS DIFFERENT ORGANIZATION TYPES

The four benchmarking agencies offered technical assistance to support proposers from different types of organizations. Technical assistance for proposers included webinars, feedback on concepts, and FAQ documents. Technical assistance for awardees included communities of practice.

CLEAR NOFO AND REVIEW PROCESSES

Findings from the literature review and benchmarking study indicated that clear NOFO wording helped proposers understand proposal alignment with funder's mission and solicitation criteria. Also, engaging a pool of reviewers with diverse backgrounds and expertise supported equity in grantmaking.

BENCHMARKING AGENCIES USE EVALUATION TO MEASURE SUCCESS

Benchmarking agencies all included evaluation as a strategy to understand the extent to which grant-funded activities led to expected project objectives. Benchmarking organizations also indicated that success stories and evidence of community impact illustrated deep and authentic engagement in STEM learning and action.

EQ3: How do past, current, and potential future TEAM II awardees characterize recommendations/needs around award size and nature of TEAM II solicitations?

EQ3 METHODOLOGY

Six focus groups were convened to gather feedback about the nature of the TEAM II solicitations, including the size of the awards (Figure 2).

EQ3 FINDINGS

TIERS OF AWARDS ARE VALUED

Awardees recognized that two award funding levels supported large and small institutions. Most participants found the funding levels to be adequate, and some participants also suggested increased award amounts, intermediate award amounts, small planning awards, and longer implementation periods. Less demanding requirements for smaller Anchor Awards, commensurate with smaller funding amounts, supported equitable grantmaking.

NOFO clarity has improved from 2008 to 2022, although some proposers still found the NOFO challenging to understand. Proposers who did not receive a TEAM II award requested more support during the proposal development process to better understand the NOFO requirements and form partnerships with NASA and other IEIs. Anchor awardees requested additional check-ins or meetings with their technical officers (TOs).

CONCLUSIONS

Study conclusions were organized into four categories: tiered grantmaking, solicitation and selection process, technical assistance, and measuring outcomes and impacts (Figure 3). Conclusions are summarized in Figure 4.
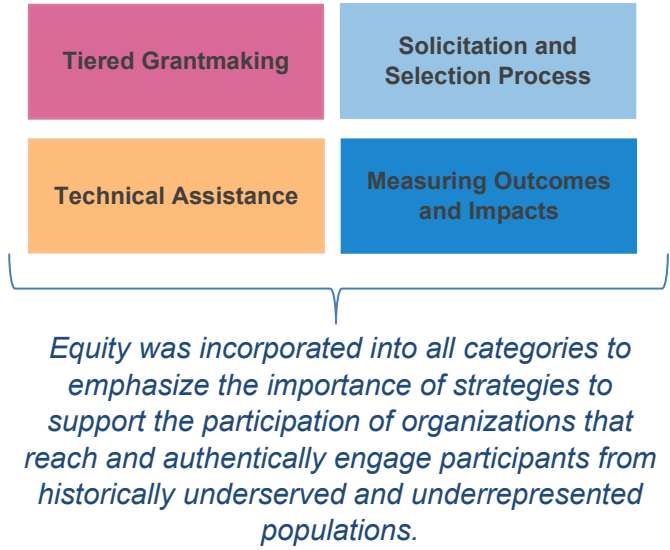
Tiered Grantmaking	Solicitation and Selection Process
Technical Assistance	Measuring Outcomes and Impacts

Equity was incorporated into all categories to emphasize the importance of strategies to support the participation of organizations that reach and authentically engage participants from historically underserved and underrepresented populations.

Figure 3. Categories of Conclusions

Tiered Grantmaking

The data collected confirms the tiered grantmaking strategy, as operationalized by TEAM II, aligns with existing research practices used by the four federal benchmarking entities,

as well as the needs of TEAM II awardees and proposers. The lower tier of funding has increased access for smaller organizations, those new to federal funding, and organizations offering informal educational experiences at a smaller or more regional scope. Larger grants are valuable for larger organizations. There was no evidence in the literature review to suggest a specific formula for funding for small versus large awards, nor for the balance between how many small versus large awards to support. Evidence across the benchmarking and needs assessment showed TEAM II fills an important niche for IEIs.

Solicitation and Selection Process

Historical analysis, benchmarking, and focus groups identified the solicitation and selection process, including the wording of the NOFO and the review process by which proposals are selected for funding, as an important aspect of grantmaking for IEIs. Historical analysis of TEAM II NOFO indicated improvement in NOFO clarity from 2008 to 2022 in terms of wording, format, and specific guidance for proposers. While the clarity of the NOFO has improved, proposers still reported difficulty understanding requirements. Clear NOFO requirements and shorter proposals for Anchor submissions align with literature recommending fewer requirements for smaller levels of funding to expand the pool of applicants and support smaller, less-resourced organizations serving participants underserved in STEM. Evidence suggests using a clear review and feedback process. Reviewers should be knowledgeable about the field, connected to the community, have diverse experiences, and understand evaluation and relevant aspects of the NOFO.

Technical Assistance

Technical assistance is important for encouraging and supporting awardees seeking, submitting, and securing awards. TEAM II proposers asked for additional support from

TEAM II around proposal development, understanding NOFO requirements, and creating partnerships with NASA and other IEIs.

Full awardees were generally pleased with the support offered by TEAM II TOs and program officers (PO). Anchor awardees reported the need for additional support and assistance. Technical assistance could enhance evaluation of partnership development efforts and the communication of impact.

Measuring Outcomes and Impacts

Evaluation of reported awardee outcomes and impacts is a practice recommended in the literature, used among all benchmarking organizations, and included in the TEAM II award program. Awardees report using

evaluation to inform program improvement as well as measuring outcomes and impacts. Awardees were successful in measuring quantifiable outcomes (e.g., STEM knowledge, STEM interest). Methods to measure reach could be enhanced. Furthermore, explanations of how underserved and underrepresented populations are served, and how partnership development impacts institutional capacity, is generally underdeveloped in the TEAM II Award evaluation reports. The inclusion of success stories and community impact in reporting may be useful to additionally highlight these areas.

Existing research supports reflective and evidence-based practices. Commissioning this study to examine TEAM II grantmaking strategy is aligned to best practices in grantmaking.

Study findings emerged in the below four categories:

TIERED GRANTMAKING	SOLICITATION & SELECTION	TECHNICAL ASSISTANCE	MEASURING OUTCOMES & IMPACTS
• Tiered grantmaking aligns with research, federal benchmarking entities' practices, and TEAM II awardee and proposer needs • Lower funding tiers provide access for smaller organizations and those new to federal funding • Larger tiers are valuable for larger organizations • TEAM II fills an important niche	• NOFO clarity has improved from 2008 to 2022 • Proposers, but not awardees, reported difficulty understanding requirements • Clear NOFO, shorter proposals for smaller award amounts, and clear review and feedback with a diverse and knowledgeable group of reviewers support equitable grantmaking	• Technical assistance encourages and supports awardees to seek, submit, and secure awards • Additional proposal development resources to understand NOFO requirements and create partnerships with NASA and IEIs were desired • Full awardees found TEAM II technical officer and program officer support useful. Some Anchor awardees asked for additional guidance	• TEAM II evaluation guidelines align with literature and benchmarking practices • Awardees find evaluation useful for program improvement and documenting outcomes • Awardees reported quantifiable learner outcomes (e.g., STEM knowledge, STEM career awareness, STEM curiosity, and STEM attitudes)

Figure 4. Summary of Conclusions