



Plans, Approaches, Needs, Context, & Reality: Meta-Evaluation of a Portfolio of External Climate Education Projects Funded by NASA

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Context

NASA Innovations in Climate Education (NICE) funds climate change education initiatives in K-12 and higher education. Via four solicitations over four years, NICE has supported a total of 71 projects. Each funded project has its own evaluator & carries out its own evaluation plan. This provides a rich case and dataset for meta-evaluation.



Above: A map of the 71 projects funded by NICE between 2008 and 2012, represented by individual flags and geographic clusters.

Why Meta-Evaluation?

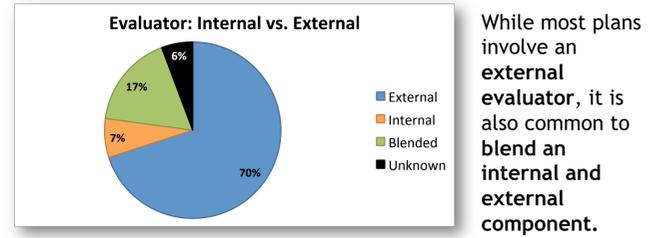
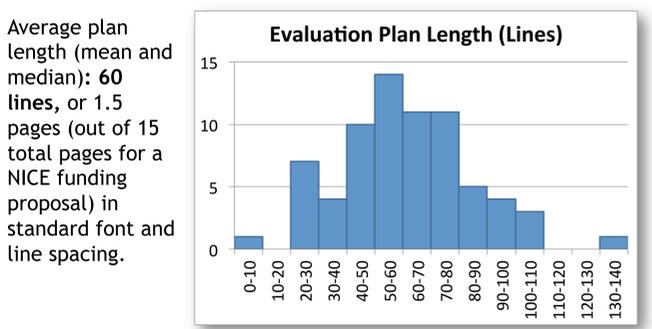
- NASA**
When we ask for evaluation, what do we get? What does the agency need to know about evaluation?
- Project Staff & Principal Investigators**
What options exist for developing a robust evaluation of a NASA-funded STEM project? What practices are “typical”?
- Evaluators**
What is “typical” for federally-funded STEM education projects of this scale? Where are there opportunities for pushing the envelope?

Method

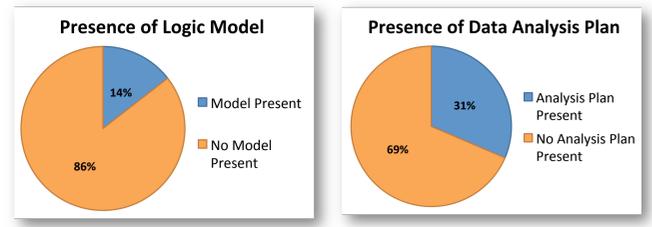
- Investigation of 71 preliminary evaluation plans submitted to the NICE program office.
- Rubric developed based on project needs, Program Evaluation Standards (Yarbrough et al. 2011), prior work on meta-evaluation (Scriven 2012), & literature in STEM education (e.g., Friedman 2008).
- Pilot study of 35 (of 71) plans used to refine and test rubric.

Caveats:
Analysis based on preliminary evaluation plans; single analyst.

Findings: Nuts & Bolts of Evaluation Plans

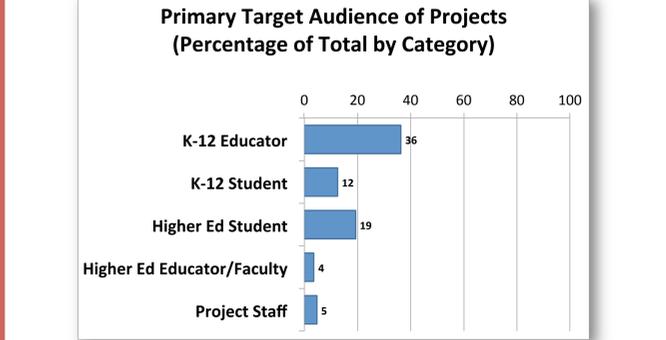


Logic models, plans of data sources, data analysis plans, timelines, and schedules of deliverables were included in a minority of plans.

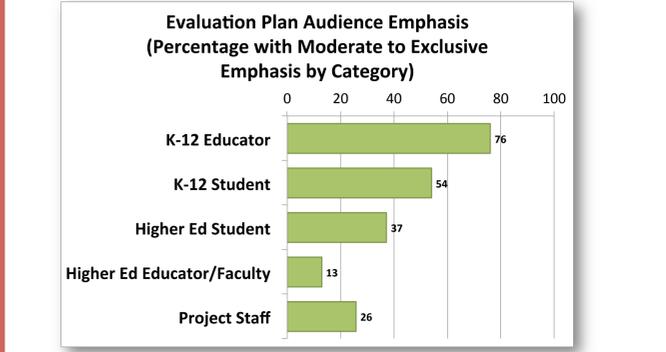


Take-Away Message: Evaluation plans tend to cover approximately 1 to 2 pages and to include limited detail.

Findings: Audiences & Participants



Generally, evaluation plans reflected the audience objectives of the project. There was more significant emphasis on K-12 educators in the evaluation plans than in the projects, which is not fully explained by details in the evaluation plans.

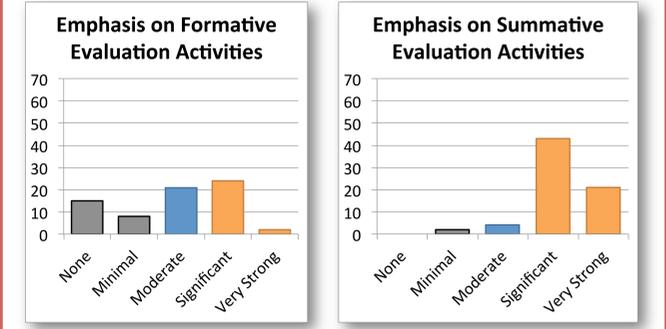


Take-Away Message: We observe a significant relationship between the audiences that projects aimed to reach and the audiences/participants examined in evaluative inquiry. More conversation between project PIs and evaluators could better target evaluations to project goals.

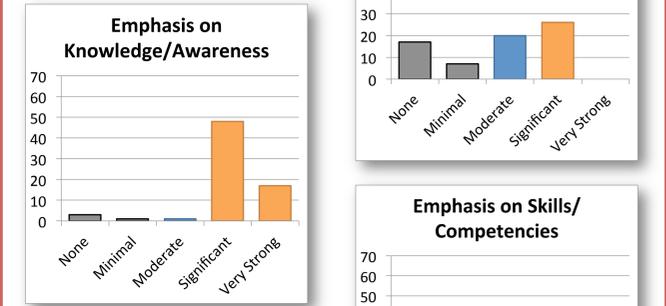
Findings: Evaluation Activities & Focus



Evaluation plans focused more on summative than formative evaluation activities, and very rarely was significant attention paid to causal inference (only 3 projects addressed causality in their plans) or validity threats.

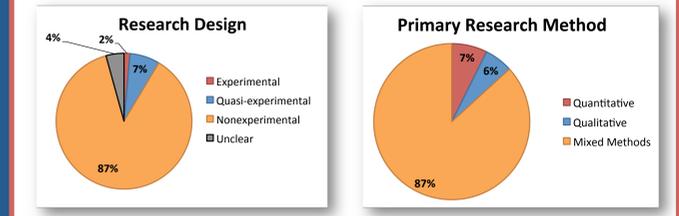


Most assessments of participant changes focused on the Knowledge/Awareness domain, with less attention paid to Skills/Competencies or Behaviors.

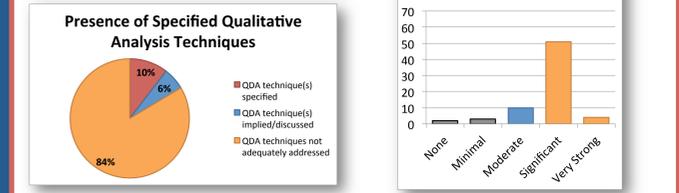
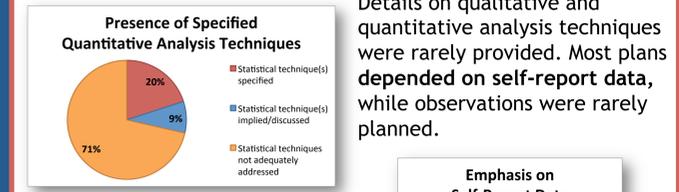


Take-Away Message: There are myriad opportunities for pushing the envelope in the practice of evaluation of STEM education projects.

Findings: Evaluation Methods & Design



Most research designs were nonexperimental. Only 5 projects used more than a single group design, and only 1 project used random assignment to treatment/control groups. The vast majority of evaluation studies took a mixed-methods approach.



Take-Away Message: Mixed methods dominate the field, but it was often unclear how, specifically, evaluators were using methods, approaches, and designs in their practice.

Acknowledgments & References
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 Yarbrough, et al., The Program Evaluation Standards, 3rd Ed. 2011, Thousand Oaks, CA: SAGE.