



Using Evaluation to Inform, Sustain, and Improve your Noyce Project

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AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

This material is based upon work supported by the National Science Foundation (NSF) under Grant Numbers DUE- 2041597 and DUE-1548986. Any opinions, findings, interpretations, conclusions or recommendations expressed in this material are those of its authors and do not represent the views of the AAAS Board of Directors, the Council of AAAS, AAAS' membership or the National Science Foundation.



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About ARISE

- AAAS ARISE network collects and shares information about topics and strategies for research and evidence-based approaches to:
 - prepare STEM teachers for the future
 - assess efficacy in STEM teaching
 - understand effective ways to recruit, train, and retain a quality STEM teacher workforce



<https://aaas-arise.org>



AAAS ARISE Network



@NoyceProgram



ARISE

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Why Evaluate?

Using Evaluation to Inform, Improve, and Sustain Your Noyce Project(s)

November 30, 2022 – 2:00-3:30 PM ET

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MN Associates, Inc.



CEISMC
Georgia Tech Center for Education Integrating
Science, Mathematics, and Computing



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Overview



- Our Experience with the Noyce Program's various tracks
- Evaluation Approaches by Noyce Track Type (with mini Q&A)
- Dynamic Breakout Session by Noyce Track (Capacity Building, 1, 2, 3, or 4)
 - Please rename yourself using the model: [Track #]-[Your name], [Your institution]
- Troubleshooting Breakout Groups (18 mins.)
- Sharing and Questions (15-20 mins.)
- Lessons Learned from the Field (10 mins.)



About MNA



Kavita Mittapalli, Ph.D.
CEO and Founder



Nina de las Alas
Senior Research Associate



Relevant Noyce Projects Evaluation Experience

8 Current Tracks CB, 1, and 4: Alcorn State University, Bowie State, Jackson State University, University of North Texas, George Mason University, University of Houston Clear Lake, Austin College, and EDC

2 Past Track 1: Math for America, DC/Carnegie Institute of Science, American University, and Appalachian State University (NC)

About Georgia Tech CEISMCM Research & Evaluation



Meltem Alemdar, Ph. D.
Associate Director
Educational Research & Evaluation
Principal Research Scientist

Center for Education Integration
Science, Mathematics, and
Computing (CEISMCM)

<https://evaluation.ceismc.gatech.edu/>

Relevant Noyce Evaluation & Research Experience

5 Past Track 2 and 3: Kennesaw State University, Georgia Tech, Georgia State University

1 Past Track 4 (ended in April 2022) as a Principal Investigator (PI)

1 Current Track 4- Advisory Board:
Rice University

Evaluation Approaches by Track Type

Capacity Building

Focus:

- Monitoring of institutional change.
- Data collection focuses more on the institutional level, and faculty involvement.

Sample of Typical Evaluation Questions for Capacity Building:

To what extent:

- has progress been made towards sustaining or “scaling up” project activities?
- do stakeholders view the project as a viable option for partner institutions?
- do recruited students feel they have the ability to engage in STEM?
- have the institutions developed the capacity for Noyce (despite the barriers or challenges they faced)?

TRACK 1: Scholarship and Stipends (S&S)

Focus:

- Monitoring outreach, recruitment, selection, training, supports, and program completion of teacher candidates; and monitoring retention of graduates as teachers of record at high-needs schools.
- Data collection targets project activities, individual teacher candidates, and program staff, faculty and district partners' engagement.

Sample of Typical Evaluation Questions for Track 1:

To what extent:

- is the implementation of the project occurring as planned?
- do the Noyce scholars show any benefits from the program?
- has the project contributed to the teaching profession in the area schools and districts that it serves?

Track 2: Teaching Fellowship (TF)

Focus:

- Select an evaluation framework in the early stages of the evaluation design.
- Develop a logic model with program leadership and stakeholders.
- Document recruitment and retention of the Fellows using data collection instruments, e.g., meetings, recruitment events, flyers, interviews of applicants by STEM faculty, etc.
- Document how the proposed Noyce Program is adding value to the Fellows' education (distinguishing it from the teacher preparation program) using data collection instruments, e.g., interviews, survey items, focus groups, etc.
- Choose readily developed survey as much as possible.
- Conduct pre-post/post surveys, focusing on high-need school districts (at least three time period points).
- Develop a formative data reporting cycle to ensure program improvements.

Track 3: Master Teaching Fellowships (MTF)

Focus:

- Select an evaluation framework in the early stages of the evaluation design.
- Develop a conceptual framework (theory of change) with the project PIs and program stakeholders.
- Consider using guiding theories to develop evaluation questions.
- Documentation of recruitment and retention of MTFs.
- Develop and implement longitudinal (same themes/constructs across 5 years) data collection plan, using tools such as surveys and interviews.
- Customize the survey to include new scales—with annual findings to inform implementation decisions for subsequent years.
- Maintain rigorous involvement with program planning and activities.
- Develop a formative data reporting cycle to ensure program changes and theory of change.

Track 2: Teaching Fellowship (TF) & Track 3: Master Teaching Fellowship (MTF)

Sample of Typical Evaluation Questions for Tracks 2 & 3:

To what extent:

- do TFs apply new ideas, knowledge, and information in classroom practice?
- does the program impact participants' self-efficacy in teaching STEM?
- do TFs/MTFs feel prepared to teach (e.g., STEM content, instructional practices, teaching in high-needs schools)?
- does the program impact TFs/MTFs' motivation to teach STEM?
- do TFs/MTFs feel prepared to teach (e.g., STEM content, instructional practices, teaching in high-needs schools)?
- do challenges exist in transferring what TFs/MTFs are learning into the classroom (and what are they?)

TRACK 4: Noyce Research

Focus:

- Either External Evaluator or Advisory Board
- For external evaluation, select an evaluation framework that fits the research and examines how the research project is conducted and its impact in the research field
- Avoid conflating research vs evaluation (understand the differences between the two)

Sample of Typical evaluation questions for Track 4:

To what extent:

- are components of the research project consistent with the needs for research and aligned with the Common Guidelines?
- has the research team been effective in implementing the research project as planned?
- is the quality of outputs or products resulting from the research and development effort?
- is the research contributing to the understanding about teaching and to the broader impacts to be realized by the research?

Evaluation Approaches



Questions?



Evaluation Frameworks

Culturally-Relevant Evaluation (CRE) Framework

CIPP Framework: Context, Input, Process, and Product

Kirkpatrick Model to Evaluate Professional Development

Theory-Driven Evaluation (Chen, 1990)

Utilization-Focused Evaluation (Patton, 2008)

Resource: M. Alemdar, C.J. Cappelli, B.A. Criswell, G.T. Rushton
Evaluation of a Noyce program: Development of teacher leaders in STEM education
Evaluation and Program Planning, 71 (2018), pp. 1-11

Evaluation Frameworks



Questions?

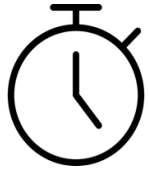


Dynamic Breakout Sessions Track Type

Session Procedures



Today's Breakout Discussions



Time Limits



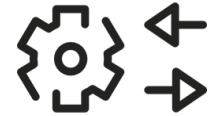
Creativity &
Flexibility



Mindful of Different
Perspectives and Contexts



Focus on the
Future



Change is
Constant



Poll (90 seconds)

What is the current state of your grant project's implementation?

Raise your hand if the following applies to you according to your project's objectives, activities, and tasks:

STATUS

- In progress, on track
- In progress, on track with some modifications
 - Behind schedule
 - Not yet started
- Ending (in final year)
- Planning to apply for a Noyce grant

Tools/Instruments

- Surveys (Pre-Post, Post only)
- Participant data disaggregated by demographics
- Classroom observations (Fall/Spring/Summer)
- Assessments as submitted in the evaluation plan (e.g., Praxis, edTPA, SAT, ACT)
- Meetings agenda & notes
- Observation rubrics, notes of activities
- Project documents and correspondence
- Site visits with observations and focus groups/interview protocols with PI, CoPI(s), Mentors, Supervisors, project staff, Advisory Boards/Committees

Troubleshooting

Most grant implementation concerns fall in at least one of the following categories:

Technical = Technological problems (e.g., observing teacher candidates in classrooms during COVID)

Process = Institutional processes (e.g., MOUs, procurement and hiring, staff turnovers, infrastructure inefficiencies, decisions, and approvals)

Environment = Changes to context with school district, school board or state policy or changes to community or student demographics

Resource = Budget, equipment, material, and/ or personnel (e.g., human and social capacity)

Other = Low recruitment numbers, STEM major students' lack of interest in the teaching profession, low program awareness

(adapted from Mind Tools Content Team, n.d.)

What are the implications for evaluation?

What does the evaluator need to know to report on the implementation and outcomes of the grant project accurately?

- Ex: Baseline data moved to SY 2021-22/another year?
- Ex: Teacher candidates teaching virtually, PD activities delayed or became virtual?
- Ex: Project staff turnover?
- Ex: Changes to state teacher preparation policies, assessments, and internship mandates; COVID effects (teacher shortages, lack of substitute teachers)

How is your project capturing the concerns and solutions? (Hint: There should be some record somewhere through meeting notes, project management issue logs, etc.)

How is the grantee sustaining the project activities after the funding ends?

Breakout Session: Troubleshooting Exchange

Select one strategy or activity you would like to consult with a peer grantee (from the same track) or share best practices according to the following concern categories:

Technical = Technological problems (e.g., observing teacher candidates in classrooms during COVID)

Process = Institutional processes (e.g., MOUs, procurement and hiring, staff turnovers, infrastructure inefficiencies, decisions, and approvals)

Environment = Changes to context with school district, school board or state policy or changes to community or student demographics

Resource = Budget, equipment, material, and/ or personnel (e.g., human and social capacity)

Other = Low recruitment numbers, lack of interest in the teaching profession, low program awareness

Troubleshooting Exchange

Based on the concerns identified and the potential solutions and practices shared, **what are the implications for evaluation?**

What does the/your evaluator need to know in order for them report on the implementation and outcomes of the grant project accurately?

How is your project capturing the concerns and solutions? (Hint: There should be some record somewhere through meeting notes, project management issue logs, etc.)

What aspects of the grant will continue after the funding ends? (e.g., curricula, internship placement practices, Praxis exam supports, mentoring, CoP, post-graduation follow-ups with Scholars, etc.)

Time: 18 mins.

Whole Group Sharing



- Selected spokesperson to share to the entire group.
- Provide a summary of the concern(s), corresponding solution(s), and evaluation implications

Time: 15-20 mins.



Other Issues and Approaches

- Track 1a-Institutional Process Issue: Institutional policies, such as MOUs, course selection, funding set aside (50% of indirect costs)
- Track 1b-Other Issues: How to approach Noyce graduates to complete the survey; recruitment of participants into the program
- Track 3-Other Issues: Environmental contexts that lead fellows to be scared to implement what is required by the grant. Solutions: Find creative ways to ensure fidelity of implementation; demonstrate how transparency is important.
- Track 4-Technical Issues: Collecting data during COVID during the last year of the grant. Solution: Talk with the advisory board for additional time & flexibility.
- Capacity Building-Technical Issues: Data and reporting requirements for capacity building grants (what are they?); Solution: Conduct a virtual summer activity that helps meet those requirements.
- Other Comments: What makes a good evaluator? Session validates qualities of a good evaluator, e.g., one who collects and reports on program data in a timely manner.

Lessons Learned from the Field

- **Expect adjustments** during the planning year and in the implementation year(s).
- **Anticipate potential obstacles** (e.g., administrative and staff turnover, faculty & staff buy-in, and school district's or state's other initiatives and policies) **and possible implications** (e.g., delays in implementation; funds not spent/not encumbered; pre- and post-assessment data not comparable; staff/faculty turnovers; PI, Co-PI, evaluator changes; budgetary changes, and other implementation challenges)
- **Talk to your PO.** They are there to help you.

Lessons Learned - continued

- **Plan and act accordingly.**
- **Document as much as you can** (e.g., meeting agendas and notes with action items). **Check that action items are addressed.**
- **Communicate clearly, often and regularly with the Evaluator** to ensure all aspects of implementation are captured in a timely manner. **Work with the Evaluator to address issues** as they arise.
- **Keep your evaluator informed of any and all changes!**
- **Plan to sustain successful policies, processes, procedures, and personnel and build towards the next Noyce Grant** (scale up?)

Additional Resources

Noyce Research Book: *Research in Practice: Preparing and Retaining K-12 STEM Teachers in High-Need School Districts* (Manier, York, & Calinger (Eds.), 2022)



Book

Recorded Webinar: Untangling Knowledge Generation and Evaluation
(Pearson, March 30, 2020)



Recorded Webinar

Webinar Slides (AAAS S-STEM Initiative,
November 17, 2020)



Webinar Slides

Writing Research and Evaluation Plans for NSF Grants (Mittapalli, 2021)



R & E Plan Guide

Collaborative Reflection For Action

- Based on what you heard today, share what you have learned in this workshop with a colleague (if your colleague did participate in this workshop) and create a collaborative response to share with your project team using the following framework:

Reflection Starter	Response
We used to think....	
Now we think...	
So now we will...	

Additional Questions?



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Thank you!



THANK YOU!

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