MID-LIFE PROJECT EVALUATION
setting the stage for continued funding

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This material is based upon work supported by the National Science Foundation under Grant No. 1204683. The content reflects the views of the authors and not necessarily those of NSF.

MATERIALS

Slide handout
Worksheet
Results from NSF Prior Support checklist
OBJECTIVES

1. **UNDERSTAND** the fundamentals of Intellectual Merit and Broader Impacts
2. **IDENTIFY GAPS** in evaluation data that need to be addressed in order to make a strong case for new funding
3. **FILL GAPS** with low-cost, high-impact evidence
4. **CREATE** a persuasive Results from Prior NSF Support section proposals
NSF CRITERIA:
INTELLECTUAL MERIT & BROADER IMPACTS

• Every NSF ATE project should make a difference in terms of both merit criteria
• Every proposal is reviewed against both merit criteria
• Results from Prior Support must be explicitly described in terms of both merit criteria

NSF CRITERIA:
INTELLECTUAL MERIT & BROADER IMPACTS

• Evaluation of every project must examine implementation and impact in terms of both merit criteria
• Activities proposed—then implemented and evaluated—will typically fall into two categories defined by the merit criteria
NSF DEFINITIONS

**Intellectual Merit**
Potential to advance knowledge and understanding

**Broader Impacts**
Potential to benefit society or advance desired societal outcomes

REAL PROJECT ACTIVITIES

**Intellectual Merit**
The activity is about contributing to greater understandings of STEM technician training...

...generally RESEARCH

**Broader Impacts**
The activity is about the improvement, capacity building, or preparation of some STEM innovation...

...generally DEVELOPMENT
Activities described in a proposal will be influenced by factors in the real world

The purpose of “research and development” makes responsive, purposeful changes an OK thing

Evaluation strategies must accommodate—and document—such changes at the activity level

REAL PROJECT ACTIVITIES

• tested the initial efficacy of a student-led, project-based course, which was formerly didactic
• published results and lessons learned in peer-reviewed journal

Intellectual Merit

• increased retention of female students in course sequence by 25%
• created agreements with 3 local employers for program that places 50 students per year in paid internships

Broader Impacts
### Identifying Your Project’s Intellectual Merit and Broader Impacts

With a Partner: Use worksheet in your folder

#### Intellectual Merit: Advances in Knowledge

<table>
<thead>
<tr>
<th>IS YOUR PROJECT ...</th>
<th>WHAT ARE YOUR PROJECT’S ACHIEVEMENTS IN THIS AREA?</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑ innovative? (using novel research methods or investigating a novel topic to better understand an aspect of STEM education)</td>
<td>Researched the causes for high dropout rates among first-generation, minority students using innovative approach: Mentored former community college students who have transferred to local 4-year college to collect data through in-person and mobile technology-based qualitative data collection techniques</td>
</tr>
</tbody>
</table>
### INTELLECTUAL MERIT: ADVANCES IN KNOWLEDGE

<table>
<thead>
<tr>
<th>DO YOU HAVE EVIDENCE?</th>
<th>WHAT IS YOUR EVIDENCE?</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑ Yes</td>
<td>• Adaptation of peer-mentoring model for engaging underrepresented minority students directly in data collection and analysis—an approach not documented in the literature</td>
</tr>
<tr>
<td>□ No</td>
<td>• Two papers accepted for publication on both the design and the results of this study</td>
</tr>
<tr>
<td>□ Somewhat</td>
<td></td>
</tr>
</tbody>
</table>

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### BROADER IMPACT: BENEFIT TO SOCIETY ...

<table>
<thead>
<tr>
<th>IS YOUR PROJECT …</th>
<th>WHAT ARE YOUR PROJECT’S ACHIEVEMENTS IN THIS AREA?</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑ serving groups that have historically been underrepresented in STEM?</td>
<td>Replaced all traditional remedial courses for students in technician programs with online, on-demand, competency-based modules; augmented online learning with drop-in support sessions lead by specially trained faculty</td>
</tr>
</tbody>
</table>
BROADER IMPACT: BENEFIT TO SOCIETY …

<table>
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</tr>
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<tbody>
<tr>
<td>□ Yes</td>
<td>Too early for graduation data, but enrollment data show that 50% of students are on track to graduate within 3 years, compared with 15% prior to elimination of remedial courses at our college and 10% of students nationally who take remedial courses</td>
</tr>
<tr>
<td>□ No</td>
<td></td>
</tr>
<tr>
<td>☒ Somewhat</td>
<td></td>
</tr>
</tbody>
</table>

IDENTIFYING YOUR PROJECT’S

Intellectual Merit  Broader Impacts

WITH A PARTNER:
Use worksheet in your folder
USING A LOGIC MODEL

to identify gaps in evidence
**INPUTS**
are the resources brought to bear on a project

**ACTIVITIES**
the things a project does
**OUTPUTS**

are the tangible results of activities (things you can see and count)

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**OUTCOMES**

are the changes brought about through project activities and outputs
SHORT-TERM outcomes are *typically* changes in knowledge, skills, and attitudes.

MID-TERM outcomes are *typically* changes in practice or behavior.
LONG-TERM outcomes are *typically* changes in social or economic conditions.
Biodiesel training projects train STEM teachers in making biodiesel and maintenance issues.

Brought high school students from underrepresented populations to college for lab portion of dual enrollment class taught at area high school.
MAPPING INTELLECTUAL MERIT & BROADER IMPACTS EVIDENCE ONTO A LOGIC MODEL

Analysis of how 2-year and 4-year colleges best collaborate

MAPPING INTELLECTUAL MERIT & BROADER IMPACTS EVIDENCE ONTO A LOGIC MODEL

An articulation agreement between technical high school and the community college
Found new ways to measure 21st century skills and to show their increase after PD.

“Normal” electronics technology retention: 50%

“Cohort” model electronics technology retention: 90%
MAPPING INTELLECTUAL MERIT & BROADER IMPACTS EVIDENCE ONTO A LOGIC MODEL

More technical high school students are receiving college credits and attending college.

MAPPING INTELLECTUAL MERIT & BROADER IMPACTS EVIDENCE ONTO A LOGIC MODEL

Reduction in food contamination/adulteration/microbial content in manufacturing.
3 FILLING EVIDENCE GAPS
with low-cost, high-impact data

crafting a persuasive description of
RESULTS FROM PRIOR NSF SUPPORT
RESULTS FROM PRIOR NSF SUPPORT

specific outcomes and results including metrics to demonstrate the impact of the project

Intellectual Merit

Broader Impacts

FOLLOW THE RULES

Do not exceed 5 pages
FOLLOW THE RULES

Make it the first section of the proposal

FOLLOW THE RULES

Identify the prior project’s
• title
• NSF award number
• period of support
FOLLOW THE RULES

Use these exact, distinct headings:
- Intellectual Merit
- Broader Impacts

FOLLOW THE RULES

Include complete bibliographic citations for all publications
—may go in References
SUGGESTIONS

Provide a brief factual account of what the project did, created, and who was engaged.

SUGGESTIONS

Describe the project’s Intellectual Merit and Broader Impacts, with as much evidence as possible.
SUGGESTIONS

Be forthright about what didn’t work and lessons learned

SUGGESTIONS

Describe how the current proposal is building on the prior project’s results
SUGGESTIONS

Describe what aspects of previously funded work are being sustained without NSF support

FOR MORE INFORMATION

Read Lori’s blog on this topic: www.evalu-ate.org/blog/wingate-oct2015 with links to helpful RESOURCES for understanding and writing about Intellectual Merit and Broader Impact
QUESTIONS & COMMENTS

THANK YOU!