Connecting the Dots for an Effective Evaluation

November 20, 2013

Introductions

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Evaluation Questions, Data, Conclusions, Recommendations:  
Connecting the Dots for an Effective Evaluation

Welcome!

Centers for Disease Control and Prevention

Advanced Technological Education

www.nsf.gov/ate
Objectives

Participants will

1. Deepen their understanding of the importance of appropriate and well-written evaluation questions.

2. Know the key considerations for developing sound evaluation questions.

3. Be able to strengthen the linkages between evaluation questions, data, conclusions, and recommendations.
Connecting the Dots for an Effective Evaluation

**Materials**

- Handout
- Slides
- Recording

**Questions, Data, Conclusions, Recommendations:**

- Distinct components of an evaluation
- Each component must be clearly linked to the others
- Strengthening the connections will improve an evaluation’s quality
<table>
<thead>
<tr>
<th>Utility</th>
<th>Feasibility</th>
<th>Propriety</th>
<th>Accuracy</th>
<th>Accountability</th>
</tr>
</thead>
</table>

www.jcsee.org
Evaluation Questions

Overarching questions about a project’s merit, worth, or significance that the evaluation seeks to answer based on evidence.

“big-picture” questions that typically require multiple sources of data to answer.
Evaluation Questions

“Questions establish **boundaries** for the evaluation by stating what aspects of the program will be addressed.”


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![Diagram showing Sources for Determining Evaluation Questions]

1. **Funder requirements**
2. **Project goals**
3. **Criteria**
4. **Logic Models**
5. **Stakeholders**
6. **Target audience needs**
What does the program funder expect the evaluation to address?

(Re)read the solicitation

**EXAMPLE: Professional Development Projects**

"Evaluation should demonstrate use in the classrooms and sustainable changes in practice of participating faculty and teachers. Changes in student learning outcomes as well as students' perceptions of technical careers should be measured."

To what extent ...
- do participants integrate the PD content in their instruction?
- do participants sustain the changes they make to their instructional practices?
- are learning outcomes affected by changes in instruction related to the PD?
- do changes in instruction affect students' perceptions of technical careers?"
EXAMPLE: Occupational Safety and Health Training Projects

Funder’s Evaluation Requirements [or Expectations]

The application must describe an evaluation plan to review and determine the quality and effectiveness of the proposed training program. This should include plans to obtain feedback from current and former trainees to help identify weaknesses in the program and to provide suggestions for program improvements. What is the quality of the training program? How effective is the training program? (this type of evidence is valued) What are the strengths and weaknesses of the training program? (recommendations are expected)

QUALITY and EFFECTIVENESS need to be defined and unpacked
Sources for Determining Evaluation Questions

- Program requirements
- Stakeholders
- Target audience needs
- Logic Models
- Criteria
- Project goals
- Target audience needs

Goals

What is the project seeking to achieve?
What was the project funded to achieve?

→ make sure evaluation questions clearly align with project purposes
Shouldn’t an evaluation focus on whether a project is meeting its goals?

- Develop externship-driven curriculum modules in emerging technology
- Identify and apply appropriate frameworks for evaluation
- Implement industry-driven project-based learning modules created by secondary and post-secondary faculty
- Increase the pool of skilled ATE graduates for green/sustainable technology careers
- Create a long-term student engagement model

293 ATE awards (NSF database) → 29 (10%) randomly selected → 24% (7) included goals/objectives → 23 goal/objective statements → 5 randomly selected
### Are these ATE goal/objective statements focused on project PROCESS or OUTCOMES?

<table>
<thead>
<tr>
<th>What a project does</th>
<th>PROCESS - Activities</th>
<th>PROCESS - Products</th>
<th>PROCESS - People reached</th>
<th>OUTCOMES - Changes in Knowledge, Behavior, Broader conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop externship-driven curriculum modules in emerging technology</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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</tr>
<tr>
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</tr>
<tr>
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<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Create a long-term student engagement model</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

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An evaluation should include, *but not be limited to*, assessing whether goals were met.
Sources for Determining Evaluation Questions

- Program requirements
- Project goals
- Criteria
- Logic Models
- Stakeholders
- Target audience needs
- Project goals

Stakeholders

- Individuals who are involved in or affected by the project and its evaluation
- Intended users: Individuals in a position to make decisions about a project based on the evaluation results
**Stakeholders**

Ask:
- What do you hope to learn from the evaluation?
- What, if any decisions will be influenced by the results?

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**Sources for Determining Evaluation Questions**

Program requirements  
Stakeholders  
Target audience needs  
Criteria  
Logic Models  
Project goals
External Criteria

What makes this type of intervention good or successful?

External Criteria

- Research-based
- Authoritative
- Generally accepted quality standards

Especially useful for assessing quality in process evaluation (implementation, content, products)
Evaluation Questions, Data, Conclusions, Recommendations:
Connecting the Dots for an Effective Evaluation

External Criteria for Professional Development for Educators

External Criteria for Occupational Health and Safety Training

Quality

Effectiveness

Evaluation of training programs should demonstrate evidence of:
- achieving training objectives
- show gains in trainee knowledge and skills
- exhibit beneficial organizational performance

www.learningforward.org

www.ansi.org
External Criteria for Curricula and Programs

Criteria established by accrediting organizations, e.g.,

- Automotive programs
- Engineering and technology programs

External Criteria for Public Health Interventions

WHO Guidelines

World Health Organization

Morbidity and Mortality Weekly Report (MMWR)
Guidelines and recommendations

CDC
Evaluation Questions, Data, Conclusions, Recommendations:
Connecting the Dots for an Effective Evaluation

Sources for Determining Evaluation Questions

Program requirements

Project goals

Criteria

Stakeholders

Target audience needs

Logic Models

Needs

What do those being served by the project need?
What gap(s) in services, opportunities, or products is the project addresses?
Target audience needs

Project goals

These should match

Sources for Determining Evaluation Questions

Program requirements

Stakeholders

Criteria

Target audience needs

Logic Models

Project goals

NSF
Logic Models

What results should be achieved at each stage of the project?

Activities
- Train faculty to serve as mentors to first-year students
- Pair students with faculty mentors
- Develop and implement professional skills course
- Place students in internships in their final semesters

Outputs
- 20 faculty members in applied technology departments trained
- 60 students paired with faculty mentors
- 60 students enrolled per semester in professional skills course

Short-term Outcomes
- Students identify academic and professional goals and the steps needed to achieve them
- Students increase commitment to program completion

Mid-term Outcomes
- Students persist in their advanced technology programs (improved retention and completion)

Long-term Outcomes
- Graduates obtain employment related to their certification or degree
- Graduates continue on to a 4-year degree in a STEM discipline

Focusing at least 1 question at each level ensures that the evaluation will fully address both process and outcomes.
Overlaying evaluation questions on a logic model may reveal flaws in the model.

If so, then it’s a good time to revisit

Goals  Stakeholders  Criteria  Needs

Good evaluation questions are....

☐ Evaluative
☐ Relevant
☐ Reasonable
☐ Answerable
☐ Balanced

evalu-ate.net/downloads/resources/Evaluation_Questions_Checklist.pdf
Evaluation questions are essential to an evaluation because they...

- Focus the evaluation
- Point to the types of evidence needed
- Set the stage for conclusions and recommendations

Discussion

Goldie MacDonald

Lori Wingate
1. Indicator

: a sign that shows the condition or existence of something

: a pointer or light that shows the state or condition of something
2. Data

Lori

: factual information ... used as a basis for reasoning, discussion, or calculation

3. Evidence

Lori

: something which shows that something else exists or is true
Aligning data with questions

1. Determine what indicators will help answer the evaluation questions.
2. Determine how data for the indicators will be collected.
3. Think ahead to how data may need to be combined to generate credible evidence to inform conclusions.

A common pitfall is to concentrate exclusively on data
The criteria for selection of high-performing indicators include:

1. **Accepted Practice and History of Use**
2. **Applicability in Different Settings**
3. **Availability of Data**
4. **Burden of Data Collection on Participants**
5. **Clarity of Focus and Meaning**
6. **Cultural Appropriateness and Relevance**
7. **Data Quality**
8. **Investment of Resources**
9. **Opportunity to Detect Unexpected or Unintended Findings**
10. **Pathway for Use of Data**
11. **Relevance to Evaluation Questions**
12. **Strength of Evidence or Substantive Merit**
13. **Value within a Set of Indicators**

**Evaluation Questions**

The degree to which an indicator helps to address predefined evaluation questions.
How effective is the mentoring program in terms of improving student retention?

Are these indicators relevant to this evaluation question?

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Relevant?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of students who receive mentoring</td>
<td>No</td>
</tr>
<tr>
<td>Percentage of mentored students retained in program compared with nonmentored students</td>
<td>Yes</td>
</tr>
<tr>
<td>Faculty mentors’ level of satisfaction with the training they received to serve as mentors</td>
<td>No</td>
</tr>
<tr>
<td>Percentage of mentored students who self-report that mentoring positively influenced their decision to continue in their programs</td>
<td>Yes</td>
</tr>
<tr>
<td>Degree to which mentoring increases students’ sense of self-efficacy</td>
<td>No</td>
</tr>
</tbody>
</table>
“NSF is committed to broadening participation.”

- Women
- Minorities
- Persons with disabilities

See Chapter 4:

Measuring Success and Effectiveness of NSF’s Broadening Participation Programs:

Suggested Monitoring Metrics and Evaluation Indicators
Example….

26% of RCNET’s students are female

What other information would be helpful for interpreting this result?
Evaluation questions typically require multiple sources of data to answer

*Take this into account when identifying indicators and planning data collection*
Comments

Goldie MacDonald

Criteria for Selection of High-Performing Indicators
A Checklist to Inform Monitoring and Evaluation

Goldie MacDonald
Centers for Disease Control and Prevention
Atlanta, Georgia
qum9@cdc.gov

- Accepted Practice and History of Use
- Applicability in Different Settings
- Availability of Data
- Burden of Data Collection on Participants
- Clarity of Focus and Meaning
- Cultural Appropriateness and Relevance
- Data Quality
- Investment of Resources
- Opportunity to Detect Unexpected or Unintended Findings
- Pathway for Use of Data
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- Strength of Evidence or Substantive Merit
- Value within a Set of Indicators
## Conclusions

Answers to the evaluation questions.

<table>
<thead>
<tr>
<th>If the question is...</th>
<th>The answer should be about</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>To what extent has the project increased the representation of women in the college's engineering programs?</td>
<td>Level and direction of change</td>
<td>The project has resulted in a moderate increase in the representation of women in engineering at the college.</td>
</tr>
<tr>
<td>What is the quality of workshops?</td>
<td>Level of quality</td>
<td>Overall, the workshops are excellent.</td>
</tr>
<tr>
<td>How replicable is the project’s approach to student engagement?</td>
<td>Degree of replicability</td>
<td>The project’s approach to student engagement is partially replicable.</td>
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Conclusions

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<th>If the question is...</th>
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<th>Examples</th>
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</thead>
<tbody>
<tr>
<td>How effective has the project been in increasing the representation of women in the college's engineering programs?</td>
<td>Level of effectiveness</td>
<td>A significant increase in the number of women enrolled in engineering courses</td>
</tr>
<tr>
<td>What is the quality of workshops?</td>
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Only ask questions that call for evidence of causation if you can meet methodological conditions necessary for determining attribution.

Conclusions

How well is the project doing in terms of...

- Activities: reaching and engaging its target audience?
- Outputs: meeting the needs and expectations of participants?
- Short-Term Outcomes: contributing to changes in participants’ knowledge, skills, or attitudes?
- Mid-Term Outcomes: contributing to changes in participants’ behavior or organizational practices?
- Long-Term Outcomes: contributing to changes in broader conditions?

Level of quality

Reach  Satisfaction  Knowledge  Behavior  Impact
Conclusions

Excellent

Very Good

Good

Fair

Poor

Reach  Satisfaction  Knowledge  Behavior  Impact

All-Purpose Holistic Rubric

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>Clear example of exemplary performance or best practice in this domain; no weaknesses</td>
</tr>
<tr>
<td>Good</td>
<td>Very good or excellent performance on virtually all aspects; strong overall but not exemplary; no weaknesses of any real consequence</td>
</tr>
<tr>
<td>Adequate</td>
<td>Reasonably good performance overall; might have a few slight weaknesses but nothing serious</td>
</tr>
<tr>
<td>Marginal</td>
<td>Fair performance, some serious (but nonfatal) weaknesses on a few aspects</td>
</tr>
<tr>
<td>Poor</td>
<td>Clear evidence of unsatisfactory functioning; serious weaknesses across the board or on crucial aspects</td>
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Source: Table 8.2 from Evaluation Methodology Basics by Jane Davidson (2005)
### Project-Specific Holistic Rubric

<table>
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<th>Poor</th>
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<td><strong>Student Impact</strong></td>
<td>No set plan for how to engage students either through coursework or experiential learning under the auspices of the project</td>
<td>Students engaged at least sporadically in experiential learning activities; there is talk of a certificate or degree program</td>
<td>Students engaged in a systematic way in experiential learning or a degree/certificate program, but may need further development</td>
</tr>
<tr>
<td><strong>Scholarship</strong></td>
<td>No established plan for obtaining external grants or contracts; no evidence of activity in this area</td>
<td>Minimal plans for obtaining external grants or contracts; some proposals submitted</td>
<td>Clear plan for obtaining external funding; proposals have been submitted</td>
</tr>
<tr>
<td><strong>External Impact</strong></td>
<td>No set plans for external engagement</td>
<td>Some ideas for external engagement, but few have been implemented yet</td>
<td>External engagement, either through service or collaborations, is an important part of the project</td>
</tr>
<tr>
<td><strong>Sustainability</strong></td>
<td>No clear plan for supporting the center by grants, contracts, and/or fees</td>
<td>Some ideas for becoming partially self-sustaining but need to be further developed</td>
<td>Grants or contracts may bring significant external support to the project, but it depends on forces beyond the control of the project; fees or other revenue streams are likely to provide stable income</td>
</tr>
</tbody>
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### Project-Specific Holistic Rubric

#### Student Impact Rubric

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Works well with quantitative data – just plug in ranges for each indicator
How effective is the mentoring program for improving student retention?

- 55% of students said mentoring positively influenced their decision to continue in their program.
- Retention rate of course participants is 22% better than that of a matched group.
Mentoring was *moderately effective* in improving student retention, according to the criteria established for the project.*

* Criteria and specific results also provided to justify conclusion.
Discussion

Goldie MacDonald

Lori Wingate

Recommendations
**Recommendations**

Proposed actions for improving a project’s performance based on evidence

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**Types of Recommendations**

- **FORMATIVE**
  - Suggestions about actions to take to improve performance

- **MINOR**
  - Tweaks to implementation

- **MAJOR**
  - Significant changes in goals, activities, or audiences

- **SUMMATIVE**
  - Suggestions about program expansion/contraction, continuation, cancellation
  - Changes that substantially impact funding, personnel, policy or service delivery

These are the types of recommendations generated from ATE project-level evaluations
Recommendations

Increase outreach activity and modify message to enhance resonance to different audiences

Create/disseminate tools to support translation of knowledge into practice

Reach | Satisfaction | Knowledge | Behavior | Impact

Diagnose

What are the causes of suboptimal performance?

Identify weak links/breaks in the project’s implementation and outcomes

Look for unintended outcomes
### Evaluation Recommendation Tips

#### Developing

1. To the extent reasonable at the design stage, determine the nature of recommendations needed or expected.
2. Generate possible recommendations throughout the evaluation, not just at the end.
3. Base recommendations on evaluation findings and other credible sources.
4. Engage stakeholders in developing and/or reviewing recommendations prior to their finalization.
5. Focus recommendations on actions within the control of intended users.
6. To the extent reasonable, provide multiple options for achieving desired results.

#### Presenting

7. Clearly distinguish between findings and recommendations.
8. Write recommendations in a clear and actionable way.
9. Specify the justification/information sources for each recommendation.
10. To the extent reasonable, explain the costs, benefits, and challenges associated with implementing recommendations.
11. Exercise political sensitivity in the focus and wording of recommendations.
12. Categorize recommendations, such as by type, focus, and/or priority.

#### Following-up

13. Meet with stakeholders to review and discuss recommendations in their final form.
14. Provide tools to facilitate decision making and action planning around recommendations.

---

**Focus recommendations on actions within the control of intended users**
Focus recommendations on actions within the control of intended users

Revisit how stakeholders responded when asked,

What, if any, decisions will be influenced by the results?

Evaluation Recommendation Tips

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Following-up
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14. Provide tools to facilitate decision making and action planning around recommendations.
Specify the justification/information sources for each recommendation.

**Recommendation**
Provide additional in-person workshops in lieu of more Web-based tutorials.

**Justification**
- Workshop participants learned more and expressed greater satisfaction than those who completed Web-based tutorials.
- There are technical problems with the tutorial system that caused more than half of the users to terminate sessions before completing.

Proposed actions for improving a project’s performance **based on evidence**

**What information sources other than evaluation results might influence evaluation recommendations?**
Specify the justification/information sources for each recommendation.

- Give precedence to evaluation findings
- Consult research literature/established best practices
- Acknowledge the influence of personal experience/substantive expertise
- Use common sense

Evaluation Recommendation Tips

Developing
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Provide tools to facilitate decision making and action planning around recommendations.
**Provide tools to facilitate decision making and action planning around recommendations.**

- Record decisions
- Assign responsibilities
- Set deadlines
- Track progress

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### UNDP Management Response Template

<table>
<thead>
<tr>
<th>Evaluation Recommendation 1:</th>
<th>Management Response:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluators verbatim recommendation</td>
<td>Project’s response (re: perceived validity, relevance, acceptability)</td>
</tr>
<tr>
<td>Key action(s)</td>
<td>Time frame</td>
</tr>
<tr>
<td>----------------</td>
<td>------------</td>
</tr>
<tr>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td>1.3</td>
<td></td>
</tr>
</tbody>
</table>

- Concrete actions to be implemented, articulated by project
- When actions will be taken
- Notes on progress
- Who is responsible for implementation
- - Pending
- - Initiated
- - Completed

Want to Know More about Evaluation Recommendations?

www.wmich.edu/evalctr/2010/06/lori-wingate-ph-d/
Comments

Goldie
MacDonald

ATE PIs, evaluators, and project staff, join us at our next webinar...

Orientation to ATE Survey 2014
January 22, 2014

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