

# Creating an Evaluation Plan for Your NSF TUES Proposal

Bonnie Swan, Ph.D., Director

Program Evaluation and Educational Research Group (PEER)

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# Expected Outcomes Today

- ❑ Help you to:
  - ❑ Better understand the TUES-specific criteria
  - ❑ Develop evaluation components of proposals that make them more competitive
- ❑ Facilitate discussion



# TUES vs. CCLI

- ❑ Title changed to emphasize the special interest in projects that have the potential to transform undergraduate STEM education
- ❑ Review criteria was modified to emphasize the desire for projects that:
  - ❑ Propose materials, processes, or models that have the potential to
    - ❑ Enhance student learning
    - ❑ Be adapted easily by other sites
  - ❑ Involve a significant effort to facilitate adaptation at other sites
  - ❑ Institutionalize the approach at the investigator's college or university as appropriate (e.g., for the Type)
  - ❑ Have the potential to contribute to a cultural shift in undergraduate STEM education



**Note:** Slide adapted from a NSF mock review webinar



# TUES Program

- ❑ Vision: Excellent STEM education for all undergraduate students
- ❑ Reflects national concerns about producing:
  - ❑ Skilled STEM professionals (including K-12 teachers)
  - ❑ Citizens knowledgeable about STEM and how it relates to their lives
- ❑ Seeks to build a community of faculty committed to improving undergraduate STEM education
- ❑ Encourages projects with potential to advance and transform undergraduate STEM education



Note: Slide adapted from a NSF mock review webinar



# TUES Project Components

- ❑ **Creating Learning Materials and Strategies**
  - ❑ Guided by research on teaching and learning
  - ❑ Incorporate and be inspired by advances within the discipline
- ❑ **Implementing New Instructional Strategies**
  - ❑ *Contribute to understanding on how existing strategies:*
    - ❑ Can be widely adopted
    - ❑ Are transferred to diverse settings
    - ❑ Impact student learning in diverse settings
- ❑ **Developing Faculty Expertise**
  - ❑ Enable faculty to acquire new knowledge and skills in order to revise their curricula and teaching practices
  - ❑ Involve a diverse group of faculty



**Note: Slide adapted from a NSF mock review webinar**



# TUES Project Components (cont)

- ❑ **Assessing and Evaluating Student Achievement:**
  - ❑ Develop and disseminate valid and reliable tests of STEM knowledge
  - ❑ Collect, synthesize, and interpret information about student understanding, reasoning, practical skills, interests, attitudes or other valued outcomes
  
- ❑ **Conducting Research on Undergraduate STEM Education:**
  - ❑ *Explore how:*
    - ❑ Effective teaching strategies and curricula enhance learning and attitudes
    - ❑ Widespread practices have diffused through the community
    - ❑ Faculty and programs implement changes in their curriculum



**Note: Slide adapted from a NSF mock review webinar**



# Instructional Materials and Methods Projects

- ❑ Projects developing instructional materials and methods should:
  - ❑ Be based on how students learn
  - ❑ Consider transferability and dissemination throughout the project's lifetime
  - ❑ Involve efforts to facilitate adaptation at other sites in more advanced projects



*Note: Slide obtained from a NSF mock review webinar*



# Type 1 Projects

- ❑ **Expect to award approximately 10%**
- ❑ **Total budget: up to \$200,000 for 2 to 3 years**
  - ❑ \$250,000 when 4-year and 2-year schools collaborate
- ❑ **Typically involve a single institution & one program component – but there are exceptions**
- ❑ Contribute to the understanding of undergraduate STEM education
- ❑ Informative evaluation effort based on the project's specific expected outcomes
- ❑ Institutionalized at the participating colleges and universities

## **Deadlines:**

*May 28, 2012 (A-M)*

*May 29, 2012 (N-W)*



**Note: Slide obtained from a NSF mock review webinar**





# Type 2, 3, and CRP Projects

## □ Type 2 Projects

- 20 to 25 awards expected
- Total budget: up to \$600K for 2 to 4 years

## □ Type 3 Projects

- 3 to 5 awards expected
- Budget negotiable, but not to exceed \$5M over 5 years

## □ Tucs Central Resource Projects

- 1 to 3 awards expected
- Budget negotiable, depending on the scope and scale of the activity
  - **Small focused workshop projects -- 1 to 2 years & up to \$100K**
  - **Large scale projects -- 3 to 5 years & \$300K to \$3M**

**Deadline: *January 14, 2013***



Note: Slide obtained from a NSF mock review webinar



# Evaluation versus Research

Research seeks to *prove* while  
evaluation seeks to *improve*.

M.Q. Patton



# Reasons for Evaluations

- ❑ Provides information to help improve a project.
- ❑ Documents what has been achieved.
- ❑ Assesses the extent to which goals and objectives are met and desired impacts are attained.
- ❑ Can provide new insights or new information that was not anticipated.
- ❑ Often required by sponsor.



# Importance of Evaluation

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- ❑ People (stakeholders) naturally make evaluative judgments about programs and policies, often based on limited information and are susceptible to biases
- ❑ Evaluators use a set of “tools” (research designs, methods) and “roadmaps” (evaluation theories) that offer stakeholders’ understanding of and action in relation to programs and policies



# Where Evaluation Fits

**What are you trying to accomplish?**

**What will be the outcomes?**

} *Goals etc.*

**Why do you believe that you have a good idea?**

**Why is the problem important?**

**Why is your approach promising?**

} *Rationale*

**How will you manage the project to ensure success?**

**How will you know if you succeed?**

} *Evaluation*

**How will others find out about your work?**

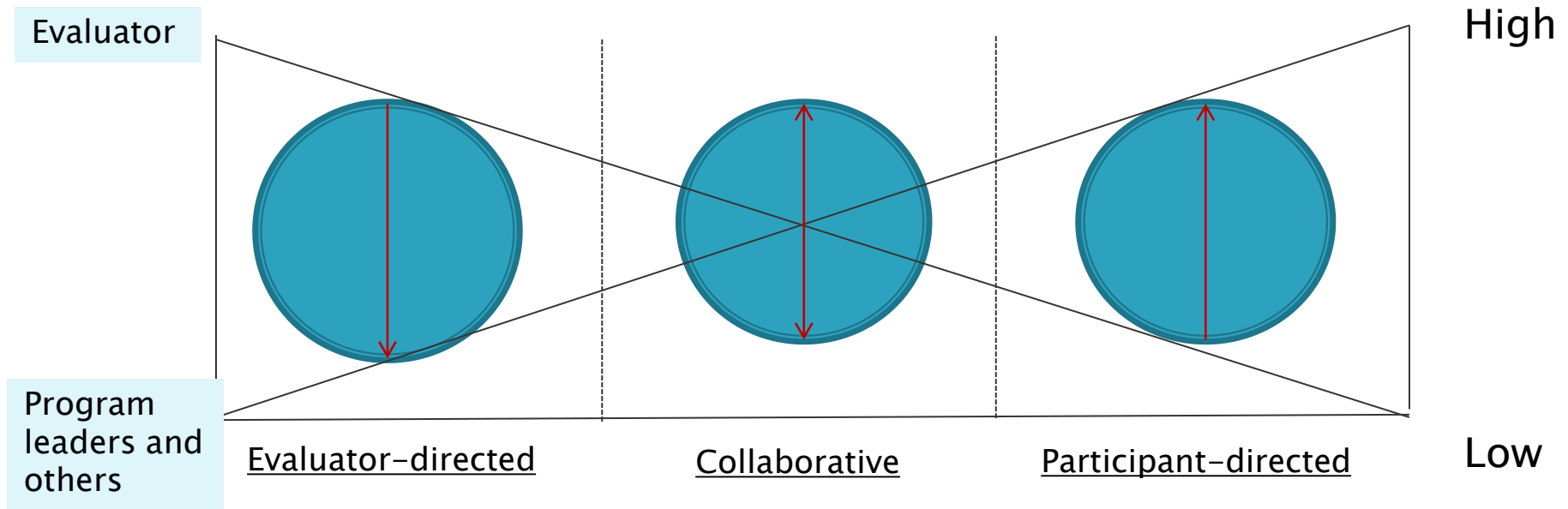
**How will you interest them?**

**How will you excite them?**

} *Dissemination*

# Define Your Relationship with Your Evaluator

*Primary Responsibilities: Who plans? Who conducts?*



Involvement in decision making and implementation. This can shift during the project period.

# Steps to Take When Describing a Program

- ❖ *Advance Organizer*
  - *Logic Models*
  - *Writing Goals, Objectives and Outcomes*



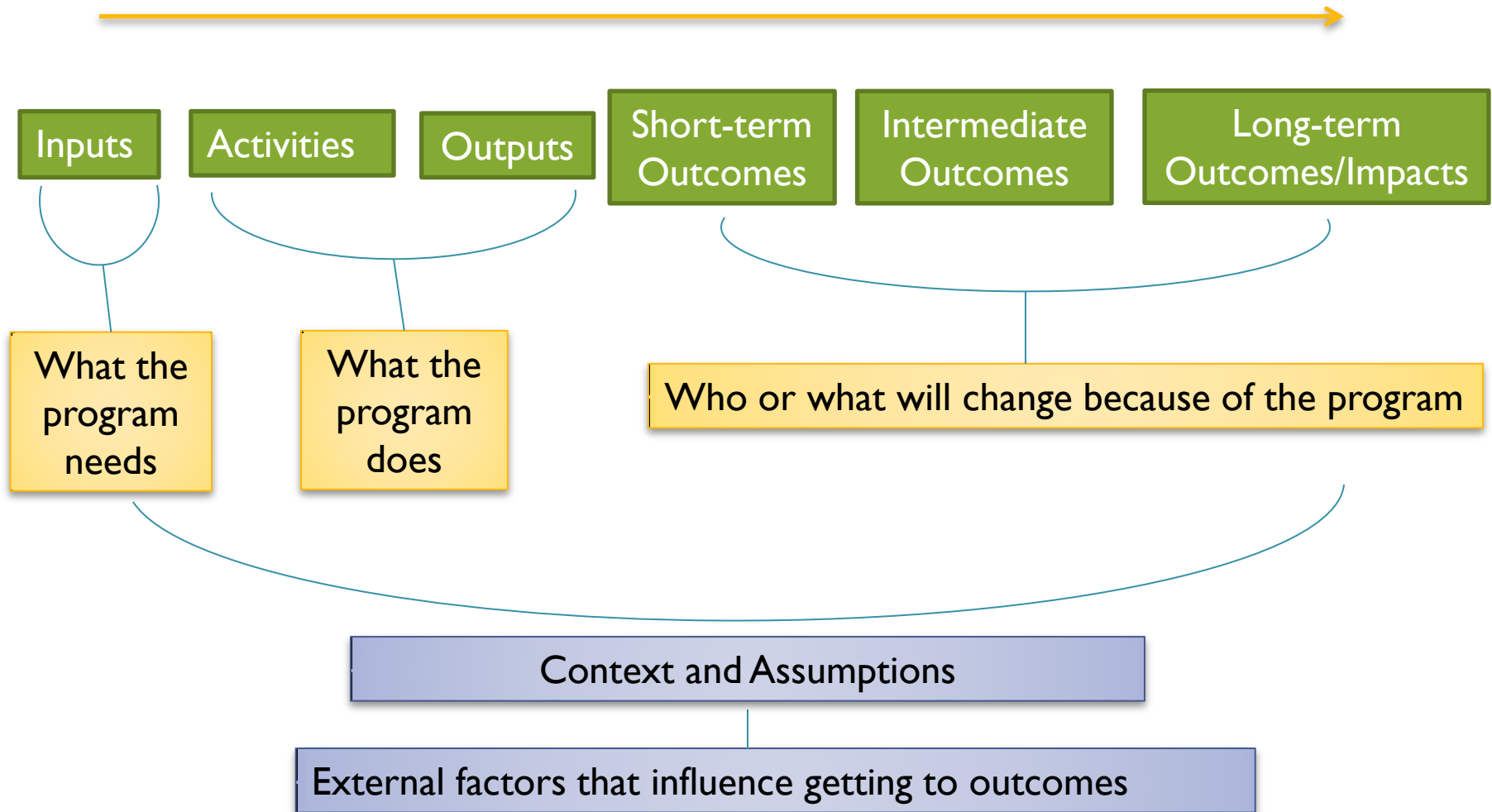
# You Don't Ever Need a Logic Model BUT You Always Need an Effective Program Description

- ❑ **Before you start with planning your evaluation, identify:**
  - ❑ The big “*need*” your project is to address
  - ❑ Who your *important stakeholders* are
  - ❑ The key *target group(s)* who need to take action
  - ❑ The kinds of actions they need to take (clearly state intended *outcomes* or objectives)
  - ❑ *Activities* needed to meet those outcomes
  - ❑ “Causal” *relationships* between activities and outcomes





# Typical Components of a Project/Program



# Logic Model Guidelines

## Project Plan

### Inputs

What inputs are needed to do this?

Resources:

- Staff
- Supplies
- Facilities
- Funding

### Activities

What activities need to be carried out by our organizations and partner organizations to meet the outcomes?

Planning/Develop:

- Recruitment
- Staff Activities and Assignments
- Marketing
- Course Materials Development

## Project Results

### Outputs

What services need to be delivered to external participants to achieve the outcomes?

Implementation:

- Training course materials
- Train the trainers workshops
- Workshop sessions for clients
- Follow-up Support

### Outcomes

What changes in a target audience's skills, attitudes, knowledge, behaviors, status, or life condition will be brought about by experiencing the program.

# Defining the Project Dimensions

## *Establishing Project Criteria and Standards*

- ❑ CRITERIA are the factors that are considered important to judge something
  - ❑ What would be some good criteria for performance in a course?
  
- ❑ STANDARDS are the level of performance expect on each criterion. They can be absolute or relative. Relative standards are sufficient, for example with a comparison group.
  - ❑ What are standards or metrics for the criteria?



# Project Goals and Outcomes

- ❑ Goals/outcomes related to:
  - ❑ Project management
    - ❑ Initiating or completing an activity
    - ❑ Finishing a “product”
  - ❑ Student behavior
    - ❑ Modifying a learning outcome
    - ❑ Modifying an attitude or a perception



# Developing Goals & Outcomes

- ❑ Start with one or more overarching statements of project intention
  - ❑ Each statement is a *goal*
- ❑ Convert each goal into one or more expected measurable results
  - ❑ Each result is an *outcome*



# Definition of Goals, Objectives, and Outcomes

- ❑ **Goals – Broad, overarching statements of intention or ambition**
  - ❑ Each of these can lead to several objectives.
  
- ❑ **Objectives – Specific statements of intention**
  - ❑ These are more focused and specific than goals.
  - ❑ Can lead to one or more outcomes.
  
- ❑ **Outcomes – Statements of expected result**
  - ❑ Can be measured with criteria for success.



# Examples of Outcomes

- **Conceptual understanding**
  - ▣ Students will be better able to solve simple conceptual problems
  - ▣ Students will be better able to solve out-of-context problems.
  
- **Attitude**
  - ▣ Students will be more likely to describe computing as an exciting career
  
  - ▣ The percentage of students who transfer out of computing after the OS course will decrease.



# Example of How Goals and Objectives Might be Linked to Data Sources and Methods, cont'd.

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- ❑ **Goal 2:** Build and Support undergraduate students' xxx and xxx expertise and institutional capacity using project developed content and methods.
  - ❑ **Objective 1:** Effectively recruit a large and diverse group of students.
    - ❑ **Data sources and methods:** Document review; Baseline enrollment and completion for comparison.
    - ❑ **Activity 1.1:** Students will be recruited through presentations and announcements in courses typically taken by freshman and sophomores.  
**Activity 1.2:** UCF faculty and academic advisors will aid in recruitment.  
**Activity 1.3:** Compelling posters and flyers will be developed and used as a recruiting tool.





# Example of How Goals and Objectives Might be Linked to Data Sources and Methods, cont'd.

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- ❑ **Objective 2:** The course will increase students' xxx awareness and build on existing knowledge about xxx.
  - ❑ **Data sources and methods:** Pre and post tests and end-of-course questionnaires using control groups to measure students' attitudes, confidence, and knowledge related to content goals, as well as their overall experience, and recommendations for improvement; Student records and document review; Qualitative interviews with faculty; Semi-structured focus groups with students to rate satisfaction and impact; faculty advisor questionnaires, and a review of project related student work.
  - ❑ **Activity 1.1:** Targeted Instructors will effectively teach a section of the newly developed course in fall 2012. Estimated enrollment for these courses is xx students per section.



# The Evaluation Plan



# The Evaluation Plan

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- ❑ Should
  - ❑ Include both formative and summative components
  - ❑ Have an external evaluator
  - ❑ Link qualitative and quantitative methods (mixed-methods) and triangulation procedures
  - ❑ Engage multiple perspectives
  - ❑ Use a quasi-experimental design
    - ❑ Comparison group and/or pre and post test design, etc.



## Formative

- ❑ Evaluative activities undertaken to furnish information that will guide program improvement.

## Summative

- ❑ Evaluative activities undertaken to render a summary judgment on certain critical aspects of the program's performance, for instance, to determine if specific goals and objectives were met.

# The Evaluation Plan

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- ❑ Formative evaluation
  - ❑ Project development and implementation analysis should examine the effectiveness of the program at the beginning states to help direct the implementation and help determine whether planned approaches and strategies are evident.
  - ❑ Expert review of content
  - ❑ Formative feedback should provide recommendations to allow for design modifications to improve the program's impact.



# The Evaluation Plan

## Formative Evaluation Question Examples

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- ❑ Is the program providing high-quality experiences?
- ❑ What impact is the program having on participating students' attitude, interest, confidence and knowledge related to xxx?
- ❑ To what extent are instructors using project-developed content to replace standard lessons?
- ❑ To what extent, if at all, does the project help change the way instructors think about how they teach and what their students should learn?
- ❑ Do they feel that this new content and methods of teaching inspires students to pursue further coursework or careers in ...?



# The Evaluation Plan

## Summative Evaluation Question Examples

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- ❑ To what extent does the project meet the stated goals and objectives for change or impact? Which components are the most effective? Which components are in need of improvement?
- ❑ Was clarity and vision shared among the collaborators? Did the collaboration change faculty/instructor professional knowledge, interest or behaviors?
- ❑ Did experience change instructor professional knowledge and behaviors?
- ❑ To what extent did the experience prepare participants with the ability to participate in ...?
- ❑ Is the program replicable and transportable?
- ❑ Can the program be sustained?



Questions?





# Creating an Evaluation Plan for NSF TUES

Bonnie Swan, Ph.D., Director

Program Evaluation and Educational Research Group (PEER)

[bonnie.swan@ucf.edu](mailto:bonnie.swan@ucf.edu)

Office: 407-823-1351

