







### Session Goals

The session will enable you to collaborate with evaluation experts in preparing effective project evaluation plans

It will not make you an evaluation expert



## Evaluation and Assessment Evaluation and assessment have many meanings...one definition: Assessment - is gathering evidence Evaluation - is interpreting data and making value judgments Examples of assessment and evaluation Individual's performance (grading) Program's effectiveness (ABET and regional accreditation) Project's progress and success (monitoring and validating)

### **Evaluation and Assessment**

 Session addresses: Project Evaluation
 May involve evaluating individual and group performance – but in the context of the project

### Project evaluation

- Formative monitoring progress to improve approach
- Summative characterizing final accomplishments



### Evaluation and Project Goals/Outcomes Effective evaluation starts with carefully defined project goals and expected outcomes Casela and expected externes related for

- Goals and expected 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

### Learning Goals and Outcomes Goals provide overarching statements of project intention What is your overall ambition? What do you hope to achieve? Expected outcomes identify specific observable results for each goal

FIE session S1A

- How will achieving your "intention" reflect changes in student behavior?
- How will it change their learning and their attitudes?

### Goals, Expected Outcomes, and Evaluation Questions

- $\blacktriangleright$  Goals  $\rightarrow$  Expected outcomes  $\rightarrow$  Evaluation questions
- Questions form the basis of the evaluation process
- Evaluation process collects and interprets data to answer evaluation questions























### Comparing Surveys and Observations







### Tools for Characterizing Intellectual Development

- Levels of Intellectual Development
   Students see knowledge, beliefs, and authority in
  - different ways

    "Knowledge is absolute" versus "Knowledge is
  - contextual"

Felder et.al., JEE 94:57, 2005

- Tools
  - Measure of Intellectual Development (MID)
- Measure of Epistemological Reflection (MER)
- Learning Environment Preferences (LEP)

### Activity Considering an Existing Tool

- Suppose you were considering an existing tool (e.g., a concept inventory) for use in your project's evaluation
- What questions would you consider in deciding if the tool is appropriate?



















Question/ Concept	Number of Students		Percent with Correct Answer	
	Comparison Group	Experimental Group	Comparison Group	Experimental Group
1	25	30	29	23
2	24	32	34	65
3	25	31	74	85





# PD's Response: Alternate Explanation for Change Students learned concept out of class (e.g., in another course or in study groups with students not in the course) Students answered with what the instructor wanted rather than what they believed or "knew" An external event distorted pretest data Instrument was unreliable Other changes in course and not the intervention caused improvement Characteristics of groups were not similar











### PD's Response: **Evaluation Plan** ۲ Name & qualifications of the evaluation expert Get the evaluator involved early in the proposal development phase Goals, outcomes, and evaluation questions Instruments for evaluating each outcome Protocols defining when and how data will be collected • Analysis & interpretation procedures Confounding factors & approaches for minimizing their impact Formative evaluation techniques for monitoring and improving the project as it evolves Summative evaluation techniques for characterizing the accomplishments of the completed project

### Other Sources

- NSF's User Friendly Handbook for Project Evaluation
   http://www.nsf.gov/pubs/2002/nsf02057/start.htm
- Online Evaluation Resource Library (OERL)
   <u>http://oerl.sri.com/</u>
- Field-Tested Learning Assessment Guide (FLAG)
   http://www.wcer.wisc.edu/archive/cl1/flag/default.asp
- Student Assessment of Their Learning Gains (SALG)
   <u>http://www.salgsite.org/</u>

### Reflection

What are the three most important pieces of advice for a colleague on dealing with evaluation in an engineering education-focused proposal (i.e., a TUES proposal)?









