Institute for the Development of Excellence in Assessment Leadership

January, 2017

Facilitators:

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SETTING THE STAGE

- We have lots of expertise in this room to draw upon
- Format of the next couple of days should appeal to all learning preferences
- We have lots of things to uncover
- Role of feedback and improvement

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SETTING THE STAGE

- Evaluation—every day
- Reflection/Daily Journal
- Capstone
- Professional Development Hours (30) to acquire or maintain your professional license or certification (check with your certifying body)

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ISSUE BIN

Use the sticky notes to record:

- Something that is still unclear to you
- A question related to program assessment that has come to mind but not yet been addressed
- Place sticky notes in the *Issue Bin.*

The facilitators will monitor the issue bins and respond after the breaks or at the end of the workshop

ABET'S VISION

ABET ACCREDITED PROGRAMS

ETAC 629 accredited programs at 220 institutions	EAC 2550 accredited programs at 528 institutions
CAC 461 accredited programs at 354 institutions	ASAC 87 accredited programs at 67 institutions

IDEAL OVERVIEW

- Setting the context for program assessment – the big picture
- Understanding the terminology
- Program Educational Objectives
- Identifying the similarities/differences between classroom and program assessment
- Review and critique student outcomes
- Review and critique scoring rubrics
- Establishing inter-rater reliability
- Mapping the curriculum

IDEAL OVERVIEW

- Identifying assessment methods
- Writing/revising surveys
- Developing efficient and effective assessment processes
- Reporting results
- Review case study
- Assessment lessons learned
- Leadership
  - Context
  - Process
  - Tools
  - Progress

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WHAT CAN WE DO AFTER THE INSTITUTE?

- Describe the process of program continuous improvement and the purpose of assessment
- Distinguish between program educational objectives and student outcomes
- Develop measurable student outcomes
- Write scoring rubrics
- Use curriculum mapping to plan assessment strategies and enhance evaluation decisions

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WHAT CAN WE DO AFTER THE INSTITUTE?

- Evaluate a variety of assessment options
- Develop and/or Improve the quality of existing surveys
- Design efficient assessment processes
- Transform data into information for evidence-informed decision making
- Develop strategies for engaging others
- Facilitate the process to maximize results

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ORGANIZING PREMISES

- Outcomes assessment is becoming/has become an international standard of quality
- In an era of accountability and transparency, it is not going away
- It is important for us to define anticipated student learning before someone else does it for us
- Because we are going to be mandated to provide the evidence, it is critical for us to develop assessment processes that are consistent with our institutional values and honor faculty priorities

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BEST PRACTICES SHOULD BE CONSISTENT WITH PRINCIPLES OF LEARNING

- Learning occurs best when we build on what students already know
- Learning is an active process (importance of students active involvement in their own learning)
- Learners perform better when expectations for their learning is clear

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BEST PRACTICES SHOULD BE CONSISTENT WITH PRINCIPLES OF LEARNING

- Learners perform better when they get feedback on their performance
  - Question: When I score student work, will the student know their areas of strength and weakness and what they need to do to improve?
- Learners perform better when they know the relevance of what they are learning to their future careers and personal lives.

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PRINCIPLES OF PROGRAM/ INSTITUTIONAL ASSESSMENT

- Student learning is cumulative over time
  - What students learn in one course, they use, practice, develop and get feedback in other courses.
- Focus of providing evidence of program/ institutional assessment is on the cumulative effect of student learning and influences:
  - When to collect data
  - From whom to collect data
  - Interpretation of the results

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CHALLENGES OF LEADING AND IMPLEMENTING PROGRAM ASSESSMENT

✓ Programs

- Are at different places in the maturity of their assessment processes
- Have different resources available to them (e.g., number of faculty, availability of assessment expertise, time)
- Have faculty who are at different places in their understanding of assessment practice at the program level

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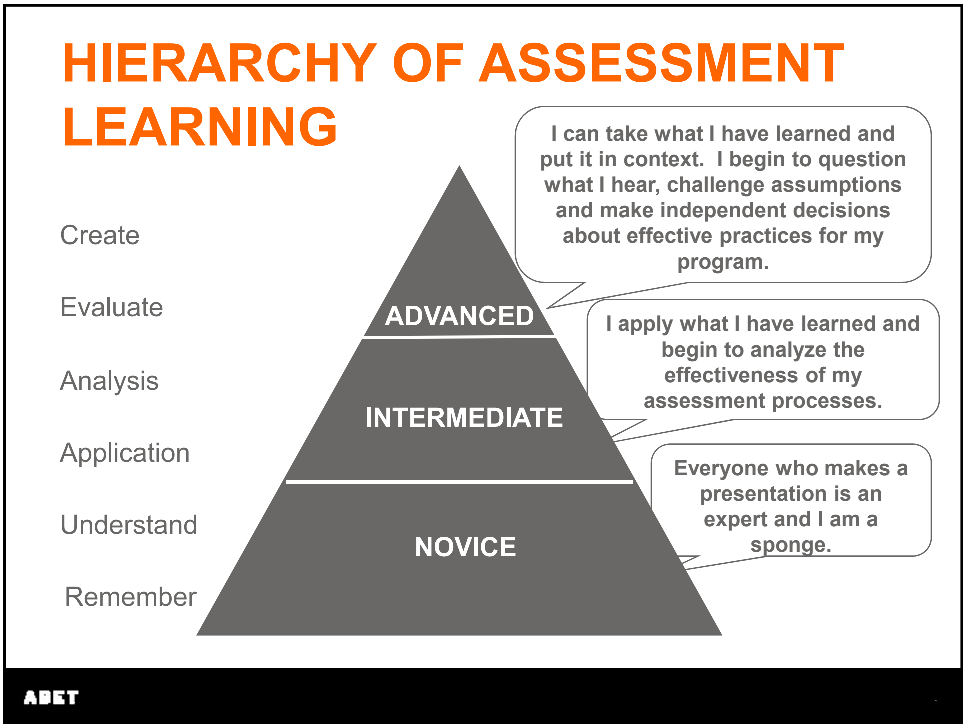

HIERARCHY OF ASSESSMENT LEARNING
Create
Evaluate
Analysis
Application
Understand
Remember
ADVANCED
INTERMEDIATE
NOVICE
I can take what I have learned and put it in context. I begin to question what I hear, challenge assumptions and make independent decisions about effective practices for my program.
I apply what I have learned and begin to analyze the effectiveness of my assessment processes.
Everyone who makes a presentation is an expert and I am a sponge.
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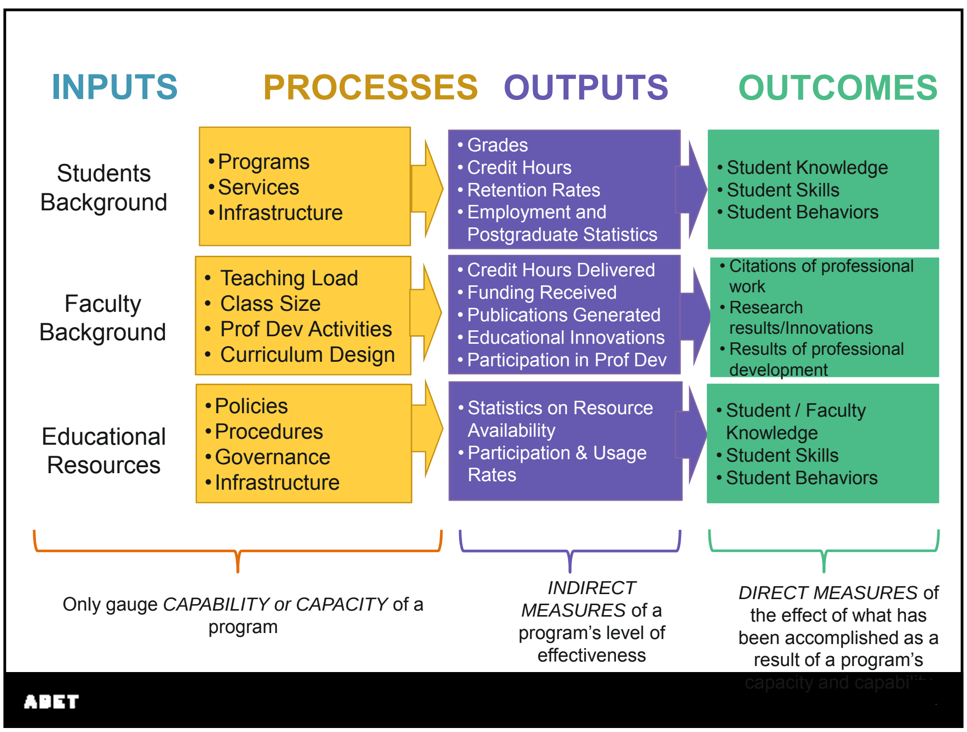

INPUTS
PROCESSES
OUTPUTS
OUTCOMES
Students Background
• Programs
• Services
• Infrastructure
• Grades
• Credit Hours
• Retention Rates
• Employment and Postgraduate Statistics
• Student Knowledge
• Student Skills
• Student Behaviors
Faculty Background
• Teaching Load
• Class Size
• Prof Dev Activities
• Curriculum Design
• Credit Hours Delivered
• Funding Received
• Publications Generated
• Educational Innovations
• Participation in Prof Dev
• Citations of professional work
• Research results/Innovations
• Results of professional development
Educational Resources
• Policies
• Procedures
• Governance
• Infrastructure
• Statistics on Resource Availability
• Participation & Usage Rates
• Student / Faculty Knowledge
• Student Skills
• Student Behaviors
Only gauge *CAPABILITY or CAPACITY* of a program
INDIRECT MEASURES of a program's level of effectiveness
DIRECT MEASURES of the effect of what has been accomplished as a result of a program's capacity and capabi
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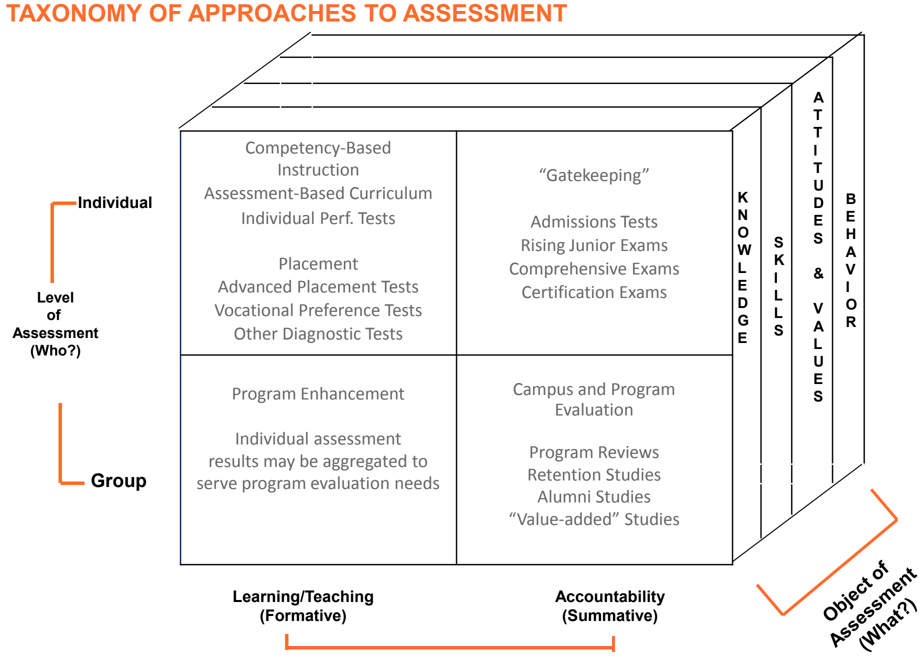
THE ASSESSMENT PROCESS

TAXONOMY OF APPROACHES TO ASSESSMENT



(Terenzini, JHE Nov/Dec 1989)

DEFINITIONS

TERMS	DEFINITIONS
Program Educational Objectives	Program educational objectives are broad statements that describe what graduates are expected to attain within a few years of graduation. Program educational objectives are based on the needs of the program's constituencies.
Student Outcomes	Student outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the skills, knowledge, and behaviors that students acquire as they progress through the program.
Performance Indicators	Specific, measurable statements identifying student performance(s) required to meet the outcome; confirmable through evidence.
Assessment	Assessment is one or more processes that identify, collect, and prepare data to evaluate the attainment of student outcomes. Effective assessment uses relevant direct, indirect, quantitative and qualitative measures as appropriate to the outcome being measured. Appropriate sampling methods may be used as part of an assessment process.
Evaluation	Evaluation is one or more processes for interpreting the data and evidence accumulated through assessment processes. Evaluation determines the extent to which student outcomes are being attained. Evaluation results in decisions and actions regarding program improvement.

ABET TERMS	OTHER POSSIBLE TERMS FOR THE SAME CONCEPT
Program Educational Objectives	Goals, Outcomes, Purpose, Mission, etc.
Student Outcomes	Goals, Objectives, Competencies, Standards, etc.
Performance Indicators	Performance Criteria, Competencies, Outcomes, Standards, Rubrics, Specifications, Metrics, etc.
Assessment	Evaluation
Evaluation	Assessment

PEO's & SO's

PROGRAM EDUCATIONAL OBJECTIVES

PROGRAM EDUCATIONAL OBJECTIVES

- Program educational objectives are broad statements that describe what graduates are expected to attain within a few years of graduation. Program educational objectives are based on the needs of the program's constituencies.

PEO's answer the question: *What knowledge and skills will our graduates need to be successful in their careers?*

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CRITERION 2: PROGRAM EDUCATIONAL OBJECTIVES

Mission Statement

- Provide the institutional mission statement.

Program Educational Objectives

- List the program educational objectives and state where these can be found by the general public.

Consistency of the Program Educational Objectives with the Mission of the Institution

- Describe how the program educational objectives are consistent with the mission of the institution.

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CRITERION 2: PROGRAM EDUCATIONAL OBJECTIVES

Program Constituencies

- List the program constituencies. Describe how the program educational objectives meet the needs of these constituencies.

Process for Revision of the Program Educational Objectives

- Describe the process that periodically reviews and revises, as necessary, the program educational objectives including how the program's various constituencies are involved in this process. Include the results of this process and provide a description of any changes that were made to the program educational objectives and the timeline associated with those changes since the last general review.

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Application: Critique

PROGRAM EDUCATIONAL OBJECTIVES

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APPLICATION

PROGRAM EDUCATIONAL OBJECTIVES

Part A: 15 minutes

1. Working independently, review the PEO's and make a list of strengths and weaknesses (5 minutes). Document your findings using the table below the PEOs.

Think about:

a) Do they meet the ABET definition?
   - Broad statements
   - Based on the needs of the constituents
   - Describe what graduates are expected to attain within a few years of graduation

b) Are they well constructed?

c) Clearly defined?
   - Serve as thresholds for early career development
   - Relevant to the profession
   - Achievable and realistic
   - Align with constituent needs and institutional mission

2. Share your findings with the others on your team and develop one list of strengths and weakness (10 minutes)

APPLICATION
PROGRAM EDUCATIONAL OBJECTIVES

Part B: 10 minutes

- Where you find weaknesses, suggest changes to the PEOs. You can also add new PEOs if necessary. Based on your discussion, provide a bullet list of modified PEOs.

Part C: 10 minutes

- Report out using Nominal Group Process.

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PROGRAM EDUCATIONAL OBJECTIVES

- Where do they come from?
- Who decides what they are?
- What is their purpose?
- How do you know if they are still relevant?
- How do you keep them current?

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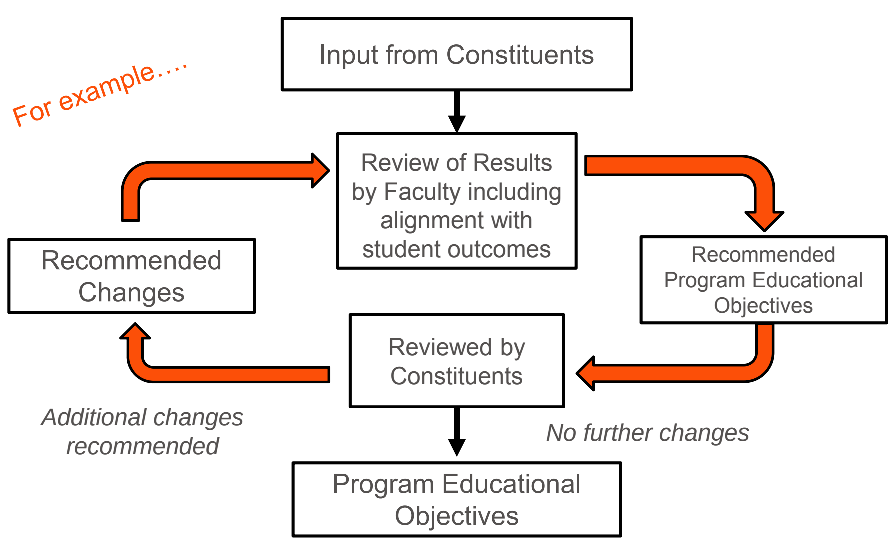
ABET NO LONGER REQUIRES ASSESSMENT OF ATTAINMENT OF PROGRAM EDUCATIONAL OBJECTIVES

	OLD DEFINITIONS	NEW DEFINITIONS
Program Educational Objectives	Program educational objectives are broad statements that describe what graduates are expected to attain within a few years after graduation. Program educational objectives are based on the needs of the program's constituencies.	
Assessment	Assessment is one or more processes that identify, collect, and prepare data to evaluate the **attainment of student outcomes and program educational objectives**…	Assessment is one or more processes that identify, collect, and prepare data to evaluate the **attainment of student outcomes**…
Evaluation	Evaluation is one or more processes for interpreting the data and evidence accumulated through assessment processes. Evaluation determines the **extent to which student outcomes and program educational objectives are being attained**...	Evaluation is one or more processes for interpreting the data and evidence accumulated through assessment processes. Evaluation determines the **extent to which student outcomes are being attained**…

REVIEWING AND REVISING PROGRAM EDUCATIONAL OBJECTIVES



CRITERION 2 – COMMON ISSUES
PROGRAM EDUCATIONAL OBJECTIVES

- Program educational objectives are not published or readily accessible to the public.
- Program educational objectives are not related to institutional mission or are inconsistent with the mission.
- Program educational objectives are not consistent with the needs of the program's various constituencies.
- Program educational objectives do not describe what graduates are expected to attain within a few years after graduation.
- There is no indication as to who are the program's constituents.

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CRITERION 2 – COMMON ISSUES
PROGRAM EDUCATIONAL OBJECTIVES

- There is no evidence the needs of the program's constituents have been considered in the formulation of the program's educational objectives.
- There is no process to periodically review and revise the program educational objectives.
- There is no evidence of constituency involvement in the periodic review and revision of program educational objectives.

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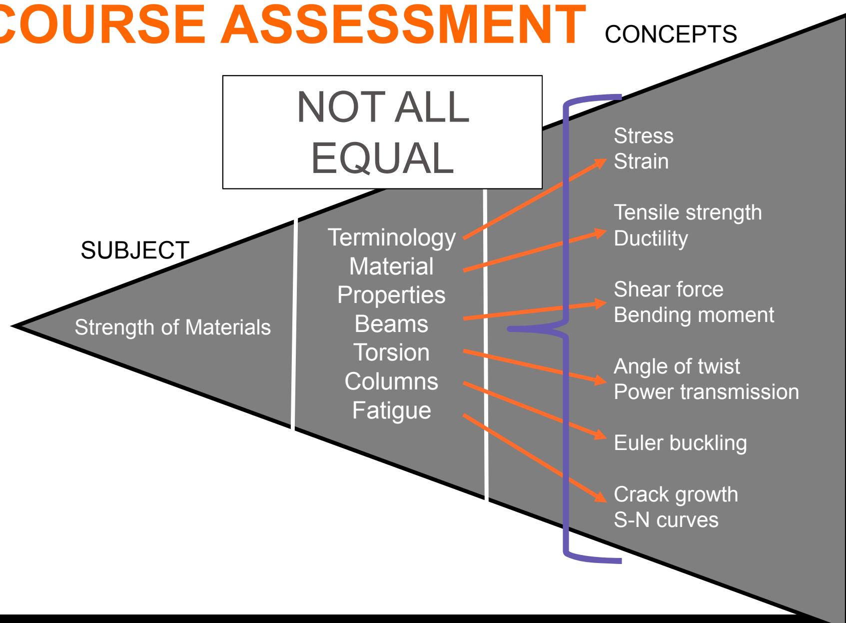
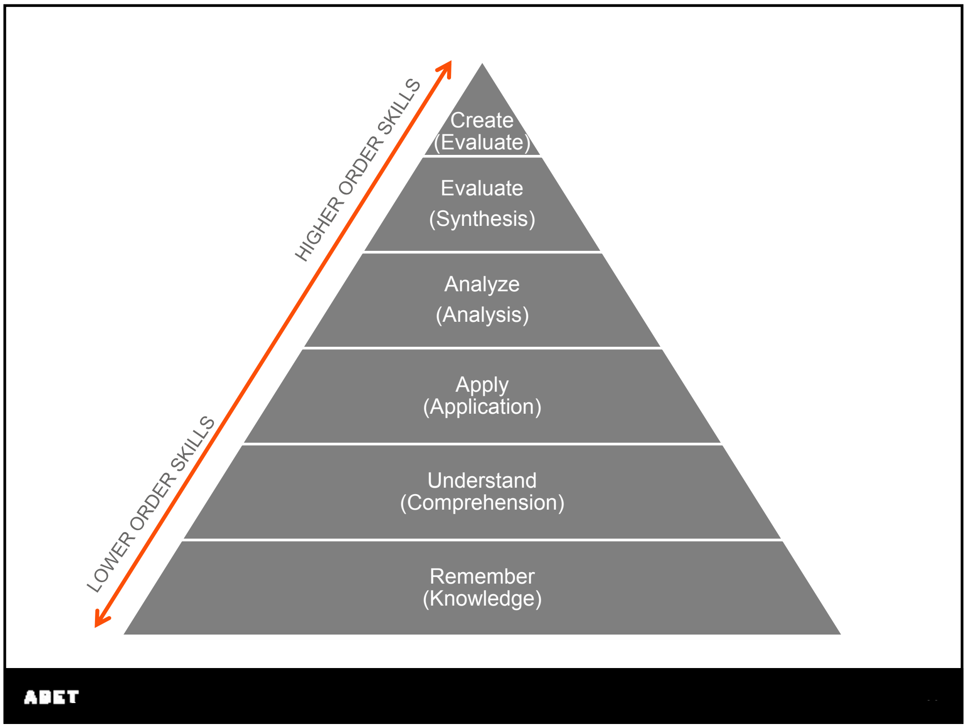
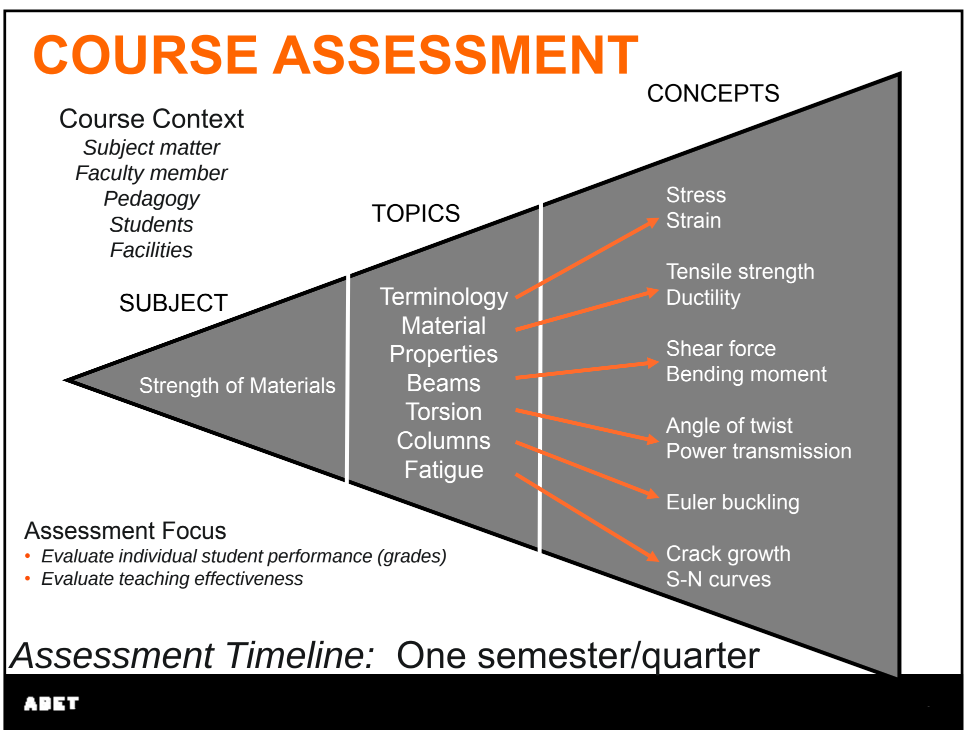
COURSE ASSESSMENT AND PROGRAM ASSESSMENT

SIMILARITIES AND DIFFERENCES

COURSE ASSESSMENT




HIGHER ORDER SKILLS
LOWER ORDER SKILLS
Create
(Evaluate)
Evaluate
(Synthesis)
Analyze
(Analysis)
Apply
(Application)
Understand
(Comprehension)
Remember
(Knowledge)
ABET


COURSE ASSESSMENT
Course Context
Subject matter
Faculty member
Pedagogy
Students
Facilities
SUBJECT
Strength of Materials
TOPICS
Terminology
Material
Properties
Beams
Torsion
Columns
Fatigue
CONCEPTS
Stress
Strain
Tensile strength
Ductility
Shear force
Bending moment
Angle of twist
Power transmission
Euler buckling
Crack growth
S-N curves
Assessment Focus
• Evaluate individual student performance (grades)
• Evaluate teaching effectiveness
Assessment Timeline: One semester/quarter
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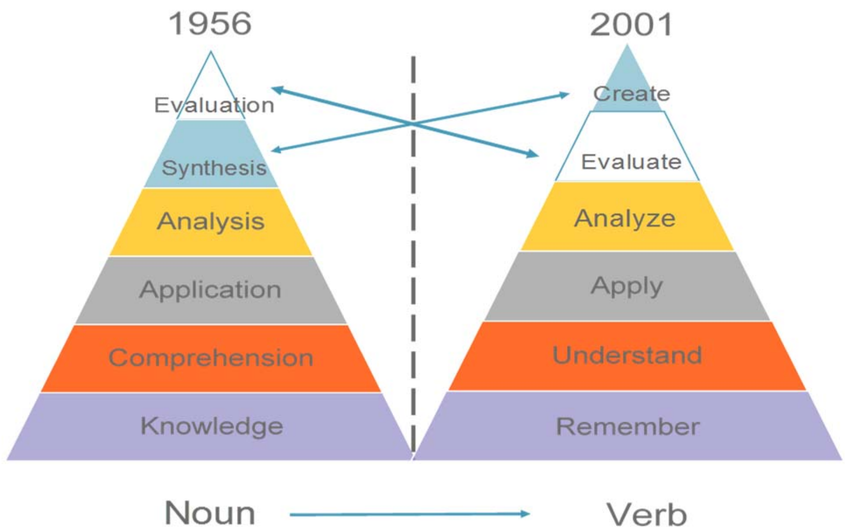
CHANGES TO BLOOM'S TAXONOMY

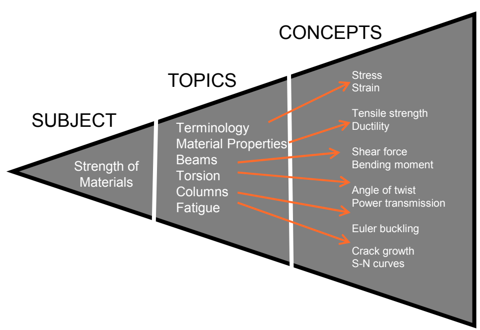


Great web reference: http://www.celt.iastate.edu/teaching/RevisedBlooms1.html
Great presentation: http://prezi.com/gb4mbz9vg7hg/blooms/

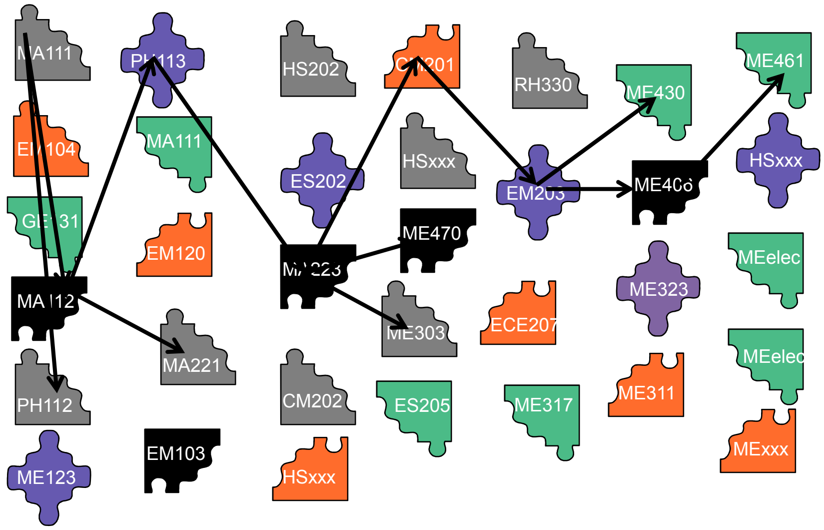
Anderson and Krathwohl, 2001

COURSE ASSESSMENT

- Cannot "cover" all topics related to subject
- Cannot "cover" all concepts related to each topic
- Decisions made based on context of course and characteristics of students
- Not all concepts are at the same performance (cognitive) level
- Assessment data taken at the concept level
- Assumptions related to performance on topics based on performance on concepts



COURSE ASSESSMENT



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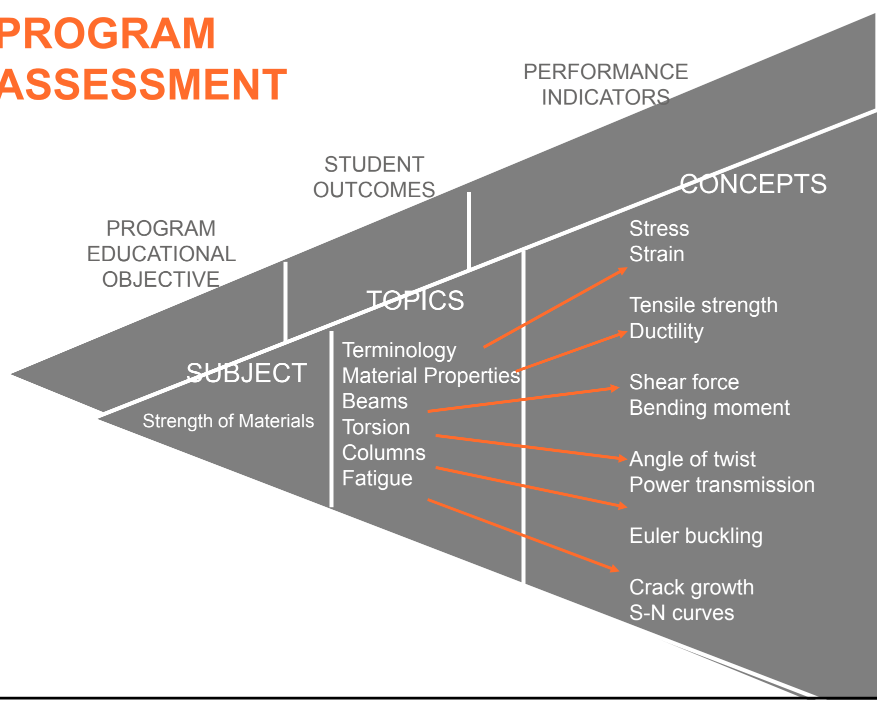
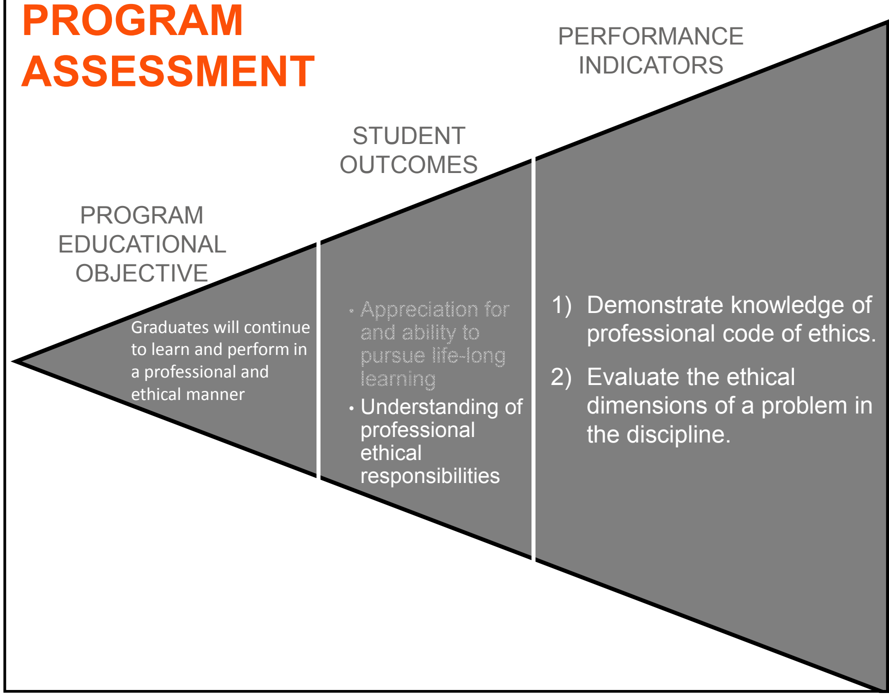
PROGRAM ASSESSMENT

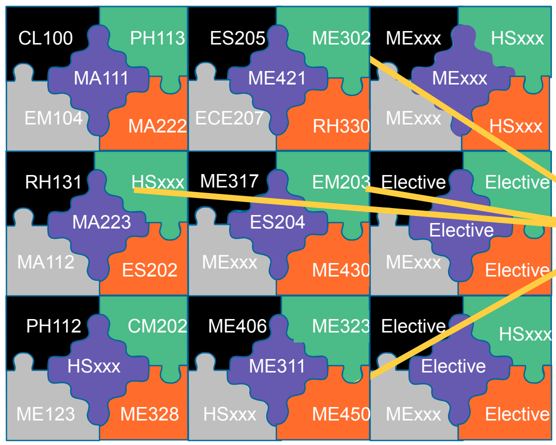


PROGRAM ASSESSMENT



Course Assessment	Program Assessment
• Cannot "cover" all Topics related to Subject	• Cannot "cover" all Outcomes related to Program Educational Objectives
• Cannot "cover" all Concepts related to each Topic	• Cannot "assess" all Performance Indicators related to each Outcome
• Decisions made based on context of course and characteristics of students	• Decisions made based on context of your program and characteristics of students
• Not all Concepts are at the same performance (cognitive) level	• Not all Performance Indicators are at the same expectation (cognitive) level
• Assessment data taken at the Concept level	• Assessment data taken at the Performance Indicator level
• Assumptions related to performance on Topics based on performance on Concepts	• Assumptions related to performance on Student Outcomes based on demonstration of Performance Indicators

PROGRAM ASSESSMENT



Student Outcomes:

Technical

Ethics

Global

Teams

Cultural

Communications Skills

Contemporary Issues

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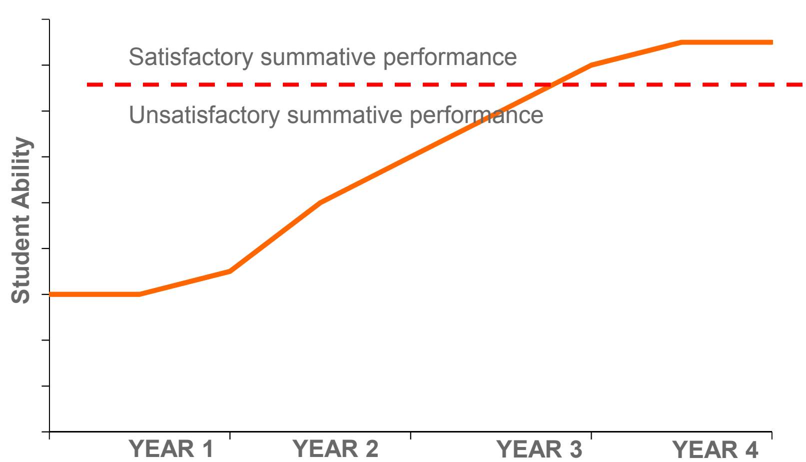
CUMULATIVE EFFECT OF LEARNING OVER TIME



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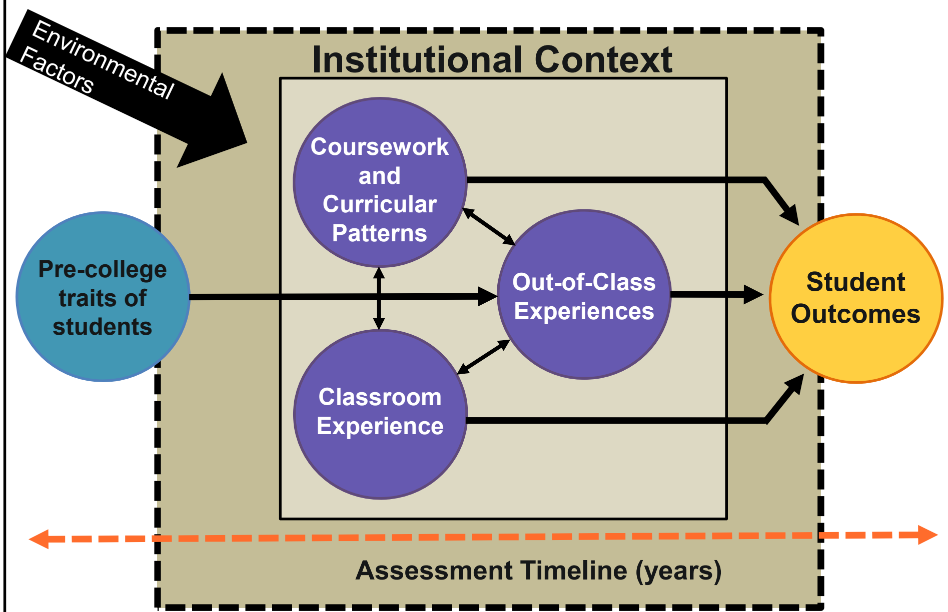
CONTEXT FOR PROGRAM LEVEL ASSESSMENT



Adapted from Terenzini et al. (1994, 1995)

GRADES ≠ ASSESSMENT

- Grades have limited use for program assessment as they do not have diagnostic value.
- Grades can be a ‘flag,’ but do not point to specific strengths and weaknesses of what students know or can do.
- A student’s grade in a course or on a project or exam represents the student’s performance on an set of aggregated knowledge/skills.

DIFFERENCES BETWEEN CLASSROOM AND PROGRAM ASSESSMENT

- ✓Degree of complexity
- ✓Time span
- ✓Accountability for the assessment process
- ✓Cost
- ✓Level of faculty buy-in
- ✓Level of precision of the measure

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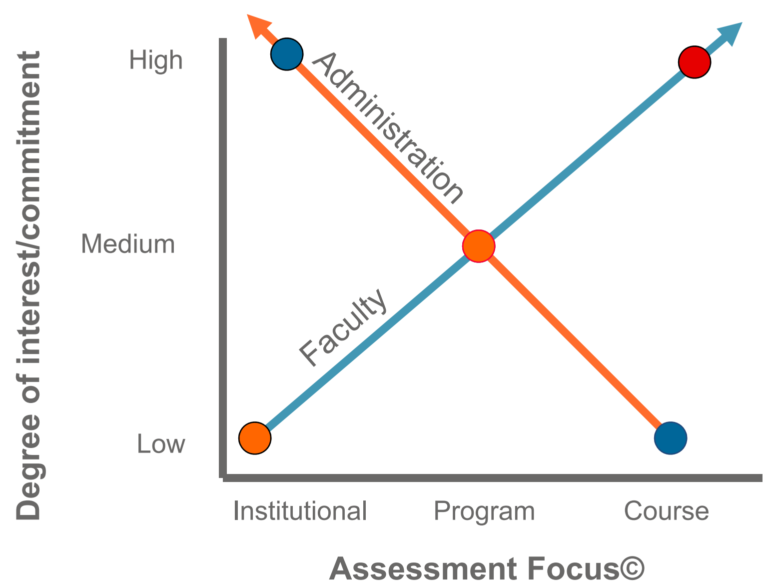

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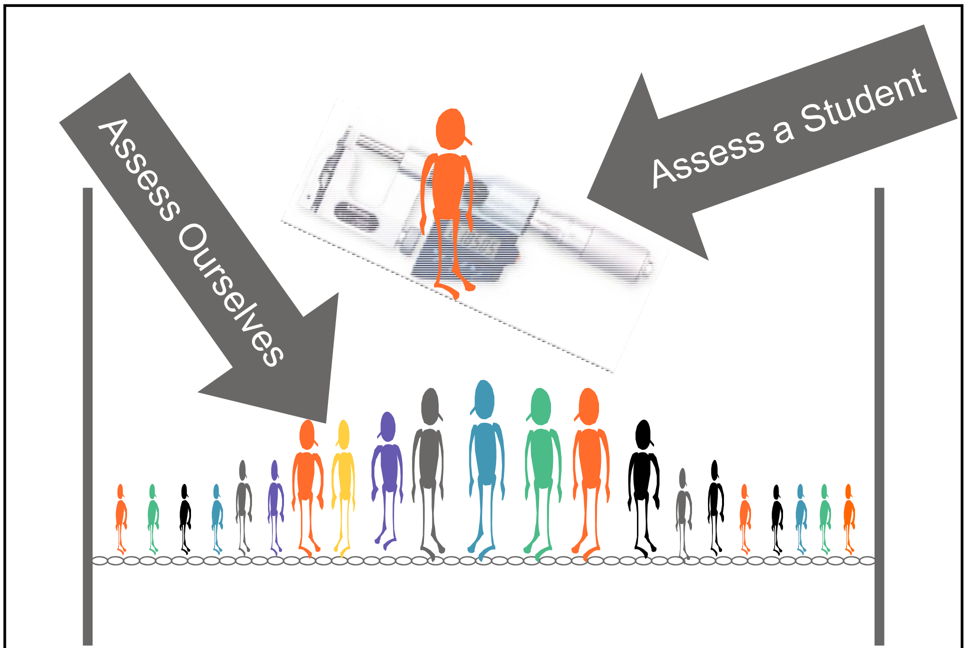
G. Rogers - ABET, Inc.



STUDENT OUTCOMES

MEASURING STUDENT ABILITIES

DEFINITION: STUDENT OUTCOMES

- From ABET Criteria:

Student outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills, and behaviors that students acquire as they progress through the program.

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Your program can:

- Adopt
- Adapt
- Add

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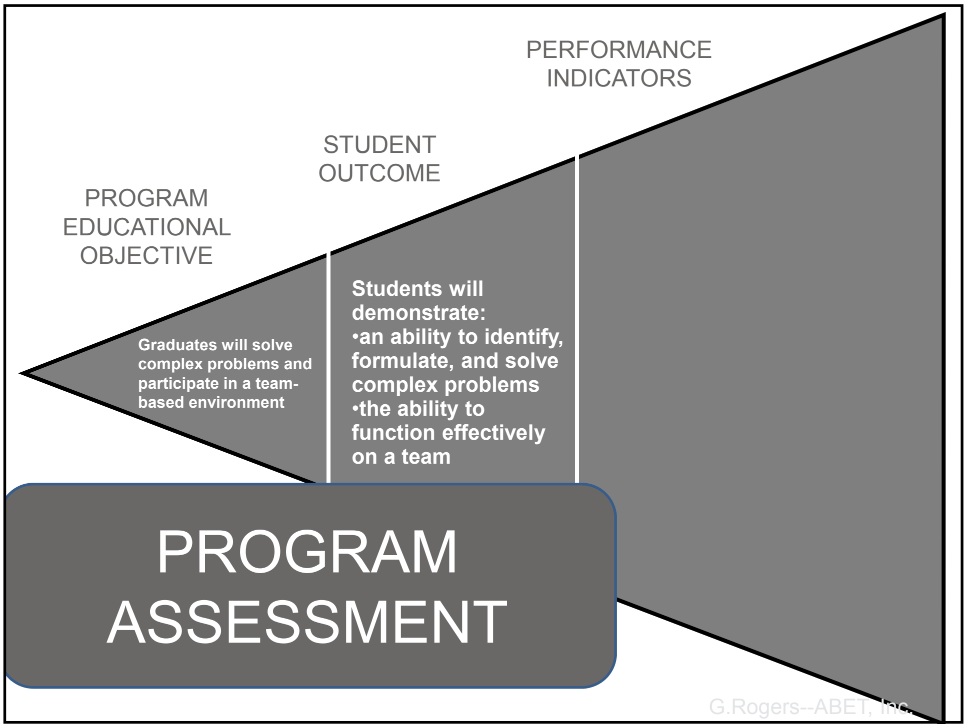
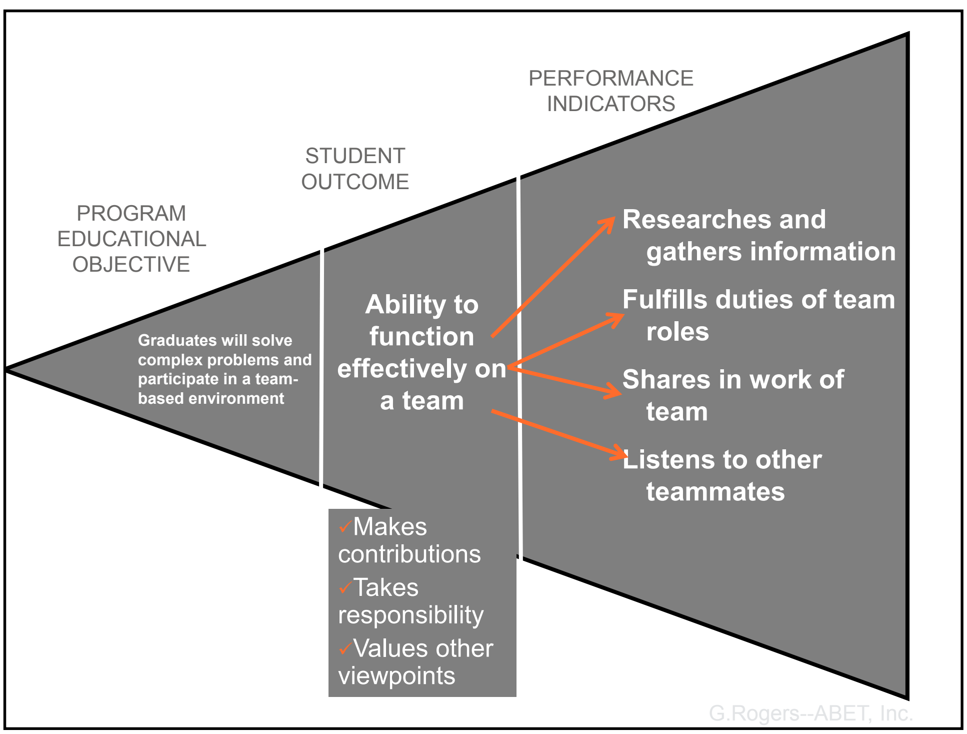

PERFORMANCE INDICATORS
STUDENT OUTCOME
PROGRAM EDUCATIONAL OBJECTIVE
Graduates will solve complex problems and participate in a team-based environment
Students will demonstrate:
•an ability to identify, formulate, and solve complex problems
•the ability to function effectively on a team
PROGRAM ASSESSMENT
G.Rogers--ABET, Inc.


PERFORMANCE INDICATORS
STUDENT OUTCOME
PROGRAM EDUCATIONAL OBJECTIVE
Graduates will solve complex problems and participate in a team-based environment
Ability to function effectively on a team
Researches and gathers information
Fulfills duties of team roles
Shares in work of team
Listens to other teammates
✓Makes contributions
✓Takes responsibility
✓Values other viewpoints
G.Rogers--ABET, Inc.

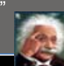
REMEMBER	**UNDERSTAND**	**APPLY**	**ANALYZE**	**EVALUATE**	**CREATE**
Arrange	Classify	Apply	Analyze	Appraise	Arrange
Define	Compare	Change	Appraise	Argue	Assemble
Describe	Compute	Choose	Break down	Assess	Construct
Duplicate	Convert	Calculate	Calculate	Choose	Collect
Identify	Contrast	Classify	Categorize	Compare	Compose
Label	Defend	Demonstrate	Compare	Contrast	Create
List	Describe	Determine	Contrast	Criticize	Design
Match	Differentiate	Employ	Criticize	Defend	Develop
Name	Distinguish	Examine	Debate	Discriminate	Formulate
Order	Estimate	Illustrate	Diagram	Estimate	Integrate
Outline	Explain	Interpret	Differentiate	Evaluate	Manage
Recite	Extrapolate	Modify	Discriminate	Explain	Organize
Recognize	Generalize	Operate	Distinguish	Interpret	Plan
Relate	Interpolate	Practice	Examine	Judge	Prepare
Repeat	Locate	Predict	Experiment	Measure	Prescribe
Reproduce	Paraphrase	Prepare	Indentify	Predict	Produce
Select	Predict	Produce	Infer	Rank	Propose
State	Recognize	Restructure	Inventory	Rate	Specify
Tabulate	Review	Schedule	Relate	Recommend	Synthesize
Tell	Summarize	Sketch	Separate	Select	Write
	Translate	Solve	Subdivide	Support	
		Use	Test	Validate	

REMEMBER	**UNDERSTAND**	**APPLY**	**ANALYZE**	**EVALUATE**	**CREATE**
Arrange	Classify	Apply	Analyze	Appraise	Arrange
Define	Compare	Change	Appraise	Argue	Assemble
Describe	Compute	Choose	Break down	Assess	Construct
Duplicate	Convert	Calculate	Calculate	Choose	Collect
Identify	Contrast	Classify	Categorize	Compare	Compose
Label	Defend	Demonstrate	Compare	Contrast	Create
List	Describe	Determine	Contrast	Criticize	Design
Match	Differentiate	Employ	Criticize	Defend	Develop
Name	Distinguish	Examine	Debate	Discriminate	Formulate
Order	Estimate	Illustrate	Diagram	Estimate	Integrate
Outline	Explain	Interpret	Differentiate	Evaluate	Manage
Recite	Extrapolate	Modify	Discriminate	Explain	Organize
Recognize	Generalize	Operate	Distinguish	Interpret	Plan
Relate	Interpolate	Practice	Examine	Judge	Prepare
Repeat	Locate	Predict	Experiment	Measure	Prescribe
Reproduce	Paraphrase	Prepare	Indentify	Predict	Produce
Select	Predict	Produce	Infer	Rank	Propose
State	Recognize	Restructure	Inventory	Rate	Specify
Tabulate	Review	Schedule	Relate	Recommend	Synthesize
Tell	Summarize	Sketch	Separate	Select	Write
	Translate	Solve	Subdivide	Support	
		Use	Test	Validate	

STUDENT OUTCOMES SHOULD FOCUS ON:

- What do you want students to know/do by the time they complete the program?
  - Transfer of learning
    - What is the cumulative knowledge or skills you what students to demonstrate by the time they complete the program?
  - Critical abilities, knowledge, and skills developed over time.

"NOT EVERYTHING THAT COUNTS CAN BE MEASURED. NOT EVERYTHING THAT CAN BE MEASURED COUNTS."



PERFORMANCE INDICATORS

COMPARABLE TO LEADING INDICATORS

- Concept used in economics
- Identify specific characteristics of the economy that are significant indicators of the current state and predict future trends
  - Not everything
  - Those that have found to be the most critical in predicting how well the economy is doing
  - Several characteristics taken together

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DEVELOPING PERFORMANCE INDICATORS

- Two essential parts
  - Subject content
    - Content that is the focus of instruction (e.g., steps of the design process, chemical reaction, scientific method)
  - Action verb
    - Direct students to a specific performance (e.g., “list,” “analyze,” “apply”)

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WHAT TO AVOID IN WRITING PERFORMANCE INDICATORS:

- Verbs that describe feelings, emotions, thoughts or similar features that are not observable or measurable
  - E.g., appreciate, believe, know, learn, realize, think, understand.
- Descriptions of what the student will do
  - E.g., "write a paper on social issues," "demonstrate how to use a laser guide . . ."
- REMEMBER: write performance indicators from the perspective of what the student should be able to demonstrate by means of the assessment

PERFORMANCE INDICATORS

- Students should be able to:
  - <<action verb>>
  - <<something>>
- Learner-centered
- Specific action-oriented
- Measurable
- Cognitively appropriate for intended level

Application:

PERFORMANCE INDICATORS

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CHOOSE AN OUTCOME

1. An ability to communicate effectively (speaking) (EAC, CAC)
2. Knowledge of contemporary issues (EAC)
3. Recognition of the need for, and an ability to engage in continued professional development (EAC, CAC, ETAC)
4. Ability to identify, formulate and solve technical problems (EAC, CAC, ETAC)
5. Ability to use current techniques, skills, and tools necessary for practice (EAC, CAC)
6. Knowledge of the impact of … solutions in a societal and global context (EAC, CAC)

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SILENT BRAINSTORMING

Step 1: At your table, select one student outcome specific to your commission. If more than one commission is represented at your table, select a student outcome that is either shared or very similar between the commissions.

Step 2 (5 minutes): Now your table has selected their student outcome, each person will spend 5 minutes silently brainstorming performance indicators for the outcome.

- Write down **one performance indicator per post-it note**. Remember that each performance indicator should include a measurable action verb and a content referent. A list of action verbs can be found on the next pages. This step should be **completed individually without discussion.**

\

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AFFINITY PROCESS

Step 3 (20 minutes): Once each person has developed performance indicators (one performance indicator per post-it note), place all the post-it notes on the flip chart.

As you have all been working on the same student outcome there will be some similarities between the performance indicators. Group the **performance indicators by content NOT action verb.**

After all the Post-It notes have been grouped, the team should determine an appropriate action verb for each performance indicator grouping. Be sure to discuss any “outliers.” It is not unusual that these are important and should not be overlooked.

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DOCUMENT PERFORMANCE INDICATORS

Step 4 (5 minutes): The final step is to draft your finalized performance indicators.

Write these out on a sheet of plain paper using a sharpie. Each group of post-it notes on the flipchart should represent one performance indicator.

Remember to include the student outcome and your table number at the top of your paper.

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IMPORTANCE OF WELL-STATED PERFORMANCE INDICATORS

- Provides faculty with clear understanding for implementation in the classroom
- Makes expectations explicit to students (great pedagogy)
- Focuses data collection

ABET

CRITERION 3 – COMMON ISSUES
STUDENT OUTCOMES

- Student outcomes are stated such that attainment is not measurable. (Note: Having student outcomes whose attainment is not measurable is not by itself a violation of any criterion, but if attainment of an outcome is not measurable then the extent to which it is attained may not be appropriately evaluated, as required in Criterion 4.)
- There is missing or incomplete justification as to how the student outcomes prepare graduates to attain the program educational objectives.

ABET

CRITERION 3 – COMMON ISSUES
STUDENT OUTCOMES

- The student outcomes do not reflect what the students should know and be able to do at the time of graduation.
- There is no process to periodically review and revise the student outcomes. (ASAC, CAC, ETAC only.)

ABET

RUBRICS

Scoring the level of student performance

WHAT IS A RUBRIC?

- ✓ "Rubrics" are a way of explicitly stating the expectations for student performance. They may lead to a grade or be part of the grading process but they are more specific, detailed, and disaggregated than a grade.
- ✓ Rubrics provide a description of each level of performance as to what is expected.
- ✓ The rubric provides those who have been assessed with clear information about how well they performed and a clear indication of what they need to accomplish in the future to better their performance.

ABET

LEVELS OF PERFORMANCE

COMMUNICATION SKILLS

	Unsatisfactory	Developing	Satisfactory	Exemplary
Indicator #1				
Indicator #2				
Indicator #3				
Indicator #4				

DIMENSIONS

DESCRIPTORS

DIMENSIONS

COMMUNICATION SKILLS

	Indicator #1	Indicator #2	Indicator #3	Indicator #4
Unsatisfactory				
Developing				
Satisfactory				
Exemplary				

LEVELS OF PERFORMANCE

DESCRIPTORS

WHAT IS A RUBRIC?

- ✓ Tool to score student performance in an assessment environment (e.g., oral presentation, local exam, performance observation, etc.)
- ✓ Can be used for both formative and summative purposes
- ✓ Defines expectations, and especially useful when dealing with processes or abstract concepts
- ✓ Provides a common "language" to help faculty and students talk about expected learning
- ✓ Increases reliability of the assessment when using multiple raters

ABET

PURPOSE OF RUBRIC

- How you are going to use the results drives decisions about rubrics
  - What kind of feedback do you want?
    - Individual student/program
    - General/specific
  - How will data be collected?
    - Formative/summative
    - Developmental over time/single point in time
  - For whom?
    - Student
    - Faculty member
    - Program

ABET

HOW ARE YOU GOING TO USE RESULTS?

- Do you want general information about student performance?
- Do you want specific information about student competence?

ABET

TYPE OF RUBRIC - HOLISTIC

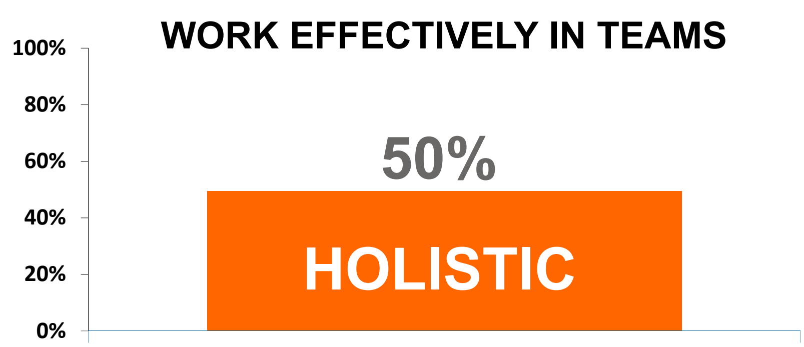
- Holistic rubric provides general information about student learning
  - Raters make judgments by forming an overall impression of a performance and matching it to the best fit from among the descriptions on the performance levels
  - Each category of the performance levels describes performance on several performance indicators

ABET

WORK EFFECTIVELY IN TEAMS

UNSATISFACTORY	DEVELOPING	SATISFACTORY	EXEMPLARY
• Does not collect any information that relates to the topic. • Does not perform any duties of assigned team role. • Always relies on others to do the work. • Is always talking--never allows anyone else to speak.	• Collects some information relate to the topic but incomplete. • Inconsistently performs duties that are assigned • Rarely does the assigned work--often needs reminding. • Usually doing most of the talking--rarely allows others to speak.	• Collects basic information related the topic. • Performs duties that are assigned • Usually does the assigned work--rarely needs reminding. • Listens most of the time	• Collects a great deal of information which goes beyond the basics. • Performs all duties assigned and actively assists others. • Always does the assigned work without having to be reminded. • Consistently listens and responds to others appropriately.

EXAMPLE OF RESULTS - FORMATIVE



Percent of students who perform at or above satisfactory level
n=60 (population)

TYPE OF RUBRIC - ANALYTIC

- Analytic performance levels focus on specific dimensions of student performance related to performance indicators.
- Dimensions are presented in separate categories and rated individually.
- Each performance indicator is rated separately.

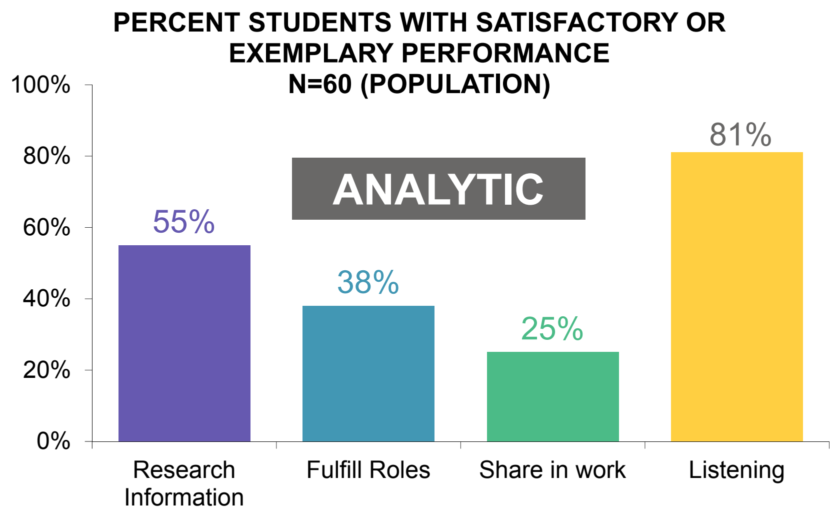
ABET

WORK EFFECTIVELY IN TEAMS

	UNSATISFACTORY	DEVELOPING	SATISFACTORY	EXEMPLARY
RESEARCH & GATHER INFORMATION	Does not collect any information that relates to the topic.	Collects very little information--some relates to the topic.	Collects some basic information--most relates to the topic.	Collects a great deal of information--all relates to the topic.
FULFILL TEAM ROLE'S DUTIES	Does not perform any duties of assigned team role.	Performs very few duties.	Performs nearly all duties.	Performs all duties of assigned team role.
SHARE IN WORK OF TEAM	Always relies on others to do the work.	Rarely does the assigned work--often needs reminding.	Usually does the assigned work--rarely needs reminding.	Always does the assigned work without having to be reminded.
LISTEN TO OTHER TEAMMATES	Is always talking--never allows anyone else to speak.	Usually doing most of the talking--rarely allows others to speak.	Listens, but sometimes talks too much.	Listens and speaks a fair amount.

ABET

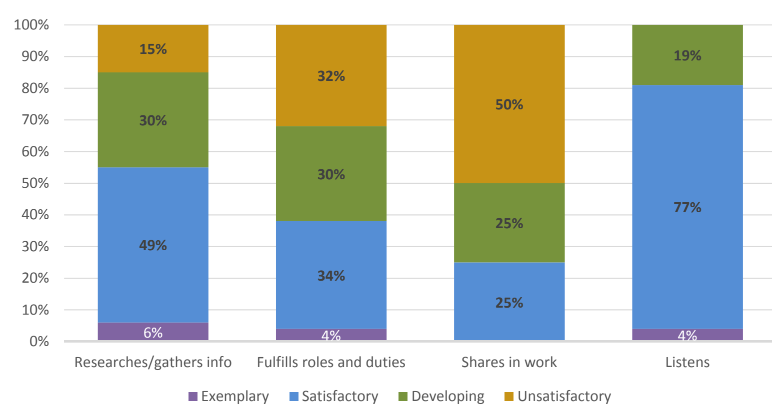
TEAMING SKILLS - FORMATIVE



ABET

TEAMING SKILLS - FORMATIVE

n=60 (population)



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STRENGTH OF ANALYTIC RUBRIC

- Provides information about relative strengths and weaknesses of student performance related to an outcome.
- Provides detailed feedback which can be used to promote curricular enhancements
- Useful for assessment of abstract concepts or processes
- Provides students an opportunity to self-assess their understanding or performance

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GENERIC OR TASK-SPECIFIC RUBRIC

- Generic
  - Rubric that can be used across similar performances (used across *all* communication tasks or problem-solving tasks)
- Task-specific
  - Rubric which is designed for a single task
  - Cannot be generalized across a wide variety of student work

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HOW MANY LEVELS OF PERFORMANCE?

- Consider both the nature of the performance and purpose of scoring
- Recommend 3 to 5 levels to describe student achievement at a single point in time
- If focused on developmental curriculum (growth over time) more performance levels are needed (i.e., 6-???)
- More performance levels, the more difficult it is to get inter-rater reliability

DEVELOPING RUBRICS

- Be clear about how the rubric is to be used
  - Program assessment
  - Individual student assessment
- Analytic/Holistic
  - For process improvement, analytic rubric provides information that can be used to focus instruction in areas of weakness
- Can use student work as a guide in developing rubric
- Start with extremes and work toward middle
- Pilot test
- Rubric development is a process

PLEASE RATE EACH MEMBER OF THE TEAM ON THE FOLLOWING SCALE:

UNSATISFACTORY	DEVELOPING	SATISFACTORY	EXEMPLARY
1	2	3	4

NAME	ATTRIBUTE	1	2	3	4
	Produces research information for team				
	Demonstrates understanding of team roles when assigned				
	Shares in the work of the team				
	Demonstrates good listening skills				
	Produces research information for team				
	Demonstrates understanding of team roles when assigned				
	Shares in the work of the team				
	Demonstrates good listening skills				
	Produces research information for team				
	Demonstrates understanding of team roles when assigned				
	Shares in the work of the team				
	Demonstrates good listening skills				
	Produces research information for team				
	Demonstrates understanding of team roles when assigned				
	Shares in the work of the team				
	Demonstrates good listening skills				

OUTCOME: WORK EFFECTIVELY IN TEAMS

	UNSATISFACTORY	DEVELOPING	SATISFACTORY	EXEMPLARY
RESEARCH & GATHER INFORMATION	Does not collect any information that relates to the topic.	Collects some information relate to the topic but incomplete.	Collects basic information related the topic.	Collects a great deal of information which goes beyond the basics.
FULFILL TEAM ROLE'S DUTIES	Does not perform any duties of assigned team role.	Inconsistently performs duties that are assigned	Performs duties that are assigned	Performs all duties assigned and actively assists others.
SHARE IN WORK OF TEAM	Always relies on others to do the work.	Rarely does the assigned work--often needs reminding.	Usually does the assigned work--rarely needs reminding.	Always does the assigned work without having to be reminded.
LISTEN TO OTHER TEAMMATES	Is always talking--never allows anyone else to speak.	Usually doing most of the talking--rarely allows others to speak.	Listens most of the time	Consistently listens and responds to others appropriately.

STUDENT	RESEARCH & GATHER INFORMATION	FULFILL TEAM ROLE'S DUTIES	SHARE IN WORK OF TEAM	LISTEN TO OTHER TEAMMATES
Marcus Wellman	Satisfactory	Satisfactory	Satisfactory	Satisfactory
David Willison	Satisfactory	Developing	Satisfactory	Exemplary
Dottie Whitely	Developing	Developing	Developing	Satisfactory
...n...	…	…	…	…

DEVELOPING RUBRICS

Identify characteristics you want to be demonstrated by students (Performance Indicators)

Determine how rubric will be used: Analytic or holistic, generic or task-specific

Write narrative description for each performance level (satisfactory, excellent, etc.)

Pilot test the rubric for interrater reliability

Review usefulness of rubric after applying and revise (if necessary)

ABET

Application:

DEVELOPMENT OF RUBRICS

ABET

RUBRIC TEMPLATE

Student Outcome____

	Performance Level (Descriptor)	Performance Level (Descriptor)	Performance Level (Descriptor)	Performance Level (Descriptor)
Performance Indicator				
Performance Indicator				
Performance Indicator				
Performance Indicator				

EXERCISE: RUBRIC DEVELOPMENT
(30 MINUTES)

Step 1: Using the outcome and performance indicators you developed, create an analytic rubric (at least four rows).

Step 2: Determine how many performance levels

Step 3: Description of each performance level

Should be value free--free from subjective values or standards as best you can (avoid use of words like “many,” “most,” “few,” “little”)

Step 4: Remember: How will the findings be used? Will findings enable you to make decisions about program improvement?

Step 5: Use the template provided or develop your own using a blank piece of paper. Please use a dark pen or fine-tipped marker so that your rubric can be seen using the document camera.

Application:

CALIBRATING RUBRICS

EXERCISE: RUBRIC CALIBRATION PROCESS

Constraints:

- We are not grading the papers.
- Do not change the rubrics.
- Don't overthink your assessment.
- Think globally about the student work and about the learning skill.
  - Start with the high rubric level and work backward. Ask what is missing here that would bring the score down?
- N/A may exist (meaning that the work is not intended to meet a particular performance indicator).

CALIBRATION PROCESS

An assignment was given asking students to write a one-page executive summary of a paper on the ethical considerations of the Bhopal disaster. This assignment was designed to demonstrate the student outcomes: Professionalism and ethics, and writing

Step 1-- Individual Assessment (10 minutes): Each person at the table should read through the executive summary and, using the rubrics provided, assess how well the students demonstrate the student outcomes.

Step 2 -- Group Discussion (15 minutes): Using your flip chart, record the scores for each group member. Discuss and record the group's observations, insights and questions.

* AAC&U, 2013

EXAMPLE OF SCORE SHEET (ETHICS)

	Needs Imp	Meets Expect	Exceeds Expect
Knowledge of codes	*Initials*	*Initials*	*Initials*
In ethical/ professional behavior	*Initials*	*Initials*	*Initials*
Recognize ethical dilemmas	*Initials*	*Initials*	*Initials*

EXAMPLE OF TEAM SCORE SHEET (WRITING)

	Not Accept	Below Expect	Meets Expect	Exceeds Expect
Articulation of ideas	*Initials*	*Initials*	*Initials*	*Initials*
Professionalism	*Initials*	*Initials*	*Initials*	*Initials*
Organization	*Initials*	*Initials*	*Initials*	*Initials*
Quality of work	*Initials*	*Initials*	*Initials*	*Initials*
Use of graphs/tables/ etc.	*Initials*	*Initials*	*Initials*	*Initials*

Executive Summary—Ethical Considerations of the Bhopal Disaster.

Throughout history there have been many disasters involving chemicals that have affected the chemical industry. Out of all these disasters there may not be a disaster with more impact on the industry than the Bhopal Disaster of 1984. The Bhopal Disaster took place on the night of December 3rd, 1984 at a Union Carbide plant in Bhopal, India. This plant was used to produce a pesticide called Sevin. The main ingredient in Sevin is methyl isocyanate (MIC). MIC reacts violently with water, and inhalation of its vapors can cause blindness and severe lung damage. Large quantities of MIC were being held in three large storage tanks. With normal safety measures in place at the plant, most common accidents would not be a problem. Unfortunately the Bhopal plant did not have all the necessary safety nets in place.

In the late hours of December 3, 1984, approximately one ton of water leaked into a tank containing MIC. As the water reacted with the MIC, the tank the pressure built until it blew the top off the tank. The iron in the tank reacted with the MIC and caused a large secondary explosion, sending large amounts of MIC into the air. Because MIC is heavier than air, the MIC vapors settled on a high density of people living around the plant. The secondary explosion resulted in the death of around 3,800 people in the hours following the explosion. As the night wore on more MIC leaked into the air and more and more people were exposed to MIC. After the first few days of the accident it was estimated that around 10,000 people had died and 500,000 people had been exposed to MIC.

When a disaster of this magnitude takes place there are always multiple factors that have an effect. This disaster was no different and ethical considerations are a major part. The basics of the disaster is the problem of safety violations by plant management, which is the first concern of the Code of Conduct of engineers. The reports on the disaster show that there were many safety measures that could have helped stop this disaster. A major failure in safety was that preventative measures in place in the plant for MIC leaking did not work or had been shut down to save on costs. With all of these safety measures out of commission there was almost no way to stop the MIC once it got out of the storage tank. Another contributing factor to the disaster was that the operators of the plant were not well trained. The operator working that night did not understand the chemical process and was not trained to deal with what was going on. He called one of the scientists who had invented the process and was on site. By the time the scientist got to the operation control room it was too late to stop the disaster. The last factor is political in that at the high density of people lived as "squatters" in shanty towns around the plant. Once the MIC was in the air it was able to affect a large amount of people in a short amount of time.

While this horrible disaster is a gross example of the consequences of poor manufacturing practices, it serves as a lesson in safety and ethics to the chemical industry around the world. Clearly safety equipment should not be shut down as the harm to the public was significant. Second, the MIC should have been stored in smaller quantities, a cost consideration that should have been managed. Training of employees should also be mandatory since the Engineering Code of Conduct requires that engineers only work in their area of expertise. Citizens living near chemical plants also have the right to know about the dangers of the chemical produced at the plant. However, governments should also enforce zoning and possibly make sure a safe border exists around plants that produce harmful chemicals. The silver lining is that this disaster led to many changes in the chemical industry and led to a closer look at better safety and ethics in plant management for the future.

Outcome H: An understanding of professional and ethical responsibility

Rating Scale / Element	Needs Improvement	Meets Expectations	Exceeds Expectations
Knowledge of professional codes of ethics	Is aware of ethical standards such as the Code of Professional Engineers, the AIChE Code of Ethics, and the MSU Students' Rights and Responsibilities Document.	Applies relevant aspects of codes of ethics when considering possible alternative decisions or solutions.	Evaluates and judges a situation and possible future actions in terms of the appropriate professional code of ethics
Demonstration of professional and ethical behavior in the classroom [attendance, punctuality, professional work submitted]	Student work is unprofessional; has been caught plagiarizing	Student work is acceptable, but not exemplary; usually punctual with fairly regular class attendance	Is punctual, professional, and collegial; attends classes regularly; work is always neat and professional
Recognition of ethical dilemmas and use of appropriate tools and strategies in making ethical decisions [recognizes when an issue is an ethical decision versus a purely technical decision, applies decision-making models, applies code(s) of ethics].	Identifies a situation in which ethical issues are concerned for the individual or other stakeholder, but does not use ethical decision-making models or uses personal opinion to evaluate	Applies ethical decision-making tools when considering an ethical issue in engineering or in the campus classroom; simple approach with little or no additional analysis	Identifies an ethical dilemma; evaluates and judges a situation using appropriate analysis tools; evaluates the credibility of information to make sound judgments

OUTCOME G: An ability to communicate effectively (WRITING)

Performance Criteria	Not Acceptable	Below Expectations	Meets Expectations	Exceeds Expectations
Articulation of Ideas - Written	Student does not articulate ideas at all	Text rambles, points made are only understood with repeated reading, and key points are not organized	Articulates ideas, but writing is somewhat disjointed and difficult to follow	Articulates ideas clearly and concisely
Professionalism - Written	The writing style is inappropriate for the audience and for the assignment	Style is informal or inappropriate, jargon is used, improper voice, tense, etc.	Usually uses good professional writing style	Uses good professional writing style
Organization - Written	Little or no structure or organization is used	Some structure and organization is used	Generally organized well but paragraphs combine multiple thoughts or sections are not identified clearly	Organized written materials in a logical sequence to enhance the reader's comprehension
Quality of Work - Written	Work is not presented neatly; spelling/grammar errors present throughout more than 1/3rd of the paper	Work is not neatly presented throughout; one or two spelling/grammar errors per page	Written work is usually presented neatly and professionally; grammar and spelling are usually correct	Written work is presented neatly and professionally; grammar and spelling are correct
Use of Graphs/Tables/ etc. - Written	No Figures, Tables, or graphics are used at all	Figures, Tables, and Graphics are present but are flawed (axes mislabeled, no data points, etc.)	Use of Figures, Tables, and Graphics that are usually in the proper format	Use of Figures, Tables, and Graphics that are all in proper format

CALIBRATION PROCESS

Step 3 -- Group Assessment (10 minutes): As a group, re-read the student summary and rate it using the rubrics. Each score should be reached by consensus. Record any instances where a consensus cannot be reached or any additional comments you consider pertinent.

Step 4 -- Rubric Critique (15 minutes): Discuss how useful the rubrics were. Things to consider are:

- Number of performance levels;
- Description of performance levels;
- Language specificity (was the language vague or subjective);
- Usefulness: does the scoring provide useful information about areas of strength and the need for improvement?

Step 5 -- Recommendations (5 minutes): What recommendations would you make to improve the rubrics?

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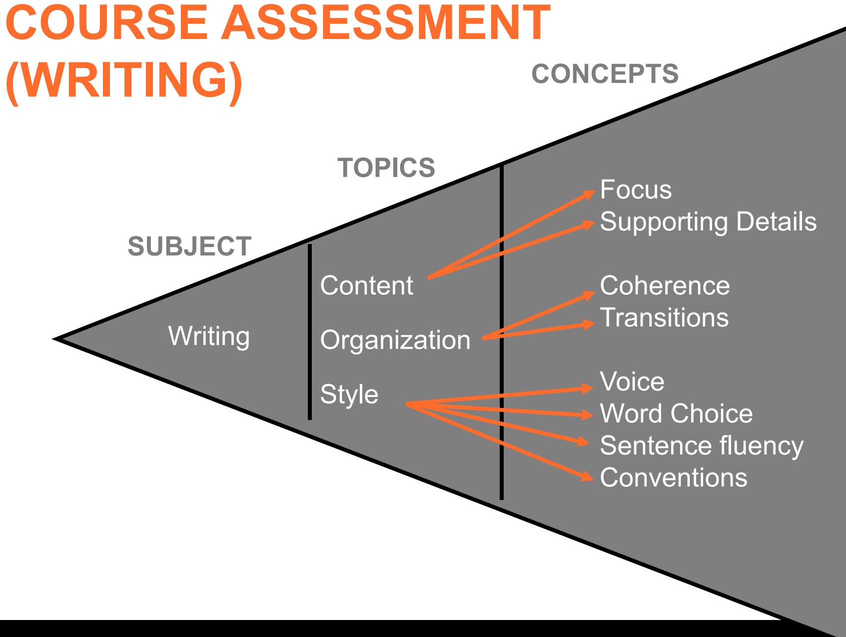
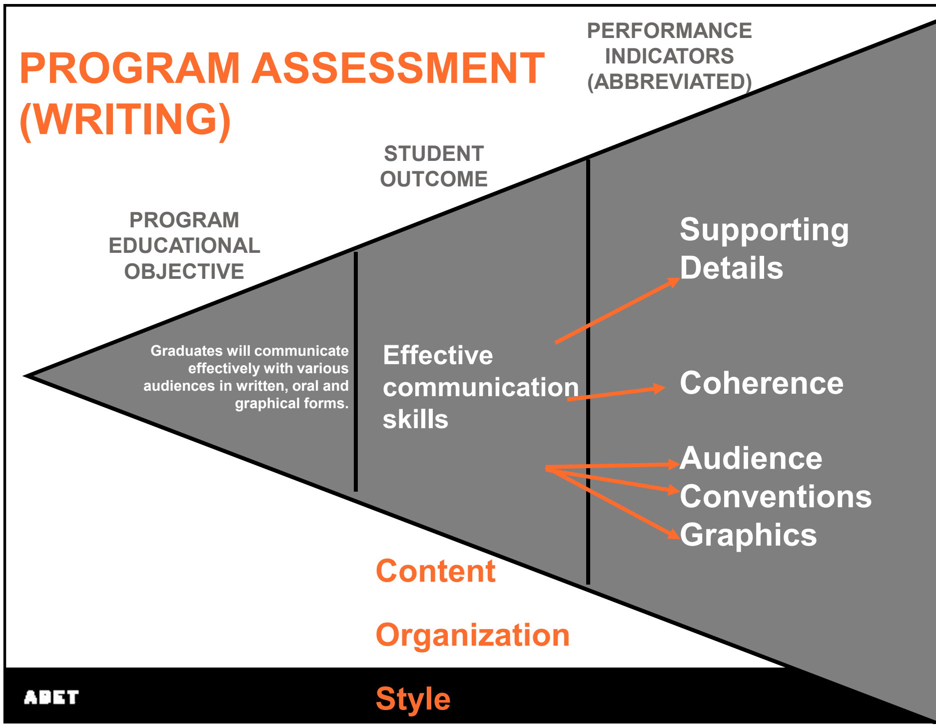
* AAC&U, 2013

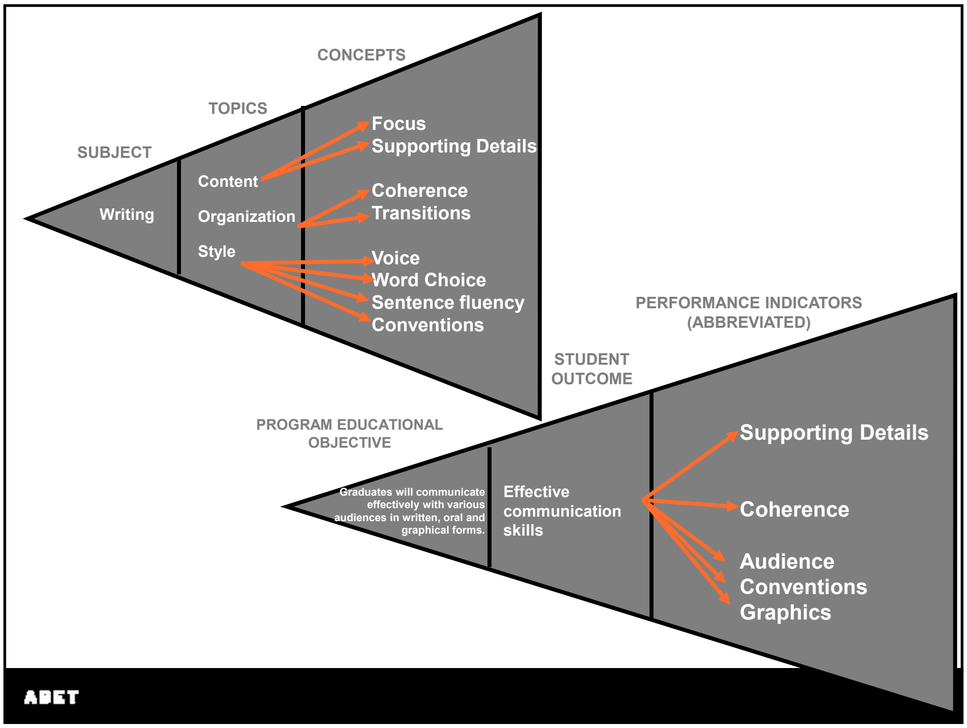
USE OF SCORE RUBRICS IN THE CLASSROOM

COURSE ASSESSMENT (WRITING)



PROGRAM ASSESSMENT (WRITING)




CONCEPTS
TOPICS
SUBJECT
Writing
Content
Organization
Style
Focus
Supporting Details
Coherence
Transitions
Voice
Word Choice
Sentence fluency
Conventions
PERFORMANCE INDICATORS (ABBREVIATED)
STUDENT OUTCOME
PROGRAM EDUCATIONAL OBJECTIVE
Graduates will communicate effectively with various audiences in written, oral and graphical forms.
Effective communication skills
Supporting Details
Coherence
Audience
Conventions
Graphics
ABET

Writing Skills Rubric

http://www.kent.k12.wa.us/KSD/KR/CP/WritingSkillsRubric.doc

Performance Indicators	Exceeds standard	Meets standard	Progressing to standard	Below standard
Focus	Maintains exceptional focus on the topic	Maintains consistent focus on the topic	Provides inconsistent focus on the topic	Demonstrates little or no focus
Supporting Details	Provides ample supporting details	Provides adequate supporting details	Includes some details, but may include extraneous or loosely related material	Includes inconsistent or few details which may interfere with the meaning of the text
Coherence	Organizational pattern is logical; conveys completeness & wholeness	Organizational pattern is logical; conveys completeness & wholeness with few lapses	Achieves little completeness & wholeness though organization attempted	Little evidence of organization or any sense of wholeness & completeness
Transitions	Provides transitions that eloquently serve to connect ideas	Provides transitions which serve to connect ideas	Provides transitions which are weak or inconsistent	Uses poor transitions or fails to provide transitions
Voice	Allows the reader to sense the person behind the words	Some sense of the person behind the words is evident	Some sense of the person behind the words is attempted	Little or no sense of the person behind the words is evident
Word Choice	Uses effective language; makes engaging, appropriate word choices for audience & purpose	Uses effective language & appropriate word choices for intended audience & purpose	Limited & predictable vocabulary, perhaps not appropriate for intended audience & purpose	Has a limited or inappropriate vocabulary for the intended audience & purpose
Sentence Fluency	Sentences/phrases appropriately varied in length & structure	Sentences/phrases somewhat varied in length & structure	Shows limited variety in sentence length & structure	Has little or no variety in sentence length & structure
Conventions	Consistently follows the rules of Standard English for conventions	Generally follows the rules for Standard English for conventions	Generally does not follow the rules of Standard English for conventions	Does not follow the rules of Standard English for conventions

Performance Indicators
Provides supporting details which enhances the quality of the report
Uses logical organizational pattern which enhances understanding
Uses language which is appropriate to audience
Applies the rules of standard English
Uses graphics which enhance audience understanding

Performance Indicators	Exceeds standard	Meets standard	Progressing standard
Focus	Maintains exceptional focus on the topic	Maintains consistent focus on the topic	Provides inconsistent on the topic
Supporting Details	Provides ample supporting details	Provides adequate supporting details	Includes some details may include extranec loosely related mater
Coherence	Organizational pattern is logical; conveys completeness & wholeness	Organizational pattern is logical; conveys completeness & wholeness with few lapses	Achieves little compl & wholeness though organization attempt
Transitions	Provides transitions that eloquently serve to connect ideas	Provides transitions which serve to connect ideas	Provides transitions w are weak or inconsist
Voice	Allows the reader to sense the person behind the words	Some sense of the person behind the words is evident	Some sense of the pe behind the words is attempted
Word Choice	Uses effective language; makes engaging, appropriate word choices for audience & purpose	Uses effective language & appropriate word choices for intended audience & purpose	Limited & predictable vocabulary, perhaps appropriate for inten audience & purpose
Sentence Fluency	Sentences/phrases appropriately varied in length & structure	Sentences/phrases somewhat varied in length & structure	Shows limited variety sentence length & str
Conventions	Consistently follows the rules of Standard English for conventions	Generally follows the rules for Standard English for conventions	Generally does not fo the rules of Standard for conventions

Adapted from http://www.kent.k12.wa.us/KSD/KR/CP/WritingSkillsRubric.doc

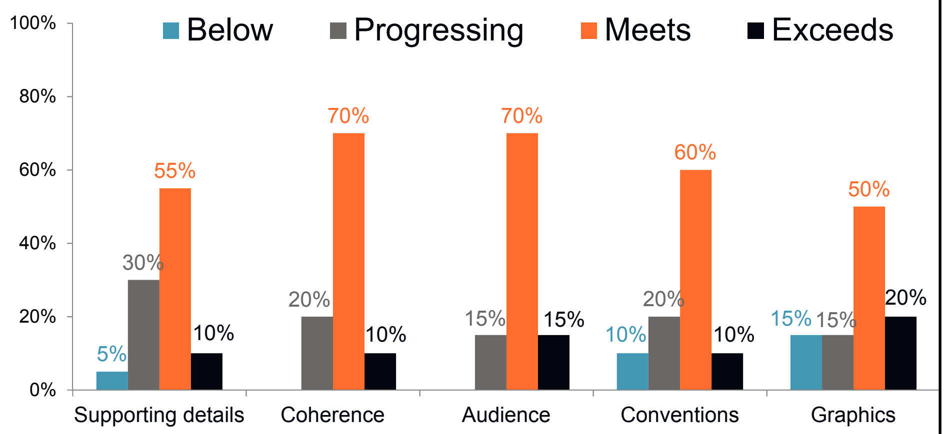
Ability to write effectively

Performance Indicators	Exceeds standard **Excellent** **16-20**	Meets standard **Good** **11-15**	Progressing to standard **Fair 6-10**	Below standard **Poor** **1-5**
Provides supporting details which enhances the quality of the report .25	Provides clarity of detail that enhances the overall quality of the report	Provides details that support the premise of the report	Includes some details, but also includes extraneous or loosely related material	Includes inconsistent or few details which interfere with the meaning of the text
Uses logical organizational pattern which enhances understanding .20	Organizational pattern is logical and conveys completeness & wholeness	Organizational pattern is logical with only minor lapses in coherence	Evidence of organization but completeness & wholeness is lacking	Little evidence of organization or any sense of wholeness & completeness
Uses language which is appropriate to audience .15	Uses effective language; makes engaging, appropriate word choices for audience & purpose	Uses effective language & appropriate word choices for intended audience & purpose	Limited & predictable vocabulary, perhaps not appropriate for intended audience & purpose	Has a limited or inappropriate vocabulary for the intended audience & purpose
Applies the rules of standard English .15	Consistently follows the rules of Standard English for conventions	Basically follows the rules for Standard English for conventions with only minor lapses	Generally does not follow the rules of Standard English for conventions	Does not follow the rules of Standard English for conventions
Uses graphics which enhance audience understanding .25	Figures and charts are appropriate, clear and communicate well to the audience	Figures and charts are clear and, with a few exceptions, communicate clearly to the audience.	Figures and charts are used to communicate but lack consistency in format and style detracting from audience understanding.	Figures and charts are missing or have deficiencies in formatting and style which detract from understanding.

STUDENT TOTAL POINTS = 100

COMMUNICATION SKILLS

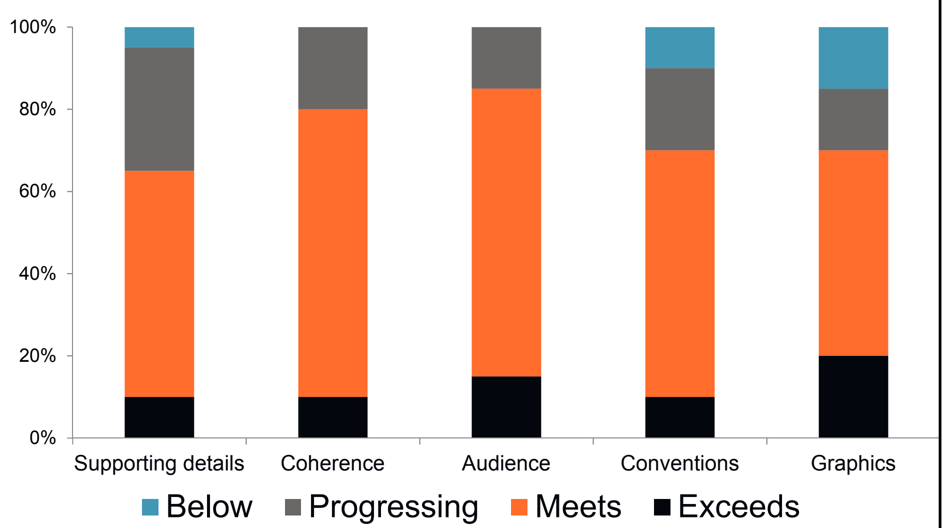
(60 STUDENTS/2 SECTIONS)



ABET

COMMUNICATION SKILLS

(60 STUDENTS/2 SECTIONS)



ABET

USE OF EXCEL TO SCORE PERFORMANCE

USING EXCEL TO CAPTURE RUBRIC SCORING

- Developed by IDEAL Senior Scholar, Dr. Donald Sanderson, East Tennessee State University
- Demo Excel spreadsheet
- See Appendix ("Using Excel")

ABET

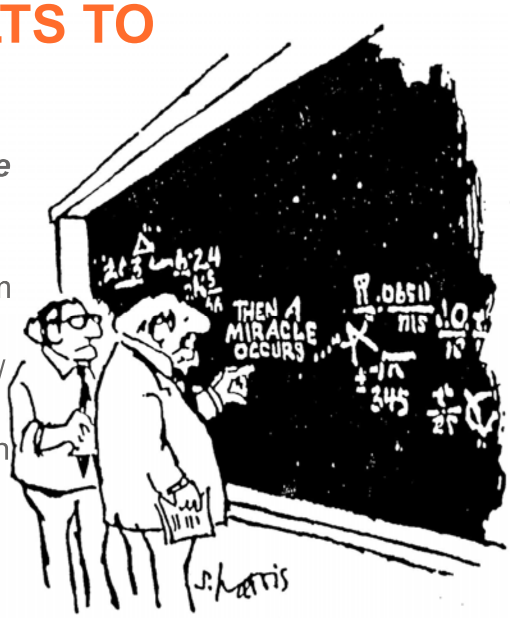
CURRICULUM MAPPING

Linking results to practice

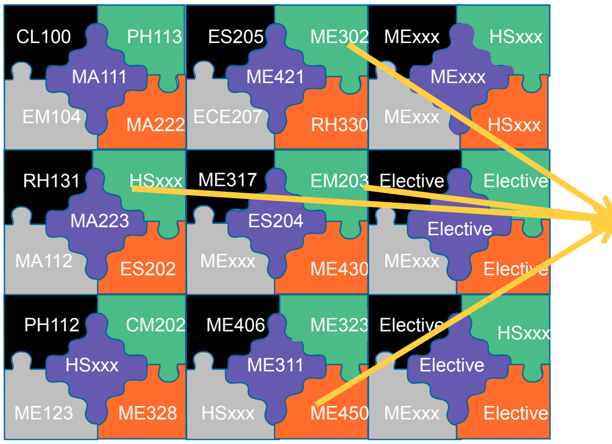
LINKING RESULTS TO PRACTICE

"I think you should be more explicit here in Step Two."

- Development of Curriculum Map
- Linking curriculum content/ pedagogy to knowledge, practice and demonstration of performance indicators.



PROGRAM ASSESSMENT



Student Outcomes:

Technical

Ethics

Global

Teams

Cultural

Communications Skills

Contemporary Issues

ABET

PURPOSE OF CURRICULUM MAP

- Demonstrates the alignment of the curriculum to student outcomes/performance indicators
- Enhances decisions about where to collect data for summative assessment
- Guides the evaluation process and decision-making about curriculum improvements

ABET

Performance indicator Explicit. This indicator is explicitly stated as performance for this course.
Demonstrate Competence. Students are asked to demonstrate their competence on this performance indicator through homework, projects, tests, etc.
Formal Feedback. Students are given formal feedback on their performance on this indicator.
Not covered. This performance indicator is not addressed in this course.
Note: Clicking on the link 'view rubric' will show you the scoring rubric for that particular performance indicators related to the outcome.

PERFORMANCE INDICATORS	INDICATOR EXPLICIT	DEMONSTRATE COMPETENCE	FORMAL FEEDBACK		NOT COVERED
RECOGNITION OF ETHICAL AND PROFESSIONAL RESPONSIBILITIES.					
1. Demonstrate knowledge of professional codes of ethics. View rubric or make a comment (optional)	☐ YES	☐ YES	☐ YES		☐
2. Evaluate the ethical dimensions of professional engineering, mathematical, and scientific practices. View rubric or make a comment (optional)	☐ YES	☐ YES	☐ YES		☐
AN ABILITY TO WORK EFFECTIVELY IN TEAM					
1. Research & Gather Information . View rubric or make a comment (optional)	☐ YES	☐ YES	☐ YES		☐
2. Fulfill Team Role's Duties . View rubric or make a comment (optional)	☐ YES	☐ YES	☐ YES		☐
3. Share in work of team . View rubric or make a comment (optional)	☐ YES	☐ YES	☐ YES		☐
4, Listen to Other Teammates . View rubric or make a comment (optional)	☐ YES	☐ YES	☐ YES		☐
AN ABILITY TO COMMUNICATE EFFECTIVELY IN ORAL, WRITTEN, GRAPHICAL, AND VISUAL FORMS					
1. Identify the readers/audience, assess their previous knowledge and information needs, and organize/design information to meet those needs. View rubric or make a comment (optional)	☐ YES	☐ YES	☐ YES		☐
2. Provide content that is factually correct, supported with evidence, explained with sufficient detail, and properly documented. View rubric or make a comment (optional)	☐ YES	☐ YES	☐ YES		☐
3. Test readers/audience response to determine how well ideas have been relayed. View rubric or make a comment (optional)	☐ YES	☐ YES	☐ YES		☐
4. Submit work with a minimum of errors in spelling, punctuation, grammar, and usage. View rubric or make a comment (optional)	☐ YES	☐ YES	☐ YES		☐

COMPILE THE MAP:

Curriculum map for communication skills

	FIRST YEAR	SOPHOMORE	JUNIOR	SENIOR
FALL	Intro to Eng	Statics	Materials	Design I
	Chem I	Physics II	Diff Eq	Biomech
	Composition I	Cacl III	Bio Instrum I	Biomaterials II
	Calc I	Comp Prog	Elective	Phys Sys
	Biology I	Elective	Gen Ed	Tissue Eng
	Gen Ed			Seminar
SPRING	Intro Design	Dynamics	Thermo	Design II
	Chem II	Org Chem	Bio Instrum II	Fluids
	Physics I	Calc IV	Biomaterials I	Eng Elective
	Calc II	Modeling	Biosystems	Elective
	Composition II	Eng Elective	Tech Writing	Gen Ed
	Gen Ed			

BUSINESS ADMINISTRATION MAP	MACRO - ECONOMICS	MICRO-ECONOMIC	MICROCOMP APP FOR BUS	WRITING FOR BUS	PRE-CAL (BUS)	INTRO TO BUS	BUS STATISTICS	PRIN MGMT	PRIN MKTG	INTERNATIONAL BUS	PRIN ACCTG I	PRIN ACCTG II	BUS LAW I	MTG FINANCE
I = Introduce; R = Reinforce; E = Emphasize	ECON 207	ECON 208	CS 214	ENG 200	MATH 1165	BUSI 201	BUSI 203	BUSI 211	BUSI 231	BUSI 241	BUSI 251	BUSI 252	BUSI 281	BUSI 371
WRITING COMPETENCIES														
Identify a subject and formulate a thesis statement.						I			R					
Organize ideas to support a position.				I		R			R				R	
Write in a unified and coherent manner appropriate to the subject matter.				I		R			R				R	
Use appropriate sentence structure and vocabulary.				I		R			R				R	
Document references and citations according to an accepted style manual.						I			R				R	
CRITICAL THINKING COMPETENCIES														
Identify business problems and apply creative solutions.								I	R	R	R		R	E
Identify and apply leadership techniques.								I					R	E
Translate concepts into current business environments.								I	R	R	R		R	E
Analyze complex problems by identifying and evaluating the components of the problem.								I			R	R	E	E
QUANTITATIVE REASONING COMPETENCIES														
Apply quantitative methods to solving real-world problems.														
Perform necessary arithmetic computations to solve quantitative problems.														
Evaluate information presented in tabular, numerical, and														

I = Introduce (knowledge/comprehension)
R = Reinforce (application/analysis)
E = Emphasize (evaluation/synthesis)

I = Introduce; R = Reinforce; E = Emphasize	MA 207	MA 208	CS 214	ENG 200	MATH 365	CS 201	CS 203	CS 211	CS 231	CS 241	CS 310	CS 312	CS 325	CS 412	CS 424
WRITTEN COMMUNICATION															
Identify a subject and formulate a thesis statement.						**K (F)**			**A**						**A (S)**
Organize ideas to support a position.				K		**A(F)**			**A**				**A**		**A (S)**
Write in a unified and coherent manner appropriate to the subject matter.				K		**A (F)**			**A**				**A**		**A (S)**
Use appropriate sentence structure and vocabulary.				K		**A (F)**			**A**				**A**		**A (S)**
(S)Document references and citations according to an accepted style manual.						**K (F)**			**A**				**A**		**A (S)**
PROBLEM SOLVING															
Identify computing problems and apply creative solutions.										**A**	**A**				
Identify and apply leadership techniques.															
Translate concepts into current computing environments.								**K (F)**	**A**	**A**	**A**				
Analyze complex problems by identifying and evaluating the components of the problem.								**K (F)**			**A**	**A**	**E**	**E (S)**	**E**
QUANTITATIVE REASONING															
Apply quantitative methods to solving real-world problems.					**K (F)**		A				A	A		E	**E (S)**
Perform necessary computations to solve quantitative problems.					**K (F)**		A								
Evaluate information presented in tabular, numerical, and graphical					**K (F)**		A								

K (F)

E (S)

K= Knowledge/Comprehension;
A= Application / Analysis;
E= Evaluate/Create

ASSESSMENT METHODS

"…assessment uses relevant direct, indirect, quantitative and qualitative measures as appropriate to the outcome being measured."

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TYPES OF ASSESSMENT

FORMATIVE VS. SUMMATIVE	Formative – those undertaken as students progress through the course/curriculum; the purpose is to identify areas of learning that need to be improved before the end of the course/program.	Summative – obtained at the end of a course or program; the purpose of which is to document student learning; designed to capture students' achievement at the end of their program of study
DIRECT VS. INDIRECT	Direct – Provides for the direct examination or observation of student knowledge or skills against measurable student outcomes.	Indirect – Ascertains the opinion or self-report of the extent or value of learning.
OBJECTIVE VS. SUBJECTIVE	Objective – one that needs no professional judgment to score correctly; examples: multiple-choice, true-false, exams where there is a finite number of "right" answers	Subjective – yield many possible answers of varying quality and require professional judgment to score
EMBEDDED VS. ADD-ON	Embedded – program assessments that are taken as a part of the course work	Add-on – assessments that are in addition to course requirements
QUANTITATIVE VS. QUALITATIVE	Quantitative –predetermined response options that can be summarized into meaningful numbers and analyzed statistically	Qualitative – use flexible, naturalistic methods and are usually analyzed by looking for recurring patterns and themes

ASSESSMENT METHODS
CONTEXT FOR DATA COLLECTION

- Written surveys and questionnaires
- Exit and other interviews
- Standardized exams
- Locally developed exams
- Archival records
- Focus groups
- Portfolios
- Simulations
- Performance Appraisal
- External examiner
- Oral exams

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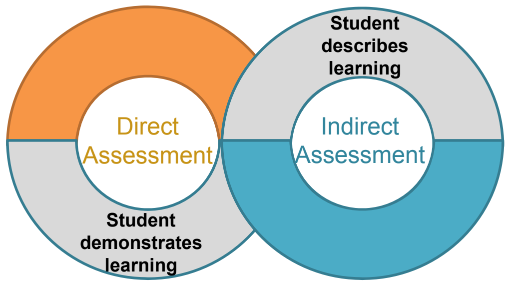
DIRECT MEASURES

Provide for the direct examination or observation of student knowledge or skills against measurable student outcomes



Indirect measures of student learning ascertain the opinion or self-report of the extent or value of learning experiences

INDIRECT MEASURES

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DIRECT

- Exit and other interviews
- Standardized exams
- Locally developed exams
- Portfolios
- Simulations
- Performance Appraisal
- External examiner
- Oral exams

INDIRECT

- Written surveys and questionnaires
- Exit and other interviews
- Archival records
- Focus groups

Whether or not a particular assessment method is direct or indirect depends on the nature of what is being measured and how the method is being used.

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Application:

Choosing Assessment Methods

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APPLICATION: ASSESSMENT METHOD RESOURCE

Step 1. Review of methods (25 minutes)

- Meet with the representatives from the other tables who have been assigned the same methods as yours.
- Spend 20 minutes total discussing together the highlights of advantages and disadvantages for each assigned method clarifying any questions that you might have.
- Discuss plans to "teach back" the methods to those at your team table. You have **three minutes per method** for the teach back.
- Remember, in the teach back process it does not make any difference if you like the method or not. It is only your responsibility to learn about the method so that you can teach others about it. You will get an opportunity to lobby for/against it during Step 3 below.

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APPLICATION: ASSESSMENT METHOD RESOURCE

Step 2: Teach back at your team table (33 minutes): Appoint someone to be a timekeeper. Start with method one and, whoever studied method #1 will teach the method to the others at your table. Continue until all methods are covered. Spend **no more than 3 minutes per method**.

Step 3: Assignment (10 minutes): After sharing the assessment methods, choose THREE methods that can be used to assess the student outcome for which you developed/critiqued performance indicators. At least one method chosen must be a direct method. Record your findings so that you can share your recommendations. Include an example of how the method could be used to assess the outcome.

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Assessment Methods*

1. **Written surveys and questionnaires -** Asking individuals to share their perceptions about a particular area of interest—e.g., their own or others' skills/attitudes/behavior, or program/course qualities and attributes.

2. **Exit and other interviews -** Asking individuals to share their perceptions about a particular area of interest—e.g., their own skills/attitudes, skills and attitudes of others, or program qualities—in a face-to-face dialog with an interviewer.

3. **Commercial, norm-referenced, standardized examinations -** Commercially developed examinations, generally group administered, mostly multiple choice, "objective" tests, usually purchased from a private vendor.

4. **Locally developed examinations -** Objective or subjective designed by local staff/faculty.

5. **Focus groups -** Guided discussion of a group of people who share certain characteristics related to the research or evaluation question, conducted by <u>trained</u> moderator.

6. **Portfolios** (collections of work samples, usually compiled over time and rated using scoring rubrics).

7. **Simulations** - A **competency-based** measure where a person's abilities are measured in a situation that approximates a "real world" setting. Simulation is primarily used when it is impractical to observe a person performing a task in a real world situation (e.g., on the job).

8. **Performance Appraisals -** Systematic measurement of overt demonstration of acquired skills, generally through direct observation in a "real world" situation—e.g., while student is working on internship or on project for client.

9. **External Examiner -** Using an expert in the field from outside your program – usually from a similar program at another institution – to conduct, evaluate, or supplement the assessment of students.

10. **Archival Records -** Biographical, academic, or other file data available from college or other agencies and institutions.

11. **Oral examinations -** Evaluation of student knowledge levels through a face-to-face dialogue between the student and the examiner—usually faculty.

*Except where noted, materials relating to the advantages and disadvantages of assessment methods have been modified by Gloria Rogers and used with permission. Prus, J. and Johnson, R., "Assessment & Testing Myths and Realities." New Directions for Community Colleges, No. 88, Winter 94. These materials cannot be duplicated without the expressed written consent of the authors.

GLOSSARY*

Backload (--ed, --ing): amount of effort required after the data collection.

Competency: level at which performance is acceptable.

Confounded: confused.

Convergent validity: general agreement among ratings, gathered independently of one another, where measures should be theoretically related.

Criterion-referenced: criterion-referenced tests determine what test takers can do and what they know, not how they compare to others. Criterion-referenced tests report how well students are doing relative to a pre-determined performance level on a specified set of educational goals or outcomes included in the curriculum.

Externality: Externality refers to the extent to which the results of the assessment can be generalized to a similar context.

External validity: External validity refers to the extent to which the results of a study are generalizable or transferable to other settings. Generalizability is the extent to which assessment findings and conclusions from a study conducted on a sample population can be applied to the population at large. Transferability is the ability to apply the findings in one context to another similar context.

Forced-choice: the respondent only has a choice among given responses (e.g., very poor, poor, fair, good, very good).

Formative assessment: intended to assess ongoing program/project activity and provide information to improve the project. Assessment feedback is short term in duration.

Frontload (--ed, --ing): amount of effort required in the early stage of assessment method development or data collection.

Generalization (generalizability): The extent to which assessment findings and conclusions from a study conducted on a sample population can be applied to the population at large.

Goal-free evaluation: Goal-free evaluation focuses on actual outcomes rather than intended program outcomes. Evaluation is done without prior knowledge of the goals of the program.

Inter-rater reliability: the degree to which different raters/observers give consistent estimates of the same phenomenon.

Internal validity: Internal validity refers to (1) the rigor with which the study was conducted (e.g., the study's design, the care taken to conduct measurements, and decisions concerning what was and wasn't measured) and (2) the extent to which the designers of a study have taken into account alternative explanations for any causal relationships they explore.

Longitudinal studies: Data collected from the same population at different points in time.

Norm (--ative): a set standard of development or achievement usually derived from the average or median achievement of a large group.

Norm-reference: A norm-referenced test is designed to highlight achievement differences between and among students to produce a dependable rank order of students across a continuum of achievement from high achievers to low achievers.

Observer effect: the degree to which the assessment results are affected by the presence of an observer.

Open-ended: assessment questions that are designed to permit spontaneous and unguided responses.

Operational (--ize): defining a term or object so that it can be measured. Generally states the operations or procedures used that distinguish it from others.

Reliability: Reliability is the extent to which an experiment, test, or any measuring procedure yields the same result on repeated trials

Rubrics: A rubric is a set of categories that define and describe the important components of the work being completed, critiqued, or assessed. Each category contains a gradation of levels of completion or competence with a score assigned to each level and a clear description of what criteria need to be met to attain the score at each level.

Salience: a striking point or feature.

Stakeholder: Anyone who has a vested interest in the outcome of the program/project.

Summative assessment: assessment that is done at the conclusion of a course or some larger instructional period (e.g., at the end of the program). The purpose is to determine success or to what extent the program/project/course met its goals.

Third party: person(s) other than those directly involved in the educational process (e.g., employers, parents, consultants)

Triangulate (triangulation): The use of a combination of assessment methods in a study. An example of triangulation would be an assessment that incorporated surveys, interviews, and observations.

Topology: Mapping of the relationships among subjects.

Utility: usefulness of assessment results.

Variable (variability): Observable characteristics that vary among individuals responses.

Validity: Validity refers to the degree to which a study accurately reflects or assesses the specific concept that the researcher is attempting to measure. Validity has three components:

- <u>relevance</u> - the option measures your educational objective as directly as possible
- <u>accuracy</u> - the option measures your educational objective as precisely as possible
- <u>utility</u> - the option provides formative and summative results with clear implications for educational program evaluation and improvement

Written Surveys/Questionnaires 1

Definition: Asking individuals to share their perceptions about the curricular/co-curricular areas of interest—e.g., their own or others skills/attitudes/behavior, or program/course qualities and attributes.

Advantages:

- Typically yield the perspective that students, alumni, the public, etc., have of the program that may lead to changes especially beneficial to improving the program.
- Can cover a broad range of areas of interest within a brief period of time.
- Results tend to be more easily understood by lay persons.
- Can cover areas of interest, which might be difficult or costly to assess more directly.
- Can provide accessibility to individuals who otherwise would be difficult to include in assessment efforts (e.g., alumni, parents, employers).

  When **'third-parties'** are completing the survey/questionnaire there are additional advantages, as follows:

  - Can provide unique stakeholder input, valuable in its own right (especially employers and alumni). How is the program serving their purposes?
  - Offer different perspectives, presumably less biased than either student or faculty.
  - Can increase both internal validity (through "**convergent validity"/"triangulation**" with other data) and **external validity**.
  - Convey a sense of importance regarding the opinions of stakeholder groups.

Disadvantages:

- Results tend to be highly dependent on wording of items, **salience** of survey or questionnaire, and organization of instrument. Thus, good surveys and questionnaires are more difficult to construct than they appear.
- Frequently rely on volunteer samples, which can be biased.
- Mail surveys tend to yield low response rates.
- Require careful organization in order to facilitate data analysis via computer for large samples.
- Commercially prepared surveys tend not to be entirely relevant to an individual institution and its students.
- Forced response choices (**forced-choice**) may not provide opportunities for respondents to express their true opinions.
- Results reflect perceptions, which individuals are willing to report and thus tend to consist of indirect data.
- Locally developed instrument may not provide for **externality** of results.

  Third party disadvantages also include:

  - As with any indirect data, inference and reports can contain a high degree of interpretation error.
  - Third-parties can be biased too, in directions more difficult to anticipate than self-reports.
  - Less investment by third-parties in assessment processes often means lower response rates, even lower than student/alumni rates.
  - Usually requires logistical details (e.g., identifying sample, making contact, getting useful responses, etc.), therefore more costly than it appears.
  - If information about specific individuals is requested, confidentiality becomes an important and sometimes problematic issue that must be addressed carefully.

Ways to Reduce Disadvantages:

- Use only carefully constructed instruments that have been reviewed by survey experts.
- Include open-ended, respondent worded items along with forced-choice.
- If random sampling or surveying of the entire target population is not possible, obtain the maximum sample size possible and follow-up with non-respondents (preferably in person or by phone).
- If commercially prepared surveys are used, add locally developed items of relevance to the program.
- If locally developed surveys are used, attempt to include at least some externally-referenced items (e.g., from surveys for which national data are available).
- Word reports cautiously to reflect the fact that results represent perceptions and opinions respondents are willing to share publicly.
- Use pilot or "try out" samples in local development of instruments and request formative feedback from respondents on content clarity, sensitivity, and format.
- Cross-validate results through other sources of data through **triangulation**.

Ways to Reduce **Third Party** Disadvantages:

- Very careful, explicit directions for types of responses requested can reduce variability.
- Attain informed consent in cases where information about specific individuals is being requested.
- Coordinate contacts with other campus organizations contacting the same groups, to reduce ("harassment" syndrome) and increase response rates.

Bottom Lines:

A relatively inexpensive way to collect data on important evaluative topics from a large number of respondents. Must always be treated cautiously, however, since results only reflect what subjects are willing to report about their perception of their attitudes and/or behaviors.

Exit and Other Interviews

2

Definition: Asking individuals to share their perceptions of their own attitudes and/or behaviors or those of others. Evaluating student reports of their attitudes and/or behaviors in a face-to-face dialogue.

Advantages:
Student interviews tend to have most of the attributes of surveys and questionnaires with the exception of requiring direct contact, which may limit accessibility to certain populations. Exit interviews provide the following advantages:
- Allow for more individualized questions and follow-up probes/questions based on the responses of interviewees.
- Provide immediate feedback to interviewer.
- Include same observational and **formative** advantages as oral examinations.
- Frequently yield benefits beyond data collection that comes from opportunities to interact with students and other groups.
- Can include a greater variety of items than is possible on surveys and questionnaires, including those that provide more direct measures of learning and development.

  When **'third-parties'** are making the reports there are additional advantages, as follows:
  - Can provide unique stakeholder/constituent input, valuable in its own right (especially employers and alumni). How is the program/course serving the purposes of the stakeholder group?
  - Offer different perspectives, presumably less biased than either student or the faculty.
  - Can increase both internal validity (through "**convergent validity"/"triangulation**" with other data) and **external validity** (by adding more "natural" perspective).

Disadvantages:
- Requires direct contact, which may be difficult to arrange.
- May be intimidating to interviewees, thus biasing results in the positive direction.
- Results tend to be highly dependent on wording of items and the manner in which interviews are conducted.
- Time consuming, especially if large numbers of persons are to be interviewed.

  Third party report disadvantages:
  - As with any indirect data, inference and reports risk high degree of error in interpretation.
  - Third parties can be biased too, in directions more difficult to anticipate than self-reports.
  - Usually requires logistical details (e.g., identifying sample, making contact, getting useful responses, etc.), therefore more costly than it appears.
  - If information about specific individuals is requested, confidentiality becomes an important and sometimes problematic issue that must be addressed carefully.

Ways to Reduce Disadvantages:
- Plan the interviews carefully with assistance from experts.
- Provide training sessions for interviewers that include guidance in putting interviewees at ease and related interview skills.
- Interview purposeful samples of students when it is not feasible to interview all.
- Conduct telephone interviews when face-to-face contact is not feasible.
- Develop an interview format and questions with a set time limit in mind.

- Conduct pilot testing of interview questions and process and request feedback from interviewee to improve the interview process.
- Utilize focus groups when individual interviewing is not possible or is too costly.

Ways to Reduce **Third Party** Disadvantages:

- Conduct face-to-face or phone interviews wherever possible, increasing validity through probing during dialogue.
- Very careful, explicit directions for types and perspectives of responses requested can reduce variability. Attain informed consent in cases where information about individuals is being requested.
- Coordinate contacts with other campus organizations contacting the same groups, to reduce "harassment" syndrome and increase response rates.

Bottom Lines:

Interviews provide opportunities to cover a broad range of content and to interact with respondents. Opportunities to follow-up responses can be very valuable. Direct contact may be difficult to arrange, costly, and potentially threatening to respondents unless carefully planned.

Commercial, Norm-Referenced, Standardized Exams

3

Definition: Group administered mostly or entirely multiple-choice, "objective" tests in one or more curricular areas. Scores are based on comparison with a reference or norm group. Typically must be purchased from a private vendor.

Target of Method: Used primarily on students in individual programs, courses or for a particular student cohort.

Advantages:

- Can be adopted and implemented quickly.
- Reduce/eliminate faculty time demands in instrument development and grading (i.e., relatively low **"frontloading"** and **"backloading"** effort).
- Objective scoring.
- Provide for **externality** of measurement (i.e., **externality validity** is the degree to which the conclusions in your study would hold for other persons in other places and at other times—ability to **generalize** the results beyond the original test group)
- Provide **norm** group(s) comparison often required by mandates outside the program/ institution (e.g., accreditation agency, state or federal regulations).
- May be beneficial or required in instances where state or national standards exist for the discipline or profession.
- Very valuable for benchmarking and cross-institutional comparison studies.

Disadvantages:

- May limit what is measured.
- Eliminates the process of learning and clarification of goals and objectives typically associated with local development of measurement instruments.
- Unlikely to completely measure or assess the specific objectives and outcomes of a program, department, or institution.
- "Relative standing" (i.e., how student performance compares with others) results tend to be less meaningful than **criterion-referenced** (i.e., what students know or can do without comparison to others) results for program/student evaluation purposes.
- **Norm-referenced** data is dependent on the institutions in comparison group(s) and methods of selecting students to be tested. (Caution: unlike many **norm-referenced** tests such as those measuring intelligence, present **norm-referenced** tests in higher education do not utilize, for the most part, randomly selected or well stratified national samples.)
- Group administered multiple-choice tests always include a potentially high degree of error, largely uncorrectable by "guessing correction" formulae (which lowers **validity**).
- Results unlikely to have direct implications for program improvement or individual student progress.
- Results highly susceptible to misinterpretation/misuse both within and outside the institution.
- Someone must pay for obtaining these examinations; either the student or program.
- If used repeatedly, there is a concern that faculty may teach to the exam as is done with certain AP high school courses.

Ways to Reduce Disadvantages:

- Choose the test carefully, and only after faculty have reviewed available instruments and determined a satisfactory degree of match between the test and the learning outcomes of the curriculum.
- Request and review technical data, especially **reliability** and **validity** data and information on **normative** sample from test publishers.
- Utilize on-campus measurement experts to review reports of test results and create more customized summary reports for the institution/program, faculty, etc.
- Whenever possible, choose tests that also provide **criterion-referenced** results
- Assure that such tests are only one aspect of a multi-method approach in which no firm conclusions based on **norm-referenced** data are reached without **validation** from other sources (**triangulation**).

Bottom Lines:

Relatively quick, and easy, but useful mostly where group-level performance and external comparisons of results are required. Not as useful for individual student or program evaluation. May not only be ideal, but many times the only alternative for benchmarking studies.

Locally Developed Exams

Definition: Objective and/or subjective assessments designed by faculty in the program or course sequence being evaluated.

Advantages:

- Content and style can be geared to specific outcomes, objectives, and student characteristics of the program, curriculum, etc.
- Specific indicators for performance can be established in relationship to curriculum.
- Process of development can lead to clarification/crystallization of what is important in the process/content of student learning.
- Local scoring by program faculty can provide relatively rapid feedback.
- Greater faculty/institutional control over interpretation and use of results.
- More direct implication of results for program improvements.

Disadvantages:

- Require considerable leadership/coordination, especially during the various phases of development.
- Cannot be used for benchmarking, or cross-institutional comparisons.
- Costly in terms of time and effort (more **"frontloaded"** effort for objective assessments; more **"backloaded"** effort for subjective assessments).
- May not provide for **externality**.

Ways to Reduce Disadvantages:

- Enter into consortium with other programs, departments, or institutions with similar outcomes and objectives as a means of reducing costs associated with developing assessments. An element of **externality** is also added through this approach.
- Utilize on-campus assessment experts whenever possible for construction of assessments and **validation**.
- Contract with faculty "consultants" to provide development and scoring.
- Incorporate outside content experts, into development and grading process.
- Embed in program requirements for maximum relevance with minimum disruption (e.g., a "capstone" course).
- Validate results through use of multi-method approach (**triangulation**).

Bottom Lines:

Most useful for individual coursework or program evaluation, with careful adherence to assessment principles. Must be supplemented for **external validity**.

FOCUS GROUPS**

Definition:

Typically conducted with 7-12 individuals who share certain characteristics that are related to a particular topic related to a research or evaluation question. Group discussions are conducted by a trained moderator with participants (several times, if possible) to identify trends/patterns in perceptions. Moderator's purpose is to provide direction and set the tone for the group discussion, encourage active participation from all group members, and manage time. Moderator must not allow own biases to enter, verbally or nonverbally. Careful and systematic coding and analysis of the discussions provides information that can be used to evaluate and/or improve the desired outcome.

Advantages:

- Useful to gather ideas, details, new insights and to improve question design.
- Helpful in the design of surveys.
- Can be used to get more in-depth information on issues identified by a survey.
- Can inform the interpretation of results from mail or telephone surveys.
- Can be used in conjunction with quantitative studies to confirm/broaden one's understanding of an issue.
- Interaction among focus group participants often leads to new insights.
- Allows the moderator to probe and explore unanticipated issues.

Disadvantages:

- Not suited for **generalizations** about population being studied.
- Not a substitute for systematic evaluation procedures.
- Moderators require training.
- Differences in the responses between/among groups can be troublesome.
- Groups can be difficult to assemble.
- Moderator has less control than in individual interviews.
- Data are complex to code and analyze.

Ways to Reduce Disadvantages:

- Offer an incentive for participants if possible.
- Over-recruit participants.
- Train moderators to use **open-ended** questions, pauses and probes, and learn when and how to move into new topic areas.

Example of Applications:

- Focus groups can be used as a follow-up to survey data. In cases where the results of a survey do not meet the expected standard on a particular outcome, a focus group of participants who are representative of the population surveyed (e.g., students, alumni, females) could be held to further investigate the results.
- Focus groups can be used to get input from alumni or business partners on the strengths and weaknesses in the knowledge and/or skills of graduates. Focus groups are a particularly helpful tool to use to **"triangulate"** or validate the results from other assessment methods.

Bottom Lines:

Focus groups are a quick and, if locally done, inexpensive method of gathering information. They should be conducted by someone who has training and experience in conducting Focus Groups and analysis of Focus Group data. They are very useful for triangulation to support other assessment methods but they are not a substitute for systematic evaluation procedures. Focus Groups should meet the same rigor as other assessment methods and should be developed and analyzed according to sound qualitative practices.

**Prepared by Gloria Rogers, ABET, Inc.

Portfolios

Definition: Collections of multiple student work samples usually compiled over time and scored using rubrics. The design of a portfolio is dependent upon how the scoring results are going to be used.

Advantages:
- Can be used to view learning and development **longitudinally** (e.g. samples of student writing over time can be collected), which is a useful perspective.
- Multiple components of a curriculum can be assessed (e.g., writing, critical thinking, research skills) at the same time.
- The process of reviewing and scoring portfolios provides an excellent opportunity for faculty exchange and development, discussion of curriculum objectives and outcomes, review of scoring criteria, and program feedback.
- Greater faculty control over interpretation and use of results.
- Results are more likely to be meaningful at all levels (i.e., the individual student, program, or institution) and can be used for diagnostic/prescriptive purposes as well.
- Avoids or minimizes "test anxiety" and other "one shot" assessments.
- Increases "power" of maximum performance measures over more artificial or restrictive "speed" measures on test or in-class sample.
- Increases student participation (e.g., selection, revision, evaluation) in the assessment process.

Disadvantages:
- Can be costly in terms of evaluator time and effort.
- Management of the collection and scoring process, including the establishment of reliable and valid scoring rubrics, is likely to be challenging.
- May not provide for **externality**.
- If samples to be included have been previously submitted for course grades, faculty may be concerned that a hidden agenda of the process is to validate their grading.
- Security concerns may arise as to whether submitted samples are the students' own work, or adhere to other measurement criteria.

Ways to Reduce Disadvantages:
- Consider having portfolios submitted as part of a course requirement, especially a "capstone course" at the end of a program.
- Investigate the use of electronic portfolios as a means to increase process efficiency.
- Utilize portfolios from representative samples of students rather than having all students participate (this approach may save considerable time, effort, and expense but be problematic in other ways).
- Have more than one rater for each portfolio; establish **inter-rater reliability** through piloting designed to fine-tune rating criteria.
- Educate the raters about the process.
- Recognize that portfolios in which samples are selected by the students are likely represent their best work.
- Cross-validate portfolio products with more controlled student work samples (e.g., in-class tests and reports) for increased **validity** and security.

Bottom Lines:
Portfolios are a potentially valuable option adding important longitudinal and "qualitative" data, in a more natural way. Particular care must be taken to maintain validity. Especially good for multiple-learning outcomes assessment.

Simulations

7

Definition: A **competency based** measure where a person's abilities are measured in a situation that approximates a "real world" setting. Simulation is primarily used when it is impractical to observe a person performing a task in a real world situation (e.g., on the job).

Advantages:
- Better means of evaluating depth and breadth of student skill development than tests or other performance-based measures **(internal validity)**.
- More flexible; some degree of simulation can be arranged for most student target skills.
- For some skills, can be group administered, thus providing an excellent combination of quality and economy.

Disadvantages:
- For difficult skills, the higher the quality of simulation the greater the likelihood that it will suffer from same problems as "Performance Appraisals."
    - Ratings of student performance is typically more subjective than standardized tests.
    - Sample of behavior observed or performance appraised may not be typical, especially because of the presence of others.
    - Usually requires considerable **"frontloading"** effort; i.e., planning and preparation.
- More expensive than traditional testing options in the short run.

Ways of Reducing Disadvantages:
- Reducing problems is relatively easy, since degree of simulation can be matched for maximum **validity** practicable for each situation.
- Can often be "standardized" through use of computer programs (and enhance **external validity**).

Bottom Lines:

An excellent means of increasing the **external and internal validity** of skills assessment at minimal long-term costs.

Performance Appraisals

Definition: A competency-based method whereby abilities are measured in most direct, real-world approach. Systematic measurement of overt demonstration of acquired skills.

Advantages:
- Provide a more direct measure of what has been learned (presumably in the program).
- Go beyond paper-and-pencil tests and most other assessment methods in assessing skills.
- Preferable to most other methods in measuring the application and **generalization** of learning to specific settings, situations, etc.
- Particularly relevant to the objectives and outcomes of professional training programs and disciplines with well defined skill development.

Disadvantages:
- Rating of student performance is typically more subjective than standardized tests.
- Requires considerable time and effort (especially **front-loading**), thus being costly.
- Sample of behavior observed or performance appraised may not be typical, especially because of the presence of observers.

Ways to Reduce Disadvantages:
- Develop specific, **operational** (measurable) indicators for observing and appraising performance.
- Provide training for observers/appraisers.
- Conduct pilot-testing in which rate of agreement (**inter-rater reliability**) between observers/appraisers is determined. Continue training and/or alter performance indicators for more specificity until acceptable consistency of measurement is obtained.
- Conduct observations/appraisals in the least intrusive manner possible
- Observe/appraise behavior in multiple situations and settings.
- Consider training and utilizing graduate students, upper level students, etc. as a means of reducing the cost and time demands on faculty.
- Cross-**validate** results with other measures, multiple methods should be used to **validate** the results of appraisals.

Bottom Lines:

Generally the most highly valued but costly form of student outcomes assessment. However, it is usually the most valid way to measure skill development.

External Examiner

9

Definition: Using an expert in the field from outside your program such as someone from a similar program at another institution or a capstone project client to evaluate, or supplement assessment of your students. Information can be obtained from external evaluators using many methods including feedback forms (including scoring rubrics), surveys, interviews, etc.

Advantages:
- Increases impartiality, **third party** objectivity (**external validity**)
- Feedback useful for both student and program evaluation. With a knowledgeable examiner it provides an opportunity for a valuable program consultation.
- May serve to stimulate other collaborative efforts between business partners or other programs.
- Incorporate the use of external **stakeholders**.
- Students may disclose to an outsider what they might not otherwise share.
- Outsiders can "see" attributes to which insiders have grown accustomed.
- Evaluators may have skills, knowledge, or resources not otherwise available.
- Useful in conducting **goal-free evaluation** (without prior expectations).

Disadvantages:
- Always some risk of a misfit between examiner's expertise and/or expectations and program outcomes.
- For individualized evaluations and/or large programs, can be very costly and time consuming.
- Volunteers may become "donor weary" (tired from being asked multiple times to participate).

Way to Reduce Disadvantages:
- Share program philosophy and outcomes and agree on assessment procedure before the assessment.
- Form reciprocal external examiner "consortia" among similar programs to minimize costs, swapping external evaluations back and forth.
- Limit external examiner process to program areas where externality may be most helpful.

Bottom Lines:

Best used as a supplement to your own assessment methods to enhance external validity, but not as the primary assessment option. Other benefits can be accrued from the cross-fertilization that often results from using external examiners.

Archival Records

Definition: Biographical, academic, or other file data available from the college or other agencies and institutions.

Advantages:
- Tend to be accessible, thus requiring minimal effort.
- Build upon data collection efforts that have already occurred.
- Can be cost efficient if required date is readily retrievable in desired format.
- Constitute non-intrusive measurement, not requiring additional time or effort from students or other groups.
- Very useful for **longitudinal studies**.
- Good way to establish a baseline for before and after comparisons.

Disadvantages:
- Especially in large institutions, may require considerable effort and coordination to determine exactly what data are available campus-wide and to then get that information in desired format.
- To be most helpful, datasets need to be combined. This requires an ability to download and combine specific information for multiple sources. It may require designing a separate database for this downloaded information.
- Typically the archived data are not exactly what is required, so that the evaluator must make compromises. In some cases, it may be a stretch to use such data as surrogates for the desired measures.
- If individual records are included, protection of rights and confidentiality must be assured; where applicable, Institutional Review Board approval should be obtained if there is doubt.
- Availability of data may discourage the development of other, more appropriate measures or data sources.
- May encourage attempts to "find ways to use data" rather than assessment related to specific outcomes and objectives.

Ways to Reduce Disadvantages:
- Early-on in the development of an assessment program, conduct a comprehensive review of existing assessment and evaluation efforts and data typically being collected throughout the institution and its units (i.e, "campus data map"). An Office of Institutional Research is found on many campuses and can be helpful in this process.
- Be familiar with the Family Educational Rights and Privacy Act (Buckley Amendment) and avoid personally identifiable data collection without permission. Assure security/protection of records.
- Only use archival records that are relevant to specific outcomes and objectives of learning.

Bottom Lines:

Can be quick, easy, and cost-effective method, if data are available and accessible. Usually limited data quality but integral to valuable longitudinal comparisons. Should be a standard component of all assessment programs.

Oral Examination

11

(This method may be inconsistent with campus policies that prohibit the use of oral examinations.)

Definition: An assessment of student knowledge levels through a face-to-face dialogue between the student and examiner—usually faculty.

Advantages:

- Content and style can be geared to specific objectives and outcomes, and student characteristics of the institution, program, curriculum, etc.
- Specific indicators for performance can be established in relationship to course/curriculum.
- Process of development can lead to clarification/crystallization of what is important in the process/content of student learning.
- Local scoring by faculty can provide immediate feedback related to material considered meaningful.
- Greater faculty/institutional control over interpretation and use of results.
- More direct implication of results for program improvements.
- Allows measurement of student knowledge in considerably greater depth and breadth through follow-up questions, probes, encouragement of detailed clarifications, etc. (increased **internal validity** and **formative evaluation** of student abilities)
- Non-verbal (paralinguistic and visual) cues aid interpretation of student responses.
- Dialogue format decreases miscommunications and misunderstandings, in both questions and answers.
- Rapport-gaining techniques can reduce "test anxiety," helps focus and maintain maximum student attention and effort.
- Dramatically increases "**formative evaluation**" of student learning; i.e., clues as to how and why they reached their answers.
- Provides process evaluation of student thinking and speaking skills, along with knowledge content.

Disadvantages:

- Requires considerable leadership/coordination, especially during the various phases of development.
- Can be difficult to document by note-taking and providing student feedback with a grade.
- Costly in terms of time and effort (more "**frontload**" effort for objective; more "**backload**" effort for subjective).
- May not provide for **externality** (degree of objectivity associated with review, comparisons, etc. external to the program or institution).
- Requires considerably more faculty time, since oral exams must be conducted one-to-one, or, at most, with very small groups of students.
- Can be inhibiting on student responsiveness due to intimidation, face-to-face pressures, oral (versus written) mode, etc. (May have similar effects on some faculty!)
- Inconsistencies of administration and probing across students reduce standardization and **generalizability** of results (potentially lower **external validity**).

Ways to Reduce Disadvantages:

- Prearrange "standard" questions, most common follow-up probes, and how to deal with typical students' problem responses; "pilot" training simulations.
- Take time to establish open, non-threatening atmosphere for testing.
- Electronically record oral exams for more detailed evaluation later.

Bottom Lines:

Oral exams can provide excellent results, but usually only with significant – perhaps prohibitive – additional cost. Definitely worth utilizing in programs with small numbers of students, and for the highest priority objectives in any program and local testing policies do not prohibit the testing method.

SURVEY DEVELOPMENT

ENEMIES OF EFFECTIVE SURVEYS

- Fatigue
- Distrust
- Bias
- Lack of Audience Knowledge
- Other

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SURVEY CREATION PROCESS

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BEST PRACTICE #1

Use concise, common language for questions and options

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BEST PRACTICE #1

START WITH OBJECTIVES, THEN DEVELOP QUESTIONS

Ask Yourself

- What do we need to know?
  - Make a list of specific informational needs
- Can we develop questions that will provide the information needed?
- Who will provide the data (target audience)?
- How will the data be used?
- Is approval from the Institutional Review Board necessary?

BEST PRACTICE #2

Use concise, common language for questions and options

BEST PRACTICE #2
QUESTIONS TO ASK

- What questions do you need to ask related to your objectives?
- How will the survey be administered?
- When will the survey be administered?
- What is your budget and timeline?

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Example:

What do we want to know?

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Alumni Survey - Objectives

Program Objectives:

1. Graduates will engage in engineering design and apply engineering theory.
2. Graduates will work on project-based teams and communicate effectively with various audiences in written, oral and graphical forms.
3. Graduates will lead effectively and perform with high ethical standards
4. Graduates will continue to learn.

What do we want to know? (Objectives)	
Are effective leadership skills relevant to the work of our graduates?	
Is the ability to resolve ethical issues a skill that is relevant to the work of our graduates?	
Is the ability to expand their knowledge and capabilities of our graduates a skill that is relevant to graduates early career?	
Etc.	

Alumni Survey - Objectives

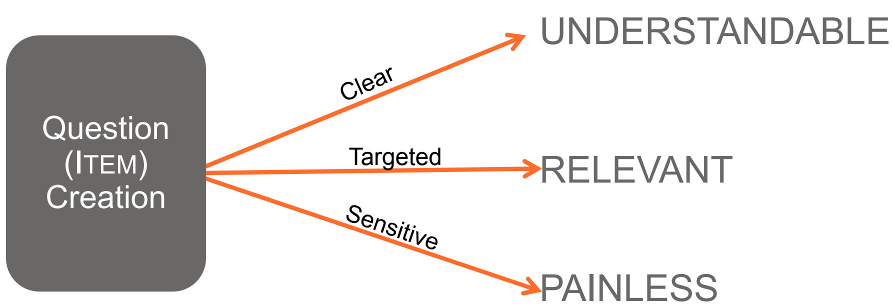
Program Objectives:

1. Graduates will engage in engineering design and apply engineering theory.
2. Graduates will work on project-based teams and communicate effectively with various audiences in written, oral and graphical forms.
3. Graduates will be effective leaders and perform with high ethical standards.
4. Graduates will continue to learn.

What do we want to know? (Objectives)	Survey Item
Are effective leadership skills relevant to the work of our graduates?	Since graduation, have you been the <u>leader</u> of a project team or similar task group?
	If no, have you participated as a member of a project team or similar task group?
	Do you anticipate being asked to lead a project team or similar task group in the near future?
	Do you think teaching leadership skills should be a priority for ABC program?
	Comment box:
Is the ability to resolve ethical issues a skill that is relevant to the work of our graduates?	Have you been confronted with an ethical issue since your employment?
	Do you believe it is important for ABC program to provide students with the ability to resolve ethical issues?
	Comment box:
Is the ability to expand the knowledge and capabilities of our graduates a skill that is still relevant to their early career?	Have you been required to seek out new information on your own since your employment?
	Do you believe it is important for ABC program to provide its students with experiences and knowledge that enable them to continue to learn after graduation?
	Comment box:
Etc.	

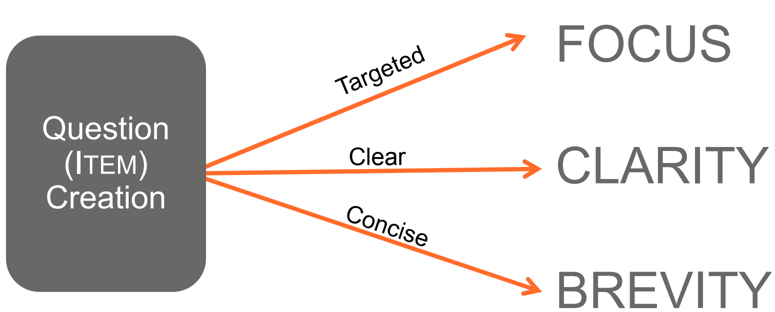
BEST PRACTICE #2

Be Clear, Targeted, and Concise



BEST PRACTICE #2

Be Clear, Targeted, and Concise



DEVELOPING SURVEY ITEMS

- Avoid double negatives:
  - "If you have not already been turned down for positions you've applied for, please skip to item 18."
  - Try: "If you already have a job, skip to item 18."
- Avoid jargon and acronyms that might not be understood by everyone.

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SURVEY ITEMS

- Avoid asking leading questions:
  - Why do you think the laboratories need to be improved?
- Questions must ask for information that the respondent can answer.
  - First-year students cannot comment on graduation check-out procedures

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COURSE SURVEY

For each question, indicate your opinion by choosing one of the following:

(5) Strongly Agree
(2) Agree
(3) Undecided
(4) Disagree
(5) Strongly Disagree

After completing this course, students should be able to:

1. Define and describe voltage, current and resistance.
2. Simplify and analyze resistor networks in series and parallel circuits.
3. *(etc.)*

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COURSE EVALUATION

Please answer the following on a scale of
1=Least/Worst to 5=Most/Best

	1	2	3	4	5
1. Students level of preparedness	O	O	O	O	O
2. Adequacy of classroom	O	O	O	O	O
3. etc.	O	O	O	O	O

Please indicate whether or not the following abilities formed an importatnt element of your course from 1=Not at all and 5=Very important

	1	2	3	4	5
1. Apply mathematics, science and engineering principles	O	O	O	O	O
2. Design and conduct experiments and interpret data	O	O	O	O	O
3. etc.	O	O	O	O	O

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ALUMNI SURVEY

Rank how well your education prepared you with speaking and writing skills for your current position.

______ Excellent
______ Good
______ Fair
______ Poor
______ Very Poor
______ Not Applicable

FROM ALUMNI SURVEY:

Each item below describes an objective of the XXXXX program at STU. These are phrases that describe the expectations for graduates in the first several years of their careers. Place an X in the box that corresponds to your response. On the left, indicate the degree to which you agree that you have personally achieved this objective. On the right, state your belief about the relative importance of this objective in your professional career.

STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE

Demonstrate proficiency in all forms of communication, perform well in a multi-disciplinary team environment and demonstrate the highest standards of personal and professional integrity and ethical responsibility

STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE

EMPLOYER SURVEY

If you have employed *STU* graduates what are their areas of specialization, how would you rate their performance, and how many do you employ?

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DESIGNING THE SURVEY

- If paper survey, stamped, self-addressed return envelope
- Consider use of social media
- Timing of delivery is important
- Professional appearance
  - Graphics and layout
- Order questions from general to specific
- Interesting, important questions
- No grammar or spelling errors
- Pilot test!!!! (sample protocol)

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BEST PRACTICE #3

Survey Structure: Optimize the user's experience

Types of Questions

Open-Ended	• Allows respondents to answer in their own words
Closed-Ended	• Pre-designed questions with a set of potential choices
Ranked	• All choices listed should be ranked according to a level of specification
Matrix and Rating	• Surveys frequency
Likert Scales	• A type of rating scale • Levels of agreement

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BEST PRACTICE #4

Pilot the Survey: Test, test, test

- Usability Testing
  - Time
  - Readability
  - Spelling
  - Accessibility
- Functional Testing
  - Logic
  - Actions
  - Behavior
- Review test data against purpose

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PILOT TEST THE SURVEY

- Find 5-10 people from your target group
  - If you can't get people from your exact target group then find people who are as close as possible.
  - Try to get a range of different people who are representative of your target group.
- Ask them to complete the survey the same way that it will be completed by the target population (e.g., online, phone interview, paper)
- Ask them to respond to the evaluation questions
- Revise the survey

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BEST PRACTICE #5

Administering the Survey

- Consider sampling if the survey is long (over 20 items?) and the numbers of respondents are large enough
- Consider two administrations if you cannot sample

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BEST PRACTICE #5

Maximize Response Rates: Introduce your survey

Response Rates and Incentives

How to maximize the likelihood of response?

- Personalize cover letter/email
- Articulate the purpose and “return on investment”
- Request participation in advance
- Provide clear instructions
- Send friendly reminders
- Non-threatening items = higher response rate

How appropriate is it to provide an incentive to respond to a survey?

- Ensure your incentive is not interpreted as coercive

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Dear :

Thank you for agreeing to help us prepare for our accreditation visit by ABET in the Fall of 2016, an intensive on-campus review and assessment which occurs every six years. It is critically important that we receive a positive review of our program. A positive review will ensure the success of our engineering program, help attract the best and brightest students to our program, and provide you, the stakeholders, with the best possible engineering graduates.

I am asking you to review two (2) areas of our programs: Department Objectives and Department Curriculum.

………………………………

Sincerely,

John J Smith,
Professor and Chair

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BEST PRACTICE #6

Analyze the data

- Analysis should include cross-tabs and filtering as appropriate (by demographic characteristics)
- Both the number of responses and the percent of responses should be considered

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BEST PRACTICE #7

Reporting Your Findings: Know your audience

- Reports should be easy to read
- Accompany findings with an Executive Summary
- Avoid statistical jargon
- Report findings to “change makers”

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Application:

Improve survey items

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SURVEY ITEM APPLICATION:

Step 1 (15 minutes): Each team has been given one survey item discussed in the survey module. The team should rewrite the survey item correcting the mistakes that were identified.

Step 2 (5 minutes): Develop at least three demographic items you would add to the survey to obtain information needed for the analysis of responses.

- Think about how the demographic information will be used to help understand the responses.

Step 3 (5 minutes): Prepare to report out. Have someone document you work.

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ASSESSMENT METHODS WRAP-UP

VALIDITY

1. Relevance - the assessment option measures the student outcome as *directly* as possible

2. Accuracy - the option measures the student outcome with confidence that the findings represent the *true value* of student learning

3. Utility - the option provides formative and summative results with *clear implications* for program evaluation and improvement

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"BOTTOM LINES"

- ✓All assessment options have advantages and disadvantages
- ✓"Ideal" method means those that are best fit between program needs, satisfactory validity, and affordability (time, effort, and money)
- ✓Crucial to use multi-method/multi-source approach to maximize validity and reduce bias of any one approach

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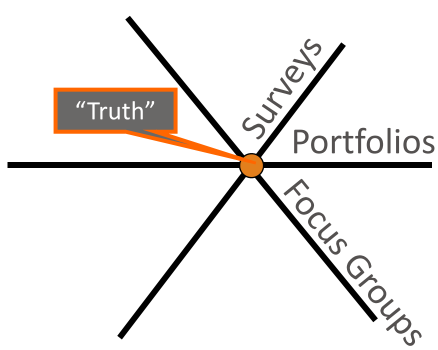
TRIANGULATION



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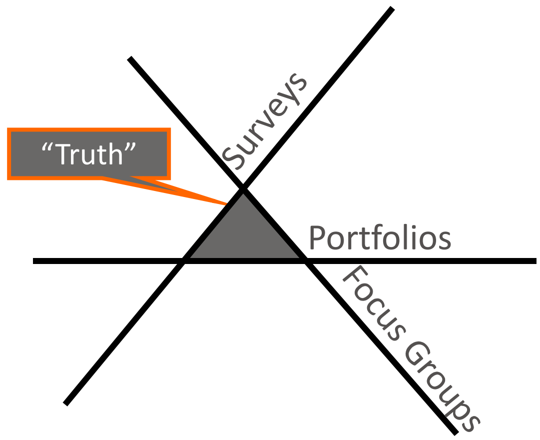
TRIANGULATION*



Adapted from Joseph Hoey
Vice President, Accreditation Relations and Policy at Bridgepoint Education

ASSESSMENT METHOD TRUISMS

- ✓ There will always be more than one way to measure any student outcome
- ✓ No single method is good for measuring a wide variety of different student abilities
- ✓ There is generally an inverse relationship between the quality of measurement methods and their expediency
- ✓ It is important to pilot test to see if a method is appropriate for your program

USE OF TECHNOLOGY

- Harness technology to enhance the efficiency and effectiveness of the assessment process.
  - What do you need to think about when making decisions about the use of technology?
    - How would we use technology that increase the effectiveness of what we are now doing?
    - What are the tradeoffs?
      - Cost/Benefit, Training, Maintenance, Quality of data/information

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DEVELOPING EFFICIENT PROCESSES

DATA COLLECTION PROCESS

- Why?
  - Understand the focus of program assessment

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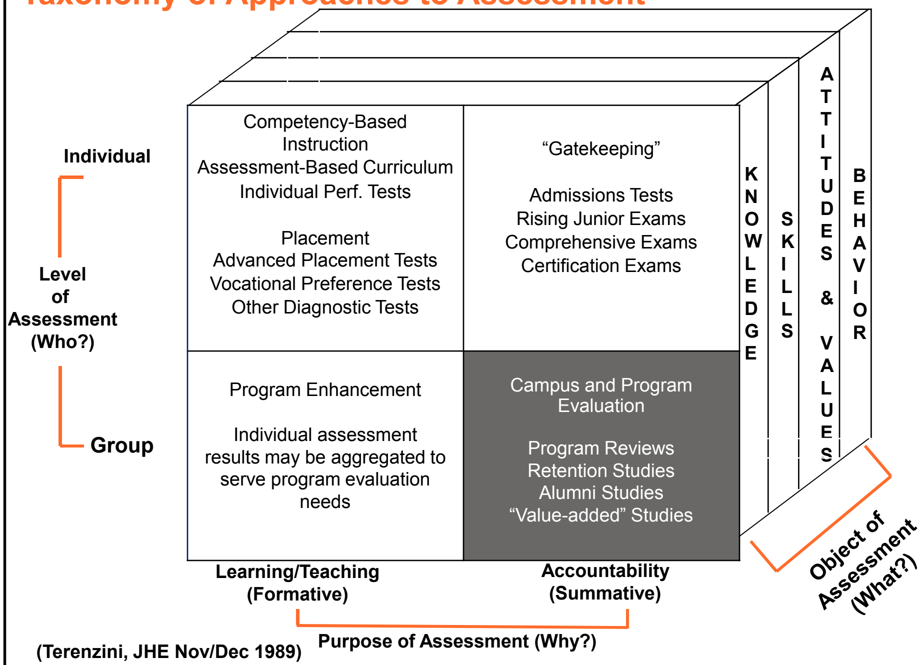
Taxonomy of Approaches to Assessment

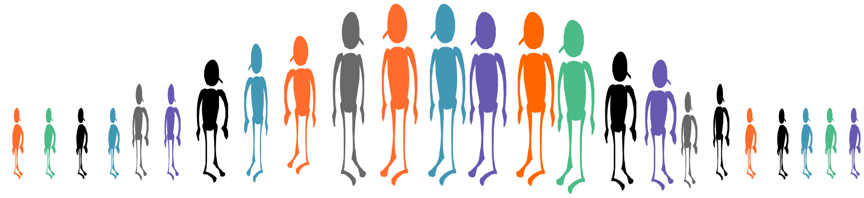


DATA COLLECTION PROCESS

- Why?
  - Know your question
- What?
  - Focus on few indicators for each outcome
- Who? Students (cohorts); faculty (some)

SAMPLING

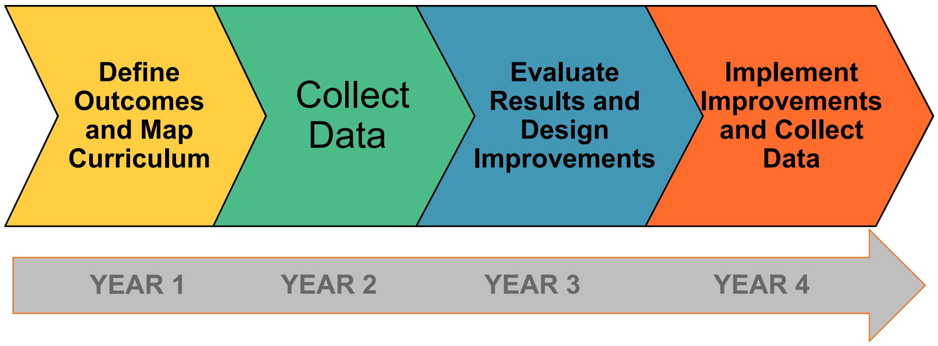
- For program assessment, sampling is acceptable and even desirable for programs of sufficient size.
  - Sample is representative of all students



http://www.surveysystem.com/sscalc.htm

DATA COLLECTION PROCESS

- Why?
  - Know your question
- What?
  - Focus on few indicators for each outcome
- Who? Students (cohorts); faculty (some)
- When?



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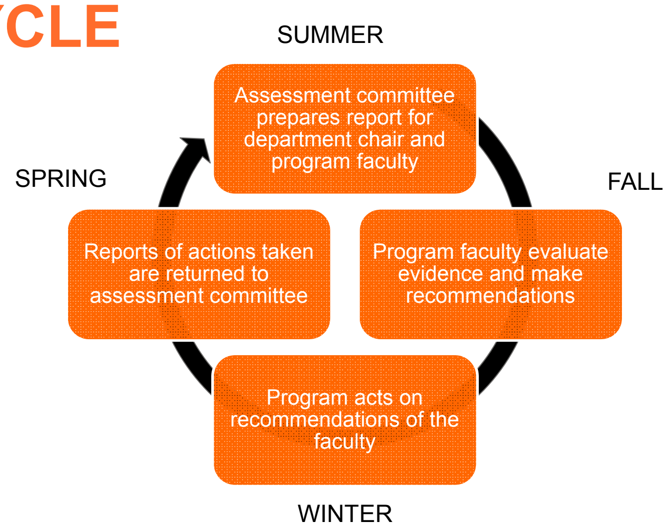
STUDENT OUTCOMES	15-16	16-17	17-18	18-19	19-20	20-21
A recognition of ethical and professional responsibilities	A	E	C	A	E	C
An understanding of how contemporary issues shape and are shaped by mathematics, science, & engineering		A	E	C	A	E
An ability to recognize the role of professionals in the global society			A	E	C	A
An understanding of diverse cultural and humanistic traditions	A	E	C	A	E	C
An ability to work effectively in teams		A	E	C	A	E
An ability to communicate effectively in o written, graphical, and visual forms						

A= Assess; E= Evaluate;
C= Change (if necessary)

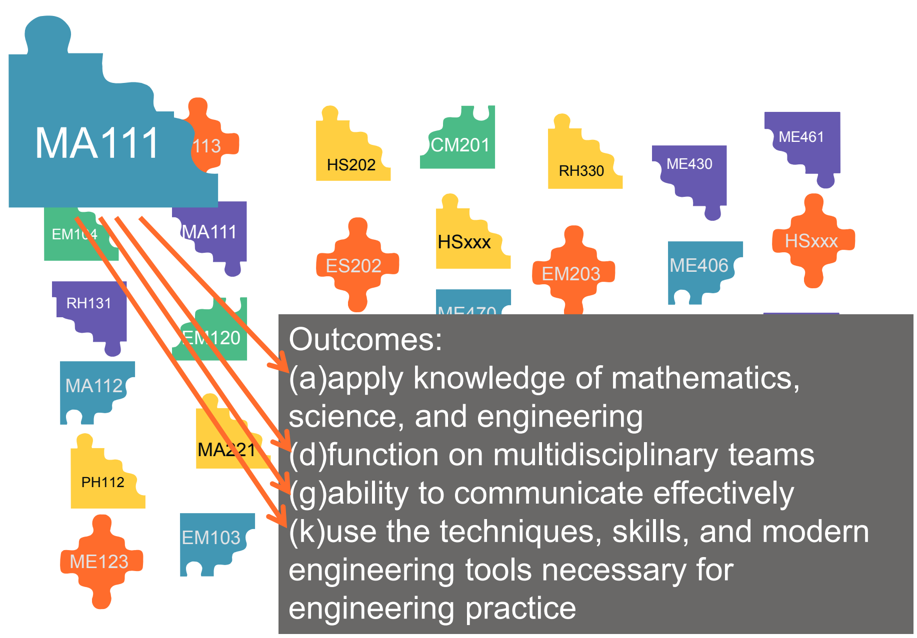
STUDENT OUTCOMES	15-16	16-17	17-18	18-19	19-20	20-21
A recognition of ethical and professional responsibilities	A	E	C	A	E	C
An understanding of how contemporary issues shape and are shaped by mathematics, science, & engineering		A	E C	A	E C	A
An ability to recognize the role of professionals in the global society			A	E	C	A
An understanding of diverse cultural and humanistic traditions	A	E C	A	E C	A	E C
An ability to work effectively in teams		A	E	C	A	E
An ability to communicate effectively in oral, written, graphical, and visual forms			A	E	C	A

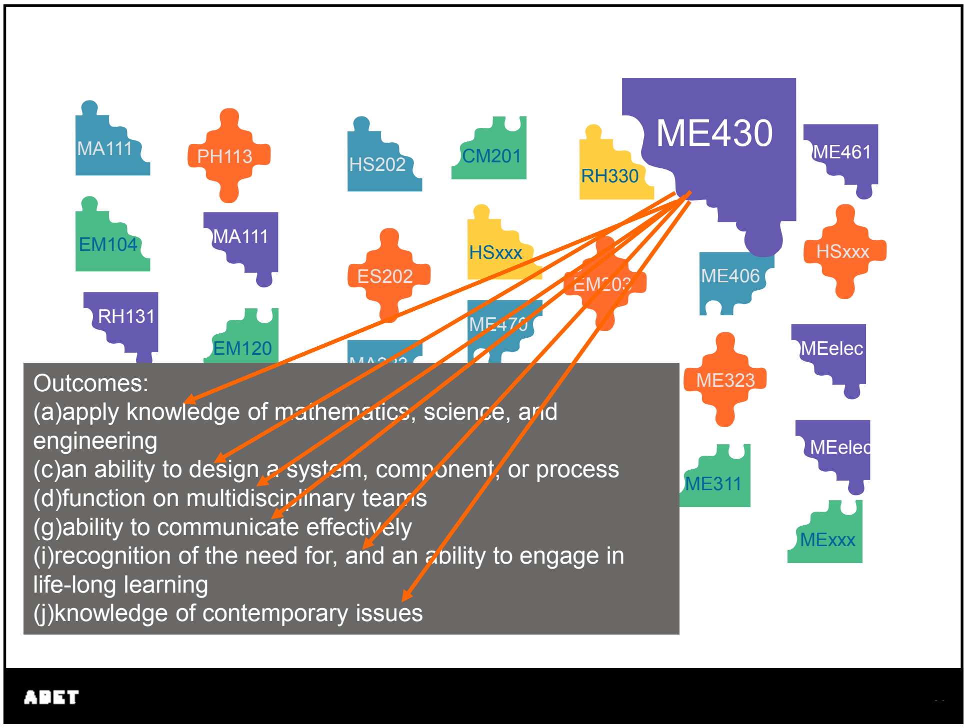
ESTABLISH AN ANNUAL CYCLE



Application:

Assessment Method Critique




MA111
PH113
HS202
CM201
RH330
ME430
ME461
EM104
MA111
HSxxx
ES202
ME406
HSxxx
RH131
EM120
MEelec
ME323
ME311
MExxx
Outcomes:
(a)apply knowledge of mathematics, science, and engineering
(c)an ability to design a system, component, or process
(d)function on multidisciplinary teams
(g)ability to communicate effectively
(i)recognition of the need for, and an ability to engage in life-long learning
(j)knowledge of contemporary issues
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For each test/exam item and homework problem, faculty map to outcomes and enter data for each student on each item/assignment. Acceptable performance level =75%

OUTCOME / COURSE	A	B	C	D	E	F	G	H	I	J	K
100	77	---	81	---	---	90	78	---	76	82	91
201	75	78	---	82	81	---	75	---	---	75	75
222	79	79	79	---	79	79	---	79	---	---	79
252	---	82	82	82	82	82	---	80	---	82	---
299	91	---	87	---	91	83	---	76	76	---	72
301	77	---	81	---	---	90	78	---	74	82	---
312	81	76	---	88	83	---	90	76	---	---	78
316	---	73	76	---	84	82	---	87	73	77	75
318	76	70	---	75	81	---	75	---	76	76	---
322	74	77	74	---	81	88	---	77	74	---	89
399	---	---	77	---	---	---	---	---	74	---	---
415	84	82	77	---	82	77	86	77	---	---	91
499	---	80	---	92	81	76	92	---	75	92	---
Average	79.3	77.4	79.3	83.8	82.5	83.0	82.0	78.86	74.8	80.9	81.3

Three different levels of achievement:

- Exceeds Expectations (EE): more than 80% of the students have achieved an **average score** of 75% or more;
- Meets Expectations (ME): between 70% and 80% of the students have achieved an **average score** of 75% or more;
- Does Not Meet Expectations (DNME): less than 70% of the students have achieved an **average score** of 75% or more.

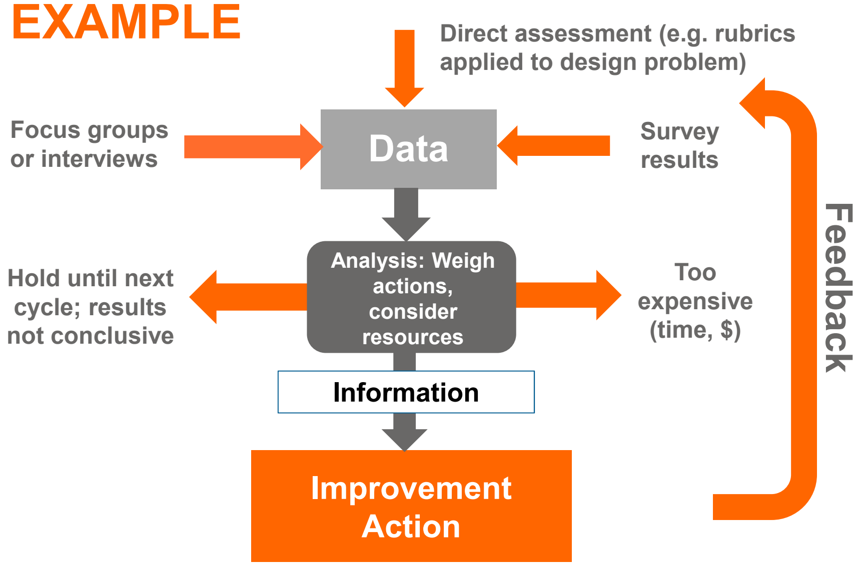
EVALUATION

EVALUATION

- Assessment is not a controlled experiment
- This is a *data-informed*, not data-driven process
- Take advantage of faculty wisdom and insight
  - NOT just anecdotal, but includes the human element as well.
  - Data tell you WHAT
  - Wisdom tells you WHY
    - Why is this student group different?
- Improvements should be linked to principles of student learning
  - Focus mainly on student learning
- Evaluation = data + wisdom
  - Data are necessary but not sufficient

ABET

IMPROVEMENT DECISIONS EXAMPLE



Application:

Evaluation

EVALUATION

20 minutes

1. The following scenario describes the results of an assessment process.
2. You and your team have been asked to consult with the program about their assessment process.
3. Review the scenario and answer the evaluation questions posed. Be prepared to report out.

ABET

Application: Evaluation

A technical program at ABC University has 53 students in the cohort that has just finished participating in internships as a part of their graduation requirements. The program's assessment coordinator has designed a simple internship survey which asks supervisors to evaluate student performance on a Likert scale (5=excellent; 4=very good; 3=good; 2=needs improvement; 1=poor) in the areas of problem solving, teamwork, continuous improvement, and the ability to communicate. This is the only summative assessment data that the program collects related to these skills. The program has set "3" as a target for performance.

The data from the survey indicate unsatisfactory performance in communication skills (2.8), and continuous improvement (2.2). Your team has been asked to provide consultation services to the program to recommend what the next steps should be.

The program has a curriculum map that identifies multiple courses where students are expected to demonstrate all of the outcomes that are the focus of the survey (see below). In order to understand why students are not performing at the desired levels and how to approach improvement strategies, what should be the program's next steps to improve student learning?

1. What are your initial observations?
2. How can they improve their overall assessment processes?
3. If you are recommending new assessment methods, what methods would you recommend?

Curriculum map:

	110	***201***	***210***	***215***	***220***	***240***	***260***	***301***	***310***	***313***	***330***	***350***	***401***	***490***	***492***
Writing	X			X					X			X		X	X
Teamwork										X	X			X	X
Problem solving	X	X	X		X	X		X	X				X	X	X
Continuous Improvement														X	X

CRITERION 4
CONTINUOUS IMPROVEMENT

- The program must use a **documented** process incorporating **relevant data** to **regularly assess** its student outcomes, and to evaluate the extent to which they are being met.

- The **results** of these evaluations of student outcomes **must be used to effect continuous improvement** of the program through a documented plan. Other information may also be used to assist in the continuous improvement of the program.

SELF-STUDY GUIDELINES
CRITERION 4. CONTINUOUS IMPROVEMENT

Student Outcomes: It is recommended that this section include (a table may be used to present this information):

- A listing and description of the assessment processes used to gather the data upon which the evaluation of each student outcome is based…
- The frequency with which these assessment processes are carried out
- The expected level of attainment for each of the student outcomes
- Summaries of the results of the evaluation process and an analysis illustrating the extent to which each of the student outcomes is being attained
- How the results are documented and maintained

REPORTING THE RESULTS

BACK TO THE BASICS

REPORTING ON OBJECTIVES, OUTCOMES, CONTINUOUS IMPROVEMENT

- Know your audience
- Keep it simple
- If you haven't done it, you're not going to fool them

ABET

Student Outcome: Students will demonstrate the ability to work effectively in teams.

Performance Indicators	Educational Strategies	Method(s) of Assessment	Where Summative Data are Collected	Where Formative Data Collected	Summative Data Cycle (yrs)	Time of Data Collection	Threshold for Performance
1. Produces research information for the team	1011, 2001, 2060, 3001, 4092	Peer Evaluations	4092	2001 (y2 of cycle), 3001 (y3 of cycle)	3 yrs	2012, 2015	80%
		Faculty Evals	4092				
		Senior Surveys	On-line survey				
2. Demonstrates understanding of team roles when assigned	1011, 2001, 2060, 3001, 4092	Peer Evaluations	4092	2001 (y2 of cycle), 3001 (y3 of cycle)	3 yrs	2012, 2015	80%
		Faculty Evaluations	4092				
		Senior Surveys	On-line survey				
3. Shares in the work of the team	1011, 2001, 2060, 3001, 4092	Peer Evaluations	4092	2001 (y2 of cycle), 3001 (y3 of cycle)	3 yrs	2012, 2015	80%
		Faculty Evals	4092				
		Senior Surveys	On-line survey				
4. Demonstrates good listening skills	1011, 2001, 2060, 3001, 4092	Peer Evaluations	4092	2001 (y2 of cycle), 3001 (y3 of cycle)	3 yrs	2012, 2015	80%
		Faculty Evals	4092				
		Senior Surveys	On-line survey				

Results Summary (direct measures) 2012: A sample of 56 students (52% of 2009 cohort) were assessed for the summative assessment. This represents 2 of 4 sections of 4092 (which is the second semester of a two-semester team experience.) The percent of the sample that demonstrated each indicator at satisfactory or exemplary were as follows: Indicator 1 - 72%; Indicator 2 - 65%; Indicator 3 - 62%; Indicator 4 - 89%

Actions 2013: The faculty who integrated teaming into their courses met in the fall of 2010 and 2011 to review the formative data and make recommendations for changes during those academic years. Based on the analysis of the summative results, the department asked faculty to provide the teaming scoring rubrics to students with the course assignments where the students were provided opportunities to demonstrate their teaming skills as defined by the outcomes. A sub-committee of the department Curriculum Committee met to review the outcomes. It was decided not to make any changes at this time. Faculty decided that they would review their assignments to be sure that students were given adequate opportunities to demonstrate the performance identified for teaming. Faculty also agreed to make students performance on the performance indicators a part of their grade for the activity. The Teaching/Learning Center will also provide a seminar for faculty on how to integrate effective teaming into the classroom.

Second-Cycle Results Summary 2015: A sample of 59 students (51% of cohort) were assessed for the summative assessment. This represents 2 of 4 sections of 4092 (which is the second semester of a two –semester team experience.) Based on changes made, the following improvements were seen: Indicator 1 – +12% (84%); Indicator 2 - +7% (72%); Indicator 3 - +13% (75%); Indicator 4 - +2% (91%).

Actions 2016: The faculty who integrated teaming into their courses met in the fall of 2013 and 2014 to review the formative data and make recommendations for changes during those academic years. Although progress was made on all indicators, the Curriculum Committee recommended that the department take another look at all the indicators related to teaming. The Teaching/Learning Center was asked to provide the department faculty some feedback on the indicators and also provide other examples of teaming indicators. This will be one of the issues that will be discussed at the Department retreat for possible revisions for the 2017 academic year.

Student Outcome: Students can work effectively in teams

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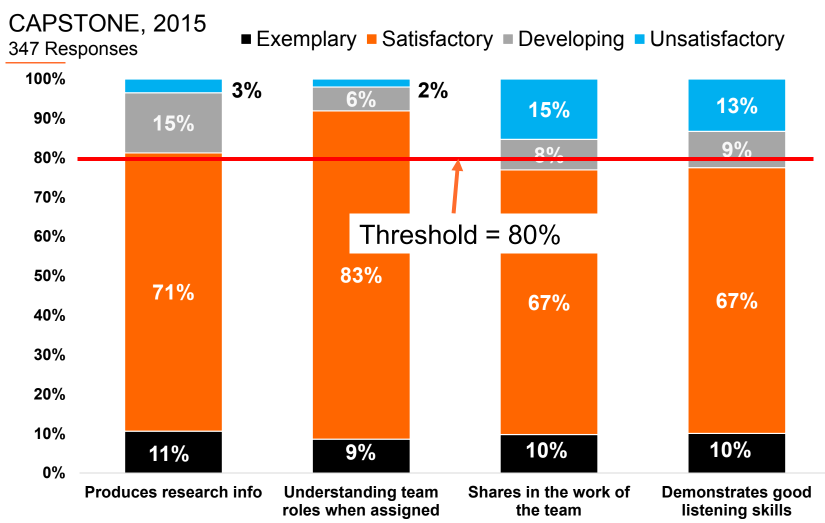
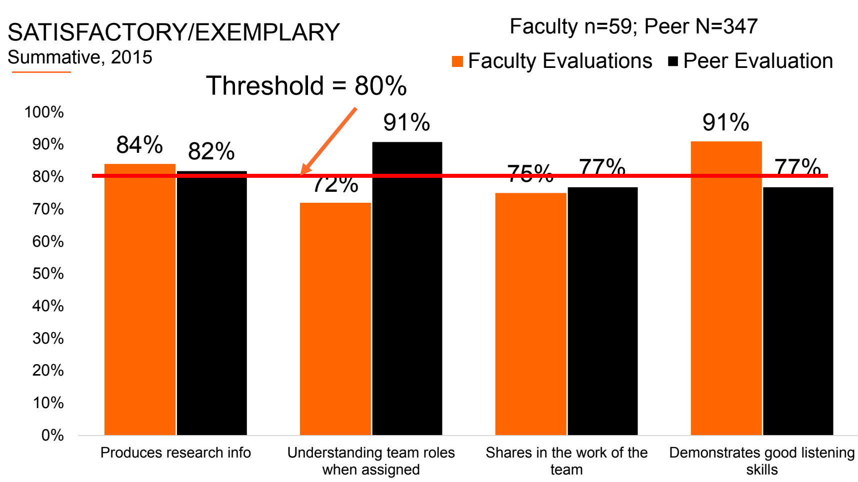
PEER EVALUATIONS



ABET

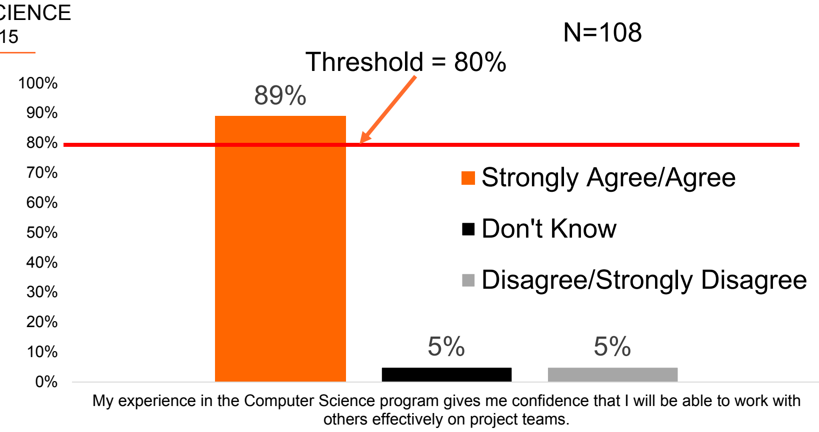
COMPARE FACULTY & PEER EVALUATIONS



ABET

SENIOR SURVEY ITEM

EXPERIENCE IN COMPUTER SCIENCE
2015



FORMATIVE ASSESSMENT

U=Unsatisfactory D=Developing S= Satisfactory E= Exemplary

COURSE 2001
N=378

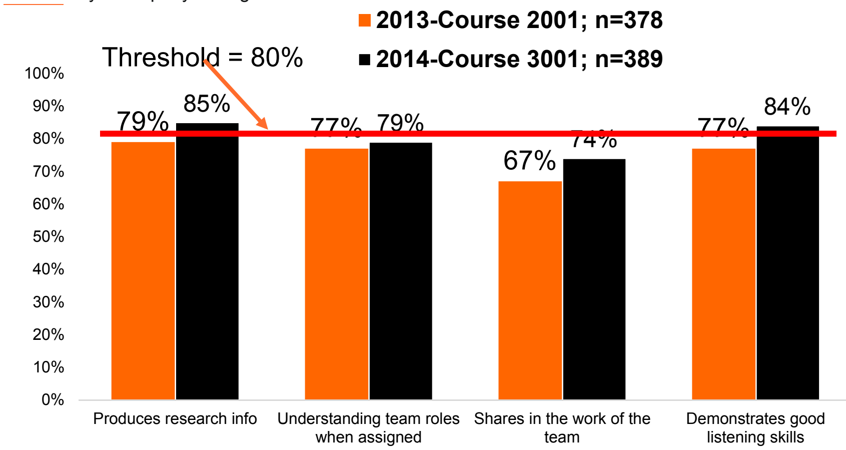
	U	D	S	E
Produces research info	10	11	74	5
Understanding team roles when assigned	13	10	72	5
Shares in the work of the team	25	8	57	10
Demonstrates good listening skills	18	5	60	17

COURSE 3001
N=389

	U	D	S	E
Produces research info	4	11	80	5
Understanding team roles when assigned	5	16	74	5
Shares in the work of the team	8	18	64	10
Demonstrates good listening skills	9	7	67	17

FORMATIVE DATA

PEER ASSESSMENTS
Satisfactory/Exemplary Rating



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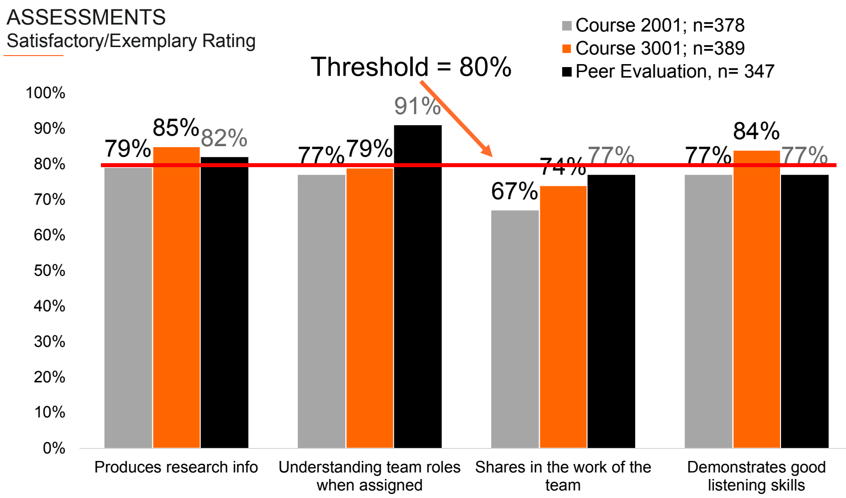
SUMMATIVE DATA

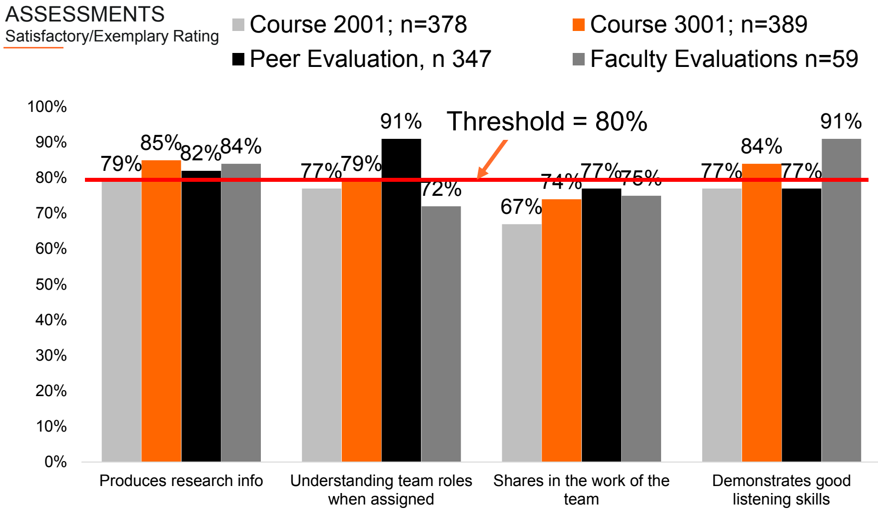
CAPSTONE PEER ASSESSMENTS
Satisfactory/Exemplary Rating



ABET

CUMULATIVE DATA

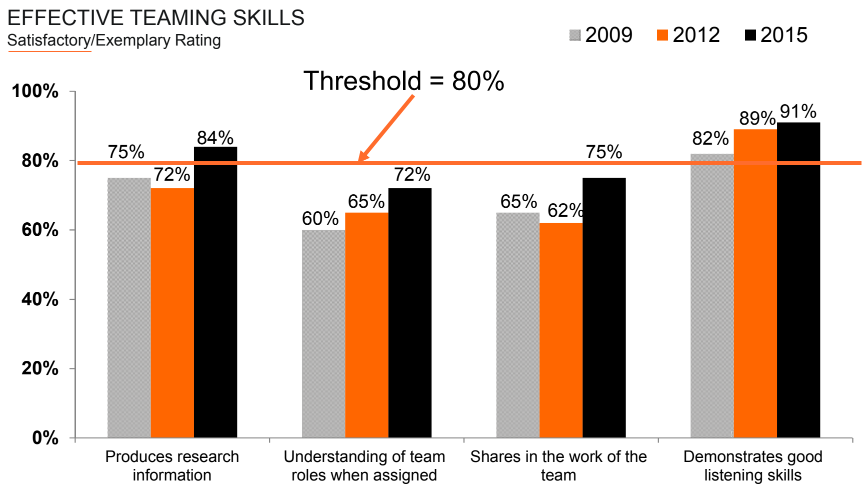
ASSESSMENTS
Satisfactory/Exemplary Rating



ABET

TREND DATA – FACULTY EVALS

EFFECTIVE TEAMING SKILLS
Satisfactory/Exemplary Rating



ABET

TREND DATA

These data can be used for reporting purposes in three areas:

- Program review: Did the changes/recommendations make any difference? The answer to this question feeds back to improve the program.
- Institution: Is the program being effective in documenting student learning and improving learning over time?
- Accrediting agency: What is the evidence of student learning? Is there a process in place that enables the program to determine the level of student learning and the ability to continuously improve their educational processes?

ABET

SETTING "THRESHOLDS"

When setting a threshold for a performance indicator, here is what you should consider:

- Cognitive level: (e.g., is expectation at the knowledge, comprehension, application, analysis, synthesis, evaluation level): One would anticipate that the higher the cognitive level, the higher degree of difficulty
- Complexity of application: The more complex the application of the skill, the more difficulty (e.g., designing a mousetrap car in a 100-level course v. a senior design project)
- Curriculum support: The more courses that support student performance for each indicator, the more likely it is that students will achieve the anticipated performance.
  - Student learning is cumulative over time. As students progress through the curriculum the application of skills are likely to be with more complex problems.
- This means that there might be different "thresholds" for each of the performance indicators that make up any one outcome.

ABET

Student Outcome: An understanding of professional and ethical responsibility

Performance Indicators	Educational Strategies	Method(s) of Assessment	Where summative data are collected	Where formative data are collected	Length of assessment cycle (yrs)	Yr/Sem of summative data collection	Threshold for Performance
1.Knows code of ethics for the discipline	2001, 2060, 3001	Locally developed exam	3001	2001(yr 1 of cycle), 2060 (yr2 of cycle)	3 years	2012, 2015	80%
		Senior Surveys	On-line survey				
2.Ability to evaluate the ethical dimensions of a problem in the discipline	3001, 4092	Case study review/rubric	4092	3001 (yr. w)	3 years	2012, 2015	70%
		Senior Surveys	On-line survey				

Assessment Results Summary (direct measures) 2012: Summative data were collected in 3001. For the summative assessment (end of program), the decision was made to focus on the direct assessment of faculty developed examination as the primary assessment data for both indicators. The assessment of indicator #1 was done in course 3001 after a review of material covered earlier in the program. Because the indicator is at the "knowledge" level, a multiple choice/true-false exam was give to see how well the student had learned the material. For indicator #2, a case study was chosen from http://ethics.tamu.edu/ethicscasestudies.htm and was used in the 4092 class. The scoring rubrics were completed by the faculty. The percent of the students that demonstrated each criterion were as follows: Indicator #1 - 66%; Indicator #2 - 58%.

Evaluation and Actions 2013: The faculty who integrated ethics into their courses met in the fall of 2007 and 2008 to review the formative data and make recommendations for changes during those academic years The assessment results were evaluated by the faculty at a retreat held in August of 2013. Indicator #1: Based on the analysis of the results, the faculty who were introducing and/or reinforcing the code of ethics in their courses were asked to reinforce the importance of knowing the code of ethics for the discipline. They were also encouraged to review the scores to see if there were common items missed and to reiterate the areas where students' performance was weak. Indicator #2: Faculty were asked to provide the scoring rubrics to students with the case study so they could see how they would be evaluated. A sub-committee of the department Curriculum Committee was assigned to meet and review the performance indicators to be sure that they were appropriate. The Advisory Committee was also asked to provide feedback. It was recommended not to make any changes at this time. Faculty integrating ethics agreed to review their assignments to be sure that students were given adequate opportunities to learn the codes in the context of the discipline and to make students performance on the exam was an adequate portion of the overall grade for the unit.

Second-Cycle Results Summary (direct measures) 2015: The second cycle summative data were again taken in the 3001 for indicator #1 and 4092 for indicator #2. Based on actions taken as a result of the 2006 evaluation process, the following improvements were seen in 2008: Indicator #1 – +10% (74%); Indicator #2 - +12% (70%).

Evaluation and Actions 2016: The faculty who integrated ethics into their courses met in the fall of 2013 and 2014 to review the formative data and make recommendations for changes during those academic years. During the August 2016 department retreat, the faculty agreed that adequate progress had been made on both of the indicators and no further action would be taken at this time. However, at the end of the 2018 assessment cycle for ethics if the trend continues upward the committee will review whether or not the thresholds should be raised in an effort to continually improve student performance.

An ability to design and conduct experiments, as well as to analyze and interpret data

Performance Indicators	Educational Strategies	Method(s) of Assessment	Where summative data are collected	Where formative data are collected	Length of assessment cycle (yrs)	Yr/Sem of data summative collection	Threshold for Performance
1. Observes good lab practice and operates instrumentation with ease	1010, 1015,1011, 2020, 2040, 2060,3010, 3013, 3050, 4090, 4092	Observations (rubrics)	3050	1015 (Yr1 cycle); 3013 (Yr 2 cycle)	3 years	2012, 2015	90%
		Senior Surveys	On-line survey				
2. Determines data that are appropriate to collect and selects appropriate equipment, protocols, etc. for measuring the appropriate variables to get required data	1010, 1015,1011, 2020, 2040, 2060,3010, 3013, 3050, 4090, 4092	Lab report (rubrics)	3050	1015 (Yr1 cycle); 3013 (Yr 2 cycle)	3 years	2012, 2015	85%
		Senior Surveys	On-line survey				
3. Uses appropriate tools to analyze data and verifies and validates experimental results including the use of statistics to account for possible experimental error	1010, 1015,1011, 2020, 2040, 2060,3010, 3013, 3050, 4090, 4092	Lab report (rubrics)	3050	1015 (Yr1 cycle); 3013 (Yr 2 cycle)	3 years	2012, 2015	75%
		Senior Surveys	On-line Survey				

Assessment Results Summary (direct measures) 2012: For the summative assessment (end of program), the decision was made to focus on direct assessment for all indicators. Summative data for Indicators were collected in the Fluid Mechanics and Lab (3050) course. In this course students completed four experiments where they were required to develop laboratory reports. The scoring rubrics for Indicator #1 was completed by the Graduate Lab Manager to assess student performance through observations and rubrics for Indicators # 2 and 3 were completed by the faculty. The percent of the students that demonstrated each criterion were as follows: Indicator #1-78%; Indicator #2-72%; and Indicator #3-66%.

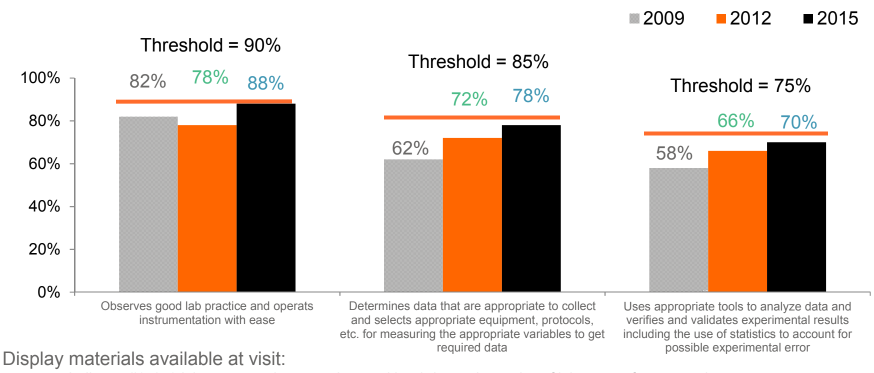
Evaluation and Actions 2013: : The faculty who used experiments in their courses met in the fall of 2010 and 2011 to review the formative data and make recommendations for changes during those academic years The assessment results were evaluated by the faculty at a retreat held in August of 2011. The summative assessment results were evaluated by the faculty at a retreat held in August of 2012. Based on the analysis of the results, the faculty recommended additional formative assessment asking faculty in Circuit Theory and Lab (2040) and Engineering Electronics and Lab (3010) to provide the students the rubrics for Indicators 2 & 3 and give them formal feedback making their scores a part of the grade where appropriate. For Indicator #1, the Graduate Lab Managers were asked to attend a seminar on how to observe students in the laboratory and complete the rubric for lab practices and the use of instrumentation. Based on results, faculty were asked to provide the scoring rubrics with the appropriate lab assignments so students could see how they would be evaluated.

Second-Cycle Results Summary (direct measures) 2015: The second cycle summative data were again taken in the 3050 course for all indicators. Based on actions taken as a result of the 2013 evaluation process, the following improvements were seen in 2015: Indicator #1 up 10% (88%); Indicator #2 up 6% (78%), Indicator #3 up 4% (70%).

Evaluation and Actions 2016: The faculty who used experiments in their courses met in the fall of 2013 and 2014 to review the formative data and make recommendations for changes during those academic years The assessment results were evaluated by the faculty at a retreat held in August of 2016. During the August 2016 department retreat, the faculty teaching the laboratory courses appointed a committee to review the scoring rubrics for clarity. The committee will also meet with the Graduate Lab Managers to review the rubrics for Indicator #1. Their findings will be reported to the laboratory courses faculty who will make recommendations to the faculty. As a result of these deliberations, minor adjustments were made in the scoring rubrics for clarity.

TREND LINE

DESIGN & CONDUCT EXP
ANALYZE & INTERPRET DATA
Satisfactory/Exemplary Rating



Display materials available at visit:

- Indicator #1, 2, 3 laboratory assignment sheets with rubrics and samples of lab reports for summative assessment
- Sample of Laboratory reports and results from 2010 formative assessments
- Copies of revised rubrics as a result of 2013 actions
- Senior Survey questions and results with faculty evaluation
- Minutes of department Laboratory sub-committee meetings where recommendations were made 2013
- Minutes of faculty retreat where actions were taken in 2010, 2013

TABLE

Outcome	Performance Indicators	2009	2012	2015
Teaming	Research and Gather Information	61%	72%	84%
	Fulfill team roles	50%	65%	72%
	Share work	58%	62%	75%
	Listens	70%	89%	91%
Ethics	Know the code of ethics	45%	64%	77%
	Analyze ethical issues	32%	56%	74%
Life Long Learning	Conduct independent research	64%	68%	65%
	Identify opportunities for continued education in the field	57%	67%	86%
	Indicates interest in continuing education	65%	76%	87%

COMMON MISTAKES

- Too many data, not enough information
  - Reporting numbers or percentages without putting them into context
    - How many students in cohort
    - How many students provided data
- Not describing how the data are evaluated
- Using very complex charts describing your assessment processes

ABET

COMMON MISTAKES

- Discussing all outcomes/objectives at once instead of one at a time.
- Using the terms “objectives” and “outcomes” interchangeably.
- Referencing the outcomes/objectives by numbers or letters that refer back to a chart. Don’t require the reader to go back in the self-study for the reference.

ABET

COMMON MISTAKES

MAPPING IN
SELF STUDY REPORT
Example

Program Educational Objectives	Supporting Student Outcomes
1.	a, b, c, e, k, j
2.	d, g , l
3.	e, f, l, j, l
4.	h, l, j

ABET

BEST PRACTICE

MAPPING IN
SELF STUDY REPORT
Example

Program Educational Objectives	Supporting Student Outcomes
1.Graduates will engage in engineering design and apply engineering theory.	a) ability to apply knowledge of math & science b) ability to design and conduct experiments/ analyze data c) ability to design a system, component, or process to meet needs with realistic constraints e) ability to identify, formulate, and solve engineering problems k) ability to use the techniques, skills, and modern engineering tools needed for engineering practice j) knowledge of contemporary issues
2.Graduates will work on project-based teams and communicate effectively with various audiences in written, oral and graphical forms.	d) ability to function on multidisciplinary teams e) ability to communicate effectively f) a willingness to assume leadership roles and responsibilities
3.Graduates will lead effectively and perform with high ethical standards	e) ability to identify, formulate, and solve engineering problems f) understanding of professional and ethical responsibility i) Recognition of and ability to engage in lifelong learning j) knowledge of contemporary issues l) a willingness to assume leadership roles and responsibilities
4.Graduates will continue to learn. .	h) broad education to understand effect of engineering solutions in a global, economic, environmental, and societal context i) Recognition of and ability to engage in lifelong learning j) knowledge of contemporary issues

SUMMARY

- Keep the report focused.
- Have someone read your report that is unfamiliar with your program. If they don't understand it, chances are neither will the visiting team.
- There is elegance in simplicity.

ABET

CRITERION 4 - COMMON ISSUES CONTINUOUS IMPROVEMENT

Processes

- The assessment and evaluation processes are not documented.
- The program cannot demonstrate the processes do what they claim.
- The assessment, evaluation, and improvement cycle is not complete.

ABET

CRITERION 4 - COMMON ISSUES CONTINUOUS IMPROVEMENT

Assessment

- Indicators of student performance have not been defined and/or no a priori level of student performance has been established. (Although there is no criteria requirement for performance indicators or a priori levels of performance, without these or something equivalent it may be difficult to appropriately evaluate the extent to which student outcomes are attained, and additional information may be needed to determine the appropriateness of the evaluation process for outcomes attainment.)
- The program uses only anecdotal results (versus measured results).

ABET

CRITERION 4 - COMMON ISSUES CONTINUOUS IMPROVEMENT

Assessment

- The program relies only on course grades as assessment for one or more student outcomes. There are many factors, rarely all relating to a single student outcome for the program, that are used to determine a course grade. Thus the level of granularity of course grades relative to student outcomes is almost always too coarse for course grades to be used as reliable indicators for attainment of specific student outcomes.

ABET

CRITERION 4 - COMMON ISSUES CONTINUOUS IMPROVEMENT

Assessment

- There is an over-reliance on student self-assessment (e.g., surveys) as opposed to assessment methods based on actual student performance. As a rule, student self-assessment of outcomes attainment is considered much less reliable than attainment data from actual student performance relative to each outcome.
- Assessment data are being collected for only some outcomes.

ABET

CRITERION 4 - COMMON ISSUES CONTINUOUS IMPROVEMENT

Evaluation

- The data collected are not analyzed and used as input to a program improvement process.
- The continuous improvement process appears to ignore evidence that students are not attaining the student outcomes at the expected level of student performance.
- The evaluation of data does not provide the information needed to make program improvements.

ABET

CRITERION 4 - COMMON ISSUES CONTINUOUS IMPROVEMENT

Results

- Program improvement plans are developed but not implemented.
- There is no documentation of how the results of assessment and evaluation processes are used to determine needed program improvements.
- Results of the evaluation of student outcomes are not used to make needed improvements to the student outcomes.
- There is no evidence improvement efforts are being assessed and evaluated.

ABET

LESSONS LEARNED?

- Cannot measure everything
- "You don't have to be bad to get better"
  - Fear factor impedes risk-taking
- Each outcome should be defined by a **few** well-stated performance indicators
  - Identify specific attributes required to demonstrate achievement of the outcome
  - Answer the question, "What do we look for as evidence of outcome achievement?"
  - Reflect the uniqueness of individual programs

ABET

CASE STUDY CRITIQUE

At your table: Ask someone to scribe

- Discuss, identify and list the strengths and weaknesses of Criterion 2 (Program Educational Objectives) – 10 minutes
- Discuss and identify the strengths and weaknesses of Criterion 3 (Student Outcomes) – 10 minutes
- Discuss and identify the strengths and weaknesses of Criterion 4 (Continuous Improvement) -10 minutes
- Be prepared to report out

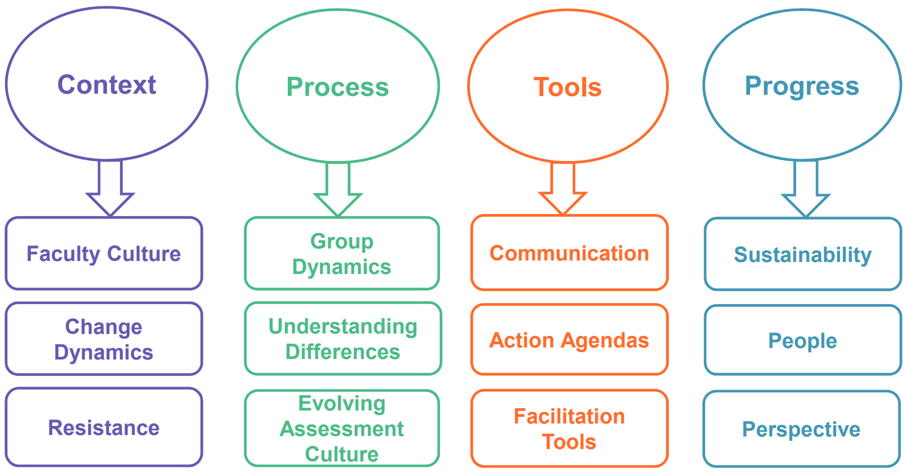
ABET

THINGS I WISH I HAD KNOWN:

- ✓ Distinctions between classroom and program assessment
- ✓ Importance of defining student outcomes
- ✓ Capitalize on what is already being done
- ✓ One size does not fit all
- ✓ You don't have to measure everything all the time
- ✓ More data are not always better
- ✓ Don't let perfection stand in the way of progress

ABET

LEADERSHIP



FACULTY CULTURE

CHALLENGE OF FACULTY INVOLVEMENT

- Continuous quality improvement is a human process
- Faculty are critical to success
  - Own the student outcomes and indicators
  - Evaluate results of assessment
  - Identify and design areas for improvement
  - Implement changes
  - Assess impact

ABET

EXPLORE OUR BELIEFS ABOUT "FACULTY"

- What do we know about faculty?
- Our beliefs about faculty can influence and hamper how we perceive new information
- Our beliefs result in limited or biased conversations and expectations

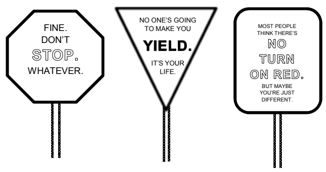
ABET

THERE IS NO SUCH THING AS A "FACULTY TYPE"

Ostrich

Freedom defender

CAVE dwellers



Passive Aggressive

Innovators

ABET *Dowe, Ronald, Mary Mahony, and Marjorie Olive, "Teaching Reconnections: Assessment-Driven Institutional Renewal," NCA 2000 Annual Meeting, Chicago, Illinois, Session 174, April 1-4, 2000

THINKING STRATEGICALLY ABOUT ENGAGING FACULTY

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Application:

Developing Strategies for Faculty Engagement

IDENTIFYING MOTIVATORS AND BARRIERS TO FACULTY INVOLVEMENT

Step 1: Force Field Analysis (15 minutes):

- In your team, use your post-its to individually brainstorm (5 minutes) driving forces (things that promote faculty engagement) and restraining forces (barriers to faculty participation). Place your post-its on the flip chart on the appropriate side.

Driving Forces (Motivators)	Restraining Forces (Barriers)

IDENTIFYING MOTIVATORS AND BARRIERS TO FACULTY INVOLVEMENT

- Once all of the ideas are on the flip chart, use an affinity process to organize ideas and identify the major factors on each side. Prioritize the top three on each side that the team feels are the most significant. If you have a large number of items (over eight), use a **modified nominal group technique** to reduce a large number of items to a smaller list of high priority items. (10 minutes)

Modified nominal group technique:

1. Count the number of items and divide by 3. This is the number of votes each person has (Round fractions off to the lower number). Give each team member as many colored dots as s/he has votes.
2. Have each person use his or her colored dots to votes for the item s/he wants to keep. Note: the group should decide if they want to allow multiple voting (i.e., allowing one person to vote for a single item more than once).
3. List your strategies in their new prioritized order.
4. Critically discuss the top alternatives to reach consensus.

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IDENTIFYING MOTIVATORS AND BARRIERS TO FACULTY INVOLVEMENT

Step 3: Strategize (20 minutes):

- Now that your group has the top three driving and top three restraining forces, divide your team into groups of two/three to develop strategies.
- Each small group should focus on one driving and one restraining force and propose strategies that can be adopted to encourage faculty engagement. That is, what can a program do to capitalize on those things that build on the promoters to encourage faculty to participate and what can be done to reduce the barriers to their participation?
- Consider actions that will reinforce the drivers and/or reduce the barriers. Be specific. For example, don't say "more money" but be specific about strategies a program might take to shift resources or develop new resource streams.

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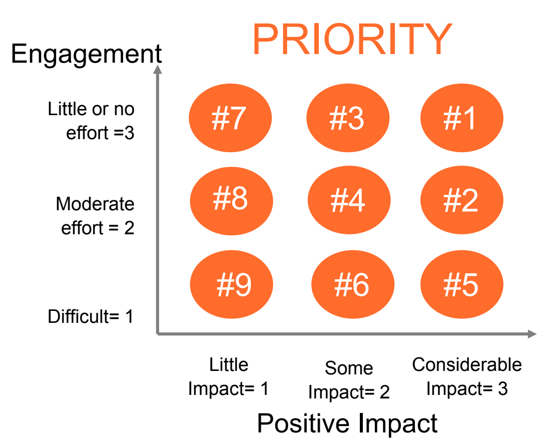
IDENTIFYING MOTIVATORS AND BARRIERS TO FACULTY INVOLVEMENT

Step 4: Team Consensus (10 minutes): Each small group report to the full team to get their input on suggested strategies. The full team should reach consensus and finalize the strategies.

Step 5: Decision Matrix (10 minutes): The final step is to determine which strategies to focus on first. This can be done with a decision matrix. For each strategy, consider the ease of implementing the strategy and the positive impact it is expected to have. After assigning each implementation strategy a score, list each strategy from #1 - #9 on your flip chart and be prepared to report out.

DECISION MATRIX



CHANGE DYNAMICS

WHAT IS KNOWN ABOUT CHANGE?

- Change is a process, *not* an event
- Individuals, not organizations, change—one by one
- Change is highly personal—each individual sees it in terms of how it affects him/her and work
- People go through phases, or stages, when trying to adopt a change
- Stages can be predicted and planned for

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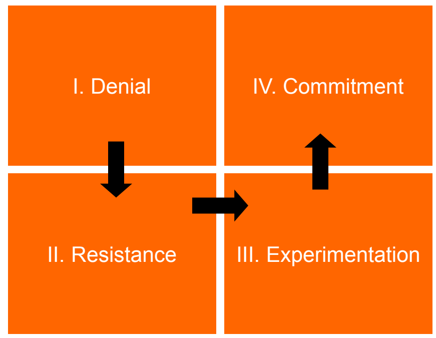
STAGES OF CHANGE

Denial: inability to picture or understand impending change

Resistance: wide variety of behaviors designed to avoid dealing with change

Experimentation: employees begin to make new concepts, processes, or practices “their own”

Commitment: program experiences general, wide acceptance of the new way of doing things (usually short-lived before the next change cycle)



COMMON CHANGE REACTION: WHAT DO THEY NEED?

- Ready and Willing
  - Encouragement, reinforcement
- Confused
  - Facts and information, planning
- Withdrawn
  - Personal contact and involvement in vision/strategy
- Angry
  - Needs to be heard/understood, then involved in vision/strategy

WAYS TO SUCCESSFULLY ROLL OUT CHANGE

- Communicate, communicate, communicate
  - Make it clear what that "future state" looks like
  - Explicitly define what the change is, who will be involved, how it will be done and what's in it for me?
    - What, who, how, WIIFM
- Use storytelling/narrative of other successful programs to help demonstrate that it can be done (vision of success)

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WAYS TO SUCCESSFULLY ROLL OUT CHANGE

- *Involve* everyone, especially the resistors
- Use inclusive language.
- Set guide posts for others to follow, without telling others "how" to do it.
- What kinds of support (interventions) might enable a person to move to the next level?
- Recognize those participating

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RESISTANCE

FACULTY RESISTANCE

- Negative view of assessment
- Always starting over
- Lack understanding
- Lack motivation

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TO DEVELOP SUCCESSFUL PROGRAM ASSESSMENT/CQI PROCESSES:

- Address faculty concerns
  - Reduce workload of massive data collection processes
  - Increase confidence in the process (produce credible evidence)
- Develop a **shared** understanding of best practice for program assessment
  - Tension between desire to be autonomous and yet wanting someone to tell us what to do
- Move from focus on individual courses to cumulative effect of learning at the program level

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RESISTANCE IS HEALTHY

- Expect resistance - it is a normal and healthy reaction.
- People always resist things that they perceive not to be in their best interests.
- Resistance is an expression of power — the ability to not get what you don’t want.
- The greater the individual’s ability to resist, the less likely he/she will end up a “victim.”

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RESISTANCE

	I get it	I don't get it
I want it	Winner (+)	Loser (–)
I don't want it	Victim (–)	Resister (+)

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PARADOXICAL THEORY OF CHANGE

People get "stuck" in the current state. They will not be "unstuck" until they can fully appreciate current state.

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LEVELS OF RESISTANCE

1. Need for additional information
   "I just need to clarify some things so I have a better picture of what's happening."
2. Emotional attachment to current situation
   "I have too much at stake to buy in."
3. Values-based attachment to current situation
   "This is in total conflict with my beliefs about how an organization should be run."

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GROUP DYNAMICS

WORKING WITH GROUPS

- Groups are living, human systems
  - Unique ‘personality’, energy, dynamic patterns
- Presumed collective intent
- Presumed specific outcome – linked to a desire to move forward

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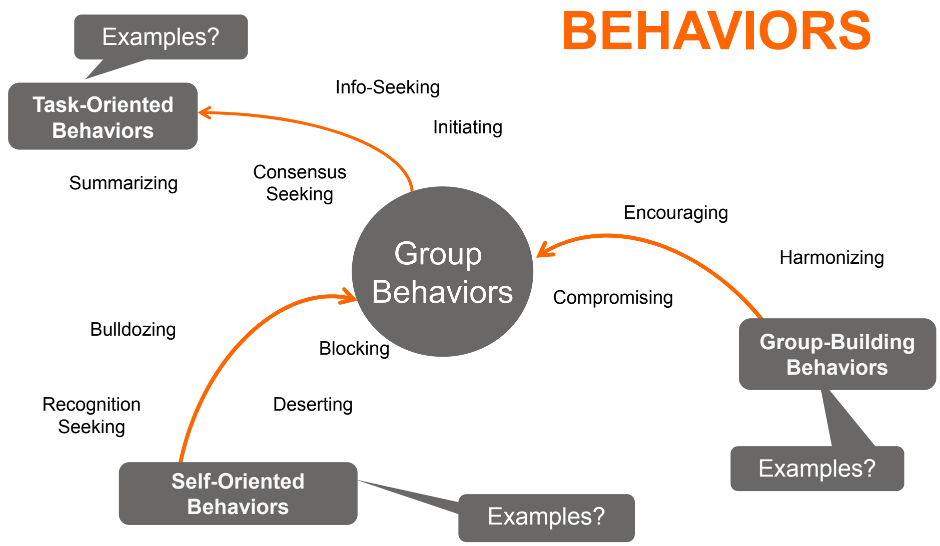
THREE PREDOMINANT GROUP BEHAVIORS



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UNDERSTANDING DIFFERENCES

“TAKING IT IN”

DIFFERENCES IN LEARNING STYLES

Active	Reflective
Sensing	Intuitive
Visual	Verbal
Sequential	Global

Excerpted from: LEARNING STYLES AND STRATEGIES[1]

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Barbara A. Soloman
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ACTIVE AND REFLECTIVE LEARNERS[2]

- Active learners tend to retain and understand information best by doing something active with it—discussing or applying it or explaining it to others. Reflective learners prefer to think about it quietly first.
- "Let's try it out and see how it works" is an active learner's phrase; "Let's think it through first" is the reflective learner's response.
- Active learners tend to like group work more than reflective learners, who prefer working alone.
- Sitting through lectures without getting to do anything physical but take notes is hard for both learning types, but particularly hard for active learners.

Everybody is active sometimes and reflective sometimes. Your preference for one category or the other may be strong, moderate, or mild. A balance of the two is desirable. If you always act before reflecting you can jump into things prematurely and get into trouble, while if you spend too much time reflecting you may never get anything done.

SENSING AND INTUITIVE LEARNERS[3]

- Sensing learners tend to like learning facts, intuitive learners often prefer discovering possibilities and relationships.
- Sensors often like solving problems by well-established methods and dislike complications and surprises; intuitors like innovation and dislike repetition. Sensors are more likely than intuitors to resent being tested on material that has not been explicitly covered in class.
- Sensors tend to be patient with details and good at memorizing facts and doing hands-on (laboratory) work; intuitors may be better at grasping new concepts and are often more comfortable than sensors with abstractions and mathematical formulations.
- Sensors tend to be more practical and careful than intuitors; intuitors tend to work faster and to be more innovative than sensors.
- Sensors don't like courses that have no apparent connection to the real world; intuitors don't like "plug-and-chug" courses that involve a lot of memorization and routine calculations.

Everybody is sensing sometimes and intuitive sometimes. Your preference for one or the other may be strong, moderate, or mild. To be effective as a learner and problem solver, you need to be able to function both ways. If you overemphasize intuition, you may miss important details or make careless mistakes in calculations or hands-on work; if you overemphasize sensing, you may rely too much on memorization and familiar methods and not concentrate enough on understanding and innovative thinking.

VISUAL AND VERBAL LEARNERS

Visual learners remember best what they see—pictures, diagrams, flow charts, time lines, films, and demonstrations. Verbal learners get more out of words—written and spoken explanations. Everyone learns more when information is presented both visually and verbally.
In most college classes very little visual information is presented: students mainly listen to lectures and read material written on chalkboards and in textbooks and handouts.

Unfortunately, most people are visual learners, which means that most students do not get nearly as much as they would if more visual presentation were used in class. Good learners are capable of processing information presented either visually or verbally.

SEQUENTIAL AND GLOBAL LEARNERS[4]

- Sequential learners tend to gain understanding in linear steps, with each step following logically from the previous one. Global learners tend to learn in large jumps, absorbing material almost randomly without seeing connections, and then suddenly "getting it."
- Sequential learners tend to follow logical stepwise paths in finding solutions; global learners may be able to solve complex problems quickly or put things together in novel ways once they have grasped the big picture, but they may have difficulty explaining how they did it.

Many people who read this description may conclude incorrectly that they are global, since everyone has experienced bewilderment followed by a sudden flash of understanding. What makes you global or not is what happens before the light bulb goes on. Sequential learners may not fully understand the material but they can nevertheless do something with it (like solve the homework problems or pass the test) since the pieces they have absorbed are logically connected. Strongly global learners who lack good sequential thinking abilities, on the other hand, may have serious difficulties until they have the big picture. Even after they have it, they may be fuzzy about the details of the subject, while sequential learners may know a lot about specific aspects of a subject but may have trouble relating them to different aspects of the same subject or to different subjects.

"Well, what I was thinking is that first, you'd look for direct assessment examples, such as grades. The data show these are easiest to find. Next, you'd find indirect assessments, such as improved perception of the importance of mathematics. You said these are more difficult to find…I'll have to think about ways to do that."

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HOW WELL DO YOU KNOW YOUR TEAMMATES?

Name	Active/ Reflective	Sensing/ Intuitive	Visual/ Verbal	Sequential/ Global
XXXX	A	I	Vb	S

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SO WHAT?

- As a leader, how does thinking about “style” help you in engaging others in the process?
- What does someone “need?”
  - What strategies would you use to appeal to someone who was primarily:
    - Table 1 & 6: Active / Reflective
    - Table 2: Sensing / Intuitive
    - Table 3: Visual / Verbal
    - Table 4 & 5: Sequential / Global

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EVOLVING AN ASSESSMENT CULTURE

PROCESS OF DEVELOPING A "CULTURE"

Beginning LEVEL ONE	Progressing LEVEL TWO	Maturing LEVEL THREE
There is minimal evidence that the assessment program is stable and will be sustainable	Assessment findings are beginning to be incorporated into program reviews and the self study of institutional effectiveness	Student learning has become central to the institution and student learning, performance, and achievement are celebrated

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PROCESS OF DEVELOPING A "CULTURE"

Beginning LEVEL ONE	Progressing LEVEL TWO	Maturing LEVEL THREE
Tolerated	Anticipated	Celebrated
Isolated	Connected	Integrated
Episodic	Periodic	Characteristic

There is minimal evidence that
and will be sustainable

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PROCESS OF DEVELOPING A "CULTURE"

BEGINNING	PROGRESSING	MATURING

CLIMATE			CULTURE
	Isolated	Pervasive	
	Temporary	Ongoing	
	Personality Driven	Structurally Driven	
	Surface	Embedded	
	External	Internal	
	Program Accreditation	Improvement & Validation	

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EVIDENCE OF CAMPUS CULTURE OF CONTINUOUS IMPROVEMENT

- ✓ Written Materials
- ✓ Formal & Informal Policies and Procedures
- ✓ Organizational Structure
- ✓ Social Knowledge
- ✓ Reward Structure
- ✓ Vocabulary
- ✓ Rites & Rituals

COMMUNICATION

EFFECTIVE LEADERSHIP

Fundamental issues for leaders:

- How to promote effective communication
- How to conduct effective meetings
- How to maximize group productivity through the use of facilitation tools

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LISTENING TECHNIQUES

- Critical Listening
  - Separate fact from opinion.
- Empathetic Listening
  - Don't talk- listen.
  - Don't give advice- listen.
  - Don't judge- listen.
- Creative Listening
  - Exercise an open mind.
  - Supplement your ideas with another person's ideas and vice versa.

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LISTENING SKILLS

- Stop talking.
- Engage in one conversation at a time.
- Empathize with the person speaking.
- Ask questions.
- Don't interrupt.
- Show interest.

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LISTENING SKILLS

- Concentrate on what is being said.
- Don’t jump to conclusions.
- Control your anger.
- React to ideas, not to the speaker.
- Listen for what is not said. Ask questions.
- Share the responsibility for communication.

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Application:

Getting faculty engaged

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TRIAD PRACTICE

- Divide into groups of three to practice giving feedback
  - Use roles provided
    - Assessment Leader
    - Faculty member

    7 minutes
    - Observer/feedback – 3 minutes
  - Switch roles

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DEBRIEF

- What was the hardest part of the exercise?
- How did you feel as the faculty member?
- How did you feel as the leader?
- Did you feel capable of providing feedback?
  - Empathetic?
  - “Yes” responses?
  - Good listener?

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ACTION AGENDAS

EFFECTIVE MEETINGS

Elements of a well-developed agenda (meeting planner)

- Topics in logical order (including a sentence or two that defines each item and its relevance)
- Process used for coming to a decision (e.g., brainstorming, multi-voting, etc.) and not simply state “discuss...”
- Team roles assigned

PRIMARY TEAM ROLES

- **Leader**: Develops the agenda; leads team through problem solving process; provides structure and guidance to allow maximum participation; influences team decisions equally with other members.
- **Recorder:** Summarizes discussion and material generated during the working meetings.
- **Timekeeper:** Makes sure the team stays on its time budget for the various tasks.
- **Issue Bin/Action Items:** Records items placed in the issue bin and all items which need action by team members

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PRODUCTIVE MEETINGS

- Plan ahead!
- Time guideline (amount of time allotted for each agenda topic)
- Item type—whether the item requires discussion or decision, or is just an announcement

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Agenda Planner

(for each item, know the following things)

Group: *(e.g., Assessment Committee, Assessment Sub-committee)*

Meeting purpose: *(e.g., Review and approve writing program rubric)*

Time Block (minutes) From: To:	Details (for each topic)		
Topic			
Purpose			
Pre-meeting Reading (see attached or location of material) or Preparation			
Tools or Activity to be used			
Visual/Audio/Other Aids/ Equipment			

Indicate responsibilities:
Leader:
Recorder:
Time Keeper:
Issue Bin/Action Items:

Agenda Planner

Group: Program Assessment Committee

Meeting title: Assessment Committee Planning Workshop

Time Block (minutes) From: To:	Details (for each topic)		
Topic:	Committee Assignments	2016 action items	Timelines, benchmarks, priorities
Purpose	Finalize committee responsibilities	Review and finalize 2016 action items	Determine timelines, benchmarks, priorities for committee work
Time allowed	15 minutes	20 minutes	20 minutes
Pre-meeting Reading (see attached or location of material) or Preparation	Review committee with responsibilities and send top three preferences for committee assignments 2 days before meeting (attach committee document to agenda)	Review and come with comments/ suggestions about action items for 2016 (send url for action item document)	
Tools or Activity			Decision matrix
Visual/Audio/Other Aids/ Equipment	Poster paper with section for each committee; post-its with each committee member names		Poster paper with tasks listed and columns for timelines, benchmarks, priority; post-its

Roles: Leader: Jeff Wilson; Recorder: Huan Chow; Time Keeper: Juanita Jones; Issue Bin/Action Items: Mary Simpson

PRODUCTIVE MEETINGS

- Keep discussion focused on the topic and moving along (determine what goes in ‘issue bin’)
- Intervene if discussion becomes ‘multiple conversations’

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PRODUCTIVE MEETINGS

- Tactfully prevent anyone from dominating or being overlooked
- Bring discussion to a close (e.g., summarize)
- Take minutes
  - Be sure someone has responsibility to record key subjects and main points raised, decisions made including who has agreed to do what and by when, and items deferred to a later time - ROTATE THIS DUTY

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AGENDA PREPARATION

Agenda should be sent out at least 5 days before the meeting

- Time to complete "homework"
- Provide any requested responses
- As the leader, you need to set aside specific time to plan the meeting
  - It may take as much as an hour to prepare the agenda
  - Be sure minutes of previous meeting have been sent
  - Follow up with any unfinished business
  - Review action items
  - Prepare materials that need to be sent out with agenda

FACILITATION TOOLS

FACILITATION TOOLS

Use techniques that keep the momentum

- In this Institute, we have used:
  - Silent brainstorming/affinity
  - Nominal group process
  - Force field analysis
  - Modified nominal group process
  - Decision matrix
  - Issue bin
- Tools are designed to maximize the involvement of participants, structure the conversations, move the process forward.

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ISSUE BIN

The Tool (sometimes referred to as "Parking Lot")
Often groups or individuals will get off track - a new topic will come up or an idea will begin to be discussed that isn't the main focus of the meeting, or might be better discussed later on. At that point whoever is facilitating the meeting would suggest that this topic or issue be placed in the Issue Bin. They would then go to a chart on the wall labeled Issue Bin and write a brief description of the issue so that the idea won't be lost. In other words, the goal of this tool is to keep a group on track with their agenda.

Beyond that though, the Issue Bin is a way to help a group "hold that thought" so that the idea isn't lost - and can be discussed later when the time is right.

The Misuse
The most common misuse of this valuable tool is that facilitators put items into the Issue Bin or Parking Lot with no real plan to revisit them - they are using the Bin as a place to put stuff they don't really want to talk about at all. Or, facilitators do have good intentions, but when the meeting runs long (how many meetings have you been to that didn't go long?), and time is short, the Issue Bin item(s) get lost in the rush to finish the meeting.

The Best Use
It isn't hard to use an Issue Bin effectively. It just requires a process and a bit of discipline.

- Make sure that everyone knows the function of the Issue Bin.
- Capture items to the Issue Bin as appropriate.
- Schedule time in the agenda (typically 2-3 minutes is all that is required) to review the Issues near the end of the meeting. This review should answer three questions: Is this still an issue (or has it been resolved since it was placed in the Bin?) Is there an action item that can be created from this issue? If so, what is it? Is this a topic that needs to be on a future meeting agenda?
- Don't leave the Issue Bin until something is done with each issue. If nothing can be done with it at this time, consider saving the issue and having it reside on the Issue Bin at the start of your next meeting.

The bottom line? Do something with every one of them! Taking this simple approach to using this tool will make your meetings run more productively and make sure that all of the best ideas and issues are both raised and considered.

Just like any tool, it is wonderfully valuable when used correctly. And just like any other tool, it can be damaging and counterproductive when it isn't.

Adapted from: *Meeting Tools: Using The Issue Bin* By: Kevin Eikenberry
http://www.sideroad.com/Meetings/meeting-tool-issue-bin.html

SILENT BRAINSTORMING AND AFFINITY PROCESS

Silent Brainstorming:

The purpose of silent brainstorming is to generate a number of ideas in a non-analytic manner that permits one group member's ideas to stimulate the ideas of others. This is also a way for every group member to get involved in the process. Everyone's ideas are recorded and valued.

Process:
- Each person generates as many responses to the topic as possible.
- This should be done in seven words or less and use a verb and a noun.
- Only one idea per post-it.
- After everyone is done writing, have all members post their ideas on the flip chart (or other available surface).
- As other members of the group review all the post-its, new ideas will emerge. New ideas should be placed on Post-It notes and put with the rest of the ideas.
- The group should discuss the Post-It notes to check if there are any questions about what any of the post-its say or mean. (Check for understanding)

Affinity Process:

The purpose of the affinity process is to organize a large set of items into smaller sets of related items.

Process: After there is an understanding of each of the post-its, team members now do the following:

- **SILENTLY** move the post-its around, grouping those which have an affinity.
- If disagreement exists when grouping (noted because they keep moving them from one group to another) make a copy of the item and place it in more than one group.
- After all items have been grouped, discuss each grouping to determine what it is that relates all the post-its.
- Write a HEADER card that captures the theme and feeling of the group of items.
- If there is are single idea Post-It notes that do not fit well with other ideas, the group needs to decide if they want to keep it ("yes" is an okay answer).

NOMINAL GROUP TECHNIQUE

This article is online at *http://joe.org/joe/1984march/iw2.html*.

This technique was originally developed by Delbecq and VandeVen[2] and is a structured variation of small group discussion methods. The process prevents the domination of discussion by a single person, encourages the more passive group members to participate, and results in a set of prioritized solutions or recommendations. The steps to follow in NGT are:

1. Divide the people present into small groups of 5 or 6 members, preferably seated around a table.
2. State an open-ended question (" What are some ways we could encourage participants to car pool?").
3. Have each Person spend several minutes in silence individually brainstorming all the possible ideas and jot these ideas down.
4. Have the groups, collect the ideas by sharing them round robin fashion (one response per person each time), while all are recorded in key term, on a flipchart. No criticism is allowed, but clarification in response to questions is encouraged.
5. Have each person evaluate the ideas and individually and anonymously vote for the best ones (for example, the, best idea gets 5 Points, next best 4 Points, etc.).
6. Share votes within the group and tabulate. A group report is prepared, showing the ideas receiving the most points.
7. Allow time for brief group presentations on their solutions.

NGT Advantages and Disadvantages

As with any technique, there are advantages and disadvantages. NGT is no exception. Some of the obvious advantages are that voting is anonymous, there are opportunities for equal participation of group members and distractions (communication "noise") inherent in other group methods are minimized. As to disadvantages, opinions may not converge in the voting process, cross-fertilization, of ideas may be constrained, and the process may appear to be too mechanical.

Footnotes

1. M D. Dunnette, J. D, Campbell, and K Jaastad, "The Effect of Group Participation no Brainstorming Effectiveness for Two Industrial Samples, *Journal of Applied Psychology*, XLVII (February, 1963), 30-37.
2. A.. L. Delbecq and A. H VandeVen, "A Group Process Model for Problem Identification and Program Planning," *Journal Of Applied Behavioral Science* VII (July/August, 1971), 466 -91 and A. L. Delbecq, A. H. VandeVen, and D. H. Gustafson, *Group Techniques for Program Planners* (Glenview, Illinois: Scott Foresman and Company, 1975).
3. K. R. Vedros, "The Nominal Group Technique is a Participatory, Planning Method In Adult Education"(Ph.D. dissertation, Florida State University, Tallahassee, 1979)

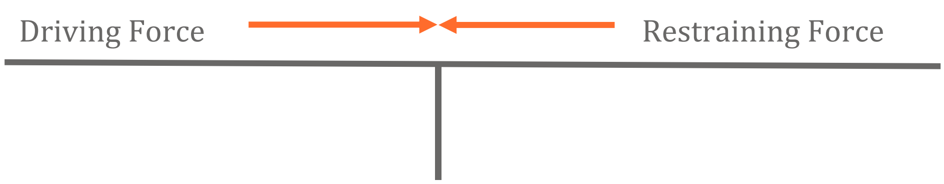
FORCE FIELD ANALYSIS

1. **QUESTION** (e.g., what strategies can we implement to engage faculty in the assessment process?) How the question is stated is very important because it will drive the rest of the process. This can also be done in terms of anticipated outcomes or expectations instead of a question.

2. Identify expectations of what the group should accomplish (e.g., a list of realistic strategies that we can implement to engage faculty)

3. **Force field analysis** (when talking about implementation strategies, need to analyze the forces involved.) i.e., what forces are there which effect the ____________?

   For any driving force there is a restraining force



   Identify driving forces and restraining forces

4. When you try to decide what action to take, **look at the forces and choose strategy**.

   How do you enhance driving forces <u>or</u> how do you reduce restraining forces? What actions can be taken to limit restraining forces?

   (If you try to enhance the driving forces, the restraining forces may push even harder.)

5. **Quality check** (<u>*What gets measured, gets valued and what gets done.)*</u>

   How did we do???? (Evaluate the process)

MODIFIED NOMINAL GROUP TECHNIQUE

Purpose

Modified nominal group technique is a technique to help a team or group quickly reduce a large list of items to a smaller number of high priority items. The process elicits a high degree of team agreement and promotes team ownership.

Steps

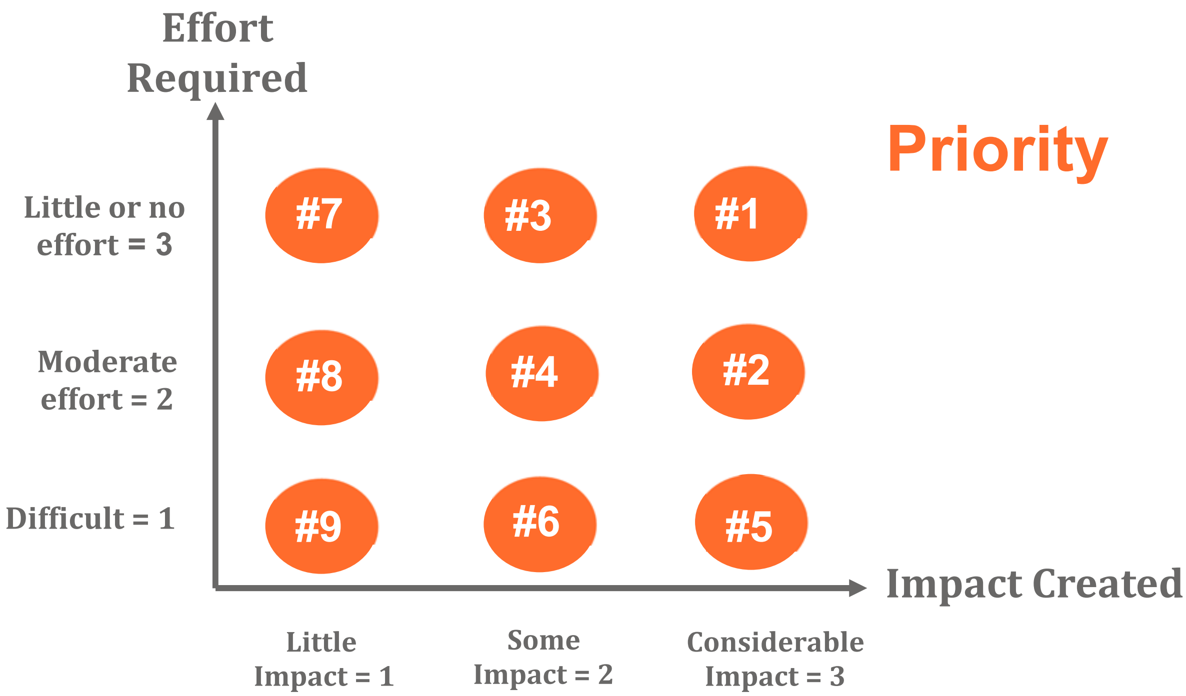
1. Count the number of items on the list and divide by three. This is the number of votes each person has. (Round fractions off to the lower number.) If the items number more than 60, do not go over a vote total of 20. Vote totals of more than 20 are hard to manage. Give each team member as many colored dots as s/he has votes.

2. Have each person use her/his votes (colored dots) to select the items s/he wants to keep. While each person can vote for any item, it is good to limit the number of votes any one item can receive from a single person to three. Note: the group can decide if they want to allow more or less multiple voting.

3. List alternatives in their new prioritized order.

4. Critically discuss the top alternatives in order to reach consensus. Eliminate those that are outside the control of the team.

DECISION MATRIX



Considerations

Effort

- Resource requirements
- Complexity of investigation
- Time required
- Ability to measure outcomes
- Number of decision making levels required

Impact

- Effect on quality
- Time savings
- Morale
- Number of people who benefit

SUSTAINABILITY

WHY SUSTAIN?

- Expectation for on-going evaluation of outcomes
- Accountability to stakeholders/constituents
- Avoid stops and start all over again

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WHAT NOT TO SUSTAIN?

- Individual ownership of the process
- Irrelevant information collection
  - More data are not necessarily better
- Burdensome processes

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FOUR THINGS TO SUSTAIN

1. Meaningful structures
2. Meaningful uses of assessment data
3. Reasonable workload that springs from the work faculty and staff already do
4. A committed culture

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1. MEANINGFUL STRUCTURES

Build assessment into:

- Policies and procedures
- Program governance:
  - standing committee
  - regular place on agenda
- Strategic planning
  - Decision-making tools:
    - Departmental plans
    - Program Review

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1. MEANINGFUL STRUCTURES

- Build visibility:
  - Resource support
    - Be creative
- Connect assessment work to relevant committees, like Curriculum and Tenure review
- Consider incorporating the scholarship of teaching and learning as elements in tenure and promotion decisions
- Consider including collecting, analyzing, and using assessment data as part of the job description

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2. MEANINGFUL USES OF ASSESSMENT DATA

- Expect, encourage, and communicate the connection between assessment data and curricular, pedagogical, and service changes
- Encourage reflection on data and on changes that result from it
- Allow analysis and reflection to fit departmental culture

ABET

3. REASONABLE WORKLOAD

- Proceed from what faculty and staff already do—but help shape it into good assessment
- Spread the burden;
  - rotation plans on committees
  - distributed functions
  - “champions” that educate, inform, and coach
- Use pilot approaches to see what works—and doesn’t—instead of “one size fits all”

ABET

4. COMMITTED CULTURE

- Build a **"community of scholars"** environment where interesting questions arise from assessment data—a culture of inquiry and evidence
- Have conversations about assessment
  - Intentional
  - Regular
  - Inclusive

ABET

4. COMMITTED CULTURE

- Build
  - Leadership
  - cadre of peer advisors
- Weave assessment into curriculum design and approval processes
- Map curriculum to determine how outcomes are developed over time
- Consider integrative assessments

ABET

4. COMMITTED CULTURE

- User-friendly processes and data systems
- Built-in peer support
- Acknowledgement
- Celebrations

ABET

BEGINNING OF “CLUES” THAT PROCESS IS NOT SUSTAINABLE

- One year of data collected
- Changes not evidence-based
- No systematic data collection process
- Student learning is assessed by single method

ABET

PEOPLE

PEOPLE – WHO DO WE INVOLVE?

Most important resource above all is **PEOPLE**.

- Faculty
  - Don't squander faculty time.
  - **Some** faculty should be involved in:
    - Assessment committee work
    - Data collection
    - Data analysis
    - Outcome "champion"
  - **All** faculty should be involved in:
    - Affirming performance indicators for outcomes
    - Mapping curriculum to performance indicators
    - Reviewing results—at some level
    - Implementing recommendations—at some level

ABET

PEOPLE – WHO DO WE INVOLVE?

- Students
  - Avoid a "stealth" assessment process.
  - Students should be knowledgeable about the STUDENT OUTCOMES.
  - Students should know the level of performance that is expected of them. Students should be given timely feedback on their performance related to the student outcomes.
  - Research on learning is definitive:
    - Students learn best when expectations for their performance is clear AND they get timely feedback on their performance.

ABET

MANAGING UPWARDS

MANAGING UPWARDS

- You need support, cooperation and commitment from your "supervisor"
- You are in charge of managing her/his expectations and keeping communication channels open
- This process is not his/her priority

ABET

MANAGING UPWARDS

- You need support, cooperation and commitment from your "supervisor"
- You are in charge of managing her/his expectations and keeping communication channels open
- This process is not his/her priority

- Plan your communication
  - Clearly define the issues (What do you need? Why?)
  - Present possible solution which not only benefit your needs but also his/her's (WIIFM—What's in it for me).
  - LISTEN…be prepared to collaborate
  - Provide "talking points"

ABET

PERSPECTIVE

PERSPECTIVE

- Your most basic beliefs and attitudes can influence how others view the process:
  - The language you use,
  - The passion (or lack thereof) you demonstrate,
  - The seriousness of commitment you show.

ABET

LANGUAGE THAT IS USED

- A College-level assessment committee was called the "Overlords."
- A College desiring to develop a "culture of assessment" produced two documents to guide the program assessment process:
  - Student Learning Assessment Methods
  - Student Learning Assessment Program
    - Referred to as "SLAM" and "SLAP"
- A College had an "Assessment Day" where programs made presentations on their assessment processes. A trophy was given to the program that best demonstrated "closing the loop."
  - It was called the " Loopie" trophy.

ABET

EXTENT OF THE COMMITMENT THAT YOU DEMONSTRATE

- Are you dedicated to the value of the continuous improvement process for student learning?
  - Does your conversation with colleagues revolve around what ABET wants or what is best for student learning?
  - Do your interactions with colleagues give the impression that you are a prisoner in this process?

ABET

WILLINGNESS TO ADMIT YOU DON'T KNOW SOMETHING

- Don't let need of **"perceived"** perfection stand in the way of progress.
  - Strive for excellence, not perfection.
- This is a process and will change over time—need to put "continuous" back into "continuous improvement."
- Listen to your colleagues.
- Critical error to believe that a previous "clean" accreditation visit means that you don't have to change anything—**EVER**!

ABET

PASSION THAT IS DEMONSTRATED

- Enthusiasm IS contagious.
- What you say and HOW you say it is important.
  - Do you begin by apologizing when you ask your colleagues to do something for program assessment?
  - Do you make promises that you can't keep?
    - This won't take any time!
  - Do you blame ABET for the workload that has been created?
  - Do you express doubts about the value of the process?

ABET

SUMMARY

- Common mistakes in the assessment process are not just related to data collection, evaluation, and improvements.
- Assessment is a human process and wise involvement of human capital is critical to its success.
- Attitudes and conversations are critical in establishing an environment for collegial engagement.
  - ***"The quality of an institution is known by the quality of its conversations."***

ABET

Self-Assessment: Continuous Improvement of Program-Level Assessment of Student Learning [1]

0-not in place; 1-beginning stage of development; 2-beginning stage of implementation; 3-in place and implemented; 4-implemented and evaluated for effectiveness; 5-implemented, evaluated and at least one cycle of improvement

Stakeholder/Constituent Involvement (Those who have a vested interest in the outcome of the program)	**RATING**	**Program Educational Objectives** (Graduates performance after completing program)	**RATING**	**Student Outcomes** (Desired knowledge, skills, attitudes, behaviors, by the time students complete program)	**RATING**	**Student Outcomes aligned with educational practices**	**RATING**	**Assessment Processes**	**RATING**	**Evaluation**	**RATING**
Stakeholders are identified		Objectives are determined		Outcomes are identified		Desired performance is mapped to curricular practices and/or strategies (e.g., courses/ teaching methodology)		Assessment is on-going and systematic at the program level		Assessment data are systematically reviewed	
Primary stakeholders are involved in identifying/ affirming program educational objectives		Objectives are publicly documented		Number of outcomes are manageable		Practices/strategies are systematically evaluated using outcomes assessment data		Multiple methods are used to measure each outcome		Evaluation of results are done by those who can effect change	
Primary stakeholders are involved in periodic evaluation of educational objectives		Number of objectives are manageable		Outcomes are publicly documented		Where necessary, educational practices are modified based on evaluation of assessment data		Both direct and indirect measures of student learning are used to measure outcomes		Evaluation of assessment data is linked to curricular practices/strategies	
Sustained partnerships with stakeholders are developed		Objectives are aligned with mission statement		Outcomes are linked to educational objectives				Assessment processes are reviewed for effectiveness and efficiency		Evaluation leads to decision making/ action	
		Objectives are periodically evaluated for continued relevancy		Outcomes are defined by a manageable number of measurable performance indicators				When needed, assessment methods are modified based on evaluation processes			

[1] This tool is intended for self-assessment only to assist in understanding areas for improvement in the assessment process development. Assessment Planning Flowchart © 2004 Revised July 2014

Developed by Gloria Rogers (gloriarogers1@gmail.com)

Journal

IDEAL[SM]

Participant Journal

Date: _______________

Points of learning (new insights/knowledge):

1.

2.

3.

4.

5.

Application to my program (what do I need to do to implement what I have learned?):

1.

2.

3.

4.

5.

IDEAL℠

Participant Journal

Date: _______________

Points of learning (new insights/knowledge):

1.

2.

3.

4.

5.

Application to my program (what do I need to do to implement what I have learned?):

1.

2.

3.

4.

5.

IDEAL℠

Participant Journal

Date: _______________

Points of learning (new insights/knowledge):

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Application to my program (what do I need to do to implement what I have learned?):

1.

2.

3.

4.

5.

IDEAL℠

Participant Journal

Date: _______________

Points of learning (new insights/knowledge):

1.

2.

3.

4.

5.

Application to my program (what do I need to do to implement what I have learned?):

1.

2.

3.

4.

5.

IDEAL[SM]

Participant Journal

Date: _______________

Points of learning (new insights/knowledge):

1.

2.

3.

4.

5.

Application to my program (what do I need to do to implement what I have learned?):

1.

2.

3.

4.

5.

IDEAL℠

Capstone

THE PLAN FRAMEWORK - Academic Year: ________________

DAY ONE

Where do you want your continuous improvement process to be at the end of the Academic Year?

GOALS: WHAT NEEDS TO BE DONE?

- What do you need to accomplish this year as the leader of the program assessment process? (e.g., form a committee, evaluate program educational objectives, write performance indicators, etc.)

- List the "issue(s)" that will need to be addressed (e.g., prioritize activities, faculty involvement, identify resources for faculty development, etc.)

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Capstone

DAY ONE

HOW ARE YOU GOING TO ACCOMPLISH YOUR OBJECTIVES?

What things are you going to continue to do in the same way you are doing them now?

What are you currently doing that needs to be modified?

What are you not doing that needs to be done?

Modified for IDEAL from work by Bob Williams (bobwill@actrix.gen.nz)

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Capstone

DAY TWO

WHAT RESOURCES DO YOU NEED TO COMPLETE THE TASKS IDENTIFIED ABOVE?

People:

Who?	What do you want them to do?

Modified for IDEAL from work by Bob Williams (bobwill@actrix.gen.nz)

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Capstone

DAY TWO

Resources (e.g., money, release time, summer support, etc.):

Resource needed:	From whom?	For what purpose?

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IDEAL

Capstone

DAY THREE
Develop a proposed work plan to achieve your goals:

WHEN?

Work Plan Matrix

Goal	Task(s) to achieve goal	Who	When	Person Responsible

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Capstone

EXAMPLE

Goal	Task(s)	Who	When	Person responsible
Create measurable student outcomes	Find examples of measurable outcomes	Sarah Pfledderer	January 2016	Sarah Pfledderer
	Assemble team of faculty	Me in consultation with Assoc. Dean	February 2016	Graceanna Cramer and Sarah Pfledderer
	Provide faculty development on how to write measurable outcomes	Center for Teaching and Learning (CTL)	March 2016	Tim Mitchell (CTL)
	Work with faculty to develop performance indicators for student outcomes	Faculty committee on assessment of student outcomes (CASO)	March/April 2016	Sarah Pfledderer
	Validate performance indicators by program faculty	CASO with Department Head and program faculty	April 2016	Sarah Pfledderer
Redesign Curriculum Map	Identify models for curriculum mapping	Sarah Pfledderer	January 2016	Sarah Pfledderer
	Review current state of curriculum mapping	CASO	February 2016	Sarah Pfledderer
	Identify needed improvements	CASO	February 2016	Sarah Pfledderer
	etc.	etc.	etc.	etc.

Use of Technology

There are many commercial products available for the collection and analysis of assessment data. ABET does not require the use of technology in program assessment, nor does it endorse and commercial software products.

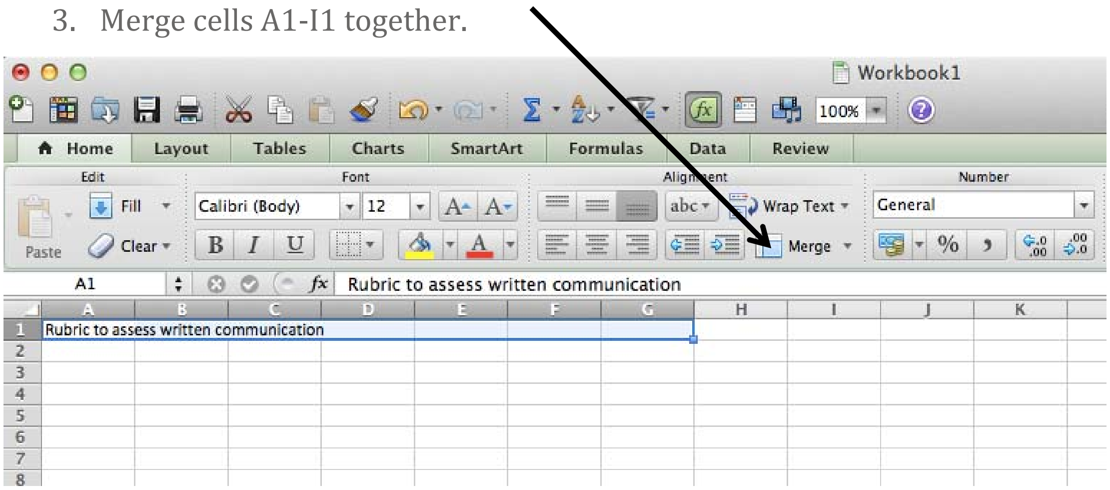
This module has been designed to show you how Microsoft Excel can be used to build a relatively foolproof data entry system that can be used for assessment and/or grading. It is also possible to use this template for instant analysis and visualization of the collected data.

Donald Sanderson, a senior IDEAL scholar from East Tennessee State University, developed this module.

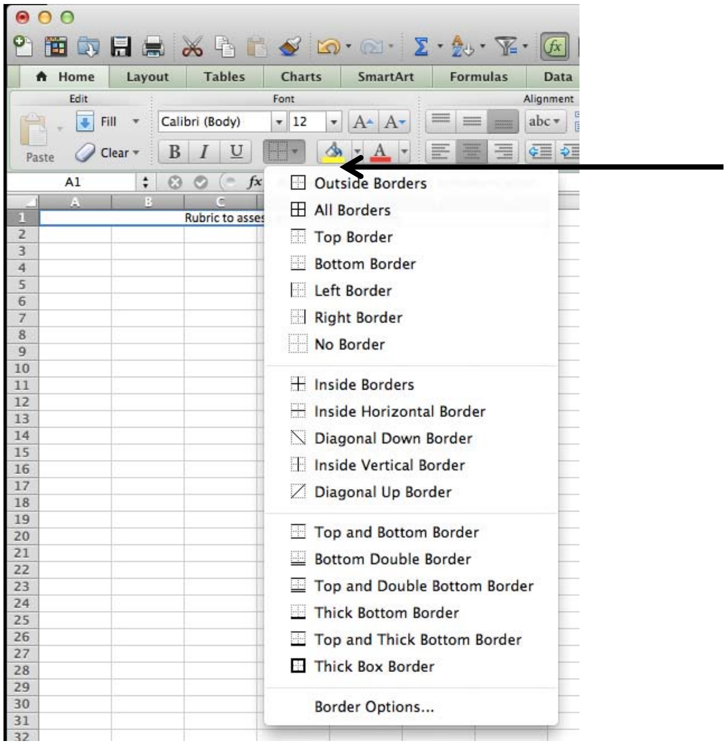
Exercise: Using Excel for Data Collection

Step 1: Build the Basic Rubric

1. Start Excel with a blank workbook
2. In cell A1 enter text that describes the outcome this rubric measures. For the purposes of this exercise we are going to use the writing rubric that was used to assess the student work.
3. Merge cells A1-I1 together.

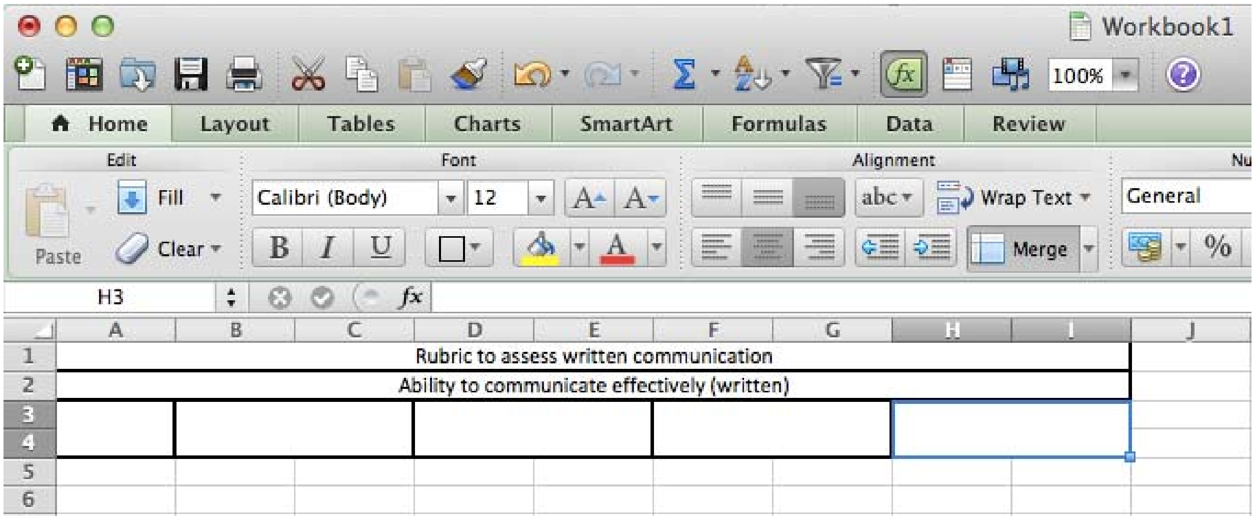


4. Place a border around the merged cells. Click on the border control button on the home tab and select Thick Box Border from the dropdown list.



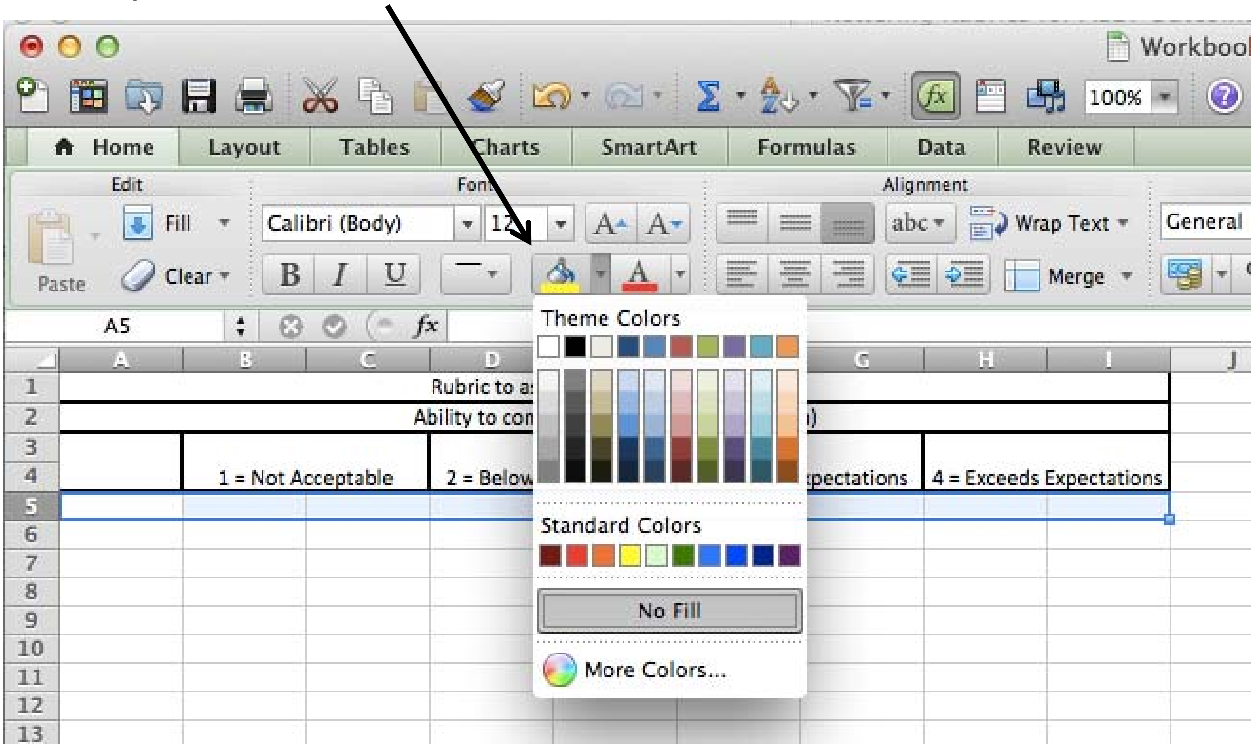
5. Repeat for row 2,type the student outcome in cell A2
6. Merge cells A2-I2 together
7. Place a Thick Box Border around the merged cell
8. Merge cells A3 and A4 together and put a Thick Box Border around the merged cell
9. Merge cells B3 and C4 together and put a Thick Box Border around the merged cell
10. Merge cells D3 and E4 together and put a Thick Box Border around the merged cell
11. Merge cells F3 and G4 together and put a Thick Box Border around the merged cell
12. Merge cells H3 and I4 together and put a Thick Box Border around the merged cell

    The new result should look like this:



13. In the new B3-C4 box write “1 = Not Acceptable”
14. In the new D3-E4 box write “2 = Below Expectations”
15. In the new F3-G4 box write “3 = Meets Expectations”
16. In the new H3-I4 box write “4 = Exceeds Expectation”

17. Highlight cells A5 through I5, select the fill tool (paint bucket) and fill the cells with any color desired.



18. To make things easier, set the width for each column. Go to the top row of the sheet and right click on the column letter and select column width from the drop down menu. Set the column width as shown in the table.

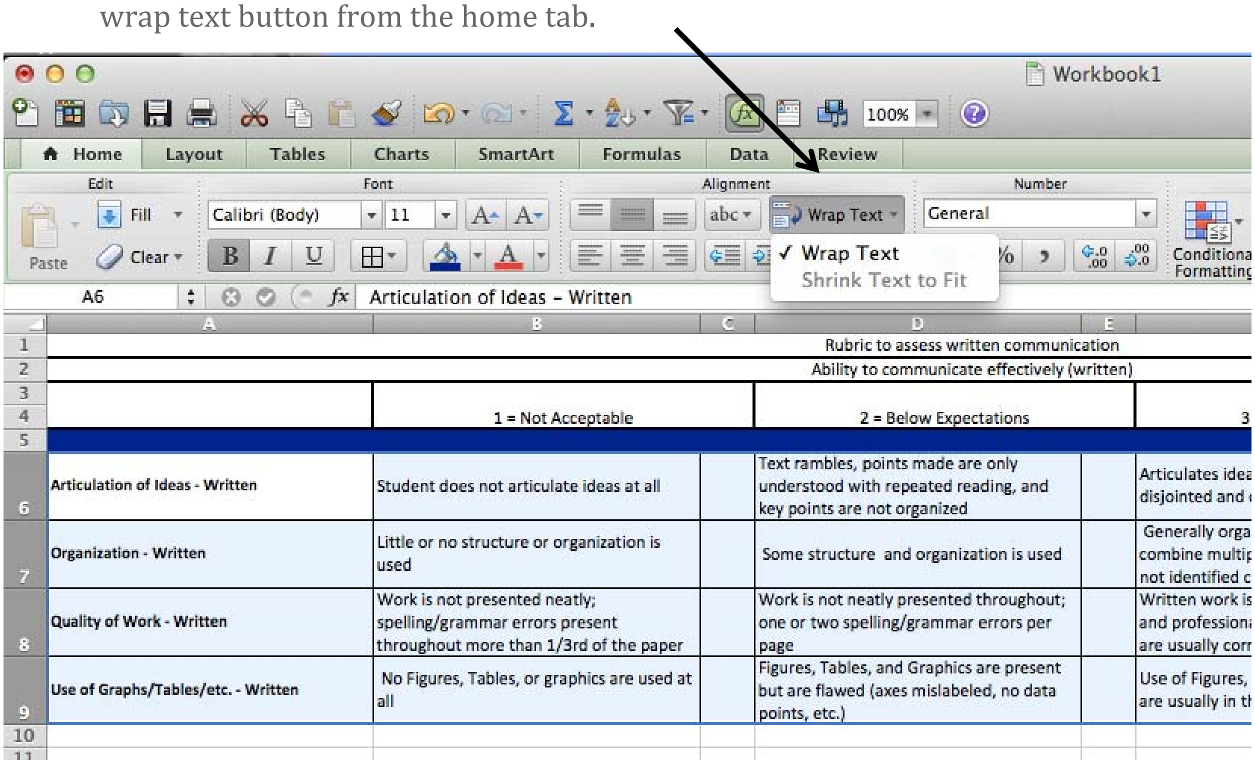
Column	Width
A	3”
B	3”
C	0.5”
D	3”
E	0.5”
F	3”
G	0.5”
H	3”
I	0.5”

19. In cell A6 write the first performance indicator for the rubric

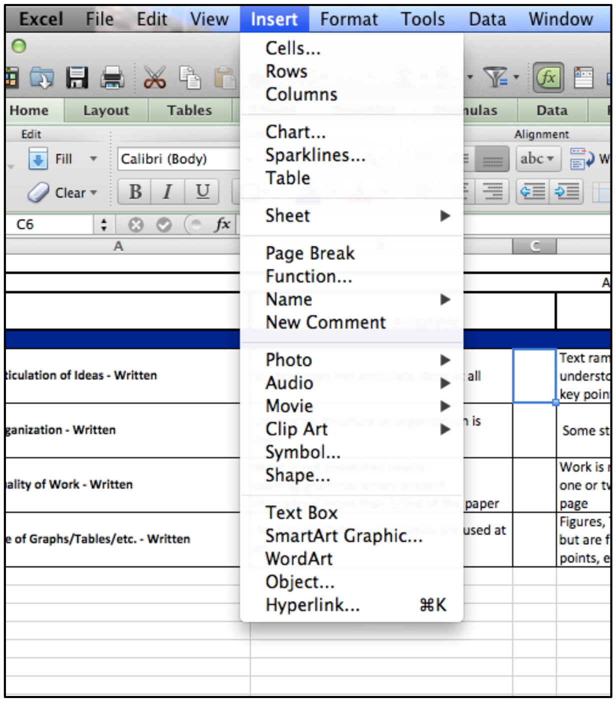
20. In cells B6, D6, F6 and H6 write the descriptions for work that is not acceptable, below expectations, meets expectations and exceeds expectations.
21. Repeat this for rows 7, 8 and 9. Feel free to add formatting embellishments as appropriate. The final result should look like this:

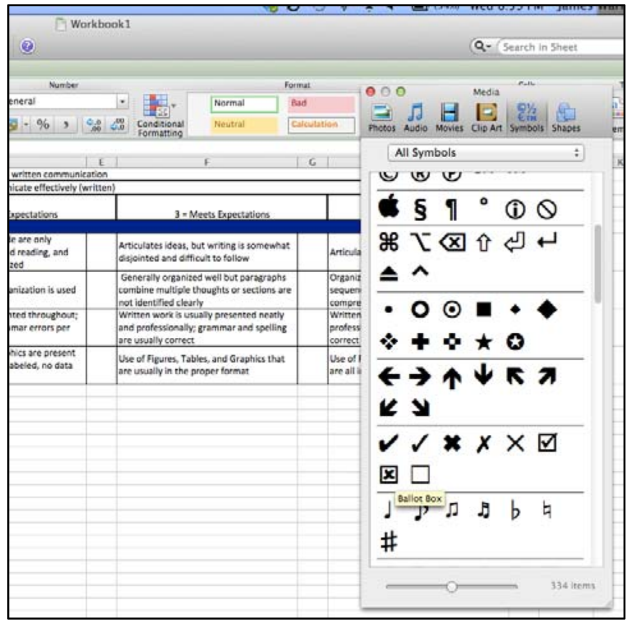
Rubric to assess written communication				
Ability to communicate effectively (written)				
	1 = Not Acceptable	2 = Below Expectations	3 = Meets Expectations	4 = Exceeds Expectations
Articulation of Ideas - Written	Student does not articulate ideas at all	Text rambles, points made are only understood with repeated reading, and key points are not organized	Articulates ideas, but writing is somewhat disjointed and difficult to follow	Articulates ideas clearly and concisely
Organization - Written	Little or no structure or organization is used	Some structure and organization is used	Generally organized well but paragraphs combine multiple thoughts or sections are not identified clearly	Organized written materials in a logical sequence to enhance the reader's comprehension
Quality of Work - Written	Work is not presented neatly; spelling/grammar errors present throughout more than 1/3rd of the paper	Work is not neatly presented throughout; one or two spelling/grammar errors per page	Written work is usually presented neatly and professionally; grammar and spelling are usually correct	Written work is presented neatly and professionally; grammar and spelling are correct
Use of Graphs/Tables/ etc. - Written	No Figures, Tables, or graphics are used at all	Figures, Tables, and Graphics are present but are flawed (axes mislabeled, no data points, etc.)	Use of Figures, Tables, and Graphics that are usually in the proper format	Use of Figures, Tables, and Graphics that are all in proper format

22. Some text may overflow its boundaries so select cells A6 through H9, then click the wrap text button from the home tab.



23. As a last, **optional** step, check boxes can be added to the criteria so this sheet can be used as a paper form for data collection. Select the cell where the box will be placed (say C6) and then select Insert from the menu bar. Click on symbol and then select the check box from the symbol dialog box.



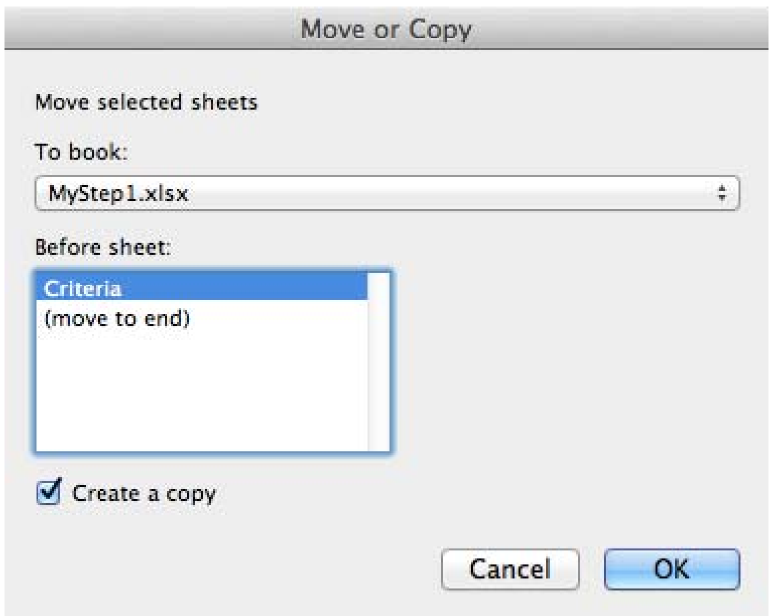


Once the first check box has been inserted, copy and paste this symbol into the rest of the cells in columns C, E, G, and I.

24. The master sheet is done! **Save the workbook as MyStep1 on your computer.**

Step 2: Prepare Data Entry Sheets

1. Save the workbook again, this time using the Save As… option and **call the file MyStep2**.
2. We are now going to rename our worksheet. Double click on the tab for the sheet and rename it "Criteria". If you are using an older version of Excel you might have two other sheets. If this is the case, right click on the tab for those sheets and choose Delete from the menu.
3. Right click on the tab for the Criteria sheet and choose the option Move or Copy… A dialog box will appear. Check the box marked Create Copy and then click OK.



4. The new sheet will be automatically named Criteria (2). Double click the sheet tab and rename the sheet summary.
5. Select all the cells that have been filled in (A1 through I9), then right click on any of them and select Clear Contents from the dropdown list. This leaves the formatting and widths, but no text.
6. Select cell A1 and enter the following formula in the formula bar:

   =Criteria!A1

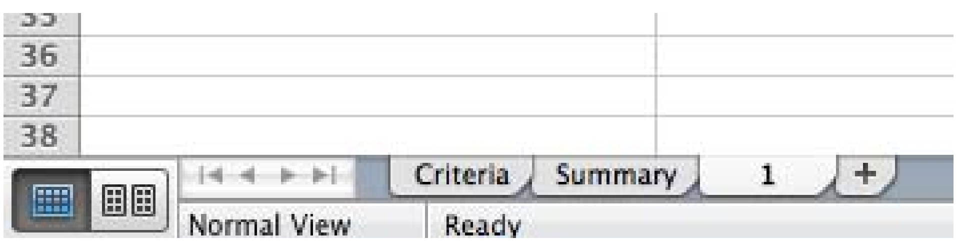
   This formula states that this cell will display the current contents of cell A1 on the Criteria worksheet. Now, if any changes are made to the student outcome or performance indicators they will automatically be updated in the Summary sheet.

7. Select cell A2 and enter the following formula in the formula bar
   =Criteria!A2
8. Select cell B3 and enter the following formula in the formula bar
   =Criteria!B3
9. Select cell D3 and enter the following formula in the formula bar
   =Criteria!D3
10. Select cell F3 and enter the following formula in the formula bar
    =Criteria!F3
11. Select cell H3 and enter the following formula in the formula bar
    =Criteria!H3
12. Select cell A6 and enter the following formula in the formula bar
    =Criteria!A6
13. Select cell A7 and enter the following formula in the formula bar
    =Criteria!A7
14. Select cell A8 and enter the following formula in the formula bar
    =Criteria!A8
15. Select cell A9 and enter the following formula in the formula bar
    =Criteria!A9
16. Move to the top of the sheet, highlight column C, right click and select delete from the dropdown menu. Repeat this for columns E, G and I.

The result should look similar to the criteria worksheet with two important differences; first, the check boxes are missing and second, any changes made to the criteria worksheet will be reflected on this worksheet.

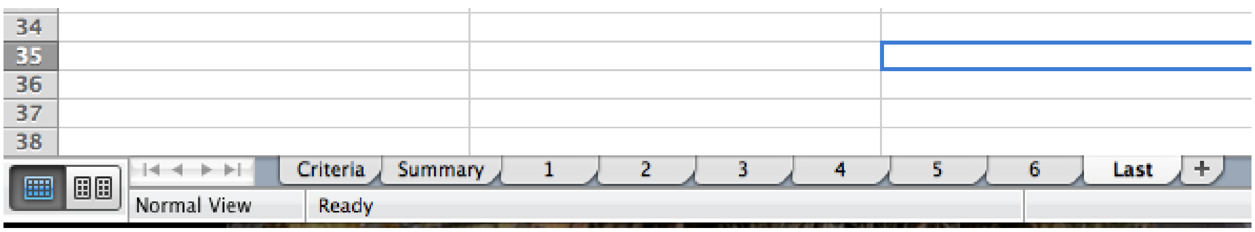
Rubric to assess written communication				
Ability to communicate effectively (written)				
	1 = Not Acceptable	2 = Below Expectations	3 = Meets Expectations	4 = Exceeds Expectations
Articulation of Ideas - Written				
Organization - Written				
Quality of Work - Written				
Use of Graphs/Tables/etc. - Written				

17. Make a copy of the summary sheet and name the copy "1" (just like steps 3 and 4 above).
18. Worksheets can be reordered by clicking on the page tab and dragging the sheet to the left or right. Order the sheets as shown below and move to worksheet 1.



19. Save the spreadsheet.
20. Select cell F6 and enter the formula:
    =IF(COUNTA(B6:D6)>1,"ERROR","")
    COUNTA is a formula that counts non-blank cells, so this formula will leave the cell blank if one box in the row contains some data, but say ERROR if more than one box is filled.

21. Copy this formula into cells F7 through F9. Select cells F6 through F9 and set the text color to red or some other attention grabber.
22. Move to cell F10 and enter the following formula:
    =COUNTIF(F6:F9,"ERROR")
    The COUNTIF formula will return the number of cells in the range of F6 to F9 that contain the value ERROR.
23. Move to cell G10 and enter the formula:
    =COUNTA($B$6:$E$9)
    This counts the number of responses on this sheet.
24. Enter some responses and check these cells; they are keeping track of errors and entries on the worksheet.
25. The first data collection worksheet is now complete. Make 6 copies of the worksheet calling them "2", "3", "4", "5", "6" and "Last". **Save the workbook**.



The reason for using Last for the last worksheet instead of 7 is so we can use multi-sheet formulas to sum up the data. If the range is given as 1 to Last then it is easy to insert additional numbered sheets without having to modify our formulas each time.

Step 3: Create a Summary Sheet

1. Save the workbook again, this time using the Save As… option and **call the file MyStep3**.
2. Put some data in the worksheets
   a. Sheet 1 mark all rows Not Acceptable
   b. Sheet 2 mark all rows Below Expectations
   c. Sheet 3 mark all rows Meets Expectations
   d. Sheet 4 mark all rows Exceeds Expectations
   e. Sheet 5 mark first row Not Acceptable, second row, Below Expectations, third row Meets Expectations and fourth row Exceeds Expectations.
   f. Sheet 6 mark first two rows only Exceeds Expectations; leave last two rows empty
   g. Sheet Last mark first two rows only Meets Expectations; leave last two rows empty
3. Return to Summary sheet. Merge cells F3-F4 and write "Responses".
4. Move to cell F6 and enter the following formula:

   =COUNTA('1:Last'!B6:E6)

   This counts the number of non-empty cells in the range B6 to E6 on worksheet 1 to Last. This gives the number of worksheets that contain a response for this performance indicator.
5. Copy the formula into cells F7 to F9. The F column should appear as follows:

Responses
7
7
5
5

6. Select cell B6 and enter the formula:

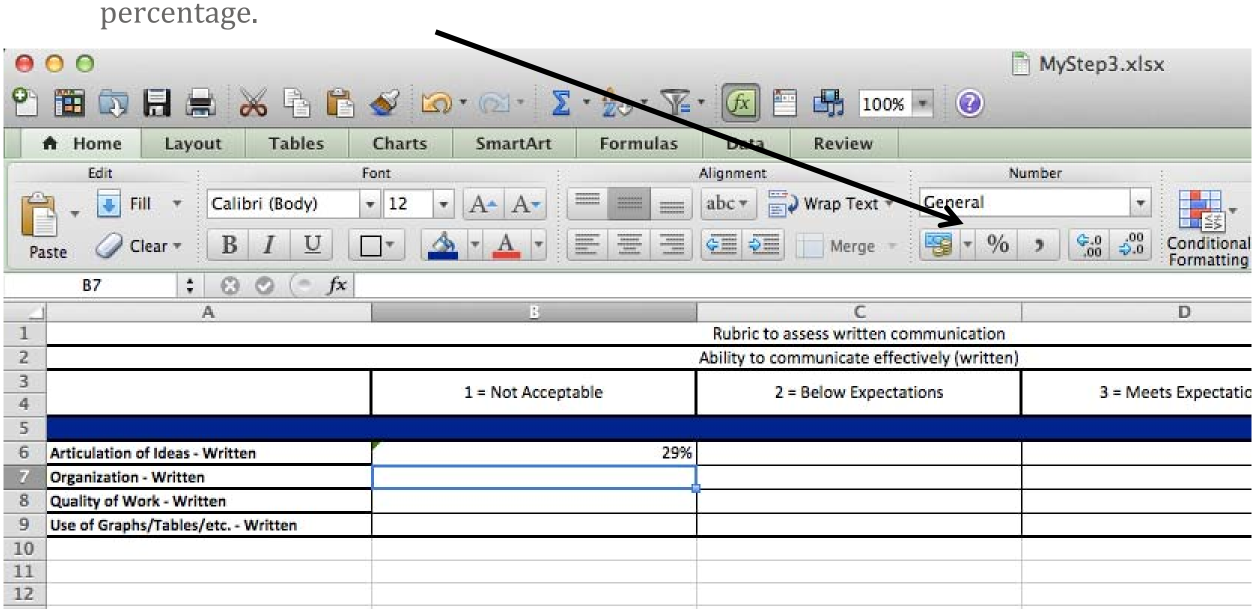
   =COUNTA('1:Last"!B6)

   The value of 2 should appear. This shows that for the first performance indicator, two responses have been Not Acceptable.

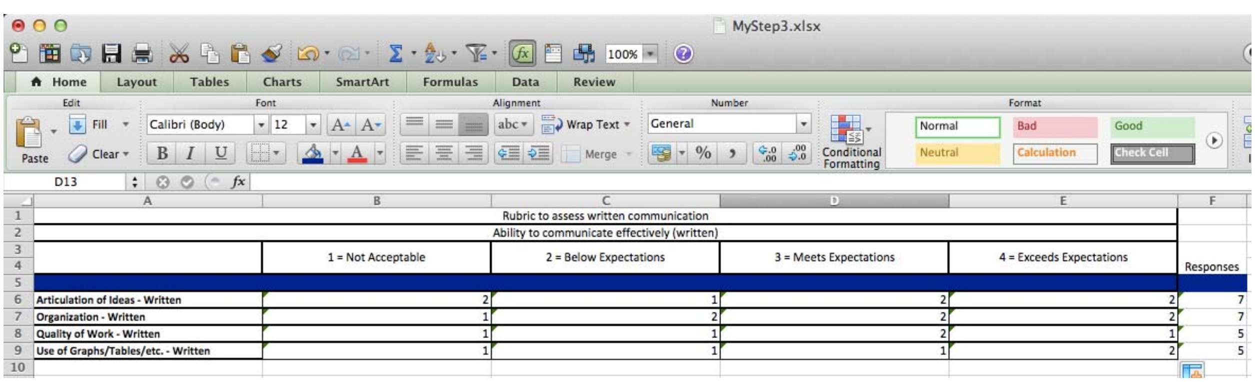
Optional step: If you want the number of responses at a given level for the performance indicator to be displayed as a percentage, use the following formula:

=(COUNTA('1:Last'!B6)/($F6+0.000000000001))

This formula is counting the number of non-empty B6 cells on sheets 1 through last and dividing by the value in F6, which is the total number of responses. By adding 0.000000000001 to the value in F6, you are preventing a division by zero error if no one has responded with making a significant difference to the data. Select cell B6 then, from the home tab, select the % button. This will format the cell as a percentage.



7. Copy cell B6 into cells C6, D6 and E6.
8. Now copy cells B6 through E6 to cells B7-E7, B8-E8 and B9-E9. The results should look like this:

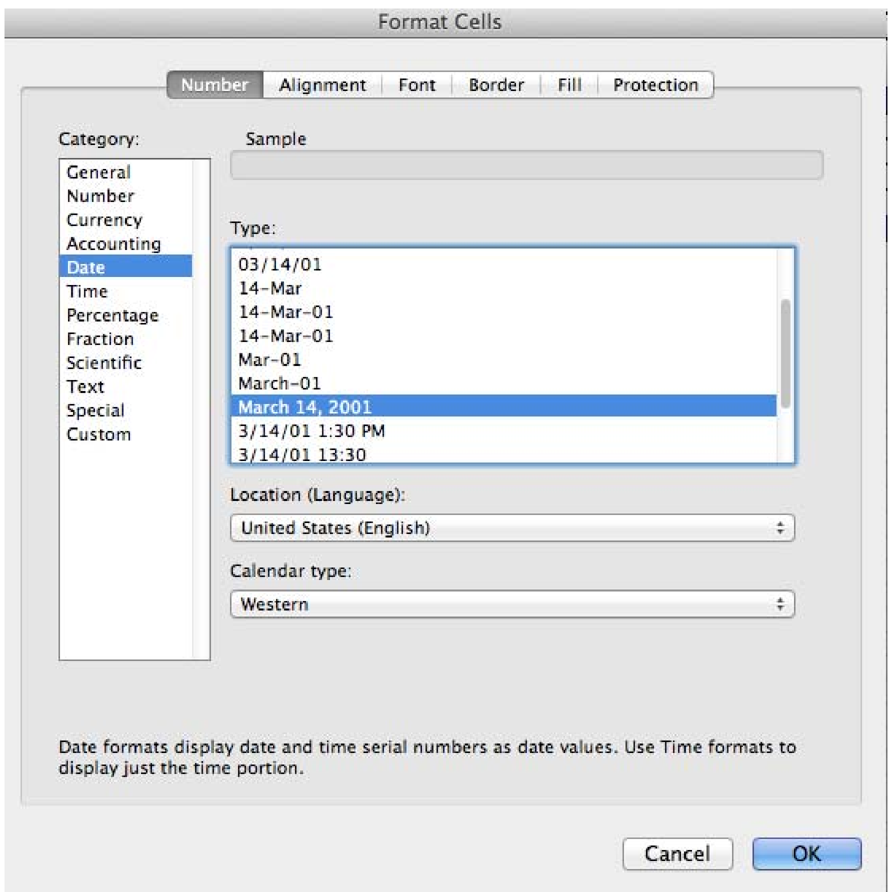


9. Select cell F14 and enter the formula:

   =SUM('1:Last'!E11)

   This will calculate the number of rows on the data sheet that have errors.
10. Now add cells to collect information about the administration of the rubric.

    Go to cell A15 and write "Date Assessed"
11. Go to cell A18 and write "Item Assessed"
12. Go to cell A21 and write "Instructor"
13. Using the border control button, format cells A16, A19 and A22 to have a Thick Box Border
14. Go to cell A16 and right click the cell. Select Format Cells from the drop down list.
15. Select the number tab on the dialog box and choose Date from the category list on the left. Select your preferred type.



16. Enter today's date in cell A16
17. Enter the name of the activity that will be assessed in cell A19

18. Enter your name in cell A22, giving results like those shown below.

Date Assessed
August 7, 2013
Item Assessed
IDEAL scholars
Instructor
J. Warnock

Save the workbook

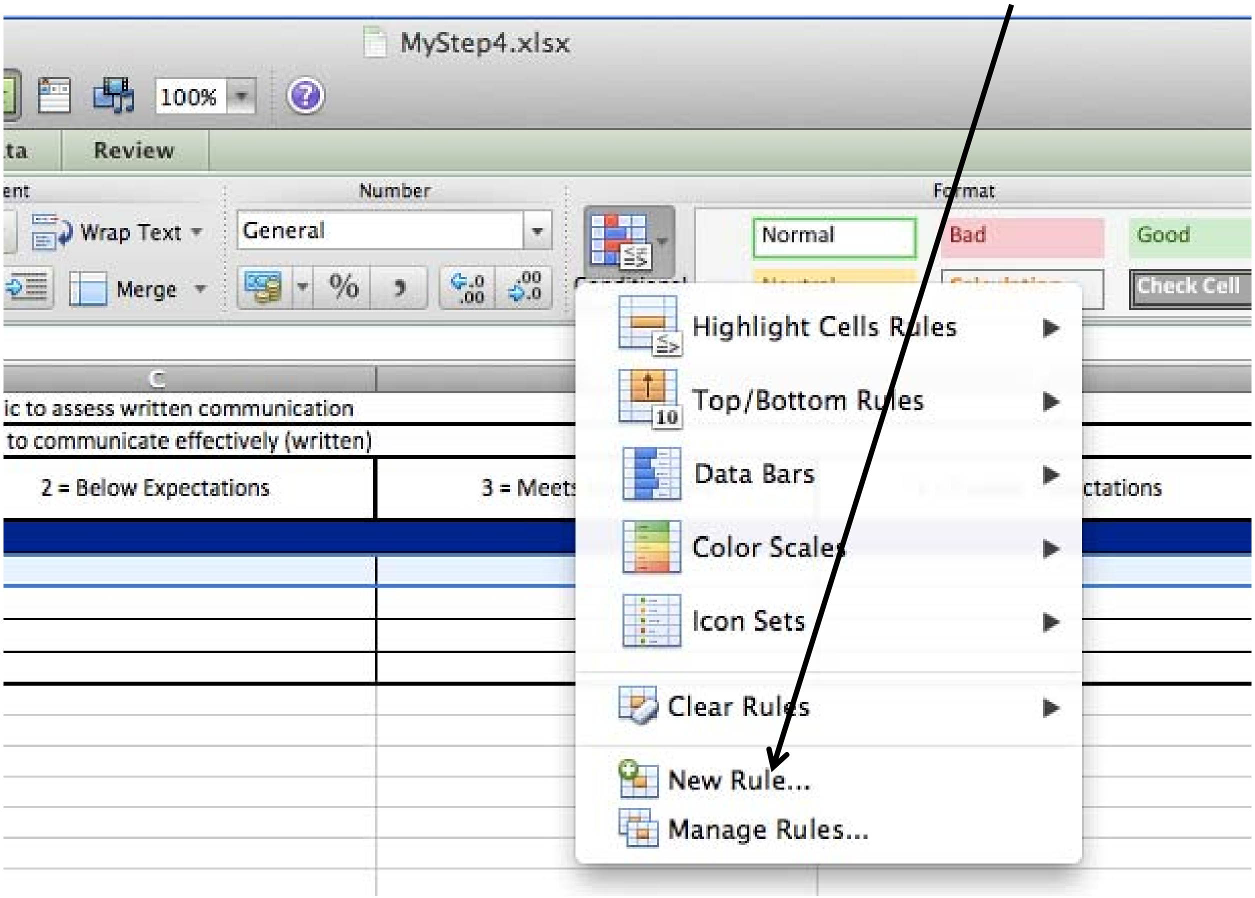
Step 4 is optional.

Step 4: Format for Easy Entry

1. Save the workbook using the Save As… option and call the file **MyStep4**.
2. Go to worksheet 1.

   Note: These next steps should have been completed before the copies of worksheet 1 were made but that would not have made sense. When done with this section you can duplicate the new worksheet 1 and replace sheets 2 through Last.

   When the data entry sheets were created the ERROR flag was built in. However, this may not be enough to call attention to an error in data entry. We will use conditional formatting to aid with data input.
3. Clear the data from sheet 1.
4. Highlight cells B6 through E6
5. Choose conditional formatting from the home tab and click on New Rule.

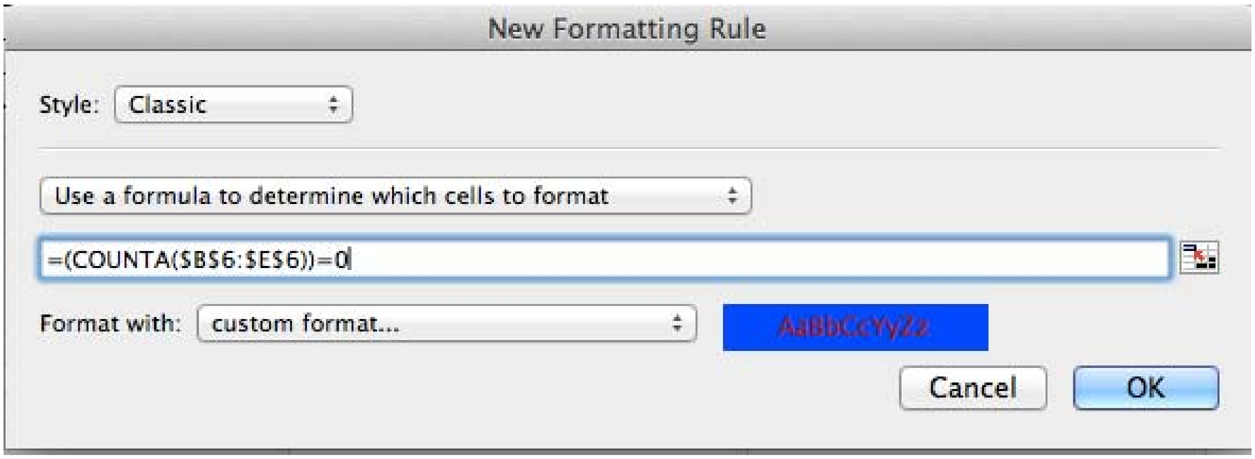


6. In the New Formatting Rule dialog box, under style select "Classic". In the next drop down menu select "Use a formula to determine which cells to format". Then enter the following formula:

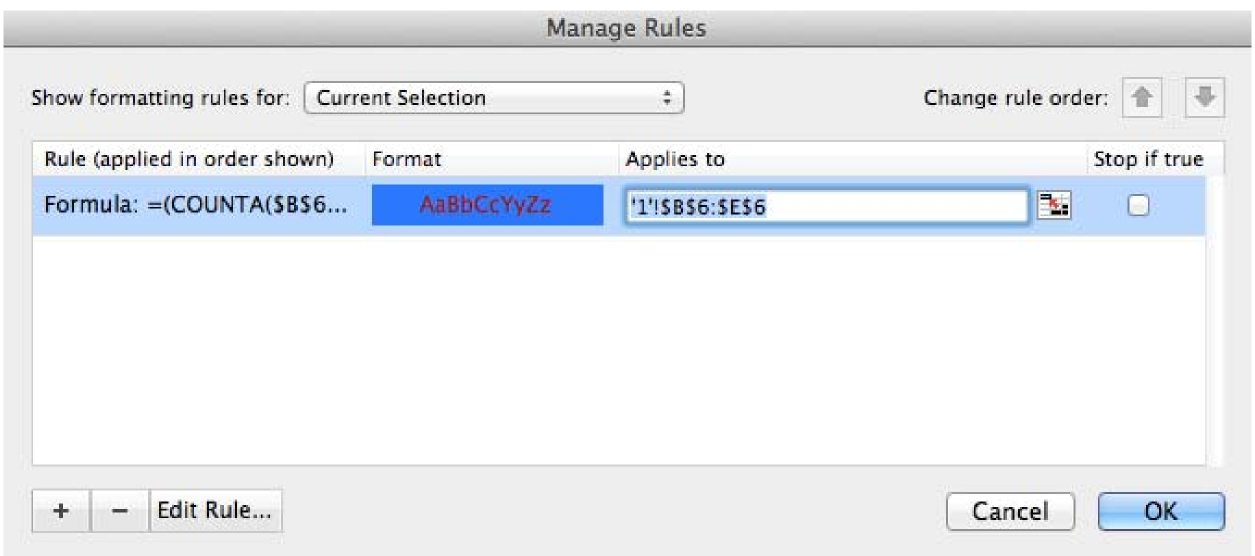
=(COUNTA($B$6:$E$6))=0

Next, select custom format from the “Format with” dropdown menu.

Select the Fill tab and choose a light color (I use light blue). Remember the color you choose, as it will be used to format all “data needed” cells. Click OK. You have now formatted the sheet so the cells to be completed by the user are filled with your chosen color. We will use a similar technique to highlight errors in data entry.



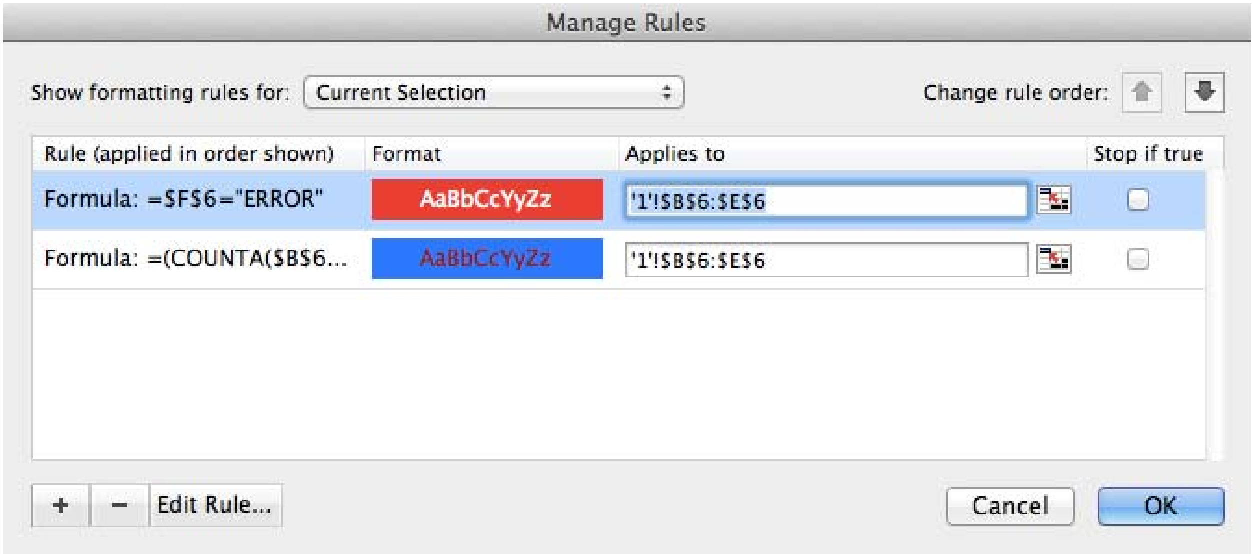
7. Highlight cells B6 to E6 again and select Conditional Formatting. This time select Manage Rules. Click on the plus sign to add a new rule.



8. As before, select “Classic” from the Style menu and “Use a formula to determine which cells to format”. Enter the following formula:

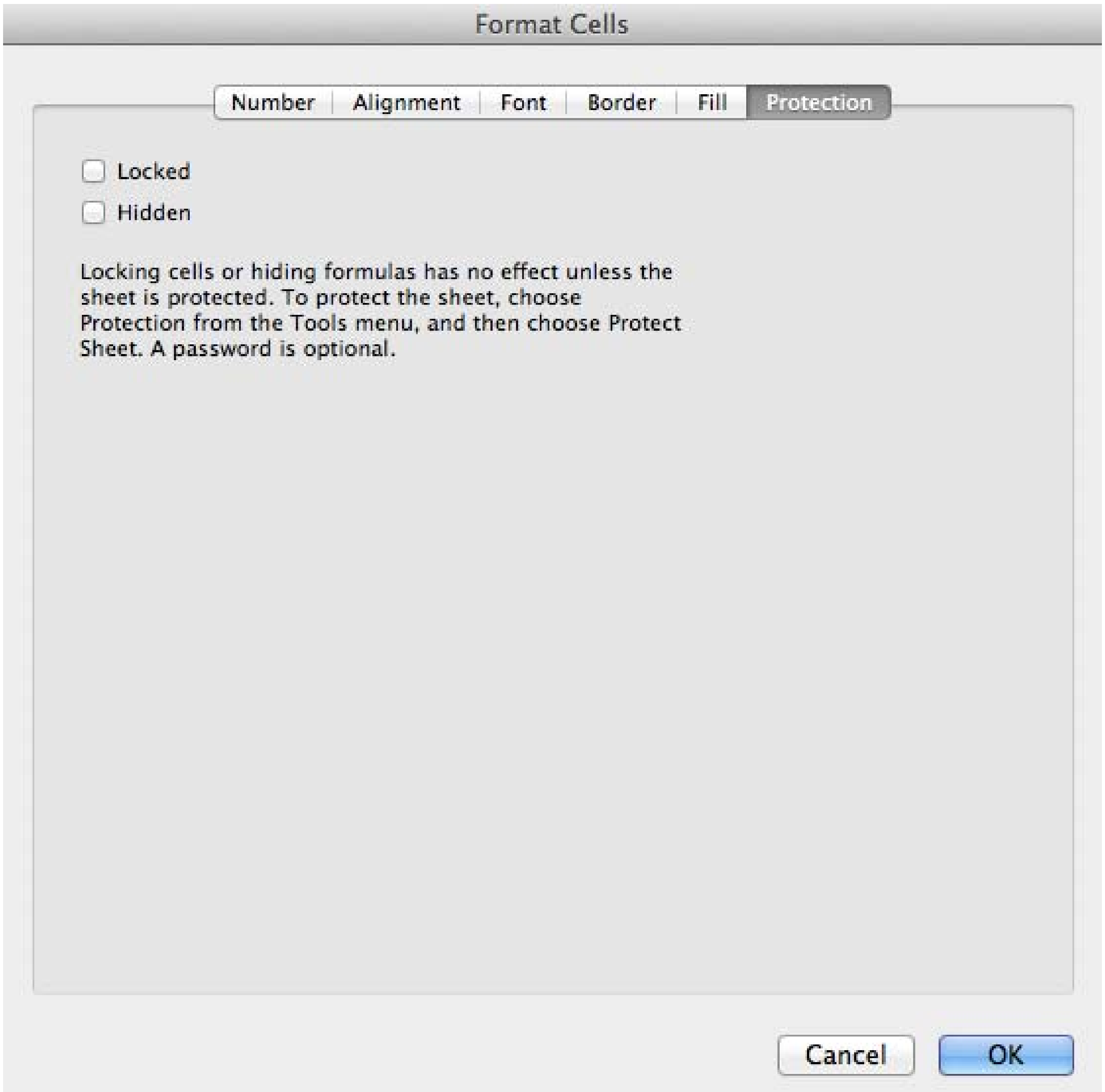
=$F$6=”ERROR”

Again, select Format with and Fill and choose a highly visible "error" color such as red. Click OK. Two rules will now display. Click OK again.

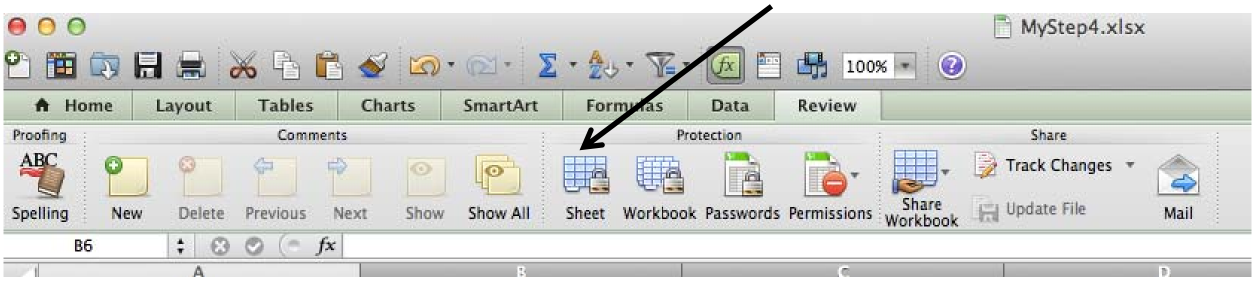


9. Highlight cells B6-E6 and copy them to cells B7-E7, B8-E8 and B9-E9. Each of these rows will now be displaying the "data needed" color. Type in some correct data (i.e. one value per row). The cells should turn to white. You can also enter data into two cells in the same row and the cells should turn red.
10. The summary sheet uses the values in cells F10 and G10 but these do not need to be seen. The columns could be hidden, but that would hide the error flags as well. To hide them in plain sight, simply set the fill and text colors to white.

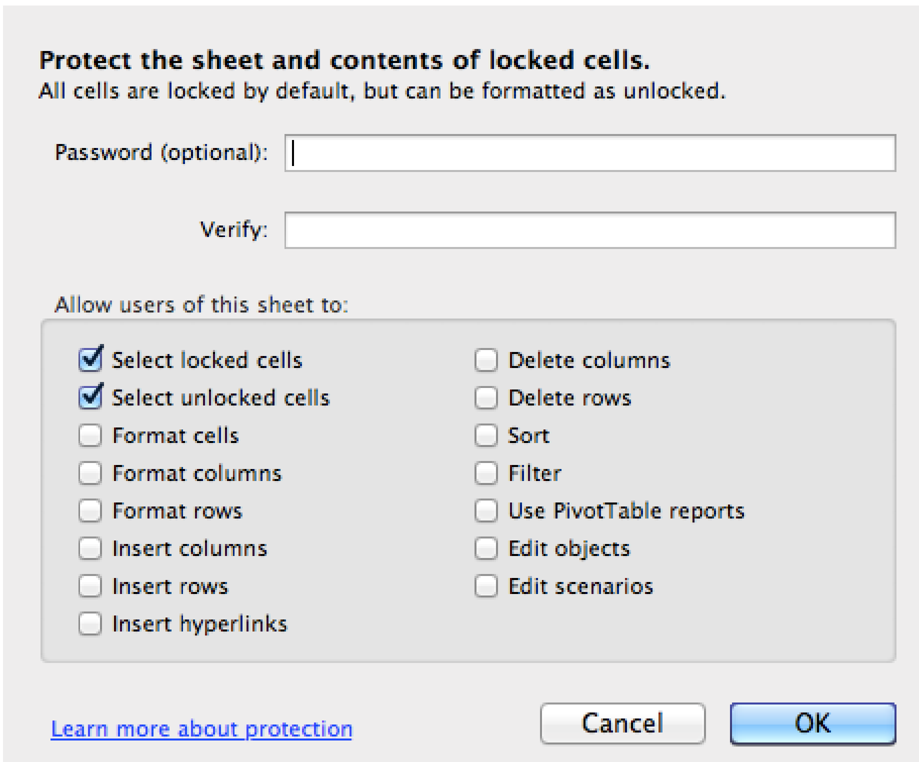
11. As a last aid to usability, lock this sheet so that changes cannot be made EXCEPT those needed for data entry. We must specify the cells to remain un-locked. Select cell B6 through E9, right click and choose Format Cells from the dropdown list. In the dialog box, select the Protection tab and uncheck both boxes (locked and Hidden), and click OK.



12. Select the Review tab from the ribbon and click Sheet.



13. A dialog box will open. We can use the default settings so just select OK. You could set a password to prevent anyone else from unlocking these cells.



You can now only alter values in the rubric that the end user will be filling in. You might also consider protecting the criteria and summary sheets.

Now save this workbook.

Please fill out this form rating the level to which Department Learning Objectives are being met in your courses. Use the *Definition Of Levels For Meeting Learning Goals In Classes* document that was sent to you (if you do not have this there is a copy in ET 204) to rate your class on a 0-5 scale, as per the definitions that are provided. Rate every class you are teaching this year and any additional classes that you taught last year that you expect to teach again. If your course falls in between two levels pick the lower score. This is not a contest, and there are no prizes for having the highest score, so please rate your courses as honestly as possible.

Please return this document to ...., either via e-mail or as a hard copy in my mailbox in ...... <u>by the end of the day on ....</u> It is very important that all surveys are completed and returned by this date, as the Assessment Committee would like to have draft reports on every program ready by the middle of exam week.

	Courses							
Student Learning Objectives								
Analytical Skills								
Visual Communication Skills								
Oral Communication Skills								
Written Communication Skills								
Project Management Skills								
Business Skills								
Teamwork Skills								
Creative Problem Solving Ability								
System Thinking Skills								
Technology Skills								
Self Learning Skills								
Ethics and Professionalism								
Programming Skills								

Questions? Contact .... or by e-mail at ....

Thank you.

WESTERN
WASHINGTON UNIVERSITY

An equal opportunity university

Engineering Technology

Bellingham, Washington 98225-9086
(360) 650-7239 Fax (360) 650-4847

Engineering Technology Department Desired Student Learning Outcomes

Analytical Skills Ability to: logically analyze and solve problems from different points of view; translate scientific and mathematical theory into practical applications using appropriate techniques and technology.	**Visual Communication Skills** Ability to: utilize appropriate technology to create drawings, illustrations, models, computer animations, or tables to clearly convey information; interpret and utilize similar information created by others.
Oral Communication Skills Ability to: verbally present ideas in a clear, concise manner; plan and deliver presentations; speak and listen effectively in discussions based upon prior work or knowledge.	**Written Communication Skills** Ability to: present ideas in clear, concise, well-structured prose; choose appropriate style, form, and content to suit audience; utilize data and other information to support an argument.
Project Management Skills Ability to: Set goals; create action plans and timetables; prioritize tasks; meet project milestones; complete assigned work; seek clarification of task requirements and take corrective action based upon feedback from others.	**Teamwork Skills** Ability to: work together to set and meet team goals; encourage participation among all team members; listen and cooperate; share information and help reconcile differences of opinion when they occur.
Creative Problem Solving Ability to: apply a design process to solve open-ended problems; generate new ideas and develop multiple potential solutions; challenge traditional approaches and solutions.	**Business Skills** Ability to: accurately estimate production costs; calculate the cost effects of alternative designs; predict the effects of quality control, marketing, and finance on product or process cost.
System Thinking Skills Ability to: understand how events interrelate; synthesize new information with knowledge from previous courses and experiences.	**Self-learning Skills** Ability to: learn independently; continuously seek to acquire new knowledge; acquire relevant knowledge to solve problems.
Ethics and Professionalism Ability to: understand and demonstrate professional and ethical behavior; understand social and ethical implications and interrelations of work, and respond in a responsible and professional manner.	**Programming Skills** Ability to: use higher level, structured programming languages to write effective and efficient code to complete a task such as modeling or calculation, or control equipment; understand and adapt existing structured programs.
Technology Skills Ability to: properly use industrial-quality technology appropriate to field; adapt to new technology; integrate existing technology to create new possibilities.	

Definition Of Levels For Meeting Learning Goals In Classes

Analytical Skills – Ability to: logically analyze and solve problems from different points of view; translate scientific and mathematical theory into practical applications using appropriate techniques and technology.

5 – Course contains significant development of analytical skills, and reinforcement and practice of analytical skills developed in earlier classes.

4 – Course contains significant development of analytical skills, with little reinforcement or practice of analytical skills developed in earlier classes.

3 – Course contains some development of new analytical skills, and some utilization of previously developed skills.

2 – Course contains significant utilization of previously developed skills, but little or no development of new skills.

1 – Course utilizes some previously learned analytical skills, but develops no new ones.

0 – Course neither develops nor utilizes any analytical skills.

Visual Communication Skills – Ability to: utilize appropriate technology to create drawings, illustrations, models, computer animations, or tables to clearly convey information; interpret and utilize similar information created by others.

5 – Course contains significant instruction in development of drawings, illustrations, models, or computer animations with multiple assignments. Course should also contain at least one assignment completed with iteration and feedback, and at least one assignment prepared for external review.

4 – Course contains significant instruction in development of drawings, illustrations, models, or computer animations with multiple assignments.

3 – Course contains multiple assignments in visual communication with some instruction on the development of new skills and feedback.

2 – Course utilizes students' existing skills in visual communication for multiple smaller or one large assignment, and provides examples and limited feedback, but little to no instruction on topic.
OR
Course contains significant instruction in the understanding and utilization of visual information produced by someone or something else, such as a computer analysis packages.

1 – Course requires one or two small assignments utilizing visual communication, but provides limited feedback and no instruction on the subject.
OR
Course contains some instruction in the understanding and utilization of visual information produced by someone or something else, such as a computer analysis packages.

0 – Course contains no visual communication by students of any kind (faculty are still visible).

Oral Communication Skills – Ability to: verbally present ideas in a clear, concise manner; plan and deliver presentations; speak and listen effectively in discussions based upon prior work or knowledge.

5 – Course contains at least two formal presentations that every student participates in, including presentation preparation instruction, supervised practice or review of content before the presentation, and written feedback. Formal presentations are defined as being given to an external audience (external to the course) and having a rigid time limit. In addition, the course content includes consistent in-class discussion with participation of all students, and part of the course grade is based on this discussion. For this purpose, in-class discussion is the exploration of concepts or ideas based upon out of class assignments such as reading, not “how do I solve problem 2?”

4 – Course contains at least two formal presentations with instruction and feedback as described above, and course has a significant, but ungraded in-class discussion component.

3 – Course has at least one formal presentation, but with limited preparation instruction and feedback, and no external audience. Course should also have some in-class discussion.

2 – Course has one or two informal presentations that may not include every student speaking. Course should also have some in-class discussion.

1 – Course has some in-class discussion, but no student presentations of any kind.

0 – Course has no student presentations and no in-class discussion of any kind.

Written Communication Skills – Ability to: present ideas in clear, concise, well-structured prose; choose appropriate style, form, and content to suit audience; utilize data and other information to support an argument.

5 – Formal, written reports/papers are the majority of the grade for the course. Multiple rough drafts are required during the quarter and feedback is given. The reports/papers are critiqued for both technical content, grammar, and spelling. This may also include large portions of exams that are essay format.

4 – Written reports/papers comprise a large portion of the course grade. This includes both formal (prescribed format) and informal (unprescribed format) reports/papers that are graded on technical content, grammar, and spelling. This may also include large portions of exams that are essay format. One assignment with drafts returned with feedback.

3 – Written reports/papers comprise a portion of the course grade. This includes both formal (prescribed format) and informal (unprescribed format) reports/papers that are graded on technical content, grammar, and spelling. This may also include portions of exams that are essay format.

2 – Written reports/papers comprise a small portion of the course grade. Report/paper grade is based on content. Students receive feedback on grammar or spelling. This may also include portions of exams that are essay format.

1 – Essay questions on exams. Written reports/papers are not part of the course grade.

0 – Multiple choice, T/F, or calculations on exams. No essay questions. No written reports/papers.

Project Management Skills – Ability to: Set goals; create action plans and timetables; prioritize tasks; meet project milestones; complete assigned work; seek clarification of task requirements and take corrective action based upon feedback from others.

5 – Projects require scheduling resources (such as tools, supplies, machines, or assistance from others), setting goals, writing procedures, and verifying progress towards meeting deadlines established by the student. Instruction in project management techniques is provided and assessed as part of course. Projects require the use of formal or informal teams, and establishing human resource roles. Teams are required to use modern project management tools and make a presentation that includes project management information to an external audience.

4 – Projects require scheduling resources (such as tools, supplies, machines, or assistance from others), setting goals, writing procedures, and verifying progress towards meeting deadlines established by the student. Instruction in project management techniques is provided and assessed as part of course. Projects require the use of formal or informal teams, and establishing human resource roles.

3 – Projects require scheduling resources (such as tools, supplies, machines, or assistance from others), setting goals, writing procedures, and verifying progress towards meeting deadlines established by the student.

2 – Some student projects, weekly or longer, require a procedure, process plan, or timeline before any other work can be performed. In addition, intermediate deadlines and an analysis of success in meeting the plan are part of a final report and grade.

1 – Some student projects, weekly or longer, require a procedure, process plan, or timeline before any other work can be performed.

0 – No prior planning for any project is required of the student.

Business Skills – Ability to: accurately estimate production costs; calculate the cost effects of alternative designs; predict the effects of quality control, marketing, and finance on product or process cost.

5 – A major class team project requires establishing a mock business to design and produce a product, and the grade is based at least partly upon the financial analysis and/or success of the endeavor.

4 – A major portion of the course discusses production costs, cost effects of alternative designs, and the interaction of functions in a business that relate to these costs, such as quality control, marketing, and finance. Case studies, outside reading assignments, and guest speakers are used to reinforce concepts.

3 – A major portion of the course discusses production costs, cost effects of alternative designs, and the interaction of functions in a business that relate to these costs, such as quality control, marketing, and finance.

2 – Cost implications and their affect on other functions of a business are discussed. Appropriate manufacturers catalogs are used to verify cost.

1 – Relative costs of alternative methods or materials are discussed.

0 – No mention is made of cost of production or business functions.

Teamwork Skills – Ability to: work together to set and meet team goals; encourage participation among all team members; listen and cooperate; share information and help reconcile differences of opinion when they occur.

5 – Students work in a structured team during the entire quarter. Roles and responsibilities of each team member are detailed. Students are graded and given feedback on the "output" of the team (written or oral report or completed project). Students are also graded by observations made by the instructor on the team work skills of each student. The majority of the grade is based on this team project. Includes significant instruction on teamwork.

4 – Students work in a structured team during the entire quarter. Roles and responsibilities of each team member are detailed. Students are graded and given feedback on the "output" of the team (written or oral report or completed project). Students are also graded by observations made by the instructor on the team work skills of each student. The majority of the grade is based on this team project. Course contains some instruction on teamwork and how to define roles.

3 – Students work in teams on a majority of the course assignments. Most of the course grade is based on assignments worked on in teams (>50%).

2 – Students are in teams for laboratory work, lab reports/papers, and HW assignments. Assignments worked on in teams are not the majority of the course grade (<50%).

1 – Students may work on HW assignments and study for exams together.

0 – Students may study for exams together, but all graded assignments are individual efforts.

Creative Problem Solving – Ability to: apply a design process to solve open-ended problems; generate new ideas and develop multiple potential solutions; challenge traditional approaches and solutions.

5 – Course revolves around design. Course should contain one significant design problem or several smaller design problems so that design is part of the course during the entire quarter. This course should include the application of a design process and the consideration of multiple solutions to any given problem. The course should also include consistent guidance and feedback.

4 – Course contains many open-ended problems and a large design project, or course contains many open-ended problems and several smaller design projects. Design component does not last for entire quarter, and instruction on design and design process, and guidance and feedback are limited.

3 – Course contains many open-ended problems and a small multi-week design project.
OR
Course contains one significant design project with multiple solutions considered and some open-ended problems.
OR
Course revolves around open-ended problem solving.

2 – Course contains many open-ended problems or course contains a small, multi-week design project.

1 – Course contains some open-ended problems, but no design projects.

0 – Course contains neither open-ended problems nor design projects.

System Thinking Skills – Ability to: understand how events interrelate; synthesize new information with knowledge from previous courses and experiences to solve problems.

5 – Course relies on previous student experiences. Students are given assignments where they analyze all of the possible effects and interactions of process or product variables that affect the outcome, such as realistic problem solving or troubleshooting. Students are given assignments that rely heavily on material presented in prerequisite courses. System thinking and development of such skills are the major focus of the course. Course contains significant instruction on the development of system thinking skills.

4 – Course relies on previous student experiences. Students are given assignments where they analyze all of the possible effects and interactions of process or product variables that affect the outcome. Realistic problem solving and troubleshooting are possible assignments. Course contains significant instruction on the development of system thinking.

3 – Course relies on previous student experiences. Assignments rely on the students' existing system thinking ability. Students are given instruction on system thinking, but it is not a major focus of the course.

2 – Course relies on minimal previous student experiences. Students are given instruction on system thinking, but focus on the development of skills is limited.

1 – Course relies on no previous student experiences. System thinking is mentioned in the course, but course does not focus on the development of skills.

0 – Course relies on no previous student experiences. Course covers topics without discussing relationships with other fields or areas.

Technology Skills – Ability to: properly use industrial-quality technology appropriate to field; adapt to new technology; integrate existing technology to create new possibilities.

5 – Students make significant use of modern, industrial-quality technology of the kind that students would be expected to use if they were hired today.

4 – Students make some use of modern, industrial-quality technology, or make significant use of older industrial technology of the type that once was common in industry, but is now out of date.

3 – Students make some use of older industrial-quality technology, or make significant use of instructional technology that mimics the type of technology used in industry, but is not of the quality or capability to be considered for an industrial environment.

2 – Students make use of some instructional technology, or course exposes students to industrial-quality technology through trips to companies, but students are not allowed to operate equipment.

1 – Students are exposed to some instructional technology through demonstrations or course exposes students to some industrial-quality technology through videos or pictures, but they do not visit the actual technology.

0 – Students are not exposed to technology at all during the class.

Self-learning Skills – Ability to: learn independently; continuously seek to acquire new knowledge; acquire relevant knowledge from outside sources to solve problems.

5 – Entire grade is based on independent work. Student performs the complete investigations, and also has selected the problem and written the goals and objectives.

4 – Entire grade is based on independent work. Student performs the complete investigations, but the problem and potentially the goals and objectives come from another source.

3 – A major part of the grade is based on oral or written reports, or student designed lab projects that require individual investigation.

2 – A small part of the course grade is based on oral or written reports, or student designed lab projects that require individual investigation.

1 – Homework and lab assignments require some research by the student in areas that are not covered in the lecture or text.

0 – All course material is covered in a lecture. All homework assignments and lab projects follow an assigned procedure.

Ethics and Professionalism – Ability to: understand and demonstrate professional and ethical behavior; understand social and ethical implications and interrelations of work, and respond in a responsible and professional manner.

5 – Subject of the class centers on ethics/human values/professionalism/and technology. Most class discussions and lectures are directly targeted at ethics/technology/engineering. [Technology and Human Values, for example]. Students write/discuss/research/present on these issues multiple times. The class is for this purpose. Students consider the issues each class and have time to reflect upon these difficult issues. Students often present their views to an audience.

4 – The class includes multiple lectures/discussions on technology/human values/ethics/professionalism, although the focus of the class may be for another purpose. The issue is woven throughout the course, although the course itself has another focus. Students consider the issues often and have time to reflect upon these difficult issues. They write formally and informally about these issues. Class discussions often center on some aspect of "ethics." Students have time to present their views to an audience.

3 – The class includes at least one lecture/classroom discussion centering on ethics/technology/human values. There is follow-up discussion in subsequent classes and the subject remains a discussion item/lecture item in multiple classes. The students write or research about the issue, at least informally.

2 – The instructor includes ethical/value issues multiple times during the quarter as part of a lecture/discussion, but the focus of the lectures still remain on other aspects of technology.

1 – The topics addressing ethics/human values/technology are brought up occasionally in lecture or discussion. No particular focus or structure, but the instructor makes sure the issue is addressed occasionally when appropriate.

0 – Nothing in lecture or class discussions center on ethics/human values/technology/professionalism.

Programming Skills – Ability to: use higher level, structured programming languages to write effective and efficient code to complete a task such as modeling or calculation, or control equipment; understand and adapt existing structured programs.

Note: A *higher level* programming language is one that includes structured concepts such as decision operators (if, etc.), looping operators (while, for, etc.), and subroutines or functions.

5 – Learning higher level programming language and writing programs is the main purpose of the class. Students write multiple programs with significant instruction and feedback. Course contains at least one assignment where program is improved over a period of time.

4 – Students are required to learn a higher level programming language to complete a significant project or projects in the class. Programming instruction is limited, but completing the programming is an essential component of the class.

3 – Students are required to utilize a higher level programming language in the course on some assignment, but do not necessarily have to learn any new aspects of it or require it to complete major projects.

OR

Students are required to learn a new, lower level programming language and utilize it for a significant amount of the course assignments, or on a large project or projects.

2 – Students are required to utilize lower level program language to complete some assignments. Instruction on the topic is limited.

1 – Students are required to utilize programs where they can write small macros to complete assignments. No instruction on the programming aspect is provided in the course.

0 – Course has no programming component at all

Guidelines: Protocol for pilot testing

Time required: Approximately one hour

Subjects: 5-10 undergraduate students. The students should have the characteristics of your target group (e.g., seniors, first-year, program, etc.)

Explain the purpose of the survey:

The students will pilot test a survey that will be administered to their cohort. The purpose is to provide feedback on their understanding and perception of the survey items. The responses of the students participating in the pilot test are not going to be recorded or reported to anyone except those who are designing the survey.

Process:

1. Fold the questionnaire on the dotted line so that the respondents ONLY see the survey itself.
2. After explaining the value of their participation, hand out the questionnaire so they can only see the questions.
3. Indicate to the participants that we would like them to take the survey seriously and respond to the items thoughtfully. They MAY NOT ask questions as they go through the items but need to take the survey as they would under normal circumstances.
4. Take note of how long it takes students to respond to all items (it may vary from one student to another, but should not vary by much).
5. After the students have completed the survey, have them open the survey and indicate that we would like them to respond to each survey item in four ways. Review with them the meaning of each of the headers.

   A. **Understanding:** Was the item "understandable." That is, did you have to read the item more than once to understand what it was asking? Was the meaning of the question clear and straightforward?
   B. **Scaling:** Was the scale (very little…..very much) adequate? That is, do you feel the scale provided you with an appropriate way to respond?
   C. **Only one response:** Was the item written in such a way that you could have answered it more than one way? That is, could you have said BOTH "very little" and "very much"?
   D. **Loading:** In your opinion, was the item written in such a way that it led you to ONLY one OBVIOUS answer? In other words, the way the item is worded, it was highly likely that students, regardless of year in college, would respond the same way.

6. Have the students respond to each item by circling "yes/no" for each item. This will allow us to document their responses for cross-campus comparisons.
7. After all the students have independently responded to the four items for each of the 12 survey questions, ask them to discuss with you any of the items that have a "no" response. Start with "understanding" and discuss any item that has a "no" rating in that column. Have them to discuss why they responded that way. TAKE NOTES!!! We will evaluate their responses to make modifications on the items. Do this for each of the four areas of focus.
8. Ask students to explain what they believe we meant by each item, especially 5, 6, 9, 11, and 12. As I remember, these are the items I think we had the most difficulty with the wording. If you have already focussed on some of these questions during step #5 and you feel you have a good grasp on any "misconnect" between what they think we are asking and what we think we are asking, then you can skip those items.
9. Ask students if they found any of the questions to be "emotionally laden." For example, did they find any of the items offensive or insulting?
10. Prepare a summary of all concerns about survey items to guide developers in improving the quality of the survey.

SURVEY QUESTIONS

For items 1-12, please use the scale below to indicate the response that most closely represents your experience.

1	**2**	**3**	**4**
Very Little	Some	Quite a bit	Very Much

<u>To what extent has your college education contributed to your learning in the following areas:</u>

______	1.	Using mathematical methods and procedures to solve the types of technical problems I will face in my career.
______	2.	Using scientific research methods and procedures to solve the types of problems I will face in my career.
______	3.	Using engineering methods and procedures to solve the types of problems I will face in my career.
______	4.	Conducting scientific investigation, including problem identification and setting up and interpreting an experiment or investigation.
______	5.	Designing a system, component, or process to meet a need.
______	6.	Using team process skills necessary to be an effective member of a team.
______	7.	Formulating and solving the types of technical problems I will face in my career
______	8.	Understanding the code of ethics for my chosen profession.
______	9.	Understanding the relationship of technical and scientific work and the cultures within which they operate.
______	10.	Planning to constantly update my professional skills after graduation.
______	11.	Understanding current societal issues.
______	12.	Preparation to use up-to-date techniques, skills and technology I will neeed for my career.

Understandable?	Scale Adequate?	Only one response possible?	Loading?	COMMENTS
1. Yes No	Yes No	Yes No	Yes No	
2. Yes No	Yes No	Yes No	Yes No	
3. Yes No	Yes No	Yes No	Yes No	
4. Yes No	Yes No	Yes No	Yes No	
5. Yes No	Yes No	Yes No	Yes No	
6. Yes No	Yes No	Yes No	Yes No	
7. Yes No	Yes No	Yes No	Yes No	
8. Yes No	Yes No	Yes No	Yes No	
9. Yes No	Yes No	Yes No	Yes No	
10. Yes No	Yes No	Yes No	Yes No	
11. Yes No	Yes No	Yes No	Yes No	
12. Yes No	Yes No	Yes No	Yes No	

Mistakes To Avoid With Your Survey

Adapted from:
(http://www.kdv.com/management/nonprofit/12mistakes.pdf.)

Surveys are possibly the best way for a program to assess its constituents' attitudes and needs. If a statistically significant number of constituents respond, you can use the results to make decisions about services and programs. Often, however, **surveys** are not successful. When surveying, be careful to avoid these **common mistakes** that invalidate results and decrease response rates, wasting your already limited time and resources.

Mistake No. 1: Not surveying. Not surveying at all is the very first mistake. Knowing your audience will enable you to keep your program continuously updated. Surveying (and, as we will later discuss, resurveying) is the key to opening the lines of communication with your constituents.

Mistake No. 2: Pilot test the survey. Before initiating the survey to your constituent group, conduct a small pilot test. Use this opportunity to troubleshoot the survey before spending time and resources on the larger survey. You may discover, for example, that your survey is not eliciting useful data or that it is too complicated.

Mistake No. 3: Overloading the survey. Too many questions, complicated ranking systems or being asked to rate dozens of items all require too much time and effort for survey participants. Make completing the survey as painless as possible. A good response rate to a survey covering a few important areas is better than a dismal response rate to a comprehensive survey.

Mistake No. 4: Bad timing. When constituents are either vacationing or in the middle of a busy time, they will not have the time nor the inclination to fill out a survey. By sending a survey during one of these periods, you not only risk a lower response rate, but also the appearance of being indifferent to the time constraints of your constituents.

Mistake No. 5: Including the survey with something else. By including the survey link in with other information, such as a newsletter, you risk a lower response rate — only those who read that particular mailing will respond to the survey. This creates a bias in the responses and skews the results.

Mistake No. 6: Failing to focus. Prioritize the areas you want to know about. It is impossible for your survey to cover everything, and if you try to make it, you will lower your response rate. Instead, focus only on the most important issues.

Mistake No. 7: Not following up on your survey. Survey experts are unanimous in the opinion that the most effective technique for increasing the response rate of a survey is follow-up requests. Send a carefully worded request to remind recipients of the survey and how valuable their input is. This is a sure way to get more responses. The acceptable response rate for your survey is up to you, but most experts agree that to draw valid conclusions, you need at least a 50% response rate and, ideally, somewhere in the neighborhood of 80%. How low or high your response rate is will dictate how many follow-ups you need to do in order to reach the acceptable level of response on which you have decided.

Mistake No. 8: Not acting on the results. Use the information from the survey as a guide to implement changes. If your survey is conducted correctly, you can assume that your results are valid and must be acted on.

Mistake No. 9: Not communicating results. Be sure and thank your constituents and let them know what you learned and what you did with the information. This will encourage them to respond to future surveys and also keep them connected to the program.

Conduct Surveys With Care
The biggest mistake you can make with a survey is to conduct it haphazardly. Conduct your **surveys** with care and considerable forethought and preparation. A carefully designed survey will provide invaluable input for planning. Keep in mind that inaccurate results can create more problems than no results at all.

Establishing Timelines and Responsibilities

-An Example-

In program assessment planning, it is important that common sense prevail. Processes must be established that capitalize on what is already being done and complement the work of the faculty. Decisions will need to be made. Just as faculty cannot teach the universe of all concepts and skills related to a single course, programs cannot assess everything that they believe students should know or be able to do by the time of graduation. As decisions are made and as assessment and evaluation process are developed, planning should be systematic and for the long term.

The timeline illustrated in Table 1 demonstrates a three year cycle where each outcome is assessed every three years. Because there are only six outcomes, this means that the data collection process takes place on only two outcomes per year. The timeline provides for two cycles of data collection every six years.

Learning Outcomes (each with measurable performance indicators):	'12-13	'13-14	'14-15	'15-16	'16-17	'17-18
A recognition of ethical and professional responsibilities	●			●		
An understanding of how contemporary issues shape and are shaped by mathematics, science, & engineering		●			●	
An ability to recognize the role of professionals in the global society			●			●
An understanding of diverse cultural and humanistic traditions	●			●		
An ability to work effectively in teams		●			●	
An ability to communicate effectively in oral, written, graphical, and visual forms			●			●

Table 1. Data collection cycle for six learning outcomes

The table above can be misleading in that during the year where data collection is taking place on some of the outcomes, activities are taking place related to other outcomes. Table 2 below represents an assessment and evaluation timeline for multiple processes for a single outcome.

Outcome: An ability to recognize the role of professionals in the global society

Assessment and Evaluation Activity	'12-13	'13-14	'14-15	'15-16	'16-17	'17-18
Review of performance indicators that define the outcome	●			●		
Map educational strategies related to performance indicators		●			●	
Review mapping and identify where data will be collected		●			●	
Develop and/or review assessment methods used to assess performance indicators		●			●	
Collect data			●			●
Evaluate assessment data including processes				●		
Report findings				●		
Take action where necessary				●		

Table 2. Assessment and evaluation activity timeline for a single outcome

To get a general view of what one cycle of an assessment program might look like, Table 3 represents three academic years of activity for six learning outcomes by assessment and evaluation activities.

Activities	2015						2016						2017					
	Ethics	Contemporary Issues	Global	Cultural	Teams	Communication	Ethics	Contemporary Issues	Global	Cultural	Teams	Communication	Ethics	Contemporary Issues	Global	Cultural	Teams	Communication
Review of performance indicators defining that outcome			●			●	●			●				●			●	
Map educational strategies related to performance indicators		●			●				●			●	●			●		
Review mapping and identify where data will be collected		●			●				●			●	●			●		
Develop or review assessment methods related to outcome		●			●				●			●	●			●		
Collect and analyze data	●			●				●			●				●			●
Evaluate assessment data including processes			●			●	●			●				●			●	
Report findings			●			●	●			●				●			●	
Take action where necessary			●			●	●			●				●			●	

Table 3. Three-year cycle of assessment and evaluation activity

Although this appears to require considerable effort, not all assessment activities need to be done by the same person or group. Table 4 suggests that there are multiple parties involved in the assessment and evaluation cycle. It is important to plan strategically and systematically so that the workload is reasonable and appropriately distributed.

Assessment and Evaluation Activity	**Responsibility for Activity**
Review of performance indicators that define the outcome	Faculty Assessment Team
Map educational strategies related to performance indicators	All Faculty
Review mapping and identify where data will be collected	Program Faculty
Develop and/or review assessment methods used to assess performance indicators	Faculty Assessment Team w/Assessment Resource
Collect and analyze data	Faculty Assessment Team w/Assessment Resource
Evaluate assessment data including processes	Program Faculty
Report findings	Program Faculty
Take action where necessary	Program Faculty

Table 4. Parties responsible for the assessment and evaluation processes

These tables are for illustrative purposes only. In order to close the loop on the assessment and evaluation process, it is important to plan with the end in mind. Creating a multi-year timeline will help to shape thinking about the activities involved in program assessment. It will also help to avoid taking on too much in the beginning and encourage systematic planning over time.

Creating these types of tables should only be seen as tools to assist in administering and communicating the process. At any time it is found that the processes need to be altered, the information in the tables should change. For example, it may be found after multiple data collection and analysis processes that one or more of the outcomes are consistently of high quality whereas there are other outcomes where the program cannot demonstrate adequate achievement. This could lead to more frequent data collection and evaluation process for some outcomes and less for others. The overall process needs to be designed to answer questions that are of interest to the program. "Systematic" does not mean "etched in stone." If you need to change your processes and/or cycles of activity, then it should be done.

LEARNING STYLES AND STRATEGIES

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ACTIVE AND REFLECTIVE LEARNERS

- Active learners tend to retain and understand information best by doing something active with it--discussing or applying it or explaining it to others. Reflective learners prefer to think about it quietly first.
- "Let's try it out and see how it works" is an active learner's phrase; "Let's think it through first" is the reflective learner's response.
- Active learners tend to like group work more than reflective learners, who prefer working alone.
- Sitting through lectures without getting to do anything physical but take notes is hard for both learning types, but particularly hard for active learners.

Everybody is active sometimes and reflective sometimes. Your preference for one category or the other may be strong, moderate, or mild. A balance of the two is desirable. If you always act before reflecting you can jump into things prematurely and get into trouble, while if you spend too much time reflecting you may never get anything done.

How can active learners help themselves?

If you are an active learner in a class that allows little or no class time for discussion or problem-solving activities, you should try to compensate for these lacks when you study. Study in a group in which the members take turns explaining different topics to each other. Work with others to guess what you will be asked on the next test and figure out how you will answer. You will always retain information better if you find ways to do something with it.

How can reflective learners help themselves?

If you are a reflective learner in a class that allows little or no class time for thinking about new information, you should try to compensate for this lack when you study. Don't simply read or memorize the material; stop periodically to review what you have read and to think of possible questions or applications. You might find it helpful to write short summaries of readings or class notes in your own words. Doing so may take extra time but will enable you to retain the material more effectively.

SENSING AND INTUITIVE LEARNERS

- Sensing learners tend to like learning facts, intuitive learners often prefer discovering possibilities and relationships.
- Sensors often like solving problems by well-established methods and dislike complications and surprises; intuitors like innovation and dislike repetition. Sensors are more likely than intuitors to resent being tested on material that has not been explicitly covered in class.
- Sensors tend to be patient with details and good at memorizing facts and doing hands-on (laboratory) work; intuitors may be better at grasping new concepts and are often more comfortable than sensors with abstractions and mathematical formulations.
- Sensors tend to be more practical and careful than intuitors; intuitors tend to work faster and to be more innovative than sensors.
- Sensors don't like courses that have no apparent connection to the real world; intuitors don't like "plug-and-chug" courses that involve a lot of memorization and routine calculations.

Everybody is sensing sometimes and intuitive sometimes. Your preference for one or the other may be strong, moderate, or mild. To be effective as a learner and problem solver, you need to be able to function both ways. If you overemphasize intuition, you may miss important details or make careless mistakes in calculations or hands-on work; if you overemphasize sensing, you may rely too much on memorization and familiar methods and not concentrate enough on understanding and innovative thinking.

How can sensing learners help themselves?

Sensors remember and understand information best if they can see how it connects to the real world. If you are in a class where most of the material is abstract and theoretical, you may have difficulty. Ask your instructor for specific examples of concepts and procedures, and find out how the concepts apply in practice. If the teacher does not provide enough specifics, try to find some in your course text or other references or by brainstorming with friends or classmates.

How can intuitive learners help themselves?

Many college lecture classes are aimed at intuitors. However, if you are an intuitor and you happen to be in a class that deals primarily with memorization and rote substitution in formulas, you may have trouble with boredom. Ask your instructor for interpretations or theories that link the facts, or try to find the connections yourself. You may also be prone to careless mistakes on test because you are impatient with details and don't like repetition (as in checking your completed solutions). Take time to read the entire question before you start answering and be sure to check your results

VISUAL AND VERBAL LEARNERS

Visual learners remember best what they see--pictures, diagrams, flow charts, time lines, films, and demonstrations. Verbal learners get more out of words--written and spoken explanations. Everyone learns more when information is presented both visually and verbally.

In most college classes very little visual information is presented: students mainly listen to lectures and read material written on chalkboards and in textbooks and handouts. Unfortunately, most people are visual learners, which means that most students do not get nearly as much as they would if more visual presentation were used in class. Good learners are capable of processing information presented either visually or verbally.

How can visual learners help themselves?

If you are a visual learner, try to find diagrams, sketches, schematics, photographs, flow charts, or any other visual representation of course material that is predominantly verbal. Ask your instructor, consult reference books, and see if any videotapes or CD-ROM displays of the course material are available. Prepare a concept map by listing key points, enclosing them in boxes or circles, and drawing lines with arrows between concepts to show connections. Color-code your notes with a highlighter so that everything relating to one topic is the same color.

How can verbal learners help themselves?

Write summaries or outlines of course material in your own words. Working in groups can be particularly effective: you gain understanding of material by hearing classmates' explanations and you learn even more when you do the explaining.

SEQUENTIAL AND GLOBAL LEARNERS

- Sequential learners tend to gain understanding in linear steps, with each step following logically from the previous one. Global learners tend to learn in large jumps, absorbing material almost randomly without seeing connections, and then suddenly "getting it."

- Sequential learners tend to follow logical stepwise paths in finding solutions; global learners may be able to solve complex problems quickly or put things together in novel ways once they have grasped the big picture, but they may have difficulty explaining how they did it.

Many people who read this description may conclude incorrectly that they are global, since everyone has experienced bewilderment followed by a sudden flash of understanding. What makes you global or not is what happens before the light bulb goes on. Sequential learners may not fully understand the material but they can nevertheless do something with it (like solve the homework problems or pass the test) since the pieces they have absorbed are logically connected. Strongly global learners who lack good sequential thinking abilities, on the other hand, may have serious difficulties until they have the big picture. Even after they have it, they may be fuzzy about the details of the subject, while sequential learners may know a lot about specific aspects of a subject but may have trouble relating them to different aspects of the same subject or to different subjects.

How can sequential learners help themselves?

Most college courses are taught in a sequential manner. However, if you are a sequential learner and you have an instructor who jumps around from topic to topic or skips steps, you may have difficulty following and remembering. Ask the instructor to fill in the skipped steps, or fill them in yourself by consulting references. When you are studying, take the time to outline the lecture material for yourself in logical order. In the long run doing so will save you time. You might also try to strengthen your global thinking skills by relating each new topic you study to things you already know. The more you can do so, the deeper your understanding of the topic is likely to be.

How can global learners help themselves?

If you are a global learner, it can be helpful for you to realize that you need the big picture of a subject before you can master details. If your instructor plunges directly into new topics without bothering to explain how they relate to what you already know, it can cause problems for you. Fortunately, there are steps you can take that may help you get the big picture more rapidly. Before you begin to study the first section of a chapter in a text, skim through the entire chapter to get an overview. Doing so may be time-consuming initially but it may save you from going over and over individual parts later. Instead of spending a short time on every subject every night, you might find it more productive to immerse yourself in individual subjects for large blocks. Try to relate the subject to things you already know, either by asking the instructor to help you see connections or by consulting references. Above all, don't lose faith in yourself; you will eventually understand the new material, and once you do your understanding of how it connects to other topics and disciplines may enable you to apply it in ways that most sequential thinkers would never dream of.

http://www4.ncsu.edu/unity/lockers/users/f/felder/public/ILSdir/styles.htm