



Preparing for EC 200x

Session 3

Rita Caso, Texas A&M University

Jeff Froyd, Texas A&M University



Workshop Presenters

- *Jeff Froyd*, **Director of Academic Development**
 - Educational Achievement Division, College of Engineering, Texas A&M University
 - Project Director, Foundation Coalition
- *Rita Caso*, **Director of Assessment & Evaluation**
 - Educational Achievement Division, College of Engineering, Texas A&M University



Overview

I 8:30 – 10:00 AM

- Overview
- Concept Inventories for Engineering Science
- Surveys of Self-Reported Mastery

Time – 90 minutes

III 1:00 – 2:30 PM

- **Soft Skills Assessment**
 - Communication
 - Teaming

Time – 90 minutes

II 10:30 – 12:00 Noon

- **Soft Skills Assessment**
 - Lifelong Learning

Time – 90 minutes

IV 3:00 – 5:30 PM

- **Rubrics for Open-Ended Assessment**
 - Design
 - Problem Solving

Time – 150 minutes



Workshop Features

- Background information about assessment instruments and methods for selected ABET “a – k” criteria
- Instruments developed or adopted by FC institutions
- Hands-on practice using instruments or methods
- Information about developing and adapting instruments and methods for tailored application



EC 200x Program Outcomes

- (a) an ability to apply knowledge of mathematics, science, and engineering
- (b) an ability to design and conduct experiments, as well as to analyze and interpret data
- (c) an ability to design a system, component, or process to meet desired needs
- (d) an ability to function on multi-disciplinary teams
- (e) an ability to identify, formulate, and solve engineering problems
- (f) an understanding of professional and ethical responsibility
- (g) an ability to communicate effectively
- (h) the broad education necessary to understand the impact of engineering solutions in a global and societal context
- (i) a recognition of the need for, and an ability to engage in life-long learning
- (j) a knowledge of contemporary issues
- (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.



Session III: 1:00 – 2:30 PM

“Soft Skills” Assessment

- Communication
- Teamwork



Teaming and Communication

Introduction

Three common Survey-type scales: attitudes, self-assessment of improvement and perceptions classroom experiences.

- Student attitudes: **As people become more adept at what they do, their attitude towards that activity often improves.**
- Self-assessment of improvement: **Writing research has shown that students sometimes recognize that they have improved before it is actually demonstrable in their writing. Although such measures are influenced by individual differences in confidence, changes over time can be detected.**
- Peer and Self-assessment : **This approach is particularly useful for formative assessment because it can allow students to compare their self perceptions with the way they are perceived by others**
- Reporting of Classroom experiences: **Students report on the frequency with which they have had specific experiences in the classroom. (Checklist)**



Communication: Attitudes and Self-Assessment Questions

Student Attitudes and Self-Assessment

- *Please give a response to the following statements in terms of : None, A little, Some, A lot, Exceptionally*
 - I can better express my ideas in class
 - I enjoy expressing my ideas in class
 - I have become a better speaker.
 - I enjoy public speaking
 - I have become a better writer.
 - I enjoy writing



Teaming: Self-Assessment Questions

Teaming: Self-Assessment of Improvement

- *Please give a response to the following statements in terms of : None, A little, some, a lot, exceptional*
 - I have improved in my teaming skills.
 - I have improved in my ability to work with others.
 - I am better able to use constructive feedback from my team members.
 - I am getting better at resolving conflicts with team members.



Teaming Instrument

- TAMU Upper Division Teaming Peer and Self-Assessment Instrument
- **Application:** Assessment for student teams to use for improving the team (formative assessment)
- **Application:** Data for assigning grades to class project
- **Application:** Generate data for WMU and compare with data generated at UMassD (comparative assessment)



TAMU Teaming: Peer and Self-assessment Questions

- Using a scale of 1-11, where 1 is the minimum and 11 the maximum rating, please rate all members of your TEAM, including your self, on the items listed below.
 - (Points assigned to each individual by team mates and self will be summed to arrive at a weighting by which the total team performance grade will be multiplied in order to arrive at an individual's team grade)



TAMU Teaming: Peer and Self-assessment Questions

TAMU Upper Division Team Peer and Self Assessment (selection)

- 1. Attended all team meetings and contributed to team activities**
- 2. Came to meetings appropriately prepared**
- 3. Stayed on track and focused when working with the team**
- 4. Met deadlines set by team**
- 5. Contributed quality ideas in team activities**
- 6. Contributed innovative, or original ideas in team activities**
- 7. Appropriately applied engineering science concepts in team activities**
- 8. Contributed quality work in team activities all semester**



Participant Activity

- **Fill out the TAMU teaming instrument using yourself and your team in the morning activities.**



Communication & Teaming: Classroom Experience Reporting Questions

Classroom Experience

Indicate how frequently you have experienced the following in your classes this semester. Answer in terms of : Less than once a month, 1-3 times a month, about once a week, and more than once a week.

- a. Working in small groups during class
- b. Working in small groups during laboratories
- c. Doing homework together with others
- d. Working on team projects outside of class
- e. Experiencing training in teaming
- f. Having assignments that involve writing
- g. Receiving instruction/feedback about my writing from engineering faculty
- h. Having assignments that involve oral presentations.



Communication: Behavioral Checklist

How often do you do the following activities?

Respond in terms of:

1. Use e-mail to communicate with others?
2. Open or send electronic attachments?
3. Participate in classroom or academic discussions using an electronic medium (chat, list serves)?
4. Use e-mail & comment features of software to write documents through sharing and commenting on drafts with others?
5. Use web or video conferencing to participate in a group project?
6. Use a word processor to format and edit text
7. Use a web software package to develop a simple web page?
8. Post a web page to a server?



Teamwork

Open Ended Questions (TAMU-TIDEE)

From the TAMU-TIDEE Design Knowledge Assessment Tool

- For a Team-Based Engineering Design Project, what are the processes that contribute to good teamwork? List as many as you can.
- List the qualities that describe effective teamwork. List as many as you can.



Participant Activity

- Write out your answers to the team questions.
- Exchange papers with a partner and rate from 1 to 5 (5 highest) the quality and depth of understanding of the answers your receive.



Teamwork

Scoring Rubric: CRITERIA & SCALE (TAMU-TIDEE)

Three specific elements articulated by students.

- **Purpose and planning** (goals, members know goals, time management, meetings)
- **Rules, roles and responsibilities** (members understand and fulfill roles to support teamwork; team uses talents, knowledge, skills of all members, other resources accessed, and communication)
- **Team attitude** (i.e. polite acceptance and respect for each other, show pride in team and motivated toward team success, commitment, constructive criticism, and communication)

5 points total for each main category:

- 1 point given for each underlying characteristic within the three elements. (Up to 3 points awarded for this part)
- 2 points given for examples or more explanation of why it is important

Grand Total of 15 Points for Section



Participant Activity

- Rate the answers you received using the scoring rubric on the previous slide.
- Compare your 1 to 5 rating with the rating obtained using the scoring rubric.



Communications

Open Ended Questions (TAMU-TIDEE)

From the TAMU-TIDEE Design Knowledge Assessment Tool

- What are the component characteristics of good communication with regards to the quality of information communicated and with regards to receiving and presenting information? List as many component qualities as possible.



Participant Activity

- Write out your answers to the communications question.
- Exchange papers with a partner and rate from 1 to 5 (5 highest) the quality and depth of understanding of the answers your receive.



Communication

Scoring Rubric: CRITERIA & SCALE (TAMU-TIDEE)

Five specific elements articulated by students.

- **Structure** (i.e. organization, highly understandable, flow of thoughts)
- **Content** (i.e. details, key points, clarity of ideas, complete and accurate information)
- **Relevance to audience** (i.e. communicated well and understandable to audience)
- **Team attitude** (i.e. co-operation, listening)
- **Involvement** (i.e. planning meetings, interaction)

5 points total: 1 point given for each characteristic that relates to the five elements for communication within the team.

5 points total: 1 point given for each characteristic that relates to the five elements for communication outside of the team.

5 points total

- 2.5 points for more explanations of communication within the team
- 2.5 points for more explanations of communication outside the team

Grand Total of 15 Points for Section



Participant Activity

- Rate the answers you received using the scoring rubric on the previous slide.
- Compare your 1 to 5 rating with the rating obtained using the scoring rubric.



Team Activity: Data Fusion

- **Select either teamwork or communications as your program outcome.**
- **Select a limited number (2-4) sources of data for your program outcome. You may use instruments covered in this session and additional sources of data that you may identify.**
- **Decide when and how you will collect the data.**
- **Describe how you will assemble and process the data to reach decisions on the degree to which your program outcome is being achieved.**



Summary: Session 3

- **Student Outcome (d): Multidisciplinary teams**
- **Student Outcome (g): Communicate effectively**
- **Approaches**
 - Student attitudes
 - Self-assessment of improvement
 - Peer and self-assessment
 - Reporting of classroom experiences
 - Short writing assignments and scoring rubrics