Engineering Coalition of Schools for Excellence in Education and Leadership (ECSEL) Classroom Activities Survey

Patrick T. Terenzini
Pennsylvania State University
403 S. Allen St., Suite 104
University Park, PA 16801-5252
email: ptt2@psu.edu
(814) 865-6346

Introduction:
This survey was developed as part of the ECSEL evaluation program. It was designed to provide a basis for judging whether alternative approaches to teaching engineering design are effective when compared with more conventional approaches. It gathers information on the extent to which students are exposed to selected instructional practices in a particular class (collaborative learning, problem solving activities, feedback, interaction with faculty and peers). It also solicits students' self-reports of gains in engineering design, problem-solving, communications, and working in groups.

Since the initial pilot testing in the Spring semester 1997 several items (relating to problem solving) have been written to be more clear about the distinction between formal/structured/ textbook/mathematical/engineering problem solving (with a known, "right" answer) and unstructured problem solving (where no "right" solution exists).

The instrument should work at all undergraduate levels. With some modifications in items, it might be useful in courses outside engineering. Administration is intended to be late in a course.

Classroom Activities and Outcomes Survey

Directions: Please write the requested information in the space provided or circle the number that best reflects your answer to the question. There are no right or wrong answers to these questions. We appreciate your assistance.

I. BACKGROUND INFORMATION

1. University s name: _____

2. Course No. and Title: _____

3. Declared/Expected Major: _____

4. Gender: 0 = Female 1 = Male

5. Race/Ethnicity with which you most closely identify:
   1 = Black/African American
   2 = Hispanic/Latino American
   3 = Asian/Pacific Islander
   4 = American Indian/Alaskan Native
   5 = White/Caucasian
   6 = Other: _____

6. Class year: 1 = freshman 2 = sophomore 3 = junior 4 = senior 5 = other

7. What is the **highest level** of formal education **completed** by your parents?

	Mother	Father		Mother	Father
Grammar school or less	1	1	College Degree	1	1
Some high school	2	2	Some graduate school	2	2
High school graduate	3	3	Master's degree	3	3
Some college/assoc. degree	4	4	Doctorate/professional degree	4	4

8. Highest degree expected in your lifetime:
   1 = Bachelors 2 = Masters 3 = Doctorate

9. Approximately **how many hours per week** are you employed:
   On-campus: _____hours/week
   Off-campus: _____hours/week

10. SAT Scores: Verbal: _____ Math: _____

11. GPA:
    In high school: __.___ In engineering: __.___ Currently, overall: __.___
    No. of courses **successfully completed** to date in:
    Engineering _____ Science/math _____

12. Did you:
    1 = enter college at this university
    2 = transfer from another college/university

13. Are you now living in:
    1 = a dormitory/college housing 3 = a private apartment/room off-campus
    2 = a fraternity/sorority house 4 = at home with a parent, spouse, or relative

II. This section asks about the characteristics of this course and the kinds of activities that go on in it. Using the scale below, please circle the number that best reflects how often you have experienced the following in this course.

1 = Never **2** = Occasionally **3** = Often **4** = Very Often/Almost Always
n/a = Not Applicable

In this course:

a.	Assignments and class activities are clearly explained.	1	2	3	4	n/a
b.	Assignments, presentations, and learning activities are clearly related to one another.	1	2	3	4	n/a
c.	I work cooperatively with other students on course assignments.	1	2	3	4	n/a
d.	Students teach, and learn from, each other.	1	2	3	4	n/a
e.	There are opportunities to work in groups.	1	2	3	4	n/a
f.	I am encouraged to show how a particular course concept can be applied to an actual problem or situation.	1	2	3	4	n/a
g.	I have opportunities to practice the skills I m learning in the course.	1	2	3	4	n/a
h.	I discuss ideas with my classmates (either individuals or in a	1	2	3	4	n/a

group).

i.	I get feedback on my work or ideas from my classmates.	1	2	3	4	n/a
j.	We do things that require students to be active participants in the teaching and learning process.	1	2	3	4	n/a
k.	The instructor makes clear what is expected of students in the way of activities and effort.	1	2	3	4	n/a
l.	The instructor gives me **frequent** feedback on my work.	1	2	3	4	n/a
m.	The instructor gives me **detailed** feedback on my work.	1	2	3	4	n/a
n.	I am encouraged to challenge the instructor s or other students ideas.	1	2	3	4	n/a
o.	The instructor guides students learning activities rather than lecturing or demonstrating the course material.	1	2	3	4	n/a
p.	The instructor encourages students to listen, to evaluate, and to learn from the ideas of other students.	1	2	3	4	n/a
q.	The instructor treats women students in the same way as male students.	1	2	3	4	n/a
r.	The instructor treats minority students in the same way as white students.	1	2	3	4	n/a
s.	Some male students treat women students differently from other male students.	1	2	3	4	n/a
t.	Some white students treat minority students different from other white students.	1	2	3	4	n/a
u.	**When working in groups**, some male students treat women students differently from other male students.	1	2	3	4	n/a
v.	**When working in groups**, some white students treat minority students differently from other white students.	1	2	3	4	n/a
w.	The instructor emphasizes the design process and activities.	1	2	3	4	n/a
x.	I interact with the instructor as part of this course.	1	2	3	4	n/a
y.	I interact with this instructor **outside of clas**s.	1	2	3	4	n/a
z.	I interact with other students in this course **outside of class**.	1	2	3	4	n/a

III. This section asks about the progress you believe you have made in a variety of areas *as a result of taking this course*. Using the scale below, please circle the number that best reflects how much progress you believe you have made in each area.

1 = None **2** = Slight **3** = Moderate **4** = A Great Deal

Progress made, because of this course,

in your:

a.	Understanding of what engineers do in industry or as faculty members.	1	2	3	4
b.	Understanding of engineering as a field that often involves non-technical considerations (e.g., economic, political, ethical, and/or social issues).	1	2	3	4
c.	Knowledge and understanding of the **language** of design in engineering.	1	2	3	4
d.	Knowledge and understanding of the **process** of design in engineering.	1	2	3	4

in your ability to:

e.	Do design.	1	2	3	4
f.	Solve an unstructured problem (that is, one for which no single right answer exists).	1	2	3	4
g.	Identify the knowledge, resources, and people needed to solve an unstructured problem.	1	2	3	4
h.	Evaluate arguments and evidence so that the strengths and weaknesses of competing alternatives can be judged.	1	2	3	4
i.	Apply an abstract concept or idea to a real problem or situation.	1	2	3	4
j.	Divide unstructured problems into manageable components.	1	2	3	4
k.	Clearly describe a problem orally.	1	2	3	4
l.	Clearly describe a problem in writing.	1	2	3	4
m.	Develop several methods that might be used to solve an unstructured problem.	1	2	3	4
n.	Identify the tasks needed to solve an unstructured problem.	1	2	3	4
o.	Visualize what the product of a project would look like.	1	2	3	4
p.	Weigh the pros and cons of possible solutions to a problem.	1	2	3	4
q.	Figure out what changes are needed in prototypes so that the final engineering project meets design specifications.	1	2	3	4
r.	Develop ways to resolve conflict and reach agreement in a group.	1	2	3	4
s.	Pay attention to the feelings of all group members.	1	2	3	4
t.	Listen to the ideas of others with an open mind.	1	2	3	4
u.	Work on collaborative projects as a member of a team.	1	2	3	4
v.	Organize information into categories, distinctions, or frameworks that will aid comprehension.	1	2	3	4
w.	Ask probing questions that clarify facts, concepts, or relationships.	1	2	3	4
x.	After evaluating the alternatives generated, to develop a new alternative that combines the best qualities and avoids the disadvantages of the previous alternatives.	1	2	3	4

IV. Using the scale below please indicate the extent (if any) to which you may have changed in any of the areas listed *as a result of taking this course*:

1 = Decreased Greatly
2 = Decreased Somewhat
3 = Not Changed
4 = Increased Somewhat
5 = Increased Greatly

As a result of taking this course:

a.	Your confidence that majoring in engineering was the right choice for you	1	2	3	4	5
b.	Your confidence in your ability to become an engineer has ...	1	2	3	4	5
c.	Your motivation to become an engineer has ...	1	2	3	4	5
d.	Your sense of responsibility for your own learning has ...	1	2	3	4	5
e.	The likelihood you will continue in your engineering program has ...	1	2	3	4	5
f.	The likelihood you will go on to graduate school in engineering has ...	1	2	3	4	5
g.	The likelihood you will pursue a teaching career in engineering has ...	1	2	3	4	5
h.	The likelihood you will become a practicing engineer has ...	1	2	3	4	5

i. What grade do you expect to receive in this course?

1 = A^-/above 2 = B^+ 3 = B 4 = B^- 5 = C^+ 6 = C 7 = C^- 8 = D/below

THANKS VERY MUCH FOR YOUR HELP!