

ASME
International Mechanical Engineering Education Conference

March 28, 2009
Plenary 1

BREAKOUT SESSION #1:

Facilitator: Frank Kulacki, University of Minnesota

Recorder: Lawrence Wolf, Oregon Tech, Recorder

How can we substantially improve the communications and people skills, and the global awareness of our graduates?

a) Can we do this without increasing the courses that our students take?

b) Can we better utilize the humanities and social sciences courses that our students take and how?

c) Can and should we make the curriculum more about people and less about things?

Summary: The consensus is that more courses are not needed. Emphasis of existing courses should change.

The use of team projects every term should be integrated in most courses.

There are many ways that schools and departments are addressing these demands. Institutions are different. Situations are different.

Departments are very creative. There are many things that have worked.

The capstone/senior project courses have become the state of the art.

This is movement from a minority of institutions several decades ago.

Some derivative of senior projects is the most often mentioned means of dealing with these issues.

Global issues can be addressed in projects.

There needs to be real extramural support/resources for these aspects of the program.

"4+1" programs have been suggested.

Communications content should be introduced where it makes sense.

The relationship between humanities and social sciences is sometimes beyond the control of the ME department. But attempts need to be continued. Partner faculties must be seen as such to be contributors.

External grading and embedding are thought to be particularly effective.

There is strong agreement that the future of ME education will be more about people, teaming, and leadership. The conceptual engineer must be prepared in the colleges, but the "basics" are needed first.

ABET has again been evoked. But we as engineers are perhaps too quick to point out the problem. ABET must be given the space to celebrate strengths.

Local guidance might be done better through the art of “feint praise” as is done in peer review by other disciplines. We may be competing with them for resources. That too is a people skill.

Group 1:

Bob Pits, Vanderbilt; Hamid____, United Arab Emirates; Annette Carlson, University of Delaware; Joan Gosink, Colorado School of Mines; Costas ____, U of Porto Rico; Francisco Vasquez, Universidad do Porto.

Global Awareness:

UAR conducts 2 day seminars, “events”, for prospective students, from 150 countries, with public participation, not dominated by one nationality, funded by country of origin with govt. support, scholarships.

U of Delaware; All students must take a multicultural course, 1 credit, freshman requirement. (Three Cups of Tea. A narrative about founding a school abroad.)

“More faculty by-in needed.”

“Most engineering freshman opt not to take the course.”

“Winter Abroad Program”

“A course with an international exposure is required of students.”

“A humanities or soc sci course is required every semester.”

“We must look at other parts of the university as contributors rather than adjuncts.”

“Strong multicultural courses are required from contributing departments.”

“Must be in ABET requirements.”

“A challenge to meet needs of students coming in from 3rd world countries. Even though they fund themselves.”

Vanderbilt has large study abroad programs: Hong Kong, Singapore, many others cited.

Kulacki asked, “Approximately what percentage of students are accommodated with some international exposure?” Answers 10%, 15%, 30-40%, 15%, 15%, 30-35%

“How would you assess the communications abilities of your students?”

Good to very good. Writing -- Good to very good.”

Sr. design project – comfortable.

Good to very good. Speaking – Very good to excellent.

Generally – OK

Very good to excellent – both speaking and writing.

Very good to excellent

Group 2:

Jonathan Wickert, Iowa State; Cheena Srinivasan, Ohio State; Carol Stevens, Norwich University; Uwe Kortshagaen, University of Minnesota; Lawrence Hoberock, Oklahoma State U; ____ Zhou, Prairie View A & M

Question by Frank Kulacki: "How do you assess the students' communication skills?"

"We use a rubric."

"Not doing a very good job."

"We need to better understand what is needed by industry."

"The senior design projects could improve in writing."

"We use --- emails, power points, conversational results, through different modalities, capstones, coaches from industry, -- (All cited) -- to teach and assess."

"We assess at multiple points, oral one-on-ones, etc. (On feet in large classes is a problem.)"

"We are trying to engage our support departments, but they don't want to play. -- Don't want to give what employers want."

Are you going it alone? "We are trying in our capstone course, and machine design. Writing is the problem. How do you strengthen that?"

Kulacki: Is there a way that humanities and soc sci can help?

Can we increase their participation?

"We have come a long way."

"The question is 'Who rules?'"

"We have involved other departments, have drawn them in. Can we do a better job of that?"

"We are assessing."

"English is a living language. How much time are they spending on the internet?"

Things are infusing into English."

Kulacki: Back to the other providers.

"Can we do it all within ME, or do we need to engage others? Should we have initiated that or go beyond?"

"In 2030 those English grads will be in engineering!"

"The answer is not within our departments as Larry says."

Group 3:

Walter Bryzik, Wayne State University; Col. Daisie Boetnner, Col. Bobby Crawford, US Military Academy; Abdollah Afjey, University of Toledo; Mary Frecker, Penn State University; Sarah Zappe, Penn State University; Mahesh Aggaral, Gannon University

"Do we have room in the curriculum for all this?"

"The challenge is to get the faculty buy-in."

"We will need more to add more weeks to the program."

"Put the communications problems outside."

"The military students get lots of feedback from alums on the email. They are networked."

"We have honors sections that look at ethics, legal aspects, role play, (active learning.)"

"Mind the students' point of view."

"We need to emphasize this, stuff from day to day, from day one. Not just travel based international experience!"

"We have design courses working with students in France. And it works with the internet." (No travel required.)

Question from Frank Kulacki: "About what % of your students are getting international experience?"

"5%, 5%, Broader penetration is needed."

"You get a comfort level by living abroad. It is a whole different world."

Question from Frank Kulacki: "How can we use humanities and social sciences faculty?"

"Show them the importance of customization."

"They already have 12 SS/HU courses in the program. There is no incentive to integrate."

"There are many divisive issues."

Frank Kulacki: "What should the people to things ratio be?"

"We should go a little more toward people."

"Maybe 50%."

Group 4:

Jeff Suhling, Auburn University; Michael Plesniak, George Washington University; Dan Hirlleman, Purdue University; Chen Zhou, Purdue Calumet; Woosoon Yim, University of Nevada, Las Vegas; Jeffery Ge, Stony Brook University; _____ Rotea, UMass Amhurst.

"More people skills needed."

"More than communications is needed."

Frank Kulacki: "How can the curriculum reflect that?"

"Take the spin off the senior project?"

"The process is missing. How do we make things?"

"The process of designing or manufacturing processes?"

"You need to know the market."

Frank Kulacki: "Is this all possible within the BS Program?"

"It is possible. Redefine multidiscipline."

"A more conceptual engineering in groups will consume courses."

"How do we create leaders?"

"More – How do we create teams?"

"Try to provide leadership for teams in the context of 100 employees."

Frank Kulacki: "How do we build soft skills?"

"If you do it within existing constraints, eventually engineering science gets pushed out."

"Perhaps the 4+1 program is the answer."

"Is that one year masters a fully integrated one? (With the BS degree program.)"

Group 5:

Bart Likens, Western New England College; Zella Kahn-Jetter, Manhattan College; Erian Armanios, University of Texas Arlington; Michael Alley, Penn State University; Jerry Ku, Wayne State University.

(At this point it should be noted that senior project or capstone courses have been cited numerous times.)

More things cited: Student contests, undergraduate research experiences, presentations required in order to get grade,"

Frank Kulacki: "How was the faculty brought in?"

"ABET is very influential!"

"Incorporate where it makes sense. Faculty need to be made aware of each other."

Several combinations of joint grading for English, and ethics.

"Not effective between engr and physics. Needs more 2-way."

"A lot of our faculty are not good communicators."

"Should we train the faculty."

"Faculty expectations are not on target."

Frank Kulacki: "Where would you put the emphasis?"

"Tchnical competence is most important."

Frank Kulacki: "What about professional development for faculty?"

"The ones who need t don't use it."

(More about ABET and force.)

Frank Kulacki: "What are the communication skill levels at your school?"

"Excellent, Very good, Fair, Fair, Fair.

"I find some money to pay an English instructor, so do grading of writing."

"Faculty time is a factor."

"Teaching/research."

"But also there is a teaching/teaching tension."

Group 6:

"Communications ---- No problem."

"Communications is a problem for non-native speakers of English."

(Joint grading, post grading for English, last capstone paper done in juries, students don't like to write, budget is always a problem, instructional services department, and sitting in on others classes.)

"New schools have an advantage. Newness and small size can also be a benefit."

"Union contract dictates peer review."

"There is a wide range of faculty abilities."

"Our students do pretty well in communications courses."

Frank: "How would you all rate them?"

Good, G,G,G,G,G+,G,G,G,G.