

## **Innovative Technical Programs: Methodology and Pedagogy Roundtable Discussions**

1. Are you already including these innovative strategies at your college/university?

- Online courses, tests, quizzes are useful.
- PowerPoint modules are available from GWEC.
- WiscOnline has tutorials.
- Use physical simulation to teach concepts (Kinex, Lego Mindstorm for design concepts)
- NETEC has a guide for training teachers, culminating in a contest of RoboRocks.
- Feedback from teachers: try to do activities with students, but too many students make it difficult. The teachers need assistance.
- Activities will keep students engaged while teaching concepts.
- Older students work with online materials better.
- Medical Device program is good, but in Boston, the program had a difficult time keeping student enrollment up. These programs tend to limit students' scope and ultimately limit their opportunities for employment. Employers tend to prefer employees with more broad skills.

2. How can the presentations on curriculum/pedagogy impact your college/university?

- Programs that use basic demonstrations of technology and processes (for example, the toothpick factory) often receive a perception from students of not being top of the line technological instruction methods. They are good for simulation and demonstration of technology and processes, but may not present the most attractive image for engineering technology programs.
- From today's presentations, the Work-Ready Electronics project could easily be implemented and adapted, and it would be beneficial.
- In our program, we're adding RFID with our sensor class. It is an item within this course. How are RFID and other emerging technologies taught? Are they part of a course, one lecture, and entire program? Different areas require different levels of knowledge. One company, such as IBM, can determine how much a certain area is taught in your program. So, if your geographical area is dominated by a major company or companies, you will teach more specific technology areas. But, if your geographical area is not dominated by a major company or companies, you will tend to address a more general knowledge of technology areas.

3. What can be easily implemented or adapted?

4. What difference will this make?

- Industrial technology program will investigate simulation (inexpensive and user-friendly, quick to learn)
- These types of projects are very useful in high school. Maybe have more in-depth activities for college kids.
- NCME has transfer activities. Students learn the concept with a simple activity. Then they use the same principle for a more complex activity.

- Activity complexity depends on the types of students – 2 year, 4 year
- A majority of students from CC go on to earn a B.S. However, retaining students in the first two years can be challenging.
- It's difficult to track graduates.
- New pedagogical activities are preferred, but professors just need the time.
- First improve teaching techniques, then acquire the projects or activities to teach.
- In the past, many more materials were in print. Now materials are online – must search.
- Now resources are “dumbed down”.
- Students don't seem to like textbooks, but faculty want them.
- “Build Your Own Book” – several companies do this. (Combining from other books) One college tried this and the resulting text had poor continuity. Another college used this technique for an Intro to Engineering class. Another college used it for aerospace – results were good.
- Students need to be engaged, learn by discovery, seems to work best.
- Smart Boards: students don't have to take notes because they are recorded and copied after class. Hands-on project included. Enables better discussion.
- WebCT or Blackboard: some students use, but some just never check. One professor doesn't hand out the assignments – students must go to WebCT.
- Instructors set up chat sessions.
- [www.ncmeresource.org](http://www.ncmeresource.org) has distributed hybrid delivery. Check out for an example.
- Will high schools prepare students with better study skills? Basic study skills seem to be lacking. Preparing for tests, etc. Skills need to start in elementary. Home school students seem well prepared, motivated, know how to study.
- In programs, it's better to create novel programs/courses as option courses to more general programs. It is more cost effective because if the technology changes or becomes unpopular, you can just drop the option from the program instead of revamping or dropping an entire program.
- If you use an existing program as an umbrella, you can just create new courses to meet demands for new technology. If you try to develop an entire program, it is a much larger undertaking that requires state approval, etc.
- “Special Topics” courses can be good ways to present new technologies as well. They are easy and quick to set up. However, they may require equipment and labs that are unavailable to complete coursework.

5. Do you know of other innovative pedagogy being implemented at colleges/universities?

6. What additional resource would you need to implement these strategies?

- In education, top administration needs to be forward thinkers instead of stagnant, traditional thinkers that are currently there. With such advancing technologies, open forward thinkers need to be in places of decisions instead of people are unwilling to change.
- Mission statements should be changed regularly to keep a forward-focus on educational goals.
- Future Search committees should be used to get faculty and all other shareholders together to keep focused on where the college is going and who will work on certain projects to achieve this shared goal of the future.

7. How can the ATE Resource Centers assist you?

- NCME/NJCATE could present our feedback here at AI to larger conferences (AACCC?) to spread the word more about the needs and goals of community college faculty.

8. Do you know of additional resources?

- ASEE white papers provide many good ideas about methodology and pedagogy.