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Engineering and Education Working Together?

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Context

- Discussions on Technological Literacy in '90s led to ideas for enhanced participation of Engineering (Colleges) in K-12 education and hence the need for a dialogue between Engineering and Education at Universities.

- Led to three conferences focusing on gathering deans (and faculty) from Colleges of Education and Engineering.

- Oct 2001(IEEE), Jan 2003 (IEEE), March 2004 (ASME).

Conferences had many Goals

- Assist engineering faculty teach better

- Prepare for engineering Colleges to be involved in the training of teachers (in service and pre-service)

- Assist in promoting technological literacy in general

- Promote the introduction of engineering into the K-12 curriculum - following Massachusetts

- Co-operate on STEM outreach activities with K-12 entities with focus on Engineering

Did you and/or your College participate in any of those conferences?

1. Yes
2. No

0%   0%

1   2

Did the conferences provide any lasting enhancement of the relationship between engineering and education – specifically at your University?

1. Yes

2. No

0% 0%

1   2

Continue the Engineering – Education Dialog?

- After these conferences a group of Engineering Deans and Education Deans, and representatives of professional societies continued to meet – to plan a "next" conference – Funded by Intel

- Dialog is Archived

- Should "we" Continue?

Challenge

- US tradition for training/exposing K-12 teachers in engineering or technology has only recently received attention, but well established between science and education

- Hence teachers are not graduating in any numbers with experience/knowledge of engineering or technology – need to change this for a long term solution of overriding problem

Issues

- Need to have engineering and education educational professions work together to solve the issues of helping train teachers in engineering and technology

- Both engineering and education have many professional societies, so not clear how to engage them simultaneously in this pursuit

- Engineering and education professions have very different relations with Departments of Education – pluses and minuses

Issues

- Education profession is under considerable pressure to:
  - Meet education standards
  - Focus on reading, writing, mathematics…..often not STEM
- Engineering profession has more flexibility to focus on STEM, building on the fundamental skills provided by the education profession
- Five years ago difficult to get the teaching profession organizations to take the issue seriously – now some of these organizations are approaching engineering organizations

Issues

- In-service (post graduate) courses for K-12 teachers relative easy to adapt to the inclusion of engineering

- Engaging pre-service teacher trainees is much harder – directly related to the need to have the K-12 curriculum change to include engineering (at the cost of what – exposure to science and mathematics?)

Other Participants?

- Informal education institutions, such as museums – science and technology discovery centers

- Industry in the outreach role – e.g. Intel's program Intel® Teach Program (former supporter of the education-engineering meetings)

- Techno- competitions (especially robotics) – usually after school programs - links to the actual K-12 curriculum

- Community Colleges in the discussion and how to avoid confusion with programs like school-to-work

The Way Forward

- Do ASEE and FIE conferences, for example, already fulfill the needs role? (probably not for the education profession)

- Funding, Focus and Participants for such conferences?

- Organization: formally organized by key universities directly (as in science), or through engineering and educational organizations?

The Way Forward

- Can one ensure evidence based practices (research) as a basis for discussion? – Is the associated Community of Practice sufficiently mature?

- Is the issue already under firm leadership through various efforts?

- ASEE – Go For It, and other Engineering Societies
- Museum of Science, Boston and National Center for Technological Literacy (NCTL)
- Purdue's University Institute for P-12 Engineering Research and Learning (INSPIRE)
- Journal of Pre-College Engineering Education Research (J-PEER)
- P-12 engineering education research summit (Seaside, Oregon, August 2010)
- Etc.

The Way Forward

- How to integrate the many approaches to these issues already blossoming over the US?

- What piece is appropriate for joint meetings of engineering and education academics and leaders?

Do you think more shared conferences between engineering and education units at universities would be beneficial?

1. Yes
2. No

0%

0%

1

2

Would you attend another conference with an educational partner(s) - not necessarily at your institution?

1. Yes
2. No

0%

0%

1

2