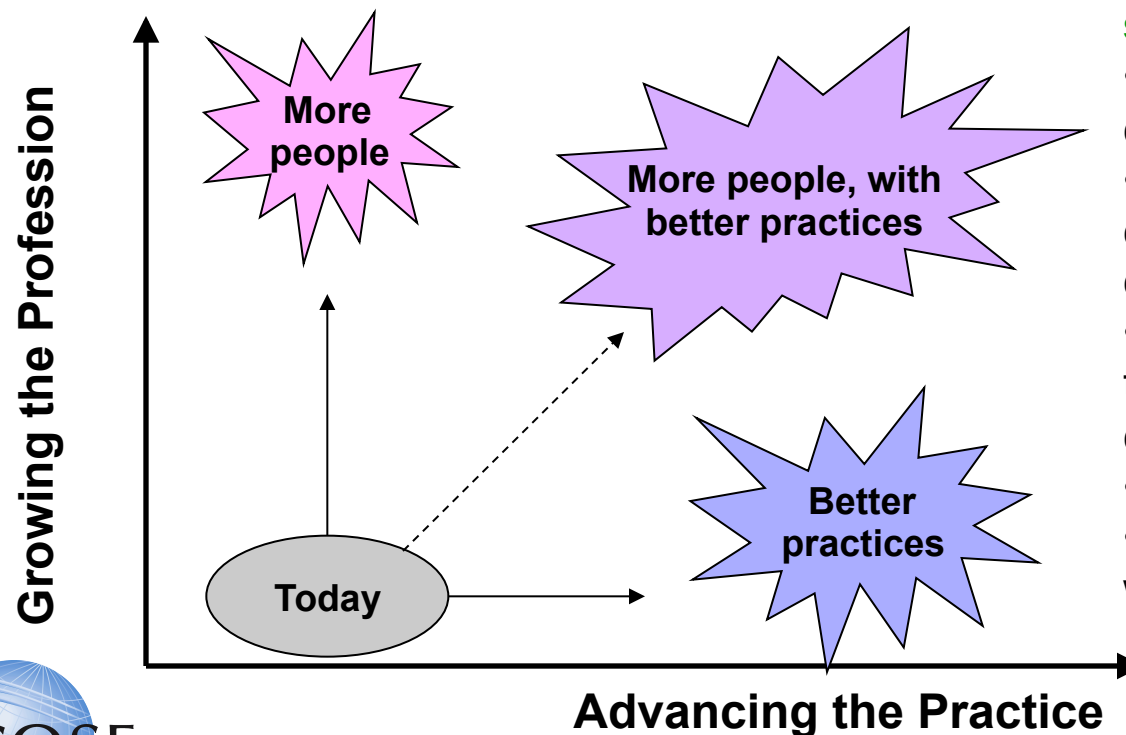


INCOSE Youth & University Outreach

Presented by Paul Robitaille
Presented at Board Meeting
7 February 2010

INCOSE: What are we trying to achieve?

- New industry/government sectors
- New geographical areas
- Broader coverage in existing sectors / areas
- **Improved SE Education**
- **Growth in entrants to the profession**



- **Broader recognition and appreciation of SE as a problem solving methodology**
- Better application of current practices
- Better & more consistent skills and competencies
- New ways of working to meet modern challenges
- Greater use of MBSE
- Greater integration with other disciplines

Youth & University Outreach (1/4)

We want students Grades K – 12:

1. To be interested in and motivated toward careers in engineering, especially systems engineering
2. To be informed so they can choose high school courses, colleges and college courses that will prepare them for those careers
3. To learn multiple ways to explore and understand the subjects appropriately for their age and grade level

Youth & University Outreach (2/4)

We want college undergraduate and graduate students:

1. To maintain their motivation and study toward careers in engineering, especially systems engineering
- 2 To navigate through learning programs that enable their engineering career goals
- 3 To contribute to the SE body of knowledge during their study, through guided research and working activities
- 4 To see INCOSE as an enabler, a valuable information source and a valued professional organization

Youth & University Outreach (3/4)

We want Education Providers (K-12 and post-secondary):

1. To offer educational engineering content that is widely available, useful and valued by industry and government – including systems thinking and systems engineering
2. To ensure that courses of study are widely available, appropriate to the grade and age of the students, motivating, and constructed and updated with instructional principles
3. To see INCOSE as an enabler, a valuable information source and a valued professional organization to help them achieve their educational goals

Objectives of our youth outreach program

1. Help our members involved in K-12 (STEM) outreach to:
 - a. Focus on systems engineering
 - b. Have good SE classroom assets readily available
 - c. Have the knowledge to participate/lead in engineering education community activities
2. Help our members who are not involved to get involved.
3. Help turn ideas from really good systems people into great assets for our members to use in the classroom
4. Help turn donations from people who believe in this to good systems outcomes
5. Help guide the INCOSE foundation into appropriate investments in this area
6. Identify and work with selected organizations who can help us succeed in reaching our objectives
7. Help colleges and universities in developing and accrediting useful and valued systems engineering degree programs geared to the culture of incoming students
8. Provide a win-win outcome for all involved
9. Treat Youth Outreach as a continuum, and make this a key focus of the organization
10. Encourage young people to join INCOSE

Strategic Initiatives (1/5)

Raise Member Awareness, Knowledge & Outreach:

- Identify interested members and what they are willing to do
- Identify ways chapters and members can get engaged (K-12 and university classroom demonstrations; lectures; curriculum development, enrichment and accreditation; monetary donations)
- Identify existing organizations INCOSE for members to volunteer: Kindergartens, STEM Schools, University Alumni, other associations etc.
- Develop and maintain an active internal and external communications program to sustain member interest – keynote speakers, volunteers testimonies, videos, articles, reports etc.

Strategic Initiatives (2/5)

Encourage Chapter Awareness & Outreach:

- Identify community STEM pathways (linking elementary & secondary schools with community colleges and universities)

Systems Engineering Education Artifact Database:

- Identify common points and differences in current global engineering education outreach
- Identify sources of assets
- Negotiate terms of usage for donated assets
- Populate and maintain asset database

Strategic Initiatives (3/5)

Support Existing Outreach Organizations:

- Start small, perhaps 3
- Identify established systems-focused partners
- Develop partnerships both directly and through national chapters as appropriate

INCOSE Sponsored Awards:

- Annual cash awards for outstanding K-6, 7-9 and 9-12 teachers in the engineering education field
- Annual scholarship for one outstanding disadvantaged or minority student at the high school and at university levels
- Annual INCOSE engineering education outreach member & chapter level awards

Strategic Initiatives (4/5)

University Focused Outreach:

- Proactive recruitment of all universities and service academies with SE programs (BS-PhD) into Academic Forum
- BS level reference curriculum and wider vetting of MS & PhD level versions
- Promote Student Divisions in local universities, establish and maintain vibrant links with them
- Widespread network of INCOSE Student Divisions
- Proactive ABET engagement with undergraduate SE programs
- Wide-spread implementation of ASEP at SE Universities and Service Academies
- Establish a “bridge program” for practicing engineers in the classroom
- Enlist support from CAB Members, their employees, Chapters and Student Divisions

Strategic Initiatives (5/5)

INCOSE Internal Improvements:

- Integrate our existing related activities into a coordinated program of youth outreach from K-PhD
 - ABET, ASEP, ISEF, etc.
- Actively and widely communicate the breadth of this program within and external to INCOSE
- Engage proactively with State and National level private and governmental STEM organizations, particularly those involved with engineering education outreach to, to assure INCOSE's program is relevant, fresh and vibrant
- With youth outreach strategy approval, develop & maintain a detailed three year implementation plan

Related 2010 Activities

- ISEF Judging and Awards
- IW 2010 K-12 Engineering Education Outreach WG Meeting
Monday, 8 February 8-5: Apache Conference Room
- ISEF Judging and Awards
- IS 2010 K-12 Engineering Education Outreach Program
 - ~~SW 2010 K-12 Engineering Education Outreach WG Meeting~~
– Monday: Plenary Keynote Speaker: Linda Kathei
Monday, 8 February 8-5: Apache Conference Room
Tuesday, 9 February 8-12: Palo Verde 1 Conference Room
- IS 2010 K-12 Engineering Education Outreach Program
 - Sunday: “Engineering is Fun Day Sunday” for kids at a local park

Youth & University Outreach (4/4)

We want organizations in the Engineering Enterprise:

1. To support and promote engineering education with all available resources (money, knowledge, people, etc.)
2. To collaborate with Educational Providers to ensure the ongoing relevance of the content in their educational programs
3. To see INCOSE as an enabler, a valuable information source and a valued professional organization to help them achieve their Enterprise goals through educational initiatives