

Student Involvement in Chapter & Working Group Activities

Day 1 Intro Workshop

Facilitator: John Brtis, MITRE Corp

Assistant: Grisella Acosta, UTEP Student

Participants:

- **Ann Hodges** Sandia National Labs
- **Mary Compton** Sandia National Labs
- **Sergio De La Rosa** UTEP Student
- **Krishnan Iyer** UTEP Student
- **Ron Lyells** Retired Honeywell
- **Joe Marvin** PSG
- **Tabatha Oria** UTEP Student
- **Eric Smith** UTEP Professor
- **Neale Smith** UTEP Student
- **Sharissa Young** Sandia National Labs

Student Involvement in Chapter & WG Activities

John Brtis, MITRE Corp

Student Involvement in Chapter & WG Activities

- Introductions
 - Who you are
 - Your organization
 - Your interest in the topic
 - Topic issues you are interested in
 - Student Chapter Involvement and Recruiting
 - Human Factors
 - Disposal Process
 - Conveying the Big Picture
 - Stimulating Professional Involvement
 - Educating Students on Benefits of Involvement
 - Communication and Corporate Culture
 - How can the chapter better serve student systems engineers?

Student Involvement in Chapter & WG Activities

- Problem Statement
 - Insufficient student participation in chapters and working groups.
 - What is the value of student involvement in the chapter and working group?
 - How to motivate students to know the value of systems engineering.
 - What are the basic needs of students, what drives them, and what are the barriers to entering systems engineering?
 - Student engineers bring a different perspective than long time career system engineers have.

Student Involvement in Chapter & WG Activities

- Stakeholders
 - Students – “What is the incentive to participate?”
 - Chapter – Want critical mass and participation.
 - Working Group – Need contributing volunteers.
 - Industry – Need Sharp Well-Educated Professionals
 - Faculty – Missed opportunity for leadership, self motivation, and self organization.
 - INCOSE Members- A student division could be a resource to INCOSE members, source of relationships, and new ideas.
 - Universities – Builds credibility for University. Networking opportunity.
 - INCOSE – Source of new members, leaders, and ideas.
 - Recruiters – Builds relationships with students who may become sharp well educated professionals.

Student Involvement in Chapter & WG Activities

- Impediments
 - Lack of Identified Mutual Benefits
 - Student groups don't involve multiple departments.
 - Lack of Self Motivation
 - They don't want to grow professionally.
 - We don't understand the motivations of students in their current life.
 - Students are idealistic, experts make them feel stifled. There is an experiential divide.
 - Students aren't sufficiently informed of the future benefits.
 - Some professors do not buy into professional development being a part of their responsibility.
 - Lack of time money and travel.
 - Systems engineering is better understood with industry experience. Without industry experience systems engineering can be a boring topic. Students need simulation of industry experience.
 - Students aren't welcomed the first time they enter a professional meeting.
 - Fear of failure, uncertainty.
 - Lack of outreach from chapters.
 - Lack of information of professional organizations.
 - Coordination of Student Events
 - Students don't have free time.
 - Frequently student outreach in INCOSE is relegated to the chapters, and they are inconsistent.
 - Lack of awareness of what the nature of the relationship between universities and INCOSE students.
(There are success stories out there)
 - Lack of networking between students.
 - Disconnect between INCOSE lifecycle and student lifecycle.

Student Involvement in Chapter & WG Activities

Impediments (continued)

- You have to be a good engineer before you become a good systems engineer.
- Lack of partnering with other successful organizations.
- Lack of suborganizations that target students.
- Lack of internship programs in systems engineering.
- Metric based rewards for student organization reduces initiative and prevents real engagement.
- Professional activities aren't fun for students
- Not enough engagement with student activities
- Lack of recognition for chapters and working groups
- Lack of systems engineering internships
- Lack of planned activities targeting the students
- Tying systems engineering into reality for students
- You can't understand systems engineering as a theory, it has to be practical and internships are perfect for that.
- Can expand target audience beyond engineering students by presenting "systems thinking."
- INCOSE is geared towards professionals impressing each other, rather than tying systems engineering into reality. More about advancement than inclusion.

Student Involvement in Chapter & Working Group Activities – Day 1

Reception Poster

- Problem Statement:
 - There is insufficient student participation in INCOSE chapters and working groups.
- Stakeholders:
 - Students, Chapter, Working Group, Industry, Faculty, INCOSE Members, Universities, INCOSE, Recruiters.
- Impediments:
 - Students may not understand professionalism or INCOSE or know the benefits.
 - Students may not care about the benefits.
 - Professional activities may not be fun for students.
 - There is a cultural/generational chasm between students and professionals.
 - Systems engineering is weird: non-physics-based, and hard to understand as an undergraduate.
 - Faculty may not see professional development of students as their job.
 - Professional organizations may not be welcoming, combined with fear of failure & uncertainty.
 - There is a disconnect between the student lifecycle and INCOSE lifecycle.

Student Involvement in Chapter and WG Activities

Day 2 Workshop Results

Day 2 Participants:

- **John Brtis** MITRE Corp
- **Mary Compton** Sandia National Labs
- **Ron Lyells** Retired Honeywell
- **Alexander Mazarakis** NMT Student
- **Paul McGoey** Retired Boeing

STUDENT INVOLVEMENT IN CHAPTER & WORKING GROUP ACTIVITIES

■ **Problem Statement:**

- There is insufficient student participation in INCOSE chapters and working groups.

■ **Stakeholders:**

- Students, Universities, Faculty, INCOSE, INCOSE Members, Chapters, Working Groups, Industry, Recruiters.

■ **Impediments:**

- Students may not care about the benefits.
 - Students may not understand professionalism or INCOSE or know the benefits.
 - Lack of networking between professionals and students.
 - Faculty may not see professional development of students as their job.
 - Lack of outreach.
 - Systems engineering is weird: non-physics-based, and hard to understand as an undergraduate.
- Professional activities may not be of interest to students.
 - There is a cultural/generational chasm between students and professionals.
 - Professional organizations may not be welcoming, combined with fear of failure & uncertainty.
- There is a disconnect between the student lifecycle and INCOSE lifecycle.
- Lack of time money and travel.



STUDENT INVOLVEMENT IN CHAPTER & WG ACTIVITIES

- Stakeholders perspectives
 - Students – “What is the incentive to participate?”
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 - Faculty – Missed opportunity for leadership, self motivation, and self organization.
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REQUIREMENTS OF SOLUTION

- Opportunities for networking between students and professionals.
- Collaborating university and INCOSE champions
 - Outreach to non-faculty university personnel. career resource, advisors, etc.
- Make SE more understandable to non SE
 - Common English explanation of SE to the non SE, “...that I could explain to my mother.”
- More student targeted effort by INCOSE
 - Guidance for forming student divisions.
- Approach this problem from a systems thinking perspective to engage the whole university (including SE applied to non-engineering situations).



ACTION

From: LUNNEY Kerry <Kerry.Lunney@thalesgroup.com.au>
Sent: Monday, April 8, 2019 9:41 AM
To: John Brtis <jbrtis@comcast.net>
Cc: dove@parshift.com; jbrtis@johnsbrtis.com
Subject: RE: Socorro Summit -- Student Participation Findings

Thanks John. I will circulate the findings to Academia and Outreach prior to a conference call we have this week on Student membership. This is quite timely.

Cheers, Kerry

