Birds of a Feather – Engineering Technology Building a Community of Practice

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This document includes the summary feedback, session description, short overview PowerPoint and templates used in the Birds of a Feather and also the SCME Round Table: *ATE Centers and Projects Collaboration with Industry – What you get, what they get and what we'd like to get.*

Session Announcement

Birds of a Feather – Engineering Technology

Engineering Technology education focuses on the applied aspects of science and engineering. There are several ATE funded projects and centers that support these cross-disciplinary technologies including but definitely not limited to Photonics, Nano, Micro, and Materials technologies. With this inherent diversity, there are also many areas of overlap. This session is aimed to bring together engineering technology ATE "Birds of a Feather." The session is designed to be interactive, allowing participants to not only introduce themselves, their projects and core competencies, but also begin to create a Community of Practice (CoP). The main goal of this session is to provide a venue to find out what each of us is doing, and discuss issues of importance. After an initial discussion session which will include identifying key "topics of a feather," we will break out in smaller groups to produce a detailed list of our community needs and aspirations. Participants are asked to bring descriptions of their projects (vision, goals, activities) with key contact information to share with the group. Topics to consider include emerging and green technology's impact on our stake holders and how we will evolve to meet their needs. How can we, as a group, best leverage our core competencies developing into an effective CoP, continuing the discussion after the ATE conference? This session will be moderated by Dr. Matthias (Matt) Pleil from the Southwest Center for Microsystems Education (SCME, mpleil@unm.edu). Please contact Matt if you plan to participate and wish to contribute.

After the short introductory PowerPoint and introductions, participants broke up into work-goup topics.

Topic: ATE Solicitation Feedback – Facilitator: David Hata

Name	Institution	Project/Center	email
Bob Kosar	Lee College	ATOP	bobkosar@verizon.net
Dan Hull		OPTEC	hull@optec.org
Jim Nichols	Truckee Meadows CC		jnichols@tmcc.edu

Top Bullets

1. Emphasis on the preliminary proposals
2. Need more STEM courses in curricula. Trades to be in the Dep of Labor RFP (i.e., welding, solar installation)
3. More emphasis on dual credit in HS/College cooperation

Discussion Notes

Over the past 16 years the ATE program has worked. Some changes have geen good, e.g., removal of matching requirements for equipment. But, some changes have weakened the program. The most significant change was to remove the "strong math and science core" requirements for ATE programs. This has resulted in many ATE projects that have weak or no math/science components. It is my recommendation that the ATE program go back to its roots and again characterize ATE programs as programs that include a strong math/science core and that upper-division courses are built on this solid math/science foundation. – David Hata 10/22/09

Grant Review

1. Too dense – seems there is duplication of some description.
2. There is more of a need for STEM courses in curricula. Welding (trades) should be in Dept. of Labor.
3. More focus on 9-12 ➔ Community College transition.
4. 2+2 is not realistic – we are creating technicians, not engineers. Otherwise, only duplicating the first two years of Engineering will leave out soldering, breadboarding, vacuum systems, wiring, CAD, hands-one clean-room experiences… Pre-engineering students can't find jobs, 2-yr techs can.
5. ATE Needs to stress supporting STEM as pipeline to Community Colleges.
6. Emphasis on preliminary proposal submissions.
7. More Emphasis on dual credits in HS/Community College.

Topic: Engineering Technology Evolution – Facilitator: Nader Vadiee

Name	Institution	Project/Center	email
Mukesh Chhajer	DCC		Mchhajer@dcc.vccs.edu
Nader Vadiee	SIPI		nvadiee@sipi.bia.edu
Anthony Clarke	Gateway CTC	Integrated Manufacturing/Mechatronics	Anthony.clarke@kctcs.edu
Jim Dokendorf	Normandale CC	TemPlate	James.dockendorf@normandale.edu
Richard Gilbert		FLATE	

Top Bullets

1. Evening Programs should be encouraged (for non-traditional students)
2. Multiple Entry and Multiple Exit Opportunities
3. Technology Based Small Businesses
4. Community Colleges are evolving to be Junior Colleges (less technology, more first two years of University)

Discussion Notes:

Green Evolution impacting Engineering Technology courses and curriculum

- Sustainable
- Carbon Footprint
- Energy Budget

What is (are) the effect(s) of adding Green?

- Positive Impact – increase enrollment
- Wind Power, Photo Voltaics ➔ Native American Student Draw

Hands – On

- Benefit the community through projects
- Solar Powered Bikes
- Solar Powered Hogans, Bus Stops
- Opportunity for increasing employment on the Reservation
- Green Technology Based Small Businesses

Topic: Educational Materials – Facilitator: David Hata

Name	Institution	Project/Center	email
Bob Kosar	Lee College	ATOP	BobKosar@verizon.net
Dan Hull		OPTEC	hull@optec.org
Tom Singer	Sinclair CC	PLM/STEM Guitar	Thomas.singer@sinclair.edu
Bob Ehrmann	Penn State	NACK	Rke2@psu.edu

Top Bullets

1. Most projects and centers produce educational materials
2. Most give materials away free, but some do publish with the idea of revenue generation

Discussion Notes

- Pick a publisher
- Use Moodle, electronic web-based system
- Electronic distribution of teaching materials but sell kits – example, guitar kit (NCME)

- Hybrid delivery options, i.e., online combined with on campus labs.
- Download From Website (for no-cost). Track who downloaded what and follow up.
- "Open Source" model used by SCME – they utilize JOOMLA! as the content management system with plugings and extensions such as "DocMAN"
- Core plus "other" makes updating easier in the long run.

Use remote-access labs to increase access to expensive equipment. Evaluation is key.Topic: Continuing this Community of Practice – Facilitator: James Hyder

Name	Institution	Project/Center	email
James Hyder	Intel	SCME	James.l.hyder@intel.com
Jim Nichols	Truckee Meadows CC		jnichols@tmcc.edu
Craig Rabatin	Wvu		Craig.rabatin@mail.wvu.edu
Richard Gilbert		FLATE	gilbert@eng.usf.edu
Steve Dulmes	College of Lake County	Photonics	sdulmes@clcillinois.edu
Tom McGlew	Maricopa CC	MATEC	Tom.mcglew@domail.maricopa.org

Top Bullets

1. There was a sentiment expressed by PIs that they wished more advisory board members and/or industry professionals would attend the PI conference.
2. Given limited resources, it was agreed that the PI Conference is not the meeting to bring them to, but that the newly developed HI-TEC conference would likely be more appropriate.
3. Regardless, everyone agreed that advisory board members/industry should be "brought according to mission" and that "webinars" and social networking solutions might be the answer

Discussion Notes

The discussion centered on creating an Engineering Technology community of practice in general, how best to include advisory boards/industry, and the utilization of webinars to accomplish this goal in particular. The consensus was that some sort of social networking website should be set up and program development updates be kept in the database. Social networking sites, such as Facebook ™ or Google ™ can "ping" users when updates are made to topics that are of particular interest to members. The desire was for the site to be hosted by the NSF and be available by industry or specialization. Specific news that needed to be emphasized or presented in greater detail, would utilize webinar technology. There was even the suggestion that advisory board meetings could be held via webinar. If a webinar was utilized to host an advisory board meeting, there was consensus that the system being used would have to indicate the presence of participants so that participants don't "tune out". MATEC Networks has webinar technology/hosting capability available as a core competency.

Topic: Recruitment and Retention – Facilitator: Fabian Lopez

Name	Institution	Project/Center	email
Bob Kosar	Lee College	ATOP	BobKosar@verizon.net
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Tom McGlew	Maricopa CC	MATEC	Tom.mcglew@domail.maricopa.org
Bob Ehrmann	Penn State	NACK	Rke2@psu.edu
Jim Dokendorf	Normandale CC	TemPlate	James.dockendorf@normandale.edu
Dan Hull		OPTEC	hull@optec.org

Top Bullets

1. Front loaded survey and introductory course in Technology of Engineering
2. Mentoring – Community of Learners
3. The balance of Math and CADD
4. Make a Difference in the Students Lives
5. Build Confidence in the teachers
6. Not a deadend

Discussion Notes

- Catch the student at Middle School with the Parents
- Dan Hull: 16 alumni – phone/recorded interviews
- Text and videos ➔ bring back to parents
- Dual Credit w/ 2yr campus lab component to build confidence
- Student centric web ➔ Primer on what nano is. Put together short 20 second snippets w/ alumni
- Should be local comttments
- When you bring something to the HS – How do we integrate but not at the sacrificing of the basic required topics.
- Teachers are the key ➔ target the middle 50% of the student population.
- Get a key recruiter that is focused on the program.
- Math supplement for retention.

Topic: Evaluation and Assessment Practices – Facilitator: Dave Hata

Name	Institution	Project/Center	email
Mukesh Chhajer	DCC		Mchhajer@dcc.vccs.edu
Jim Dokendorf	Normandale CC	TemPlate	James.dockendorf@normandale.edu
Tom McGlew	Maricopa CC	MATEC	Tom.mcglew@domail.maricopa.org
Jim Nichols	Truckee Meadows CC		jnichols@tmcc.edu
Craig Rabatin	Wvu		Craig.rabatin@mail.wvu.edu

Discussion Notes:

- Dissemination of best practices between projects and centers
- Use advisory committee to evaluate curriculum and courses
- Use external standards – e.g. certivication
- Length of grant is often too short to adequately evaluate and assess a project. Centers have a longer time frame but still may not have enough time to evaluate adequately.

Industry Relationships – Best Known Methods – Facilitator: James Hyder

Name	Institution	Project/Center	email
Ravi Manimaran	Black Hawk College	Project	manimaranr@bhc.edu
Craig Rabatin	West Virginia University of Parkersburg	Project	craig.rabatin@mail.wvu.edu
Karen Bottoms	Oklahoma State University Institute of Tech	Project	karen.bottoms@okstate.edu
Alissa Agnello	North Seattle Community College	Seattle hub for industry driven nanotech education	aagnello@northseattle.edu
Bob Ehrmann	Penn State Center for Nanotechnology Education and Utilization	Project	Rehrmann@engr.psu.edu
Rick Hansen	Maricopa Community College	Project	rick.hansen@domail.maricopa.edu
Mukesh Chhajer	Danville Community College	Project	mchhajer@dcc.vccs.edu

The following points were briefly discussed at the Industry Relationships Best Known Methods topic at the Birds of a Feather – Engineering Technology Breakout Session.

- Industry relationships are tough to establish. However, there is opportunity to develop models/methods to address this need.
- Industry Advisory Boards (IABs) are a good starting point (with participation ranging from 9-30 among participants polled). IABs market the program based on skill set presentation given from one of the participant schools (they find this a “grounding/foundational” function of their board).
- Penn State utilizes a state supported web site to identify companies that deal with Nano-technology throughout PN by region. The still struggle to get job postings from Industry.

- Personal connections are important to make, but are difficult to manage when there is movement between/termination of jobs.
- Getting industry cooperation at a "hiring level" (industry representatives that make hiring decisions/commitments) is difficult to establish/maintain.
- Scheduling conflicts/crisis at last minute of is a challenge and impacts the tactical effectiveness of IABs.
- It's hard to get industry folks to try new things. Internships/Externships look rewarding, but are hard to establish manage. It is also hard to bring technicians back to program/school for follow-up. Both are opportunities to develop models/methods to address. One participant noted that, "Externships have been highly successful when funded by NSF."
- "Formal" IABs are not enough…student driven/non mandatory advisory boards to address technical content/feedback is an idea.
- "How do we tap into a company for board members?" was a question significantly addressed. Utilizing Public Affairs/Relations offices can receive a description of what characteristics you desire in a board member and they can use these descriptions to seek participant volunteers. Similarly, in kind/tax deductable donations reminders sent through these offices are a benefit to having industry support. Industry partners can/should be approached for in kind and letters of support to feed not only NSF grants, but others (Perkins, DOL, ect).
- Getting involved with industry associations/boards develops collegial relationships with Industry; you have to show industry you are in it for the long haul!
- It is unclear what is expected (from a IAB's perspective). Clearly crafted expectations (strategically based) and clear/concise agendas (tactically based) after all meetings are a fair expectation from IABs.
- One participant suggesting dynamic IAB meetings; take your IAB for a tours/demonstrations of your labs/facilities and listen for input and suggestions for what works better rather then just going to a room to talk. Take them on tours when you get something new and introduce them to students.

The facilitator (James Hyder/SCME) offered to share a paper titled "Participation on an Advisory Board". This paper was attached as follow up to participants and is available by emailing James at jkhyder@msn.com. "Grants: The Search for External Funding – Understanding the Realities" was also discussed/cited. This presentation was given at SAME-TEC 2006 by Mike Lesiecki (MATEC) and James Hyder (Intel) and can be found at the bottom of http://www.matec.org/convention/archive2006/2006.htm under "Program Building: Grants".

Table 10: ATE Centers and Projects Collaboration with Industry – Who Gets What?

Matthias Pleil, Southwest Center for Microsystems Education (SCME), NM
James Hyder, Southwest Center for Microsystems Education (SCME), NM

This roundtable discussion will be geared towards sharing our collective experiences and learning from each other to improve on our return on investment (ROI). The discussion will address the following

questions: What do you do with industry? What do you get from industry? What does industry get from you? What would you like to get from industry?

The following people participated in the Roundtable:

Name	Institution	Project/Center	email
Judith Fitzpatrick	(QA Training for Biotech/Chemistry Student Technical Training	Project	jfitzpatrick@bergen.edu
Jeannie Allen	NASA	Project	jeannette.e.allen@nasa.gov
Dan Turner	Yuba College Weld-Ed	Project	dturner@yccd.edu
Louise Yarnall	SRI	Research of Community College Partnerships and Industrial Impacts	louise.yarnall@sri.com
Melody Yang	SMCCD/Chem Tech		yangm@smccd.edu
Steve Dulmes	Illinois Community College	Photonics	sdulmes@clcillinois.edu

The following points were highlighted at this Roundtable:

- There was a discussion based on the previous day's "Birds of a Feather Engineering Technology Breakout Session" titled Industry Relationships – Best Known Methods. Developing Industry Advisory Boards (IABs) were discussed. The facilitator (James Hyder/SCME) offered to share a paper titled "Participation on an Advisory Board" (attached as follow up to participants) as well as view the presentation "Grants: The Search for External Funding – Understanding the Realities". This presentation was given at SAME-TEC 2006 by Mike Lesiecki (MATEC) and James Hyder (Intel) and can be found at the bottom of http://www.matec.org/convention/archive2006/2006.htm under "Program Building: Grants".
- Internship/Externship development was mentioned as something that would be mutually beneficial to industry/education.
- Participation in professional societies was mentioned as a bridge building device. In particular, one participant works with the America Standards for Quality (ASQ).
- Maintaining professional contacts can help bring in money, in kind support, "skill panels" and ultimately serve to meet the need of industry to create a technical workforce. One participant stated, "The biggest challenge is getting industry involved…you have to prove yourself/ROI before you ask for something critical; success breeds success"!
- Design a Curriculum (DACUM) was discussed as a best known method for sharing program development responsibilities between education/industry. It was also mentioned that certification programs can be complimentary to full "for credit" programs. Tapping into your bigger ATE Center to address broad industry needs assessment was discussed. The key to success in this endeavor is to find out how many people/jobs/organizations can be served by your assessment.
- Research is currently underway for common methods for developing relationships with/within industry. It is important to understand that industry needs to understand educational "shop talk" from Education in order to understand how to work with DACUM models and the broader industry needs assessments previously mentioned.