

PACT Forum
Research Profile Study: Applying What We've Learned to Recruiting Efforts
Friday, May 11, 2001

Research Profile Study and Findings – Mickey Sarquis

(John K.) Chemistry is exciting to students because they're in the program

(Ken C.) This is not necessarily true. I have had students come to the program with a bad high school experience. Students are more perceptive than we think and we must give them credit for that.

(Renee) Internet and employment opportunities – Students are more acclimated to this world than we are.

- Students send resumes over the internet and that's how they find their jobs.
- Employers have a larger pool of employees to choose from.

What's Being Done: Summary from Two-Year College Attendees – Lynn Hogue

To attract older, non-traditional students:

- Target through science teachers, counselors, employment counselors, etc.
- Advertising in small town newspapers
- Place flyers in community locations
- Web pages giving detailed info including testimonials from graduates

To emphasize the chemical nature of the degree program:

- Advertise in chemistry classes
- Distribute flyers at high school career days
- Sometimes the chemical nature is not emphasized at all for fear of frightening students

To emphasize local job availability:

- Hold career expositions
- Issue an annual placement report to inform on how well we do

To emphasize jobs/wages:

- Advertise
- Show ads in C&E news

- Emphasize the mobility of a 2-year degree

To inform practicing chemical technicians and other lab professionals informed:

- Conduct on-site courses in local industries
- Advertise by word of mouth via graduates and supervisors
- Attend ACS meeting
 - **(John)** Are there opportunities for this?
 - **(Connie)** Go to local meetings, get reps, make the connections with the practicing technicians
 - **(John E.)** Industry reps are willing to talk to students and students like it
 - **(Gary)** Gives students a choice of attending meeting or writing paper
 - **(Mamie)** Can't the division schedule times at regional meetings for presentations?
 - **(Connie)** Logistics have been difficult but we do foresee it happening soon
 - **(Mickey)** Funds are available for students to attend meetings but they must be willing to make a presentation. Unfortunately, nobody takes advantage of it.
 - **(John K.)** Thinks that's out of student's realm – they can't imagine doing something like that.
 - **(Connie)** It's the job of the instructors to make students believe that this is something to consider
 - **(Shelley)** Sending students in groups is much more successful than sending one student
 - **(Lynn)** Students are not aware of the professionalism part of a job and don't truly understand something like this until they attend a local meeting
- Arrange plant/lab tours
- Establishing an advisory committee
 - encourage members of industry to help recruit

To encourage college resources and recruitment personnel:

- Establish career day sessions attended by high school students
- Send follow-up letters in response to telephone inquiries
- Arrange follow-up visits
- Run radio ads
- Problem: College counselors only have 15 minutes to create awareness of programs or some colleges don't have recruiters

- **(Kirk)** Invite college counselors for one day in-service session
- **(Joel)** It's nice for them to see the facilities
- **(Gary)** Dow busses students out to the plants
- **(Connie)** Making the industry connection is more powerful message

How High School Students Perceive Chemical Technology – Amy Stander

(John K.) Did high school students get any background about this before taking the survey?

(Amy) Most went in without any background, but Tim did put a twist on things

(Tim) Separated students into two categories – one given info, one who went in cold

- For students in chemistry class:
 - When given background, responses were lower
- For general students:
 - Without background, most answered yes to questions
 - instructors did report that these students did put a lot of thought into answering the questions
 - When given background, numbers dropped

Research Profile Study and the Voluntary Industry Standards – Ken Chapman

Profile study has made an important contribution

It's reinforced info published in areas and uncovered some things we didn't know

Recruitment – has many aspects

- Must understand these aspects better

Changes in recruitment

- Deals with articulation
- Used to mean articulation only
- Today, articulation provides many alternatives to students
 - For those students in a two-year program with the end of a bachelor's degree, give them the first two years of the program where viewpoint is that the chem tech's career is part of the chemist's career. Students take part in what a chemist needs to do
 - According to Barley's model, this didn't quite cut it

In the 90's, we've been able to use Steven Barley's work as a model for work in a post-industrial economy

- As part of his study, Barley and his fellow researchers went into the workplace serving a technical work team, observing the interactions between technicians, engineers, and chemists
- They found that chem tech personnel approach curricula in a different kind of way.

Skill standards work reveals the following about chemical laboratory technicians:

- over 75% of technicians' time was spent doing analytical activities
- many of their skills were developed on the job, regardless of educational background
- Most graduates with a B.S. in Chemistry have inadequate lab skills and have attitude
- Problems when hired for a technician job.
- The ACS starting salary surveys find that over 40% of new B.S. in chemistry graduates employed in industry have taken jobs as chemical technicians.

As a society, we push students into college with the idea of the American Dream – start out at an entry-level job and become the president of the company.

Technicians – expertise is based differently and what they value as important is different. Unfortunately, society deems their expertise as being at a lower level.

Barley's findings

- Technicians are junior professionals so training requires science, math, and other courses similar to university course.
- In work, formal knowledge is less important than hiring policies suggest.
- Technicians value experience over formal training.
- Semiotic knowledge is critical
- Technicians depend on sensory-motor skills – the “feel”
- Heuristics – or rule of thumb – Get the feel of how to do the work very rapidly.
- Work Style – puts penalties on those who step out of line. There are behaviors and demeanors that carry the moral force or code of conduct
- Local idiosyncrasies that are important to technicians
- Technicians are noted for being able to get access to distributed knowledge – get help from the experts for the particular problem.

Problems

- Emergence of technicians' work undermines the logic of vertical organizing on which most organizational theory and practice rests.
 - the nature of the work is in flux
 - the value of distinctions is waning (e.g. blue collar vs. white collar)
- Manufacturers are now finding that they have an old workforce and now have to recruit and fill positions out of what has been a very tough job market. Chemical industry has to get involved or else they'll be filling positions with the worst people available.

Challenges

- Progression (entry level technician, associate technician, technician, senior technician)
- Progression (entry-level scientist, associate scientist, scientist, senior scientist)

The two realms must be able to work very well together and be able to communicate.

- Unfortunately, education pushes everyone in the direction of getting to be the senior scientist.
- Curriculum point

How do we take the skills that technicians need to be effective on the job and incorporate them into the curriculum? We continue to give technicians the same abstract knowledge that is needed from the scientists.

(Renee) Industry wants the 3.5 – 4.0 students because they are the best. Why?

(Ken) A 3.5 – 4.0 simply means that the student is good at taking tests. These students are good at taking exams.

(Renee) We must put out the message that high GPA's are not necessarily the best and the brightest.

Group Presentations: Recruiting Recommendations

Group 1

Systemic change is needed. This requires:

- Marshalling all resources
- Expanding the public's opinion of what a technician is and what a technician does

MTV – Chem-tech style

- At the “movies”

Make a National Chemical Technology Week that includes:

- Family science night
- Industry panels
- Career fairs and/or open house
- Sending the message that it's about fun!

Develop kits for demonstrations

ACS Resources/print/video

Improve the relationship between high school and college chemistry teachers/instructors

Emphasize contact with skill centers, vocational education, and one-stop centers

Need accurate career information for dissemination

Work closer with the local ACS sections

(Carol) We need to change the perception of the career

Group 2

Recruit early and often – hit students when they're young and old

- (Mamie) Early means junior high and early high school levels and let students know what's available for them when they grow up. We must also find a way to get to the emotional mentality of young students.

Industry involvement and presence is important – carries a stronger weight if the partnership is there

Sell chem tech as a career AND as a stepping stone

Articulation

- Between high school and two year college and between two year college and four year college

Emphasize that chem tech is high tech

Emphasize the diverse opportunities and career options available for chemical technicians

Improve relationship between 2- and 4-year colleges

- Must make the 4 year colleges aware of what's available at the 2 year level

Group 3

I. Informing current lab workers

- Identify the working techs in your particular areas
- Request industry reps

- Invite techs to speak in classrooms, at career fairs, in order to get them connected to your program
- Support TAGS and advisory groups (include the personnel in groups)
- Establish good working partnerships with industries
- Send college brochures, job market info for the local area

II. Utilizing college sources correctly

- For traditional students
 - Make sure college career days include industry reps and invite high school students
- For non traditional students
- Utilize appropriate demographics
 - Recruit your 4 year college transfers
 - Put info in employment offices or where other displaced workers may be
- Offer courses at non-traditional times and places
- Other
 - Need well-informed college admissions persons
- Include economic factors in brochures
 - Tuition costs
 - Salary potential
- Increase networking

III. Availability of jobs/potential wages

- Placement report be included in recruitment literature
- Recent grad testimonials
- Job placement office websites
- Don't hide the academic challenge in the program and the chemical nature of the program

IV. Other

- Individual program websites
- Need to solicit more administrative support for your program
- Departments need to be more 'entrepreneurial' about their websites and programs

(John K.) The two main ways students get info were college sources and from friends so we need to make sure these people are well informed about the program. Must touch base

with all technicians in the area and get the information out to them about the chem tech program so that they can pass on the information to their friends.

(Dave) Offer programs in the evening so that non-traditional students are more apt to finish the degree

(B.J.) To make our programs more attractive to non traditional students

- we offer more off campus classrooms and activities
- we reformat classes to be one night a week rather than two nights a week

(Renee) Retention is another factor to deal with – we can get people to the program but only half graduate. The reasons for quitting are varied.

(Johanne) If come from an area with high minority population, what the students do depends on what they are pushed into doing by their parents. Have to make society aware of what's involved with the job.

(Carol) Found that decreasing the time frame lead to increase in failure and dropouts. Compressing the time frame from 4 days to 2 days a week is not helping in her school.

(Richard) Created town hall meetings for parents to distribute kits and information and supplement what's going on in the school.

Group Presentations: Reaching Two Different Target Groups

Group 5

Pre-college

- Audience is defined as K-12 students

Non-traditional students

- Must consider factors such as race, gender, ethnicity, language, and cultural diversity.

Recommendations:

- Those involved need to know who they're dealing with. For example, colleges need to know their communities.
- As a way to link the pre-college and non-traditional student recruitment, make a single brochure that speaks to both the traditional student and the non-traditional student
- Globalization is an issue that will need to be addressed in the near future as a result of having to meet multi-national needs

Non-traditional students:

- Match the recruiter with the student in terms of language, gender, and ethnicity

Other Recommendations:

- Check the ACS publications to ensure proper technician coverage
- Companies should collaborate and make their needs known to the larger population
- Students need to have a national focus. We can get the ACS more involved to help in this endeavor.
- More web info needs to be provided to high school students. Need to have modules available (i.e. STW) that can be easily downloaded and used by students and serve as a recruitment tool.
- Need to have AAS salaries in the ACS starting salary survey.

Group 4

Focused on how we could change the image of the profession on the whole.

Recommendations

- Must start recruiting for the occupation
 - Get companies like Dow, P&G, Monsanto involved in this process
 - Get the professional organizations involved
 - Need someone to write a grant to get things moving
- Must have a marketing/advertising campaign – a national one
 - Use the media of the students – the media that they watch
 - Develop CD's that include cameos on chemical technicians
 - Get some chemical technicians on sit-coms and other TV shows that students watch
 - Use popular celebrities to help recruit
 - Really impress upon students that importance of science
 - Put tags on commercials that emphasize that “this is a great place to work”
 - Get information to NSTA, National Biology teachers
 - Use the Saturday morning cartoons to advertise the career
 - Distribute “did you know” pamphlets and poster with fun facts about science
 - Get pictures of scientists in elementary texts
- Must work with Science related groups
 - Science clubs
 - Science Olympiad

- Science fairs
- College websites should provide a prominent page on careers – something that will catch students eyes and make the want to go to that page to see what’s there
- Must have presentations to science classes
 - Health science orientation
 - General chem
 - Biology
 - High school science classes
- Must have staff development opportunities for teacher that will bring high school teachers to the college campus and let them see what’s available to the students
 - Help in “educating 2yr/4yr college instructors”
- Use posters as a vehicle to indicate a variety of jobs that include topics such as
 - Synthetic fabrics
 - Shoes
 - Contact lenses
 - Medicines
 - cosmetics
- Must make teacher resources available that they can take home and use
 - Things like pre-packages bulletin boards
 - Can also sponsor student developed poster contests
 - Pre-packaged activity kits that are hands-on for students
- Other
 - Must target early as in elementary and middle school
 - We must continually target – have constant repetition
 - Need to identify what keeps students out of the profession and really work to overcome negative impressions

Non-traditional students

- Most of the messages and materials will still be the same, but the places that we go to do recruiting will be different
- Recommendations
 - Use role models in under-represented groups for allowing students to relate better.

- Include ads on Spanish stations
- Make them aware of the national and regional opportunities that are available
- The materials that are developed need to be sensitive to cultural diversity
- Recruit through local organizations like the Boys and Girls clubs and Civic groups
- Recruit one or two at a time

Group 3

Pre-college – requires a systemic approach

- Elementary school – must develop and awareness and work on the “image” of the scientist. Can do this by promoting hands on science to generate interest in the subject
- Middle School – Must work to expand this awareness into implementations through science classes.
- High School – Must provide specific instructions and information through chemistry classes, including A.P
- Adult Students – Target via vocational education, skill centers, and GED programs
- Strategies
- College campus tours to bring students to the college
- Career fairs/tech shows
- Industry speakers and industry tours
- Support our high school teachers
- Offer summer classes where students can come and learn about the programs
- Make the connections to industry
- Send out mailers from the college programs
- Sponsor bring your child to work day and maybe bring another child too
- Do classroom presentation possibly on topics that students are being taught to avoid “taking away class time”
- Sponsor science field trips
- Sponsor skills contests
- Advertise via public access TV, movie house ads and career centers

Non-traditional – requires an inclusive approach

Definition of the audience – older than 18, incumbent work force, women, minorities, displaced workers, those not completed a 4 year degree

Strategies

- Must have multi-lingual recruitment and materials
- Must include the families in the process and make presentations to the entire family to let them know what's available.
- Distribute materials in places where people gather such as malls, markets
- Distribute info in career centers and women's resource centers
- Include other language media
- Advertise in local newspaper and newsletters, church news
- Use the internet to develop websites
 - E.g. www.chemtech.org
- Develop data bases
- Devise a telemarketing scheme for reaching students
- Use giveaways such as the Kirk Hunter's 'pig' or T-shirts
- To help these non-traditional students, we must make our schedule of classes as user friendly as possible.

Group 2

Pre-college

1. Establish relationships with high school teachers. To do that:
 - Go to their classes and speak to their students
 - Bring along some students who are already in the program
 - Bring along an employer as a speaker
 - Establish times when teachers can come to the college campus. Can possibly have an on-campus career day for high school teacher and their students
2. Get to know these high school teachers very well – this personal relationship is vital
3. Since most students get their info from college sources, we must develop very good brochures. Can also develop career posters and put them in that hands of everyone - of teachers, prospective students, visitors to the campus, college faculty, past graduates and admissions representatives.
4. Sponsor a "Shadow Day" for high school attendance. To make this something special, establish criteria that dictate who can attend.

5. Establish alliances with industry and employers

Important for both traditional and non-traditional is to bring all the important stakeholders together to the table. This includes industry, community, schools, and colleges. This helps in executing successful recruiting and marketing plans.

Non-traditional

1. Again, alliances are the best way to start so that all people are working together.
2. Establish relationships with local agencies such as welfare, vocational rehab, and unemployment offices because this is where prospective students are likely to be.
3. Work together to “recruit” with the universities to
 - Reach the academic transfers
 - Help make contact with college advisors and 4 year colleges
 - Establish and utilize articulation agreements with university departments
4. Work with Temp agencies because they are a source of potential students who might be interested in the program
5. Advertise in local newspaper, flyers, and inserts.

Group 1

Traditional – defined as high school graduate or someone who has not been out of college for more than a year.

- Establish a dual credit or concurrent enrollment system where students can receive both high school and college credit for the work that they do.
- Have shared counselors who work for both the high school and the college
- Have shared labs
- Have information videos that let students know about the program and the opportunities that are available to them.
- Have shared faculty
- Develop interactive CD’s, games, and quizzes
- Tray liners at McDonald’s – put information anywhere where students are likely to see it.
- Antenna balls
- Book jackets with info on them (book covers)
- Allow opportunities for job shadowing and tours so that students can really see what is done on the job.
- Distribute periodic tables that also list the advantages of this type of program.

- Deliver breakfast and goody trays to high school faculty that are wrapped in information about the program
- (B.J.) Program does this and finds that teachers really like it.
- Have industry sponsored speakers come to talk to students
- Involve the American Association of University Women
- Make tech prep funds available to pay for release time and professional development activities for teachers.

Non-traditional

- To overcome the language barrier, have info sessions that are led by bilingual facilitators. Also, make these info sessions for parents and students.
- Modular skill set programs for incumbents
- Match the employment needs with vendor specific training.
- To target women, emphasize childcare and financial aid opportunities.
- Target service organizations for collaborative training ops.
- Really work to emphasize and promote the advantages of hiring older workers
- Develop some sort of fast track for second career students or those with other degrees.

Saturday, May 13, 2001

Group Presentations: Marketing Plans

Group 4

- I. **Goal:** Enroll one student from every high school in area per year
- II. **Target Audience**
 - A. **Elementary** school – all students
 - B. **Middle School** – all students
 - C. **High school** – selected students
 - work closely with one teacher at that school and find out who the best audience will be
 - It may be physical science class, biology classes, and other non four-year track classes. It probably won't be the AP classes.
- III. **Message**
 - A. **Elementary and middle school** - science is for everyone. Its fun, beneficial, it's important for everyone.
 - B. **In high school** – we want to promote the variety of careers
 - Respect profession
 - Decent wages
 - It's fun and enjoyable
 - Mobility
 - National and regional opportunities
 - Advantages of coming to 2 year college
 - Cost effective
 - Smaller classes
 - Continue education at 4 year college
- IV. **How**
 - A. **Elementary and middle school**
 - Visit schools and work with teachers.
 - Use existing mechanisms like NCW, local ACS sections.
 - Get to teachers in colleges and provide them with kits
 - Sponsor science fairs
 - Develop hands on activities as part of the kits

- make broad based printed materials (brochure)
 - more appropriate for middle school students
- Field trips to industry

B. High school

- Guest speakers from industry
- Career fairs/booths sponsored by industry and college
 - Perhaps schedule these on Saturdays or in the evenings when parents can come.
- CD-ROM
- Brochure
- Interactive internet site

V. Costs

A. Kits – get industry and local ACS sponsors

- 100 kits at \$30 each = \$3000

B. Teacher workshops at colleges

- 100 teaches at \$40 for each substitute = \$4000
- Refreshments and college brochures = \$3000

C. Brochures (\$5000)

D. CD-ROM

- Development = \$8000
- Copies = \$5000

E. Laminated posters with tear-offs

***Grand total = \$28,000**

VI. Benefits

- Media which students use
- Interesting and attracts attention
- Can track the tear-offs
- We can reach students early and often

Group 3

I. Goal: get 15 students per year

II. Target audience:

- traditional and non-traditional students

III. Cost/budget

- Total = \$5000
- Rule of thumb - about 25% of budget should be spent on marketing

IV. Message

- Too many jobs and not enough graduates
- Well-paying job

V. Methods (ongoing)

- Testimonials from former students and employers
- Radio and TV spots
- Posters with response cards (have been most effective)
 - The response cards generate 3 letters once they are returned(1 from president, 1 from market dept, and one from chem tech personnel). Letters can include other supplemental information that we want students to get.
- Trivia sheets (distributed via teachers or any other way you can get them out)
- Recruiting booths
- Scholarships (Kirk's school gave everyone in program a \$300 scholarship that was sponsored by industry)
- Personal contacts from the college faculty and with people in industry
- Letter to past graduates asking for help in recruiting
 - Help with open houses and campus tours
 - They relate better to the students
 - Put information in dorms and apartment buildings

(Renee) In her program, students are a great tool for recruitment. They believe in the program and they can bring the excitement about the career to prospective students.

Group 2 (all members of group were from same college)

I. General Introductory Comments:

- A. Started by considering the lack of time that's available to do things. Wanted to establish some workable plans that can be done quickly and implemented now. Also, wanted to target both traditional and non-traditional groups.

II. Methods

- A. **Start by advertising in some small town newspapers. Write an ad that emphasizes the positives of the program.**
- B. Revamp the college brochure
 - 1. Have an insert that can be put right into the college format brochure that is much more eye-catching and includes more information such as testimonials, salaries, employers
 - 2. (Joel) Keep a supply of inserts with college counselors who deal a lot with the public.
- C. Utilize school visits
 - 1. Requires a close working relationship with career services people in the college
 - 2. Bring along current students and/or graduates of the program
 - 3. Distribute posters to high school teachers
 - 4. Key – have a good relationship with counselors and with high school teachers
- D. Website expansion
- E. Shadow days where we bring in high school students and have them go around with students already in the program
- F. Already participating in career days and college fairs

III. Comments:

(John) Expresses his appreciation for bringing together the faculty from different campuses. Had never met Joel prior to this meeting and he's learned some things that can be done as a program to try and recruit students.

(Joel) It is difficult for admissions reps to get to know everything about all the different programs offered at a college.

(Carol) Their new admissions counselor conducted the award ceremony at the science fair. Next year, the admission counselor wants to put on a program for the parents.

(Kirk) Bussed all students and teachers in the science fair to the campus.

Group 1

I. General Introductory Comments

- A. The GCPTA looked at all things that are taking place within the industry. Saw a rapid change occurring. Wanted a scheme that would benefit everyone.

II. Target audience

- A. Industry

B. The incumbent work force

1. This group is identified as currently employed and lacking skills and knowledge
2. Comprises 85-95% of the existing workforce
3. 50% of the existing workforce is non-degreed.

III. Goal: To market college chem tech ops to industry in order to meet specific needs of incumbent workforce

IV. Methods

1. Create data-base survey including GAP analysis
2. Create a time-line (3-5 year rolling)
3. Form strong partnerships with industry and promote working with competitors on a common need

V. Message

1. In order to be globally competitive, industry must be supportive of promoting a smarter workforce
2. Also want to promote the message that there are better jobs and higher pay
3. Creates a safer more efficient employment
 - Study showed that there was a 44% reduction in safety incidences.
4. Increase in productivity because of:
 - Reduction of unit specific training time
 - Reduction of job training time
 - This allowed workers qualified on two to three jobs

VI. Comments

(Bill) Overall, in all marketing plan, we tried to incorporate cost factors. Used industry as primary recruiter. Advertise on newspapers and TV

(Kirk) Complements GCPTA for targeting the operation side of things. They have managed to get industry to specify associate's degree as minimum qualifications. This has impacted the way that our programs are perceived throughout the region.

(Bill) 5 community college and each had technical specific courses but there were too many different courses. Wanted to standardize the curriculum. To be successful, we had to get labor involved who have had a problem with declining work force. For labor to survive, had to have a more intelligent worker. The intent was to forge a partnership. To be successful, must have a meaningful working partnership.

(Mamie) All the other work is to maintain the pipeline and our scope today was to make the people in the pipeline a smarter workforce. The population is greater than I realized. Salaries will go up with degrees and this will put pressure on people to go back to school.

(Bill) If have a degree, get more money per hour. Salaries increase by almost \$6000 a year. This is how we try to promote the program

(Shelley) In Golf Coast, Dow is looking to hire degree people. Are others doing this?

(Bill) Dow was an AFL-CIO facility with an apprenticeship program but that's going out the window. Trying to mold the university concept through the alliance.

(Gary) We decided to market the industry first and then market the students.

Group 5

I. One point of view of chem tech people is that they have a number of customers. If we address the customers we have a semiotic relationship being developed.

II. Focus is on the alliance. How do we get something going that will achieve an improvement of the chem tech program?

A. College must sell program to the employers and make them realize that the pipeline is long and that the commitment is long term. We can't instantaneously supply a workforce every time something changes.

B. Alliance contains college or group of colleges

- the pre-college community (they need to be a partner, they are a customer)
- employers
- college community
- community groups (for getting to non-traditional students)

C. There are impacts on curriculum and work place structure that need addressed

III. Marketing Points

A. If work experience is part of program, the curriculum must make sure that students have skills and knowledge that is needed on the job.

B. Workplace structure must be one that accommodates those students that are coming in. This cuts down on training time

C. Alliance provides a way for employers to communicate across a lot of different areas. Employers can join with college personnel in recruitment. Without it, we have a college trying to sell itself. If employer shows an expectation that they want you to have, this provides a stronger selling point.

D. Income possibilities generated are very helpful, especially for non-traditional students. And that income is coming from a future employment area.

E. Benefits of work experience

- Enables college to have a close connection with employers
- Student comes to understand what's expected in the work place and see if that's what they want to do.

IV. Comments

(Shelley) Advantages to industry – have a hireable pool of students when it comes to hiring.

(Ken) Group 5 is sold on the concept of alliances, work experiences and collaboration.

(Renee) Used the GCPTA as a model in LA in how to go about forming an alliance. The formal structure has made a tremendous difference in program and for employers. The GCPTA did a lot of groundwork and we have used that and are thankful for that work.

(Ken) Alliance is simply a term for a closer partnership and working relationship. Advising committees haven't advised much but they didn't impact programs much. The alliance group is where decisions are made and issues are addressed.

(Johanne) Industry is not looking at programs with the same kind of need. How do we get beyond HR to someone who will listen?

(Bill) We asked industry to give us a person to lead the charge. We agreed to pay the company what it would cost to hire an adjunct faculty. He made sure what we put together was an industry driven initiative. We now have a set-up where institution is always outvoted two to one by having many other people involved. Need to get away from traditional education delivery.

(Kirk) It's scary to lose control of the program – to have an industry directed program. What we're hearing from industry people is that there's not the crisis for lab technicians as there is for operators. There's the perception that we can fill these positions with other people.

(Ken) About 250,000 chem lab techs in country and double that number of process techs.

(Kirk) Many companies are still working on apprenticeship programs for lab techs. You move from station to station and work to learn all the different tests. Then go to instrument lab. Idea is where you train for the slot below you. End up with people who don't have the knowledge or skill base to train the incoming apprentice and problems evolve.

(Renee) Some companies approached us that are looking for process technicians with chemistry background. That's an area to tap and discuss with industry. Also, there's a cross-training that's happening now. What's happening in the curriculum, our students have a year of physics. Get a lot of chem tech and some process tech. Can train other students. See how processing and chem tech can work together.

(Gary) Also seeing this cross-training trend too.

(Carol) Systemic change is going to have to be national. Every non-traditional student was once a traditional student. Must plant the little seed in the traditional arena and hope

they'll remember. Also, industry involvement is critical to ensure that they don't hire non-graduates.

Group Presentations: Addressing Misperceptions

Group 2

I. Instructor Problem

- A. 30% do not think that chem techs are professionals. We think that's a sad statistic. This mind set must be changed because students also feel this way. The attitude is carrying over to students.
- B. Perhaps the question was misperceived. "Professional" is used as a noun. What was in the mind when instructor answered the question?
- C. How to change attitude:
 - Get them out there to see what technicians are doing.
 - Get them to talk to technicians and their supervisors
 - Get them to be more in touch. See the techs doing trouble shooting, making presentations and participating in professional activities.
 - Fire them if all else fails

II. Student problem

- A. They get the attitude from the instructors.
- B. To correct the student problem, we must fix the instructor problem.

III. Technicians as Problem Solvers

- A. Why?
 - Instructors are not communicating the real world.
- B. Problem solving needs to be introduced into their curriculum
 - Maybe should go back to the materials writers such as textbook and lab manual writers. If students are using materials where problem solving is introduced, the students will pick up on this.
 - Maybe require some industrial experience of the instructors who have none.

Group 3

I. Technicians

- A. Change in:

- Corporate attitude in how they perceive 2 year students coming in. There's a professional ladder and that ladder does not include people with 2 year degrees.
- Change job descriptions and structure
- Ph. D attitude needs changed from "working for" to "working with."

II. Instructors

A. Change in attitude towards:

- "working for" to "working with"
- Industry in general
- The industrial workplace

III. Students

A. Need a better definition of what a scientist is so that everyone's on the same page.

IV. Comments

(John) Could it be a job title situation?

(Beth) That and the professional ladder

(Johanne) In spite of all this, 89% of technicians feel they're professionals and that's good.

(Connie) Some companies no longer make distinctions as used to be the case. Some companies are trying to recognize techs as professionals

(Kirk) Anyone who follows the scientific method is a scientist (Edison)

Group 4

I. Education

A. ACS needs to work on this

- TECH joint symposium
- Change in technician membership
- Be more receptive to inviting high school teachers
- All boils down to a systemic change

(Allene) One thing that's supposed to happen with the leadership meetings for incoming chairs, they're supposed to work on making high school teachers a part of everything.

(B.J.) In Texas, 70% of students in higher education are in a community college

II. Instructors

- Get rid of teachers who don't think techs are professionals
- Reach teachers via 2YC3
- Even this may not change the attitude

III. Technicians

- A. We don't need to say we're professionals, but we need to make it so that we're perceived as professionals.

IV. Comments

(Ken) Connie has been nominated to the committee on committees in the ACS. This is one of the key committees in the society. This is the committee that Dick Cobb is involved with. It's the council policy committee which controls the council agenda. These are policy committees and it's impressive to have technicians nominated for this.

Group 5

I. Professionalism issue

- Reference materials should be developed to promote technicians as professionals and problem solvers. Some work has been done on this but there needs to be a lot more.
- Instructors and chem tech students who don't feel technicians are professionals should be removed from chemical technology instruction.

II. To ACS

- Provide greater emphasis on careers in chemistry, which includes addressing chemical technician careers.
- ACS hasn't recruited since 1970. Only provides info about careers.
- Enable AAS chem tech graduates who have been ACS affiliates to obtain full membership in the society after graduation.

Group 1

I. On the survey, add supervisors (of technicians) to see how they view things

II. Our group tried to define scientist because scientist can be a confusing word.

- A. Definition: One in search on new info via the scientific method.

III. Group also felt technician was hard to define and perhaps the general public is confused as well.

- A. Perhaps we need to define for instructors, students, industry schools, and college

IV. Venn Diagram

- A. The scientist at the extreme is involved with theory. On the chem tech end, deals with application, practice, structured, procedural

V. Survey itself:

- A. Agreed that instructors and students need to be the target, with the instructors being the most important. Must affect the instructor and students will probably follow.

VI. Comments

(Art) The word technician is being thrown around too much. May need to find a new word to define chemical technician. The problem is that everyone's job is different.

(Gary) Some supervisors are more lax than others

(John) Spent time at a DuPont plant to see what technicians are doing. They came to realize that the word technician is not a good word. Use laboratorian instead.

(Mamie) Other definition of scientist – one who seeks new knowledge. The scientist discovers, the engineer scales up, the technician makes sure it's going to work.

One group comes out of colleges and told to be creative. Another group is told to be innovative. We've created these two artificial titles that we probably can't use to define chemists.

(Joel) The word technician has been used as a result of increased technology in the field and the fact that they have formal training in that field. So what's happened, we're trying to describe our graduates so that the public perceives them as being more professional.

(Renee) When working in industry, had a different title in every job she's had. It depended on the company and their business. This is done so as not to confuse everyone.

(Mamie) All has to do with job classification and salaries. The title comes with salaries.

(Dave) Must start to pay technicians like we pay salary people instead of on an hourly basis.

Sunday, May 13, 2001

Group Presentations: Curriculum Recommendations

Group 3

I. Page 35/37

A. Replacement (#2)

- Recognizing that chemical technology programs have the objective of enabling graduates to enter the workforce, students should be informed of additional academic opportunities.

B. Truncation (#3)

- Chemical technology curricula may need to include remedial assistance. We don't think its necessary to specify any further.

C. Expansion/Rephrasing (#4)

- Curriculum designers may wish to incorporate more hands-on or inquiry-based explorations, other strategies to help students enjoy and have an appreciation for chemistry and connections to the workplace or the world around us.

D. Last line

- ...industry work experience, which could serve them well in making their connections.

II. Page 36/38

A. Rephrasing (top of page)

- ...experiences more meaningful, enjoyable, and interesting.

B. Rephrasing (#1)

- ...in concrete, in addition to conceptual presentations; however, problem-solving capabilities, which could use inquiry-based instruction, must be developed

III. New Recommendations

- A. Instructors must avoid teaching to stereotypes based upon ethnicity, gender, age, etc. The kind of teaching strategies are often influenced by how we were taught. This can be a bad strategy.
- B. Reference materials should be developed to promote technicians as professionals and problem solvers.
- C. Instructors of chemical technology students who do not accept technicians as professionals and problem-solvers should be removed from chemical technology instruction.

D. To ACS:

- Provide greater emphasis on careers in chemistry, which includes addressing chemical technician careers.
- Enable AAS Chemical Technology graduates who have been ACS student affiliates to attain full membership in the society upon graduation.

E. To PACT:

- Develop and present workshop on entrepreneurs for chem tech programs
- Identify and address customers and their needs
- Develop and nurture local alliances
- Address curriculum development and improvement of curriculum
- Recruit
- Develop and implement experiential programs. Profile studies show importance of on the job training.
- Address issue of how to continually improve your program.

Group 2

Looked at issue of what seems to be missing from list that was presented

I. Communication skills

II. Behavioral traits (soft skills) – things employers are looking for

- Ethics
- Interpersonal skills
- Planning issues
- Housekeeping – being able to clean up after yourself
- Safety

III. Standardization of industry job descriptions

- Clarify titles
- Science/Math knowledge
- Communications (oral and written)

IV. Working with students in documentation of what they do.

(Kirk) Standardization of job description – something industry will have to tackle

(Connie) Doesn't think it's something that will happen

V. Conclusions and Recommendations

- Integration between colleges, pre-colleges, high school and industry. More dialogue
- Use work-place scenarios or case studies
- Flexible schedule in terms of when curriculum is offered. Most technician students are employed in the daytime
- Dynamic Curriculum to promote student involvement
- Collaboration and formation of teams among students
 - College students go to high schools
 - College students go to industry
 - Student groups
 - High school students go to industry
- Problem solving

(Kirk) In collaboration issue, have students work on projects.

Group 1

I. Need to determine the content and learning requirements of industry. Must see what industry needs.

- Local/regional content specifics
- Validation via voluntary skills standards (ACS-NSF)
- GAP analysis via the above

(Gary) Currently a GAP analysis going at DOW – expect to have the revised version in June

- Inquiry and team based methodology needs to be taught throughout the curriculum.
 - College instructors can probably learn something of what’s being done in elementary school.
- Have problem solving incorporated throughout the curriculum.
- Designed participation of introverted students via collaborative based and problem focused instructions. Introverted students will become more extroverted when they are part of a team.

(John E.) If you don’t become extroverted, you can’t go anywhere.

(Renee) Introverts are not necessarily people who don’t communicate. They may do it a different way.

(Shelley) Must give students skills to communicate because they will have to do that in industry.

(Mamie) Definitions of introvert/extrovert were taken from the survey.

(Ken) There are techniques for helping the introvert communicate on a regular basis and effectively.

- Collaborative learning via student to student teaching. Came from the idea the technicians did a lot of training in their jobs. To take advantage of having different levels of students in classes, have them train other students in the group. Students tend to ask more questions to other students.
- Instruction must allow and encourage individual approach – sensing, feeling, reflective. For example, trouble shooting courses, quality assurances. Put students in situations where they have to sense problems.

II. Diverse needs of non-traditional learners

- Instruction/content must be application based
- Instruction must be relevant and interesting
- Curriculum must address students with or without chemistry background. Talking about the entry point, especially in math. Want students to be successful in the early classes. If they don't have remedial chemistry class, the first chem tech class must be adapted to speak to students with no chem background.
- Students may require study skills assistance. Students may have been out of school for a while and have a lot of anxiety. A reason that they're not successful is because they don't have study skills.

Recruiters' General Marketing Plan

Goal: To market community college chem tech opportunities to the non- traditional and traditional student and to identify and establish relationships with all stakeholders involved in this process.

Traditional Students

Includes:

1. Education
 - a. High School
 1. Biology and chemistry teachers and students
 2. Administrators
 3. Counselors
 4. Parents

- b. Vocational schools (both high school programs and colleges)
 1. Vocational teachers and students
 2. Vocational education counselors
 3. Counselors
1. Industry personnel (contacts that we establish through advisory boards)
2. Government/Economic Development Personnel
- The more networking, the better.

Message

- A. Chem tech careers are exciting and fun. They offer career advancement as well as opportunity for growth in employment and education. ***want to word things in the language of high school students. Use a language that they'll relate to.**
 - B. Name the big companies
 - When parents hear this, they are impressed. Eliminates a lot of misconceptions that the only way to work for these companies is via a four year education.
 - C. Look at long term issues such as benefits, salaries, going on to a 4 year degree
- (Ken) May want to word things in terms of continuing education.

Methods

- A. Support the establishment of local chem tech alliances using PACT as the clearing house for the information (all NSF groups can do this)
 - Also a formal clearing house as part of ACS and they are looking for ideas of what to include.
- B. Methods that have worked in the past
 - High school class presentations by college faculty, industry partners, and college chem tech students. These things do work so we need to keep doing them.
 - On-campus recruiting events including:
 1. career days
 2. open houses
 3. visitation days for high school chemistry and biology teachers and students. If you can get teachers on your campus, they can sell it for you.
 4. shadow day (for students and teachers)

5. Campus tours utilizing student ambassadors. Students can take students around and probably relate better.
 6. women in technology day
- Continued use of advisory committees
 1. make sure that advisory committee is involved in helping you market the program and sharing costs. Massage the alliances and add to them.
 - Advertise in newspapers, movie theaters
 - Develop brochures, posters, and other key visual aids and marketing pieces.
- A. Chem tech instructors work with admissions and marketing personnel at their universities
- Counselors can only know so much about all the different programs. Can add a lot of validity by integrating all individuals together.
 - Many of the graduates working are proud of their work and they like talking about it...so get them involved. They won't ask too much. When the high school teachers sees their graduate, it's powerful.
- B. Involving the admissions representative more
- Invite admissions reps to advisory meetings
 - Have admissions personnel go on field trips
 - Establish communication lines between admissions and faculty. Keeps everyone on the same page about changes as they occur.
- C. Adopt the mentality that "Everyone's a Recruiter"
1. Why?
 - a. Prospective students will perceive the university through you by the way you speak about the university and the energy you convey. You are a walking, talking billboard for your university.
 2. Implications of this mentality
 - b. Need academic departments, student services, faculty, admissions, and all campus resources working together for dissemination of information

Non-traditional Students

This includes:

1. Individuals over 25 years of age
2. The displaced worker
3. Those with ethnic/gender issues

- a. English as a second language students
 - b. Cultural bias against women in technical careers
 - c. Single parents
4. Incumbent workers looking to improve skills

Message

- A. You can train for a lucrative career in an exciting field at your local community college.
- B. Promotional slogan - "Too many chem tech jobs...not enough chem tech grads"
T-Shirt; I'm not a rocket scientist...I'm a chemical technician because I can make more money.

Methods

- A. Develop and maintain relationships with the following for the purpose of marketing chem tech programs:
 1. Industry
 2. Local chem tech alliances
 3. Career centers
 4. Employment agencies
- B. Develop and maintain campus websites to deliver information about chem tech. Websites are cheap and fluid and can be changed easily.
 1. Components of different web pages
 - a. Job placement pages that include:
 1. local and national job opportunities in chemical technology
 2. job placement report that detail labor market trends
 3. links to industry employment opportunity pages
 - b. Chem tech department website that includes:
 1. info on degrees
 2. costs vs. 4 year college
 3. testimonials
- C. Develop brochures that specifically target non-traditional students
- D. Information delivery presentations at churches and civic organizations
- E. Develop a set of videos to target specific audiences. Specific audiences include:
 1. the older worker

2. the displaced worker
3. workers with ethnic and gender issues

***These videos would be used on public access TV and in presentations.**

- F. Disseminate information to practicing chem tech workers. This goes back to the friends and family issue of how students get info about chem tech programs.
- G. Use the media
 1. Print (local newspapers and campus newspapers that include ads and human interest stories)
 2. Radio spots that would appeal to the non-traditional student
- H. Organize job fairs and invite chem tech employers to give info to students about the job market

Promotional Packages

All promotional packages (print, videos, brochures, CD's, etc.) should include some or all of the following key ideas:

1. Information about chem tech careers and how one gets there
2. High paying jobs
3. Education is the key to moving up for practicing chem techs
4. High demand in labor force for chem techs with 2 year degree
5. Opportunities for women and minorities in chem tech are abundant
6. Community colleges offer 2 year program at low cost compared to universities
7. Offer child care and financial aid packages
8. Emphasize flexibility by offering
 - a. distance education classes
 - b. Saturday classes
 - c. evening classes
 - d. mini-session classes
 - e. classes for shift workers

Benefits (for both traditional and non-traditional students)

- A. A trained, educated, well-qualified high level candidate
- B. Attracts students to community college programs
- C. Provide education to traditional and non-traditional students
- D. Results in better and/or high paying jobs for chem tech students

- E. A better trained, safer work force
- F. Increase in productivity in industry
- G. Global – smarter workforce makes chem tech industry more globally competitive.

Other Important Points

- I. Tours are important. We must get students to campus no matter what it takes.
 - A. Involves developing a relationship with the chemistry teacher.
 - B. Tours have to be organized from the standpoint that you can do this. We can't have 100 middle school students running around the building.
- II. The shared counselor positions have exploded the registration at B.J.'s school
 - A. How does it work?
 1. Counselor's salary is paid partly by school and partly by the college
 2. Counselor spends half of his/her time at each place
 3. Main job is to counsel dual credit concurrent enrollment students
 4. Promote degrees and certificates
 - B. Positive Results
 1. Gotten auto tech and chem tech programs
 2. Building of pet plants
 3. Enrollment has exploded.
- III. Articulate with state colleges so that students can just start at these colleges as a junior. The people interested in helping are those that need students just as badly as you do.
- IV. From the industry's perspective:
 - A. Prefer to hire a person with a 2 year degree who wants to continue on as a technologist.
 - B. Companies such as Dow will pay for further education if it is deemed to be productive to your job.
 - C. Lots of range for growth in the chem tech arena.

Comments

Is there any flack from these dual enrollment classes?

(B.J.) The high schools are very happy, but AP teachers are losing some of their best students so they complain sometimes.

Next Steps- Local Action

Mickey's Challenge: Don't let these ideas die. Do at least one thing locally and communicate back about what you have done. We owe it to the chemical technology community to take the next steps.