



2003 Annual Meeting Report

The 51st Meeting of MACLAC

New Dimension

University of Evansville

October 10 – 11, 2003

General Session 1 – Friday Afternoon

The meeting at University of Evansville opened with the traditional welcoming remarks and announcements. R. Graham Cooks, Purdue University presented a talk on miniature, high throughput, preparative mass spectrometry. When MS became available in the 1960s the average instrument was as large as a car; now the instruments are much smaller. Furthermore, MS instruments have been attached to a variety of other instruments to make the technique useful in a very wide range of applications. The frontiers of MS technology now lie with improving resolution, increasing signal strength, and improving specificity.

Next Meeting

Clarke College October 15 - 16, 2004

Green Chemistry

visit the website – www.mactlac.org

General Session 2 – Friday Evening

The evening seminar presented by Ken Suslick, University of Illinois, was entitled *Chymistes: The Distillers of Waters?* Although chemistry is an old field, it continues to change and mature. Currently the individual areas of chemistry are merging and many chemists sit at the borders of overlapping areas. Dr. Suslick described his work in the areas of sonochemistry, sonoilluminescence and chemical sensing molecules.

General Session 3 – Saturday Morning

The Saturday morning session was a presentation by Gabriela Weaver, Purdue University on instructional technologies for chemical education. The current trend in chemical education is e-learning (content delivered by computer technologies) and blended pedagogies. She described several projects involving DVD video with web-linked content, many of which are funded by the NSF.

MACTLAC General Business Meeting

1. President Rich Scamehorn opened the general business meeting on Saturday morning.
2. Susan Klein, Secretary-Treasurer presented the Treasurer's Report – see below for the numbers.
3. Anne Sherren, Archivist presented a short report on archival activities. She also announced Iota Sigma Pi activities.
4. New State Representatives were introduced and announced.
 - a. Cindy Woodbridge – Hillsdale College - Michigan
 - b. Michelle Applebee, Elmhurst College - Illinois
5. Motions were made to instruct the secretary to write letters of appreciation to the outgoing state representatives and officers.
6. Announcements about the procedures for requesting emeritus and honorary status were described.
7. Mary Lou Caffery, Clarke College, Iowa made announcements and invitations to attend the next meeting at her college October 15 – 16, 2005.
8. New Officers Elected
 - Chris vanOrman, - President Elect
9. New President, Larry Ferren, Olivet Nazarene, Illinois began his new term.
10. Door prizes were drawn and awarded.

Treasurer's Report

September 1, 2002 – August 31, 2003

MACTLAC ASSETS (9/1/02):

Checking Account	\$1336.93
Savings	\$5298.67
<i>TOTAL</i>	<i>\$6635.60</i>

INCOME:

Interest	154.73
Dues	414.00
Indiana Wesleyan University meeting	4567.00
<i>TOTAL</i>	<i>\$5135.73</i>

EXPENSES:

Indiana Wesleyan University meeting	4114.81
Placement, Archivist, Website	160.00
Postage, Duplicating	368.00
<i>TOTAL</i>	<i>4642.81</i>

MACTLAC ASSETS (8/31/02) 7128.52

AN INCREASE OF \$492.92

Discussion Group Reports

Discussion Group A- Dr. Cooks' Talk

Moderator: Arlen Kaufman, from University of Evansville

Recorder: Lauralee Guilbault

Griffin Analytical may want to get instruments available to teaching schools at good discount. If this happens we will try to let MACTLAC folks know.

Sampling of Brain MALDI Imaging

Related:

Using RAMAN is also being done in medical applications

From here it was more informal discussion

Discussion Group B – General Chemistry Discussion

Moderator: Vanessa McCaffrey from Albion College

Recorder: Dennis Brinkman from Indiana Wesleyan University

Innovative Ideas:

Alternatives for Lab- Generate demos which students can then take out into the elementary schools.

Lots of Demonstrations

Homework assignment each class to force students to keep up

On-line homework system (e.g. web assign)

Guided inquiry labs (in place of cook book labs) (Source: Donald Wink of U. of Il-Chicago).

Lab reports graded by "Calibrated Peer Review" (software available via UCLA) in which students grade other students' work anonymously using a grading key (CPR.molsci.ucla.edu) Currently free!

Use unifying topics-e.g. Environmental Chemistry examples or Biochemistry to bring diverse set of topics together and make them relevant.

Have a fall back class that starts after the first exam in Gen. Chem. which meets 4 days/week to help those who can't make it in Gen. Chem. (About ¼ of class) is moved into this lower level course.

Give web-based quizzes with instant feedback and an opportunity for second try

Discussion Group C – Small Departments Discussion

Moderator: Rolf Myhrman from Judson College

Recorder: Rolf Myhrman from Judson College

Discussed recruiting and the 1 ½ ea. Of a “Discussion II” type of accreditation for smaller departments.

Discussion Group D – Grants and Discussion

Moderator: Karen Nordell from Lawrence University

Recorder: Mark Nusbam

Questions:

- Grants for equipment
- Where to go after initial sources
- Specific question- research grant proposed to NSF
- Not affecting minority students NSF turned down because of that.

Suggestions: Maybe bring in H.S. teachers or students to increase diversity.

Frustration with the NSF response reason: Research grant purposed, not intended to be an outreach.

Karen urged the group to be ambitious, not to lower expectations; but need to address under-represented groups. Karen is to call the program officer at NSF. Karen noted that reviewers change from year to year.

New Faculty- Research Co-op. ACS-PRF Type B(G)

(Cottrell Scholars)

NSF and NIH also have first-time faculty grants

NSF-RUI

Alan Hutchcraft suggested going to local industries for either equipment or small amounts of funding; also community foundations.

CUR – Summer Research Fellowships (~ \$3-4K) for undergraduate students

“CURR.org” website on-line application

Must be a member of CUR (Council for Undergraduate Research)

Alan and Karen urged people to become members of CUR (at least 1 per department).

Also getting used equipment- e.g. through businesses or websites- (e.g. gentech.com)

Merck/AAAS – Bio/Chem support for student stipends

\$60-70K across 3 project

Check with your local development office get that person to sponsor/support

Beckman Scholars Program – Fund students doing undergraduate research

Local (State) Academy of Science for small grants (e.g. \$3K)

NSF-MRI (Major Research Instrumentation) no match \$ required

NSF-CCLI (Course Curriculum lab improvement) 1:1 match

A&I Adaptation and Implementation

Development of novel ideas

Where to go if can't take federal funds?

Alumi; Industry

Also, Keck Foundation- can go to large \$, but need to match

Dreyfus Foundation- Good for new faculty start-up; other programs as well:

Special Grants Program- good for getting new equipment (~\$25-50K), Pittsburgh

Conference also good for small equipment needs.

Foundation with Support For Grants Reason: Education/community relevant research

Ford Foundation

Coca-Cola Foundation

PEW Foundation

LUCE Foundation

American Association for University Women

ACS also has other \$ besides PFR e.g. to get support travel and/or sabbaticals

Howard Hughes M.I.

NSF- Department of Undergraduate Education

-Fund computers/software; other educational initiatives

STEP- for Underrepresented Groups

NUE- Nanotechnology undergraduate Education

NSF wants to start centers for undergraduate research (e.g. collaborative effort among several departments).

Karen urged people to keep sending out their good ideas; the money is out there, even if rejected a few times. Need to have lots of proposals to keep the programs going –i.e. to ensure on-going support of grants

Federal funding groups like to see collaborative work b/w small colleges and larger universities ; work together get your peers to review and edit your grant proposals, not just to improve them, but also to demonstrate that you're working on getting \$ for your college. Don't forget to include \$ for your own salary and travel if permitted in the grant proposal.

Discussion Group E- Assessment Discussion

Moderator: Deborah McCarthy from St. Mary's College

Recorder: John Lahaner

Course, Program (Student Achievement?) Assessment

Marilou Coffee

NCA- Keep changing the rules

1. Vague Guidelines-self study
2. Outcomes Multiply ways of assessing
3. Lots of Paperwork –Copies of early and late lab reports

Development of student Learning

Suggest Technology-Burn CD's

Yearly Departmental Report

Writing

Placement

Summer Internships

Individual Student Achievement

Program Renew

Clarke- Tracking Course Grades

- ACS Exam ORGO
- Alumni Survey
- Who Evaluates

Baren College

- Critical Thinking Assessment Across Campus
- MACTLAC meetings new, idea alumni summery

Clarke Institutional

- Faculty Department
- Faculty general education
- Good thing from this process is Professional behavior and ethics institutionalize this process

Manchester- 11 months ago kept it simple

Senior Comps- Written, oral, Student assessment

Senior Research Requirement

Written, Oral, Grid of expectations

Program Assessment- Chart the department

- Lab skills
- Instrumentation
- Reflect on what students are doing and decide what is missing

Student Self Respect

- Problems with standardized exams
- BA BS Chem and Biochem ETS ACS

Core Exam

ASC Certification

40% MACTLAC non certified

Does it benefit students?

Does it give you other accountability to Dean?

(Hillsdale) Keep copies of early and late lab reports. Thesis presentations, Boxes set up for students to add to. Difficult to show progress and outcomes. Must demonstrate that program is looking at these things.

Assessing placing students, summer internships etc. Some schools are having every student have a portfolio,

Some schools only track course grades and ACS exam scores along with alumni survey (every 7th year) and exit survey.

Some assess writing samples by “blind: grading of early and late work samples. MACTLAC has been used as assessment tool (program)....seeing what others are doing.

Some schools use a survey generated by an “assessment” person hired by University. Criteria in survey determined by dept.

Manchester (Keep it simple is key)-set goals assess and make changes. Repeat. Doe, speak, write. (Don’t save lab reports). Verbs for assessing “Dochem”, “Speak Chem”, “Write Chem”, Chemistry department gives oral exam at senior year for each major. Manchester does save a writing sample (research summary).

Lab skills looked at across the curriculum to find over laps (too many Beer’s Law expts. for example).

Can use student exams as assessment tools at beginning (Freshman) and end (Senior).

ACS certification Issues: ACS changing rules and making things difficult for small departments. Lab hours are being cut down. Contact hour loads for faculty make it difficult to become certified.

ACS certification: Prospective students and parents like it. Good for recruitment. Certification does give some leverage with administration. ACS certification does certify to employers that a student has been through a thorough program.

Discussion Group F – Non-Majors Discussion

Moderator: Mary L. Caffery from Clarke College

Recorder: John Lakanen

Concordia University Lake Forest: Consumer Chemistry

Use chemistry in context text

Many education students have to show competency in all areas of science. Now offer a chemistry and bio concepts course.

Elmhurst College: Offer Chemistry in the Natural World in lab students work on two demos each. May not work well at a large school. Lab teams of students go out to local schools to give demos. 70 to 80 demos now online (4 credits). Another course is completely on-line. (Six kitchen chemistry labs) very labor intensive.

Loras College: Revamped curriculum requires active learning. "Forensic Science," "You Are What You Eat" are the new titles of courses they offer.

Hillsdale College: Physical Science/Chemistry 1st semester; 2nd semester biochemistry. Labs: Antacids/o.j. Titration stuff. Totally non-math based.

Trinity University: "Chemistry in context" text used. 1.5hr. lab session (only 3hrs. credit) Friday session is a post-lab session. Interest in ½ physics/ ½ chem. to meet Illinois Teachers Certification.

One school takes student to London for tours of museums for gen. science credit.

St. Mary's College: "Chem. in Context" two semester requirement for gen. ed. Science with lab required of each student.

Hands-on physics course (physics by inquiry text used) has been far more popular with student than traditional physics. Recommends a more active learning approach to chemistry.

Trying to move Education Department toward giving teachers more confidence in science.

Moog and Ferrell: A series of conceptual exercises in chemistry used with a traditional textbook.

Evansville University: Two lab science requirement in two different disciplines

Clarke College: Chemistry and Art ---- 30 art majors enrolled into class. NSF workshop offered in this. Made pigments and etched glass in lab, and lots in ceramics. 3cr. (2 hour lecture; 2 hour lab).

Thinking about chemistry in Focus where topic changes from year to year. (diet, env. ect)

Elmhurst: Online lab course 6 experiments in kitchen; solar energy heating water, salts/solubility oil and water etc., calorimetry like finding specific heat of water.

Has an orientation day for labs to hand-out baggies of materials. Tests done as take home tests.

Discussion Group G- Young Faculty Discussion

Moderator: Joe Ward, from Rockford College

Recorder: Karen Nordell

Issues for Young Faculty

Introductions:

Research Requirements

Some schools have it some schools don't

How do you recruit graduate students?

Grant credit, Paying students, Grad School Experience, Resume

Guidelines

A culture research with a department (science seminars)

Involve education by doing research

Give students an exposure to "Being a chemist:

Travel to meetings to present

Teaching Techniques:

Start small (Don't try to incorporate new things all at once)

Keep a journal of ideas as you go along

Incorporate things little by little

Mid-term evaluations (1/2 sheet)

Get feedback along the way

Get them to prepare – quiz at the beginning of class (so they do their reading)

1 minute papers at the end of class

Establish a safe environment in class make it easy for them to ask questions, seek fair input

Try new things- and go for it 100%

Explain your reasoning to them why things are done the way they are

Student input on some topics (book choice, lab choice)

Student Cheating:

Big vs. small school

Honor code

Make expectations clear on syllabus (on front)

Calculator issues

Buy a set of standard calculators

Grade on results in lab (change data)

Discussion Group H – Biochemistry Discussion

Moderator: Gene Losey from Elmhurst College

Recorder: Rich Scamehorn

Subjects:

1. Books

Voet and Voet;

Stryer; New edition not very successful

Lehninger; More biologically oriented

What books are available for organic and biochemistry for nursing students? Several were mentioned.

Delvin-Clinical Correlation in Biochemistry.

2. A Discussion of How to Introduce Physical Principles into a Nursing

Course

3. Lab

Project based lab- Alvano, M. Sinton- Clark- technique of anilsa

Purify a protein then do kinetics on it

Catabase –Tyrosinase- etc.

Use Ocean Optics for UV- very good reliable – on carts to move to different labs. UV-VIS is \$2,000.00

Rod Boyer- Lab Manual works reasonably well for beginning labs

4. Exams

Have take home for harder thought questions and then have an in-class test on basic information material.

Only one hard 2-semester of lab

ACS-exam- 2003 exam much improved, chemistry based

5. Use of Fragile-X

Syndrome as a good clinical example which explores a whole range of biochemistry principles. Very common condition most common form of retardation in US.

6. Use of Protein Explorer and RASMOL was discussed

7. Molecular Modeling Program; Macromodel and on UNIX- good system; Hyperchem and Spartan (PC) can't use very large models a 10 residue peptide takes several hours to minimize.

Discussion Group I – Analytical Discussion

Moderator: Mark Nussbaum from Hillsdale College

Recorder: Dennis Brinkman from Indiana Wesleyan University

Main Purpose for Course:

- Problem solving techniques/skills
- Understand that number is only as good as sample
- Better understanding of fundamental concepts such as equilibrium
- Improve students' lab techniques

Approaches:

- Force students to make their own reagents

- Have each student doing a different lab on a particular day to force them to understand the lab on their own
- Use Thorn/Smith standards and grade based on student deviations away from accepted values (based on statistics from past year)
- Forensic science project (“Solve this Crime”) in last weeks of lab. Class ends in 3-hour trial with actual judge and outside jury.

Analytical II (Instrumental Analysis)

Too many instruments to work into one semester of labs (~30!)

Solutions

- One alternative is to cover just a few techniques in depth (GC, HPLC, AA)
- Design carts for instruments to encourage other course/labs to use the instruments throughout the curriculum, not just in Instrumental Analysis
- Different groups work on different instruments and then present oral reports to rest of the class

Text Book Survey:

Quant: (1st semester)

Harris (Full) – 4

Harris (Exploring) – 2

Skogg, West, Hollar – 2

Christian – 1

Enke – 1

Harvey

Instrument Survey:

(2nd semester)

Skoog, Nieman – 8

Harris (Exploring) -1

Essentially everyone gives a special project at the end of labs during which student must come up with their own projects and make their own reagents.

Discussion Group J – Physical Chemistry Discussion

Moderator: Bryan Lynch from University of Evansville

Recorder: Cindy Woodbridge

Our discussion focused on lab primarily. We focused on three major areas:

1. Lab texts- most are using some combination of Shoemaker and handouts
2. Our favorite lab experiments-
 - a. IR of CO₂ using dry ice as a CO₂ source (Shoemaker)
 - b. IR of HCl/DCI (Shoemaker)
 - c. Absorption of acetic acid by charcoal (Sime, J Chem Ed)
 - d. NMR of MBBA
3. How many (and the format of) lab reports students required to write.

We also spoke about where slat thermo is integrated in the semester

Discussion Group K – Dr. Weaver's Talk Discussion

Moderator: Ruth Nalliah from Huntington College

Recorder: Kimberly Lawler-Sararin from Elmhurst College

Interests:

- Using technology in a reasonable way
- On-line homework
- Videos for P-Chem
- Software for p-chem lab
- Real life videos (real life applications)
- Web activities
- Assessment of technology use
- Production issues (videos etc.)
- Distance Learning

Students don't use on-line bulletin board... why?

- On-line course used on-line chat rooms students participated. When tried with in-class course students did not use on-line office board student prefer to meet in person if available.
- On-line classes competing for a different type of student, not necessarily the ones on campus.
- Teaching on-line well takes as much/more time than in class versions administrators often have misconceptions about this.
- WebCT, Blackboard: Software for course administration/delivery online grade checking, homework communication skills, etc.
- Production of videos will spend \$500,000 for videos project, but making a DVD doesn't have to be expensive for in-class use

Assessment: Qualitative research methods well in the field have been moving into Chemistry Education

Qualitative methods can inform you about statistical results

To particular in Dr. Weavers DVD/P-Chem

Study:

Schools doing this

Assign one use in class, as homework or in the lab

Decisions about how to use, if up to the instructor

Assessment pre-post surveys on-line survey

On-line homework students could try questions a second time variables change with each retake. Exam scores increased, students did more homework

Students like it, do better on test, small general differences found, helps women more not sure why yet.

One advantage of on-line homework is students can get immediate feedback

In class response systems:

Remotes can be sold by bookstore (30-40 dollars each)

Provided by department another option

\$1500 one receiver with 30 transmitters

\$2000 2 receivers with 60 transmitters

remotes can be resold back to the bookstore

Low tech option = Cards

Discussion Group L – MACTLAC Discussion

Moderator: Jean Beckman from University of Evansville

Recorder: Bill Morrison from University of Evansville

Discussion of flexible facilities, movable tables and air conditioning

Why are we here?

Revamping General Education

Making P-Chem labs less pampered

Pressure from administrators

Looking for new ways of improving student writing

How does writing in the discipline fit into writing across the curriculum

- I. Experiences with lab writing, Alternative requirements from course to course through a curriculum-Hillsdale. St. Mary's surveying students experiences and perceptions about writing. Alverno focuses on self-assessment. Wooster uses peer assessment not "Data showing" but for the experience of improving communication.
- II. What do we do with Freshman and large classes?
 - i. Less examples- students say that it works but have there been studies on this? Faculty must read lab reports- don't pass them out to the students or put too much of a load on a single faculty member. Evaluate

only focused portions of a report. Let students know in advance what reactions make it developmental.

- III. Lab Report Writing
 - i. Extra credit writing for freshmen
 - ii. Writing for freshmen on "How do we know" about something
 - iii. Allow multiple submissions of paper for improvement (both of paper and potentially for grade)
 - iv. Wooster is using "peer" writers – students who have completed organic –work study this is superior to generic university writing center
- IV. Discussion of whether teaching writing skills is really our job
 - i. General Courses – Yes!
- V. How do you actually teach and assess writing?
 - i. Are there "how to" manuals?
 - ii. We can point our problems- we are reviewers not editors!
 - iii. MID program mentioned NSF? Chem Ed? Multi initiative dissemination peer evaluations module

Discussion Group N – Environmental Chemistry Discussion

Moderator: Don Batema from University of Evansville

Recorder: Michelle Applebee from Elmhurst College

Levels of Courses:

Intro

Sophomore- require 1 semester

Juniors – require organic

Text:

Freeman Press- Environmental(S&S) Chemistry (Upper Level)

Baird – Low level

Manahan – Chapter 17 General Chemistry (ref. book) (300-400 level)

Tours:

Water Treatment; Oil Refineries

Environmental after quantitative analysis (Sophomore)

Quant. themed as environmental?

Yes, then more marketable

PCP- labs, soil contamination

Higher level quant.

Labs: Kits or trad/instrumental quant?

Hach- good real world

Instruments- for true understanding

Compare & Contrast \$5 vs. \$50,000 +, etc.

NO₃- Hach vs ISE

Preservation

PO4-2

Multiple studies at same sites

Multiple studies same sample

Environmental Programs

Start up program- administrative driven

Modify the books

A upper level analytical to environmental more larger masses

A reume builder

“Funding” for program start-up... what’s needed for a program

Faculty (Environmental Chemist; Environmental Biologists)

Recruitments of Environmental studies students

High School, Field Trips

Student product from program

Grad. School

Employment in gov; nat. resources, etc.

Administration- Be all...do all is the result good even if numbers are

Research:

Environmental backgrounds leads to natural trend of env. Research

Part of school program- sampling, lab on chip

Learning curves with research

Co-ops vs. Research:

ACS vs. Non-ACS

Research required (Summer or at school)

Guided project (Small instrumental/org. project)

Control local jobs for experiences

Write proposal for same work

Mandatory research component (Whooster/Hype)

Discussion Group O – Organic Chemistry Discussion

Moderator: Ray Lutgring from University of Evansville

Recorder: Lee Baron

Looked at books and lab books

- Disappointed by McMurry dropping all the molecular modeling and disc that came with the book.
- Solomans darling molecular models with book more models in class
- Darling Models are \$8.00 for Organic and \$14.00 for bigger groups
- Make own kits using ones Gen. back of Aldrich, student affilitates use it as a fund raiser
- Bring models to class
- Bruice Stereochem chapter poor
- Peer lead team ambassadors
- OWL: no one using it
- Difficult to get the poorer students to use supplement
- Study guides are a rip off!
- Do students use supplemental website for McMurry most not using it

- 10 write own problems some still grade
- Critical thinking in classes
- Quiz at beginning from reading: Daily quizzes do not teach after 1st class about nomenclature
- Some emphasize nomenclature every class
- Some do it with homework
- Using self assessment to become more self direct
- Navigation can be faculty driven instead of book directed
- Some have split organic with courses in between
- Stopped doing written exams, hands on lab practical exam (skills test)
- Mohug and Schatz et al: Lehman problem solving labs; Zubuck techniques
- Write own lab: Liability issues??
- Spring semester of organic use it to do research of faculty not liked
- 3 people groups at least two step synthesis and poster presentation
- Research project: Teams and advisory find lab
- 3 weeks to synthesize
- One to introduce one to get stuff together
- SN2 present in panel with power point

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