

AIBA 2014 Meeting – Mount Royal University – Summary of Presentations

Session 1. NSSE, Innovations and Barriers – Saewan Koh, UofA

Saewan covered three main topics in his presentation of how using science can be used to teach science.

1. Evidence based education

Empirical data can be used to guide education and to guide changes to curriculum and pedagogy (based on teaching research). Available teaching tools and technology can be used and research should be published.

Karl Wieman, UBC (physics), has done research in transforming courses:

<http://www.cwsei.ubc.ca/resources/>

Q – what should students learn?

Q – what are they actually learning?

Q – which approaches improve learning?

2. NSSE (National Survey of Student Engagement)

NSSE survey confirms good practices in education and shows that student engagement = student success (link)

Annual survey sent to 1st and 4th year students – US/Canada – 6 in AB

(\$1700 – cost to small institutes to do survey and get results

up to \$8000 for large institutes) http://nsse.iub.edu/html/about_institute.cfm

3. Culture and Innovations

“(i) need seekers (best performers/best culture), (ii) market readers, (iii) technology drivers”

Barriers to educational innovation ⊕ ambivalence of scientists to education:

see Nature 465, 525–526 (03 June 2010)

<http://www.nature.com/nature/journal/v465/n7298/full/465525b.html>

Barrier = teaching innovations vs. organizational strategies of institute

Session 2. The Fine Art of Dying – Sean Irwin (GPRC)

Sean Irwin gave a lively presentation on the history of microbial disease and death caused by *Yersinia pestis* (bubonic plague) *Vibrio cholera* (cholera) and *Variola major* (smallpox). A fascinating pictorial history of the diseases was traced in paintings, artifacts, and posters from 540 onwards.

Session 3. Program Alignment – Maggie Haag

Maggie discussed six topics in her presentation:

1. Q. Why look at curriculum alignment in Campus Alberta?
 - (i) Fate of block transfer – “dying”
 - (ii) Transferability of courses among institutions
 - (iii) Should there be a fundamental agreement among our institutes wrt core content?
 - (iv) The Society of Professional Biologists in Alberta would like to see some outcomes for disciplines such as the APEGA society has for geologists, physicists and engineers.

2. Courses (topics) being reviewed
Four areas views as mainstay of the core curriculum:
 - (i) Cell biology
 - (ii) Diversity and Evolution
 - (iii) Molecular Biology and Genetics
 - (iv) Ecology

3. Content:
 - (i) Most course in the first year are content heavy, irrespective if theme is cell biology or diversity/evolution
 - (ii) Courses in second year tend to have less content and more application of theory and critical thinking
 - (iii) Labs teach skills that include techniques, understanding the process of doing science and communication (written and oral)
 - (iv)

4. Course Weight

- (i) Lecture component of most courses constitutes at least 60-70% of course assessment
- (ii) Most lectures include an assessment related to use of in class personal learning devices (iClickers or THM) as a participation mark or as a percentage of correct answers to a set of questions
- (iii) Lecture assessment is predominately in midterms and exams
- (iv) Incorporate assignments to lecture material through on line activities Moodle, Blackboard – 5-10%
- (v) Most courses offered lab instruction at 25-40% weight_ of course assessment
- (vi) Labs may include assessment of lab skills, lab exam, lab reports, oral presentation and assignments

5. Course Delivery:

- (i) most course content is delivered in a standard lecture format
- (ii) some interactive teaching and learning used but most instructor driven
- (iii) Some incorporation of blended learning model – team based learning FLIP – this is instructor driven.

6. Laboratory Delivery

Lab delivery is very diverse. Examples include:

Traditional cookbook labs

Guided inquiry

Independent research

Simulations

Team based learning

Application of theory through on-line activities

Communication (oral/written)

Courses without a lab component have activities that challenge students to think critically and apply theory)

7. Learning Objectives

- (i) The degree to which learning objectives have been developed for a particular course is variable
- (ii) Mainly learning objectives are over arching statement related to course content

- (iii) Most instructors still use syllabus that just outlines topics
- (iv) A few instructors have developed comprehensive learning objectives for their students, which clearly inform students about the learning expectations for the course

Maggie posed several questions to the AIBA audience:

Challenge: Should we develop province wide learning objective goals for the core areas of biology?

If YES – how would we go about achieving this goal?

For example it might be easy to do this for biology lab education:
e.g. do laboratory goals exercise

See Maggie's handout on "General Laboratory Objectives"

Discussion: How are we going to get consensus if we enter this process (e.g. one concern is about what are the CORE topics in biology)

Maggie suggested a take home project from the AIBA conference. She proposed that the institutes:

She suggested that institutes review her spreadsheet and lab theme listings:

1. For your institute check off what areas listed are covered in your course.
2. Indicate the key areas not listed.
3. Indicate course weight for different components.
4. Indicate method(s) of delivery
5. Return to Maggie and she will compile round 2.

Maggie then proposed that in future AIBA institutes set up subcommittees to investigate these ideas and present a model to us at a future annual meeting.

Session 4 – Scaffolding Lab Reports – Randi Mewhort (MacEwan)

Q . Writing Lab reports: Why?

Student issues with writing lab reports:

Don't understand format

Academic integrity

Difficulty with reading scientific literature/integrating scientific knowledge

Perception of working hard and not getting expected grade

Solution: Scaffold lab reports

First Year:

3 written assignments in Bio 107 (Work their way UP)

1. Introduction
2. Results and discussion
3. Full lab report (with truncated methods)

Second year:

Students go do field work: (Bio 208) - Pond

They submit four written assignments and submit a data sheet

1. hypothesis – pond community diversity estimates
2. lab report hypotheses and associated statistical sheets
3. hypotheses, methods and results draft
4. complete lab report

Session 5 – Keynote Speaker – Jay Ingram – Alzheimer 's Study

Jay Ingram gave a very interesting well informed presentation on Alzheimer's diseases and some of the causes, new research and treatment methods. He kindly signed copies of his book for people.

Session 6 – The Reflections on Early Involvement and the Challenges of Multigenerational Undergraduate Research – Tomislav Terzin (UofA)

Tomislav discussed the merits and challenges of involving undergraduate students in research projects. He also emphasized the importance of research as a teaching and learning tool. He discussed a variety of “creative” methods he uses to recruit first year students including attracting students by showing them his research projects. He also mentioned that some students get marks for participating in research projects through directed studies. He opens his research opportunities to students in many disciplines not just biology. He also indicated that he was able to obtain a separate space at his institute for students to do research.

Tomislav discussed making undergraduate research publishable and discussed creative ways to get financial backing for research without grant \$. He also gave an example of an undergrad student research project that failed and of a research project that is an ongoing success and he discussed reasons for both outcomes.

Session 6 – Unburdening Content Heavy Courses – Katrina Tjandra and Joanne Bouma (MRU)

Katrina and Joanne discussed problems with high failure and drop out rates in a couple of introductory biology nursing Anatomy and Physiology courses they had taught for the past ten years. They outlined the steps they took with internal and external help to examine and change the content in the introductory courses. Their aim was to make course content was more relevant/applicable to their discipline and to ensure that information being taught in their introductory A&P courses was carried though to other more senior non-A&P nursing courses in in a variety of ways.

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