Science & Math Evening Discussion

Sept. 2, 2015

Present: Pat Babington, Tom Ball, Suman Balasubramanian, Sharon Crary, Steve Bogaerts, Bridget Gourley, Doug Harms, Wade Hazel, Matt Hertenstein, Mary Kertzman, Alex Komives, Pascal Lafontant, Sarah Lee, Jim Mills, Melissa Petreaca, Pam Propsom, Mamunur Rashid, Jackie Roberts, Henning Schneider, Maria Schwartzman, Fred Soster, Brian Wright.

Update on “Paradigm Shifts” course. Henning gave a brief update on the interdisciplinary course. The course is targeted towards students who may have some interest in science but are not sure of area or students who may not be “science-inclined.” Emphasizes scientific reasoning. There are five modules, each led by a different instructor, and at the end of a couple of modules there are “synthesis” days. Michael Roberts is collecting some data on students’ before and after performance, comparison with a psychology course. No exams, but there are papers and presentations. There was a one-week workshop in the summer to decide how to organize the course and use the tentative divisional learning goals as a guideline. The course has no lab at this point, although some people are doing some “lab-like” experiences in class.

HHMI grant proposal. Jackie gave a summary. The **grant call indicates the emphasis is to “provide excellent science education opportunities for all students, especially those students who come to college through non-traditional pathways such as transfer and first-generation students.”** Jackie and Pam are serving as the “clearing house” for ideas and shared the suggestions division members submitted on the survey at the beginning of the year.

When we discussed ideas, Doug Harms stated that research is a high-impact practice; service is as well. Could the grant incorporate service activities? It’s hard to integrate community service and outreach; could it be done in the summer? Sharon Crary suggested that given that DePauw has not received an HHMI grant before, one recommendation would be to go for a “traditional approach” to a proposal (e.g., summer research money). Jackie responded that David Asai (head of HHMI) is focusing on putting resources into introductory courses and labs, addressing underrepresented students. Bridget Gourley suggested using upperclass students to help mentor students in intro courses. We talked about Gloria Townsend’s success with the bridge program and Julian Scholars (we need to talk with her again).

Jackie also announced that we didn’t get IUSE grant, although it was fairly well reviewed. We will reapply and shift the focus a bit, send it around for feedback. Pascal Lafontant got a grant today!

Lab. We had three sets of introductory questions to begin our discussion regarding labs in our introductory courses. We were encouraged to think of the ideal and not just focus on what we already do. Jackie had also shared a document from the University of California regarding their lab guidelines. Discussion began in small groups and then we reported back to the larger group.

What is lab? Why do we value it? Is lab essential to our divisional learning goals? What do we mean by “lab”?

--“Guided playtime.”

--The opportunity to participate in science.

--Developing curiosity. Give students confidence that they can make observations and logically design and test ideas.

--Lab gives students greater “ownership” of the knowledge. They should struggle with the information and data.

--An “ideal” lab might include trying to find out something new, create new knowledge.

--Textbooks are very “clean,” but real science is rather “dirty.” Have students recognize this. Opportunity to make mistakes and learn from that.

--Having labs that are inquiry-based. Maybe we can get students excited by this.

--Tension between addressing content and being more “open-ended” and inquiry based.

--Have students understand the “pain” of collecting data.

--Many students probably picked DePauw because they thought they could do things in the lab here. Can read a textbook at any college.

--One factor in retention is feeling connected with people in the discipline; lab gives the opportunity to get to know students better.

--*Doing* science really reinforces the content.

--Does there need to be a distinction between lab and class time? Part of it has to do with having enough time.

--Tension between courses designed for majors and non-majors, need to cover a certain amount of content (although someone pointed out that “coverage” of content doesn’t necessarily mean that students have understood and retained it). Another person suggested that one way to address content is with a flipped classroom: the content is online and class time is spent on doing problems.

--Much of science involves reading the literature; how do you get students to do that in Intro classes? Much of the primary literature today is probably not accessible to intro students (e.g., physics, math).

--Regarding the sheet that Jackie handed out, only goal #3 of lab requirement is the one that HAS to be done in lab. The rest can happen in class.