Science and Math Division Meeting Notes

August 31, 2016

Present: Rebecca Achtman, Suman Balasubramanian, Lynn Bedard, Jim Benedix, Dave Berque, Steven Bogaerts, Chad Byers, John Caraher, Dana Dudle, Jacob Hale, Bryan Hanson, Jeff Hansen, Anne Harris, David Harvey, Matt Hertenstein, Carrie Klaus, Pascal Lafontant, Jim Mills, Melissa Petreaca, Jeane Pope (and Luna), Selma Poturovic, Pam Propsom, Mamunur Rashid, Dave Roberts, Jackie Roberts, Michael Roberts, Henning Schneider, Maria Schwartzman, Naima Shifa, Fred Soster, Christina Wagner, Brian Wright, Zhixin Wu

Jackie welcomed everyone and thanked them for their contributions to the success of this project. She shared some stats on participation in activities. Jacob Hale created a round of applause.

IUSE grant. This was written by Jackie Roberts, Pam Propsom, and Michael Roberts and was funded! Jackie outlined the goals of the funded NSF-IUSE grant and Michael talked about the Paradigm Shifts course:

1. Transition our emerging learning community into a genuine learning community (continue Brown Bags and divisional meetings, institute reading and pedagogical research groups)
2. Transform general education STEM courses using evidence-based practices
	1. 3-day summer workshops to which faculty from nearby institutions will be invited, using their schools as comparisons for our process (individuals, departmental teams, and interdisciplinary teams are welcome)
	2. **Curricular Reform Awards** ($1250) for faculty (or teams) to revise their intro courses or develop team-taught interdisciplinary courses (30; $750 for attending a 3- day summer workshop and $500 for revised, completed course/syllabus; liaison group makes funding decisions)
	3. **Paradigm Shifts Awards** for faculty to participate in the interdisciplinary pilot courses; $1250 for a 1-week summer/January term course development workshop; spring 2017, fall 2017, and spring 2018, four faculty will receive 0.5 teaching credit for participating in two sections; for fall 2018, four faculty members will receive 1.0 teaching credits for participating in four sections.
3. Assess—work with administration to make science and math attitude and literacy assessment a regular occurrence and with the outside assessment firm Rockman et al.

HHMI grant proposal. The DePauw team is composed of Jackie, Pam, Dana Dudle, Gloria Townsend, and Renee Madison. Anne Harris, Carrie Klaus, and Dave Berque are also contributing. Pam outlined the HHMI call for *Inclusive Excellence* emphasizing increasing “institutional capacity for inclusion of students from all backgrounds in STEM.” Our team’s proposed strategies:

Inclusive, student-centered teaching practices (workshops, team grants)

More genuine research experiences in introductory laboratories

The Peer STEM Guide program (successful students serving as mentors/tutors to students in intro SM courses)

Creating community and science and math identity among STEM majors

Focus groups with students to learn about their experiences in DePauw SM classes

Jackie suggested that these activities relate to the issues of our divisional learning goals and our SM general education requirement. Rich Martoglio, Steven Bogaerts, and Maria Schwartzman are working on developing math/Q learning goals.

Small group discussion and reporting out. Distinction between distribution requirements (where one dips in) versus general education requirements. Gen ed requirements—one suggestions is to maybe wait a year to build some buy-in from other faculty, although another is that this might also be an opportunity to lead the way. HHMI—easy for bio because they’re also rolling in the direction of more experiential labs in courses that didn’t have them before, Bio Tuesdays (always an event that brings students together—speakers, activities, etc.). Whom do we hire in work study (could we hire more diverse students)? Berea College is inspirational, connect science to real-life experiences/social and economic issues. Giving students explicit instruction on how to effectively work in groups. Focus less on “raw content” and more on teaching them to be independent learners. What are the experiences of our diverse students that they can translate to their science experiences and labs?

HHMI. Roadblocks—serious discussions about balance between content and scientific process/learning. STEM guides—students who need help often don’t come. How do you change this? Build an expectation that students will come? Could we require? Create an alternate assignment or construct incentives. Can require students to do something outside of the timebank, just can’t require a specific time, have to provide options. What is meant by a genuine research experience for intro labs? Would vary between departments: participate in faculty members’ research, work on a set data set or idea but develop own hypotheses. There needs to be funding to sustain this (e.g., consumables for lab experiences). Class size is also an issue for inquiry-based labs. Piloting a couple of sections rather than just rolling it out in all departments. Is there research on which elements of inquiry-based labs make them effective? (e.g., is it class size, the inquiry-based component, etc.?) Paradigms other than labs that produce such positive outcomes? This is the format for experienced-based learning.

Gen ed. Adopting divisional learning goals? What would be the process? Gen ed requirement—This may be a moment to push, since there are groups of people who want to better define what the institution means by P/P/D and International Experience. Students themselves are asking for learning outcomes and clarity. For multiple reasons, the time might be ripe for proposing clear learning goals for the SM requirement and working with Curriculum Committee for revising courses that meet the requirement.

Strayhorn chapter as a Brown Bag.

Outline for Divisional Meeting (8/31/16)

Celebration. Toast to the Division. (Jackie will give stats on participation rates.) Liaison group. Administration for sabbaticals, Faculty Fellowships, funding for first round of Paradigm Shifts, and to Anne for the kick-ass letter of support she wrote.

IUSE Grant. Institutional and Community Transformation grant written by Jackie, Pam, and Michael.. $288,990 over 3 years. Only 20 in the country awarded. This provides funds to keep our division moving forward in revising the science and math experience for our students and creating scientifically literate citizens. Found out late so this has messed up our timing a bit and we have to adapt. At the end of the three years our objectives are to identify factors what draw faculty to the discussion and change process; have a more genuine learning community; transformation of introductory and interdisciplinary courses based on evidence-based teaching practices; and institutionalizing any new SM learning goals, scientific literacy assessment, Paradigm Shifts course. Our division has begun many of these things, but on a relatively small budget and the goodwill of you all for being willing to attend workshops with no compensation for your time. We’re grateful for our colleagues’ participation and support, and now we have lots more funding to scale up, pay you for your work, and incentivize curricular reform. These are our goals:

1. Transition our emerging learning community into a genuine learning community (continue Brown Bags and divisional meetings, institute reading and pedagogical research groups)
2. Transform general education STEM courses using evidence-based practices
	1. 3-day summer workshops to which faculty from nearby institutions will be invited, using their schools as comparisons for our process (individuals, departmental teams, and interdisciplinary teams are welcome)
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HHMI. One million dollars over 5 years. Open to every four-year college in the country. 511 applied, of that, 91 were invited to proceed, including DePauw. Thirty will be awarded and if we don’t get it we get an automatic invitation to the next round. Our team is Jackie, Pam, Dana, Gloria, and Renee Madison. Anne, Carrie Klaus, and Dave Berque are participating in the discussions. Call—Inclusive Excellence. “Increase institutional capacity for inclusion of students from all backgrounds in STEM.” The focus cannot be on blaming the students for being underprepared and trying to “fix” them, but instead on changing the institution, including infrastructure, expertise of faculty. Catalyze creation of lasting institutional transformation. Cannot be “quick fixes” that may not be sustainable, such as summer bridge programs or more faculty-student research. Recognition that this will probably be a painful process.

Building on the data we shared previously regarding success of students in our intro courses, we are not serving all students equally. The data that we have provide us with a baseline and motivation to change. Our proposed strategies are based on best practices in the literature, not necessarily on our personal strengths or what we think will be fun or easy. For example, David Asai, Senior Director of Science Education at HHMI, has spoken many times on the value of the student research experience (a High Impact Practice). But this is not equally available to all students and perhaps lab experience comes too late in our upper-level courses. If lab is a valuable learning and engagement opportunity for drawing students to science, let’s have strong, genuine, inquiry-based labs in our *intro* courses for *all* students to draw a more diverse group of students to our classes and majors and to help create more scientifically literate poets and historians.

HHMI *Inclusive Excellence* grant proposal strategies.

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The Peer STEM Guide program (successful students serving as mentors/tutors to students in intro SM courses)

Creating community and science and math identity among STEM majors

Focus groups with students to learn about their experiences in DePauw SM classes

This is due Oct. 13, so we can’t make huge changes in direction, but we do want your feedback.

SM Gen Ed. This all links into bigger issue of our SM gen ed requirement. How do we formally adopt or revise our learning goals? Given the progress we’ve already made in the division and what we anticipate will occur as a result of IUSE and perhaps HHMI grants, do we need to change the SM gen ed requirement, perhaps reinstating a lab?

30 minutes table discussion.

 15 min. on HHMI

--How do you see your department being able to contribute to the proposed HHMI strategies?

--If you identify challenges/roadblocks to successfully implementing our proposed strategies, how could we revise them to address your concerns?

15 min. on SM gen ed req

--How do we move forward in formally adopting our tentative divisional goals and then implementing them in our instruction?

--How do we ensure students take the courses that meet our learning goals? Does this require a change to DePauw’s science and math general education requirement?

Reporting out from groups, make notes and share with us, fill out interest forms.