Whether we were ready or not, Spring has sprung! Check out these updates and opportunities:

- Project-based learning workshop recap
- What do our faculty want to learn?
- Spring reading group and project-based learning community
- From the literature: do labs actually work?
If you missed it...

**Project-Based Learning Workshop**

Before the semester started, ~18 brave souls participated in a two-day workshop on project-based learning, hosted by experts from Worcester Polytechnic Institute.

**WPI's experts shared:**

- compelling rationales for project-based learning (e.g., employers want the skills students gain in projects; alumni value what they gained in projects)
- great model projects (e.g., can student design more efficient solar charging circuits that allow women to go to school at night in African towns without electricity?)
- real hands-on teaching advice for faculty (e.g., how can we help all students contribute their best in group work?)
- and much, much more!

**What did participants think?**

84% of participants said the workshop helped them understand how PBL could help improve teaching and student learning *much* or *very much*.

100% of participants said the workshop provided many or very many ideas, examples, and tools to support PBL in their courses.

"*I thought it would be helpful, but I'm really excited by the help, examples, ideas of how to make teamwork work."

"*I believe all of us who attended will certainly stay connected as we work on our..."
PBL projects. I hope that we will also bring in additional faculty that we feel would personally benefit as well but who could not attend."

"This was an unqualified positive experience in giving me specific strategies, powerful motivation, and connecting me with helpful resources to implement project based learning in my classroom."

If you missed the workshop, but are interested in hearing more about it, or seeing some of the classroom resources WPI shared, ask Tara or Jeremy or folks in your department who attended.

Our faculty are ready

We asked faculty in the PBL workshop what topics they might want to learn more about. The results were striking - our faculty are so very ready to learn about and try new instructional approaches.

![Diagram showing faculty interest in various topics related to project-based learning. The topics include forming, managing, and evaluating student teams; recognizing and ameliorating bias or marginalization in the classroom; how active learning pedagogies can be used to achieve greater CONTENT learning gains for students; writing and using effective rubrics; ways to use peer evaluation to improve student learning and reduce faculty workload; rationales for, and methods that allow students to have input into course rules, structure, etc.; and using authentic contexts to motivate student learning. The scale ranges from not interested at all to very interested.]
We can do that...

Spring STEMed Reading Group

As you saw above, faculty are interested in learning about teaching in authentic contexts, using rubrics and peer evaluation in group work, active learning strategies, and much more.

Faculty who participated in the project-based learning workshop also wanted to find a mechanism to meet and continue that work.

We are tackling these issues head on with a great book by Terry Doyle that starts from the literature on learning and cognition and leads to practical solutions we can use in our classrooms.

Reading groups are open to any interested faculty member.

We will meet in CS 286, Fridays, at 1pm.

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<td>2/2/18</td>
<td>Doyle, Chapters 1-2</td>
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<td>2/9/18</td>
<td>Project-based learning implementation community:</td>
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<td>What assignments are you planning to implement, what help do you need</td>
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<td>Doyle, Chapter 3</td>
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<td>3/16/18</td>
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<td>How Teachers Can Facilitate Student Discussions by Not Talking</td>
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Center for Innovative Teaching and Learning

From the literature...

Do labs work? A cautionary tale about the value of defining and assessing learning outcomes

Many faculty design lab experiences for their students in order to reinforce the content and concepts covered in lecture. In fact, many faculty work really hard to coordinate the timing of concepts in their lectures and labs. Holmes and Wieman (2018) just published a shocking set of results about how well science labs reinforce content. Their answer? Not well at all.

Holmes and Wieman were studying Physics courses, though a priori there is no reason to suspect the results would be different in Biology or Chemistry. They used a fairly rigorous approach, comparing student performance among those who took or didn’t take the lab on specific content that was covered in lecture or both lecture and lab. Across three institutions, seven instructors, and a range of concepts, there was no measurable impact of the lab on student learning of concepts (Figure 1). Yikes!
Of course, labs may teach students other important skills, like the process and accuracy of measurement, how to use particular instrumentation, experimental design, teamwork, and/or the ability to write scientifically. These learning outcomes seem logical, and perhaps likely, but so did lab’s ability to reinforce concepts, before Holmes and Wieman assessed it.

It is not all doom and gloom, however. Holmes and Wieman also found that open-ended, project-based labs challenged students to tackle many of the same cognitive tasks that faculty-mentored undergraduate research experiences did, tasks like determining feasibility, designing experiments, analyzing results, and presenting findings. Students taking highly structured, “cookbook” labs did not report being challenged with the same cognitive tasks, though.

Not by coincidence, the Biology and Physics departments at Radford have signed on to the Council on Undergraduate Research’s Transformations project, to embed project-based learning and authentic research into our science curricula. There is a large literature base supporting those curricular changes, and it is encouraging that even the most critical examinations of what is happening in science classrooms find support for where we are headed.

Want more information on course-embedded undergraduate research experiences, and their advantages over traditional labs?


An invitation...

Whether you are interested, excited, nervous, or skeptical, we’d love to meet with you one-on-one for an informal chat about how we can:

- help you share your own expertise and experience with others that could benefit.
- use your concerns to improve the project as we go.
- help you find what you need to try something new in your course (e.g., materials, time, technical or instructional expertise).
- help you identify a part of the initiative that resonates with what you already do and value.
- plan for how you can get involved.
- define what the hell "Inclusive Excellence" is, anyways...

Contact Tara or Jeremy, and we can share some ideas over coffee.

Question, comments, concerns?
Email Tara Phelps-Durr or Jeremy Wojdak.