

## Pitt-CIRTL opportunities to engage in and learn about scholarly teaching

Discussion leader: Dr. Mary Besterfield-Sacre, Associate Professor, Swanson School of Engineering; Director, [Engineering Education Research Center \(EERC\)](#).

[Pitt-CIRTL website](#) – very recent, only came out last week!

The Center of Integration of Research, Teaching and Learning (CIRTL) is a consortium of 22 R1 universities (with a few exceptions) headed by University of Wisconsin. The mission of CIRTL is to advance undergraduate education in STEM by investing in the future faculty: graduate students and post-docs.

These 22 institutions are all members of CIRTL, but each is doing something slightly different, however, the mission of all institutions is the same. So Pitt had to figure out how to match what we want to do with what the other 22 institutions are doing (and learn from them) in a way consistent with the mission of CIRTL. Mistakes were made along the way, but we are at a point where we figured out what kinds of strategies can be beneficial and are ready to ramp up the effort.

Dr. Bestefield-Sacre used Charles Henderson's model of institutional transformation (see slide 5) to design the Pitt-CIRTL initiative while working primarily with graduate students and post-docs, most of whom are interested in academia.

The main purpose of Pitt-CIRTL is to develop an understanding that there are evidence-based teaching and assessment practices, and help them recognize how to utilize these practices in class. For this purpose, it is important to get the graduate students and post-docs in the classroom.

- This term, we are building a learning community of students who are highly interested, highly engaged, but do not necessarily have the opportunity to teach.
- Some of the students are working on Teaching As Research Projects (more later), in which they pair up with a faculty mentor.
  - The vice-provost for undergraduate studies is very interested in this

### **Pitt-CIRTL certification**

- Can be credit bearing or not
  - Biology department has a teaching minor, and Biology students who participate in various courses (more later) would prefer to get credit for what they do since it can be counted towards their teaching minor.
- **Levels**
  - **Associate**: primarily focused on making students aware of evidence-based practices
    - Very didactic (e.g., taking online courses), focused on the [Alignment Model](#).
      - CIRTL offers literally every week 1-2 “things” (seminars, online discussions etc.) that students can take advantage of.
    - Includes creating a teaching philosophy statement.

- This forces students who don't have one to think "what is my teaching philosophy?"
  - They need to have this when applying for academic positions – good to get support.
- Reflective practitioner
  - Students have to take courses that are more than just one session, perhaps 4 sessions and in between students have to do something (e.g., prepare a lesson plan).
  - dB-SERC also offers a workshop for graduate students focused on effective teaching which can be counted towards Pitt-CIRTL certification. The workshop is free and offered at the beginning of each fall. If interested, contact the dB-SERC post-doc, Alexandru Maries to participate.
  - In Engineering for example, they offer a 1 credit course "Preparation for an academic career" which is open to any students in natural science departments.
  - Pitt's Office of Academic Career Development (OACD) offers an in-depth two term professional development program.
  - CIRTL also routinely offers various professional development opportunities.
  - Pitt-CIRTL is also trying to engage interested students in a learning community.
    - This summer, the participants decided to have weekly journal club meetings in which an article related to teaching and learning is discussed. The Pitt-CIRTL journal club meets every Thursday 11:30 – 12:30 and offers free food! If interested contact Julie Breckenridge who is helping organize this.
- Scholar
  - This is the "icing on the cake"
  - Students have to complete and disseminate a Teaching as Research (TAR) project (disseminate by presenting either internally, or externally, or even by writing a conference proceedings or journal article).
    - CIRTL in general is very interested in the dissemination aspect.
    - For specific examples, see [CIRTL Network Teaching-as-Research Projects](#).
  - The main purpose of getting students to do a TAR project is to engage them in science or education research – get them to approach teaching as a research task (more on TARs later).

**These certifications are blessed by the Vice Provost for Graduate Studies, Alberta Sbragia!**

- In addition, CIRTL is planning to soon expand to 50 universities and getting Pitt-CIRTL certification is going to mean a whole lot more than getting a teaching certification from the local teaching and learning center – other institutions will know about this certification and what it entails.

Courses offered at Pitt/CIRTL that can count towards certification:

- Biosc 3001/Eng 3001 → can cross-list with other departments.
  - Seminar style – students read various chapters of “[How Learning Works: 7 Research-Based Principles for Smart Teaching](#)”
  - Discussions about the principles, how they may apply in different courses etc.
  - Sometimes sessions are focused on various aspects of the Alignment Model.
  - If students do not want the course credit, there are alternative ways to sign up for this course.
  - Dr. Besterfield-Sacre encouraged different departments to cross-list this course and encourage their graduate students and post-docs to join.
- Last fall: Massive Open Online Course: An Introduction to Evidence-Based Undergraduate STEM Teaching
  - High-quality, and is being improved (will be offered again this coming fall).
  - In addition to the MOOC, at Pitt, there was a learning community of students who met weekly to discuss the course.
  - Last fall:
    - Enrollment: 13,000
    - Completed: ~14%
    - If there was learning community focused around MOOC, completion rate is ~25%.
- Next spring: MOOC # 2:
  - More in-depth than fall MOOC will focus on the specifics of various teaching approaches, e.g., Problem-based learning, flipped instruction etc.)

As mentioned earlier, there is a whole host of weekly offerings, both from Pitt-CIRTL, from dB-SERC, CIDDE etc. All of these are being put together each week by Julie Breckenridge who send an email to people interested in knowing about them. If you are interested in getting on that list email her, or Alexandru Maries, the dB-SERC postdoc.

### **Teaching-as-Research project**

The basic idea to get students to approach classroom teaching with a researcher’s perspective:

- What are the learning objectives – how can we get students to achieve them?
- What methods have been shown to be successful?
- How can I evaluate to what extent

Where does TAR happen?

- Not as a class
- There are weekly meetings where sometimes TAR projects are discussed (e.g., a student presents his/her idea for a TAR project and gets feedback); other times, articles are discussed.
- Also, Dr. Besterfield-Sacre and a few other faculty affiliated with Pitt-CIRTL help out students who are interested in getting involved in a project like this but are not sure where to start:
  - What is currently being done?

- What is the research question – student motivation? Student learning? Student attitudes towards the discipline/science?

#### TAR project examples at Pitt:

- One student who is in the engineering department investigated approaches to helping students overcome misconceptions about statistical concepts.
  - We know from literature that students have difficulty with certain statistical concepts, e.g., p values.
  - Scott did an analysis which indicated that the problems go deeper, so they had to step back and think about how to help students understand the central limit theorem.
  - He developed pre-post assessments and a teaching module and found large learning gains.
- Another example: the Bioengineering program has had a tissue engineering camp for 6 years
  - Problem: very different results from “traditional” high-school/middle-school students (e.g., public schools) vs. inner city students.
    - Initially thought this was due to different preparation, but it doesn’t seem like that can account for the drastic differences. Perhaps there is a fear of “being a nerd” that is much stronger amongst the inner city students.
  - Several students are working with on TAR projects related to this:
    - Look at previous camps, try to get a sense of where the differences may be stemming from
    - Survey the literature for instruments that can be used to measure aspects of the affective domain, perform pre-post analyses.
    - Improve the camps by including more interesting and fun activities for students to do.
  - Many other examples are available on the [CIRTL Network Teaching-as-Research Projects](#).

#### Benefits to engaging in a TAR project:

- Students learn about evidence-based teaching which they can carry over to their future careers in academia – thus there is a large potential for improving undergraduate STEM education.
- One recent study found that students who engaged in TAR projects were also conducting higher-quality research in their own disciplines.
- Faculty – save time and improve teaching:
  - “I’ve been teaching [insert course] and I always see that students are not getting X, Y, and Z, but I have no time to develop better materials, pre-post tests, implement and analyze data... I know, a graduate student will do it under my mentorship!”
  - There are small stipends for faculty who mentor graduate students or post-docs on a TAR project.

#### Are there any graduate students who included TAR projects in PhD dissertation?

- There are multiple students who are at the moment in the process of a TAR project, but at the moment there aren’t any students who have finished one (Pitt-CIRTL is very recent).

### **Perspective from graduate students and post-docs engaged with Pitt-CIRTL**

- There are A LOT of resources on the CIRTL network – 22 institutions and quite literally every week there is some informative session happening somewhere.
- Post-doc – in her department, there is very little opportunity to teach, or learn about effective teaching. Engaging in a TAR project provides her that opportunity.
  - Also, getting a Pitt-CIRTL Certification can be one thing that sets her CV apart from other applicants
- A graduate student in the Biological Sciences department mentioned that while there is a teaching minor in the department, this seems to be targeting students who are interested in teaching, and is a lot more intensive than participating in Pitt-CIRTL.
  - Also, the teaching minor is focused on Biology, and she was more interested in getting an idea of teaching principles that are more general.
  - There is more flexibility in Pitt-CIRTL as to what you can do and how much you want to engage really depends on you.
- Working on a TAR project really gets you to think about investigating a question, and this can help with research because it provides