Scholarship of Teaching and Learning

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Part I: What is SoTL?
Definition of SoTL

• Systematic study of teaching and learning and the public sharing and review of such work through live or virtual presentations, performances, or publications (McKinney 2006)

At the Intersection

Teaching practice

SoTL

Disciplinary knowledge

Research
Effective teaching, scholarly teaching, and SoTL are related but not the same.

**Effective Teaching**  
Using teaching methods that support student learning

**Scholarly Teaching**  
Grounding teaching in scholarly research on teaching and learning

**SoTL**  
Creation/dissemination of scholarly work on teaching and learning

Consumption  
Production
Part II: Getting started: Defining a question
SoTL Process

Define questions

Identify evidence

Create a detailed plan

Prepare and pilot

Collect and analyze

Apply to teaching

Disseminate
Major Types of SoTL Questions

What works?
Seek evidence of the (relative) effectiveness of particular teaching approaches

What/how is …?
Seek to describe (as opposed to evaluate) a phenomenon observed in the classroom or the consequences of particular teaching approaches
Factors in Defining Questions

- **Practice**: What want to evaluate?
- **Impact**: What effect hope to achieve?
- **Context**: Where does it take place?
- **Lit Review**: What have others said?
• What works?
  • What is the impact of ___practice___ on ___area of impact___ in the context of ___context___?

• What/how is …?
  • What are the factors that influence ___something___ in the context of ___context___?
  • How does ___something___ look in the the context of ___context___?
Think – about your possible research projects. Consider the following dimensions.

Practice – What ignites your curiosity about teaching? Is there a particular problem you would like to address? What approach might you try?

Impact – What effect do you hope to achieve?

Context – In what context do the practice and intended impact take place?

Pair – discuss your projects.
Part III: Identifying evidence
SoTL Process

Define questions → Collect and analyze
Identify evidence → Prepare and pilot
Create a detailed plan
Apply to teaching
Disseminate
**Example**

Research Questions

What is the impact of pre-class videos on students in organic chemistry class?

**What do you want to evaluate?**

- Chemistry knowledge
- Ability to make connections
- Students attitude to chemistry/confidence

**How will you evaluate?**

- Exams (ACS, in-house), concept inventories
- Concept maps, reasoning chains, creative exercises
- Surveys
How large does your sample size need to be to publish the results? Because I teach at a smaller institution, I have had relatively small numbers of students in the SoTL projects I have done so far.
Examples of Research Tools (Chemistry)

- Implicit Information from Lewis Structures Instrument (IILSI) (Cooper et al., 2012)
- Diagnostic tool to identify alternative conceptions related to acid strength (McClary & Bretz, 2012)
- Chemical Representations Inventory (Taskin et al., 2015)

- Organic chemistry-specific achievement emotions questionnaire (Raker et al., 2018)
- Attitude toward Chemistry semantic differential (many versions)
- Chemistry-specific Academic motivation scale (Liu et al., 2016)
In pairs, discuss:

• What will you be evaluating?
• How will you do so?
**Personal tips on SoTL projects**

- IRB – start/check early!
- Find an accountability buddy (consider psychology/sociology colleagues)
- Use/modify published research tools/prompts when possible.
- Theory-based projects are better than personal empiricism.
- Pilot
- For treatment-control designs, report means, standard deviations, and sample sizes for both groups
- Think about ways of dissemination (JCE paper, BCCE presentation, etc) early.
- Involve students in data collection/analysis.
- Get a workbook!
Thanks for attending!