SoTL and the Use of Cases and PBL

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Adapted from Klyczek, Waterman & Marsteller 2014
SOTL or Scientific Teaching

Goal is to create collegial, critical, evidence-based communities of faculty and students where student learning goals and outcomes are central.

Systematic
Reflective
Public: published, presented or shared with colleagues
Focused on continuous improvement
What is SoTL?

Scholarly Teaching: using research findings to make pedagogical decisions

Also called DBER: Discipline Based Educational Research
Thinking about Scientific Teaching….

- What did students learn? (assessment data)
- Why did students respond a particular way? (research)
- What are the working hypotheses or questions?
- What has already been done? Literature says…
- How and why to select methods? Conduct study…
- How to analyze and interpret data?
- What do the results mean?
- Are findings valid and generalizable?
Think, Pair, Think Some More

Take 10 minutes to think about your SoTL project, consider the following:

- What would you like to change? Why?

- What so you want your students to...
  - Learn?
  - Know?
  - Be able to do?

- Be ready to share with the group
The SoTL Cycle: Research leading to action

- Identify Innovation
- Gather Data
- Analyze Data
- Interpret Data
- Develop Action Plan
- Design the Study
- (Publish/Tell Others)
SoTL Research is ...

- Important
- Rewarding
- Necessary
- Difficult
- Time-consuming
- Small effect sizes
Thinking about your project

- What are possible aspects/variables of your project that you could study?
  - Think of the project in 360°
  - Write down at least 3 aspects of your project that could be examined further
  - Discuss
SoTL on Effectiveness of Cases and PBL

Many possible aspects/variables to look at, e.g.,

- Who is learning (Demographics, Misconceptions)
- How the case is being taught (Pedagogy, Technology)
- The content of the case (Knowledge, Curriculum Delivery)
- The story of the case (Process skills, social engagement, science and the media)
- What is being learned (Knowledge, outcomes, professional development)
SoTL Often Uses These Kinds of Methods to Gather Data

- Observations: Serving customer, Telephone call, Paperwork, Waiting, Away
- Surveys: Artifact Analysis
- Interviews: Longitudinal Analysis
- Complexity of Analysis
- Authentic Interpretation
- Time Commitment
Four Methods to Gather Data

- **Make observations**
  - Unstructured or structured observations

- **Ask questions**
  - Surveys
  - Interviews

- **Examine and Score Artifacts**
  - Tests, portfolios, student comments
  - Must design scoring guide/rubric

- **Determine the Long Term Effects**
  - Changes in Major, GPA, learning gains across discipline
  - Professional Development
    - Career, academic outcomes
Methodology: Either? Both?

**Quantitative**
- empirical, statistical, comparative
- hypothesis testing, confirmatory
- predetermined, fixed
- large, representative sample
- scores, percentages, counts, rates
- outsider, non-perturbing
- analysis method deductive
- summative, precise, reliable

**Qualitative**
- naturalistic, fieldwork, constructivist
- descriptive, generative, finding meaning
- flexible, evolving
- small, purposeful
- interviews, observations, writings
- insider, perturbing
- inductive
- formative, rich, expansive
Less “Control”

- If you can’t control it – measure it
  - Student demographics
  - Possible pre-test differences
  - Characteristics of “treatment”
Some Keys to Success

- Talk about your design and instruments with SCN members or other colleagues.
- Pilot test your instruments
- Keep your data collection focused.
- Try to keep the project reasonable in scope for the time you have available.
- Share your teaching innovations with the rest of the teaching community
Give SoTL a try!
Join a group at SCN!
Let’s Begin to Design a Project

- Overall goal for project
- Research Question?
- Methods?
- What kinds of evidence?
- Assessments
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