

# SoTL 101

An Introduction to the Scholarship of  
Teaching and Learning

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<http://webphysics.iupui.edu/marian18/slides.pptx>

<http://webphysics.iupui.edu/marian18/handouts.pdf>

# Outline

- I. Introductory Remarks
- II. SoTL at Light Speed
  - a. History
  - b. Examples
  - c. Outcomes
  - d. Human Subject considerations
  - e. Getting started
- III. Lunch
- IV. Light Speed (2)
- V. Final Activity

# The impossibility of today

- An Introduction to the Scholarship of Chemistry and Chemical Engineering
- An Introduction to the Scholarship of Biology and Medicine
- An Introduction to the Scholarship of Agriculture and Cuisine
- An Introduction to the Scholarship of Human History
- Maybe not *quite* that bad, but...
- The resource list may be the most important thing I provide.

# Your goals

- “How to develop my skills in scholarship origination and ultimately publication.”
- “Strategies for course research and assessment”
- “How to plan research questions for SoTL and ideas for instruments to conduct such studies...”
- “How to publish on the Scholarship of Teaching and Learning”
- “I hope to learn how to conduct research in teaching and learning that”
- “A true reflection of what and how I am teaching and how it fits in the program as well as its effectiveness...”

# Your other goals

- “New strategies to engage students.”
- “Awesome active learning teaching methodologies...”
- “Best techniques for classroom teaching to today's students who are digital natives.”
- “Anything that will improve my teaching...”
- “Better ways to engage students”
- “Positive ways to get attention of students, especially in lower-level courses”
- “Improve classroom learning”
- “Teaching methods!”

# Our goals

- I will focus on the first set
  - What SoTL is
  - Some practical tips
  - Getting you started
- If your focus is on the second
  - Evaluation is the link
  - Plan an implementation like a research project
  - Consider publication
- Also, try this...

# Which of these is a correct penny?



# Details are hard!

Teach students the “SEE I” method

- State: Write a clear, concise definition.
- Elaborate: Create a more detailed way of saying it in your own words.
- Exemplify: Find an example in your own experience.
- Illustrate: Think of an image, analogy, metaphor, or other comparison.

Today, use it yourself!



# History

- Prehistory to 1990
- 1990: Ernest Boyer  
“Scholarship Reconsidered: Priorities of the Professoriate”
- 1999: Hutchings and Shulman  
“The Scholarship of Teaching: New Elaborations, New Developments”
- 2000 – present: Explosion of work by thousands

# Example SoTL Goals

- Measure effectiveness of learning materials: curricula, courses, books, readings, figures/images, organizers, videos, case materials, clinical settings, animations, field sites, computer simulations, physical models, lab equipment, software...
- Measure effectiveness of learning activities: lectures, reading assignments, problem sets, team projects, clickers, labs, review sessions, quizzes, exams, student presentations, critiques, group discussions...

# Example SoTL Goals II






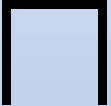

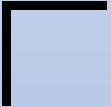

- Understand students:  
prior knowledge in the field, prior knowledge outside, misconceptions, analytical skills, ability to synthesize, reasoning ability, metacognitive skills, reading skills, teamwork skills, quantitative skills, attitudes, gender issues, racial and ethnic concerns, motivation, study methods, use of time...
- How all those topics interact,
- and how to redesign teaching and learning in response

# What topics interest you?

# Outcomes

- *Even more impossible to summarize!*
- Students are not blank slates
  - Preconceptions exist, and cannot be ignored
  - Assets as well as misconceptions
- People learn by thinking
  - Active learning methods, e.g., think-pair-share, really work
- People learn by connecting
  - Ask students to make connections, discover relevance
- Organization matters

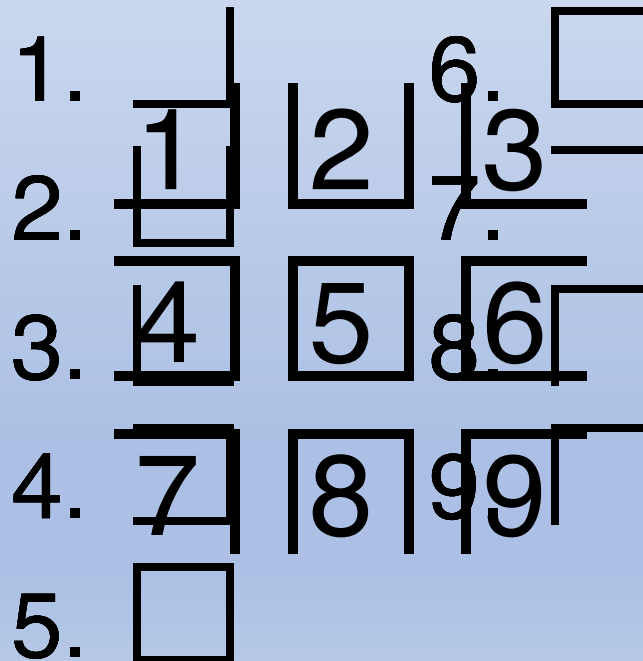
# Exercise: Remember this code for 1-9

- |   |  |
|---|--|
| 1.   | 6.  |
| 2.   | 7.  |
| 3.   | 8.  |
| 4.   | 9.  |
| 5.  |  |

# What is this number?



2 1 4 7 5 3 8 8



# Human Subjects

- Almost any SoTL project involves human subjects
- Evaluation by IRB (Institutional Review Board)
- Most will be found “Exempt”
- Exempt DOES require review
  - Minimal risk
  - No protected classes of participants
- Primary risks are to privacy
- Requires CITI training (Collaborative Institutional Training Initiative)
- Approval required **before** beginning project



# SoTL process

- Much like any other research
  1. Identify research question(s)
  2. Review the literature
  3. Plan methodology
  4. Acquire and analyze information
  5. Speak, write

# Choosing Research Question(s)

- Not a topic, a *specific* question
- Relevant to challenges in classroom
- Relevant to your discipline
- Practical scope
- Hutchings' "Taxonomy of SoTL Questions"
  - What is?
  - What Works?
  - Visions of the possible
  - Theory building

# Team Activity

- Nothing is required
- Nothing is forbidden
- But I have a few guidelines
  - Make teams of 3-4
  - Work with people who might share your teaching interests (by discipline?)
  - You have 20 minutes to identify one (or more!) good research questions
  - Refer to the handout!
- Write your question on the big pad
- Be prepared to report out, ~1 minute/team!

# SoTL 102

Advanced Scholarship of Teaching and  
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# Quantitative Methods

- **Quantitative data:**
  - Attitude surveys
  - Concept inventories
  - Exam and HW scores
  - Attendance data
  - Canvas usage statistics
  - Grades, SATs, GPAs...
- **Quantitative analysis:**
  - Descriptive statistics
  - Hypothesis testing
  - Linear regression
  - Multiple regression
  - ANOVA
  - Multiple ANOVA
  - Factor analysis
  - Item response theory...

# Qualitative Methods

- **Qualitative data:**
  - Interviews
  - Focus groups
  - Field studies
  - Student journals
  - Teacher reflections
  - Free response survey items...
- **Qualitative analysis:**
  - Grounded theory
  - Phenomenology
  - Ethnographic methods
  - Case studies
  - Discourse analysis...

# Mixed Methods

- Many forms! See Creswell's book (resources handout)
- Qualitative → Quantitative
  - Mistakes made in interviews used to develop MC distractors
- Quantitative → Qualitative
  - Hard questions guide selection of interview topics
- “Triangulation” Multiple methods in parallel, do results support or conflict?

# Research Methods Summary

| Question                 | Strategy                           | Method   | Example   |
|--------------------------|------------------------------------|--|---|
| How much X exists?       | Descriptive Statistics, Case study | Interview individuals, survey groups           | How often do students log into Canvas?                                  |
| Are X and Y related?     | Correlational                      | Gather data on at two variables from group     | Is the # of logins related to test scores?                              |
| Does X cause Y? (Weak)   | Quasi-experimental                 | Compare data from groups treated differently   | If I gives quizzes to my MW class will they do better than my TR class? |
| Does X cause Y? (Strong) | Experimental                       | Compare treatments on randomly assigned groups | Same, with students randomly assigned.                                  |



# SoTL Publication

- Start with a talk!
  - On campus
  - Indiana Academy of Science
  - E.C. Moore Symposium on Excellence in Teaching
  - Indiana Section, Amer. Assoc. of Physics Teachers
  - Central States Conf. on the Teaching of Foreign Languages
  - Central States Communications Association
  - Conference on Teaching Large Classes...
- Published proceedings?

# Journal publications

- Just like other publications
  - General to highly specific
  - EBSCO Indexed? Predatory?
  - Follow submission guidelines, etc.
- College Teaching (Taylor & Francis)
- J. College Science Teaching (Nat. Sci. Teachers Assoc.)
- Language Teaching Research (Sage Publications)
- Experiential Learning & Teaching in Higher Education (ELTHE) (Southern Utah Univ. Press)

# Open access options

- Teaching and Learning Inquiry (ISSoTL)
- Journal of the Scholarship of Teaching and Learning (IU)
- International Journal for the Scholarship of Teaching and Learning (Georgia Southern University)

# Closing activity: Poster “proposal”

- Title
- Clear research question(s)
- Data you will need
- Analysis
- Dissemination
- Room for comments