

The science of teaching: How to take a scholarly approach to your own classroom

Eric French, Amy Ort, Nate Pindell, & Julia
Remsik Larsen
Center for Transformative Teaching



Outline for today

- Part I: What Pedagogical Research *Is*
- Part II: How to Get Started with Your Own Pedagogical Research
- Part III: Getting Buy-in: Funding and Publication
- Part IV: Workshop to develop your own pedagogical research ideas
- Open discussion / Q&A



Questions to consider

Before we begin, have these questions in mind throughout today's session - and any time you are hoping to embark on your own pedagogical research:

- What are your challenges and goals for your course?
- What would success look like?
- *How would you know* if you are getting there?



Part I: What Pedagogical Research Is



Distinctions

Distinctions based on field:

- Scholarship of Teaching and Learning (SoTL)
- Discipline-Based Education Research (DBER)
- Education research

Distinctions based on aim and scope of project:

- Course- or discipline-specific vs. more broadly generalizable
- Systematic investigation (“research”) vs. narrative reflection
- Single-course vs. multi-course
- Longitudinal vs. cross-sectional



Our focus today

To remain inclusive, we will refer to “pedagogical research.” This can take many different forms.

We are concerned with those that involve “*practitioner inquiry*.” This means...

- ...one’s own students are the subjects and one’s own course design/teaching practices are the treatments; OR
- ...one conducts the study in order to inform one’s own course design or teaching practices.



Part II: How to Get Started with Your Own Pedagogical Research



Identifying a good research question

- Instead of yes/no questions, ask how/why
- Start with a specific outcome you're interested in understanding
 - In research, we call this a 'dependent variable'
- Often, these are student metrics
 - Grades on assignments or overall course, responses to student surveys, DWI rates, etc
 - Feel free to get more creative!



Identifying a good research question

- Then, ask questions about the outcome
 - What might be the cause of X?
 - For example, why did fewer students fail Exam 1 compared to last semester / Exam 2 / a different course?
 - How might certain teaching innovations impact the outcome?
 - For example, how does peer instruction affect grades in the course / assignment?
- There are infinite possible things you might look at
 - Specific teaching practices, assignment procedures, projects, student demographics (gender, race, 1st gen status, etc.)



Common options for research design

- Anecdotal
 - Can provide useful new questions, but doesn't provide particularly reliable data
- Single class before & after
 - Eg, pre-test and post-test
- Single course one semester vs another
- Single course one section vs another
- Multiple courses/instructors
 - Requires additional control variables
- Whatever you do, design your study to hold as many factors constant as possible!



Other important considerations

- IRB (Internal Review Board) approval
 - Most educational research is 'Exempt', but that doesn't mean you don't have to apply!
 - Not as scary as it sounds, although it can be time consuming
- Professional incentives or departmental expectations
 - For P&T, do some types / levels of research help more than others?
 - Can you get funding if you ask certain questions?
 - How much time do you realistically have?



Campus partners

- CTT can help with any part of the process (including IRB applications!)
 - If there's interest, we can continue a working group from this workshop!
- Advanced FIRST program
 - Faculty-led inquiry into reflective and scholarly teaching - previously Peer Review of Teaching Project (<https://peerreview.unl.edu/>)
- CIRTL
 - Center for the Integration of Research, Teaching and Learning (<https://cirtl.unl.edu/cirtlnebraska>)
- IEA: Institutional Effectiveness and Analytics
 - Can get you useful course / institutional data
 - <https://iea.unl.edu/>



Part III: Getting Buy-in: Funding and Publication



Funding: Internal

- Grants are available both on the institution level and externally through other organizations and institutions.
- Different levels of grants for both.
 - “Mini-Grants” typical range from a few hundred to a few thousand dollars.
 - Grants can range to several thousands of dollars.
- Internal Funding
 - CTT Teaching Grants: Round Four
 - Pedagogic Intervention
 - SOTL publications, presentations, or pedagogy-related grant application.
 - Student-Faculty Collaboration
 - Will be due on February 1st
 - CTT Guidelines and Selection Criteria
 - Link to list:
<https://teaching.unl.edu/ctt-teaching-grants/>



Funding: External

- External funding is available through a variety of different locations.
- These can be searched by specific discipline
 - STEM
 - Arts
 - Humanities
 - Law
 - Etc...
- Can also be education experience focused.
 - Classroom Design
 - Pedagogy
 - Equity
 - Equality
 - First Generation Students
 - Etc...
- Locations offer grants for you to view for potential inspiration.
 - Example: National Science Foundation (NSF) does have opportunities for STEM education and education grants.
 - <https://www.nsf.gov/div/index.jsp?div=DUE>



Publication and Presentation

- Often with grants a presentation or publication is requested after research is conducted.
- CTT spring and fall symposium often invites individuals to present topics and studies conducted.
 - Poster Sessions
 - Lectures
 - Workshops
- The grant should define what is expected for you to report out.
 - Specific conferences and publications.
 - While creating the grant you can state which conferences and locations you will present at.
- If you search for grants through specific organizations they often have affiliated conferences.
 - American Society of Engineering Education (ASEE)



Resources to Browse

- For a list of Pedagogical Research publications, see appendix B of Bishop-Clark, C., & Dietz-Uhler, B. (2012). Engaging in the Scholarship of Teaching and Learning: A Guide to the Process, and How to Develop a Project From Start to Finish.
- We invite you to check out the CTT Fall Teaching and Learning Symposium
 - This fall on November 5th.
 - Link to information and registration:
 - <https://teaching.unl.edu/symposium/>
- For more information about internal grants, symposium opportunities, or anything else please reach out to us at teaching.unl.edu



Part IV: Workshop to develop your own pedagogical research ideas



For the next 5 minutes...

Worksheet
Printable Map
Digital Map

On your own, think about these questions:

- What are your challenges and goals for your course?
- What would success look like?
- *How would you know* if you are getting there?

Write down a potential research question that you could pursue. On a scale of 0-10, note how confident you are in your question and your ability to pursue it.



For the next 10 minutes...

Share your research questions.

Try to further develop at least one person's question.

- What supports and resources do you know of to help you in this research?
 - Campus partners
 - External partners
 - Funding
 - Physical Resources
- What challenges or obstacles do you anticipate in this research?



CTT Contact information

- Find an instructional designer from the CTT:
<https://teaching.unl.edu/contact-us/>

