Delta Internship Project Proposal Development

The Process of Developing and Implementing a Teaching-as-Research Project

Get Inspired!
Bring your ideas or consider our existing opportunities

Your TAR Process

Cohort activities

Example

Does active learning improve learning?

Students seem to be struggling with incoming misconceptions in a class I TA (Intro to Astronomy). Specifically, they struggle with why Earth has seasons.

Bloom’s Taxonomy

Creating
Evaluating
Analyzing
Applying
Understanding
Remembering

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Pre-Internship Workshops
Write Project Proposal
Internship Seminar
Certificate

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Evaluating
Analyzing
Applying
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Remembering

This worksheet guides you toward completing your proposal, and ends with a template for completing your proposal. Please get out a notebook sheet of paper and sketch out thoughts, ideas or diagrams as you move through the activities.

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A. Identifying the Question & Learning Goals

There are three essential elements in the Teaching-As-Research process:
- Identify a situation that is occurring in the classroom or an outreach setting, which, in turn, is adversely affecting student learning,
- Consider how you will know that student learning has improved because of the instructional changes you proposed and/or tried.
- Strategize ways to improve student learning by modifying the instructional approach

**Activity: Identify the issue to be addressed in your project.**

The question that you decide to focus on should be both related to participant learning in the classroom or an outreach setting and be feasible in terms of your time, effort and available resources. It may be helpful to think about your answers to the following questions:

1) What do I see/hear happening? (who, what, where, when, how)

2) What do I think explains the problem (why?)
**Note:** Many projects could benefit from a better understanding of the underlying issue

3) How can I frame this issue as a question to be addressed?

**Activity: Create learning objectives**

What are you trying to support your students in achieving?

**See Appendix C for Bloom’s taxonomy of levels of learning and associated verbs for learning outcomes**

<table>
<thead>
<tr>
<th>CIRTL Learning Outcome: Create realistic well defined, achievable, measurable and student centered learning goals for the teaching and learning project.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) What type(s) of learning are your targets? Cognitive, Affective, Skills</td>
</tr>
<tr>
<td>2) What level(s) of learning are your targets? (Think Bloom’s Taxonomy; see Appendix C)</td>
</tr>
<tr>
<td>3) Write your project’s student learning goals</td>
</tr>
</tbody>
</table>


B. Literature Review
See Appendix B for links to resources

Just as you wouldn’t begin an experiment in your disciplinary research without consulting the literature, tackling an issue in your classroom or outreach efforts can also be supported by the educational literature. For example, there is a wealth of information about topics like student misconceptions, active learning, case-based learning, cooperative learning, on-line course development, laboratory instruction, etc. Some topics might be addressed from a disciplinary perspective similar to your own. For other topics, you may need to read about a study in a different discipline.

As you begin to explore the literature, you might find yourself feeling frustrated that you are reading studies that do not look even remotely like yours. You may even be surprised at how little research there is for you to build upon. Here are a few suggestions that might help:

- **Make time to talk with people who may have good ideas or practical advice.**
  As good as search engines are, they still miss a lot—such as small unpublished studies and especially the “practical” knowledge held by people who are actually studying what their students are learning. For example, if you were studying the effects of podcasting on learning a local campus connection may (or may not!) provide more information than you would have learned from just a Google Scholar search.

- **Review exemplary studies, irrespective of the discipline.**
  One study that immediately comes to mind is by Wright et al. (1998)1 from the Chemistry Department at UW-Madison. In this study, the authors compared cooperative learning techniques versus the standard lecture format across two separate sections of an introductory undergraduate analytical chemistry course. The study assessed the effect of the instructional approach on the development of student skills, such as success in problem solving.

- **Consider websites that inform about best practices for your project (see Appendix)**

- **Look for studies with a similar design or research question.**
  There are a number of web sites that maintain lists of disciplinary journals that publish ‘pedagogical studies.’ Once you find the journal(s) that someone in your field might publish in, then you might browse through a couple issues to see if something looks like your proposed study. For example, if you are looking at the effectiveness of lab experiences, you may find it useful to look at several disciplines to see how others determine “lab effectiveness,” even though the subjects taught in these labs may differ. In addition, not every publication you find will be data based. Although such publications may not seem sufficiently rigorous compared with your disciplinary research, they may still be worth a look and may lead you to a good idea or to other studies.

---

<table>
<thead>
<tr>
<th>Similar contexts and issues Examples:</th>
<th>Similar teaching strategies Examples:</th>
<th>Similar study design Examples:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common student misconceptions hang up student learning in your course</td>
<td>Group activities that confront misconceptions to allow a shift in students’ erroneous mental models</td>
<td>Sections of the course with and without activity (“control”)</td>
</tr>
<tr>
<td>Low student motivation in your type of course; consult motivation models (purpose, autonomy, competency, community)</td>
<td>Problem-based learning Incorporating peer feedback activities</td>
<td>One cohort, a case study descriptive approach</td>
</tr>
</tbody>
</table>

---

1 Wright et al. (1998) A Novel Strategy for Assessing the Effects of Curriculum Reform on Student Competence. JCE
Activity: What is already known about teaching these concepts and /or this approach?

CIRTL Learning Outcome: Find and critically consider the literature and existing knowledge associated with the teaching and learning project.

What are the key topic(s) in your proposed project (e.g. student misconceptions, student motivation, active learning, cooperative learning, on-line course development, laboratory instruction, podcasting, etc.)?

List some potentially useful journals or articles to read:

C. Methods & Evaluation Tools

How will you know that your students have achieved the learning goals you have identified?

1. Assessments
   Such as: pre- and post-surveys of student attitudes and/knowledge, concept maps or concept inventories, student sketches, minute papers, essay, student interviews, focus groups, quiz or test questions, student presentations, etc.

2. Study design & timeline
   How you will know that student learning has improved because of the instructional changes you proposed and/or tried? Such as: comparison to previous cohort, “control” sections, etc.

Tip: As you design your assessments, Beta test/pilot them, on your friends or fellow interns!!

Can your assessment drive learning for all three?
Ex: Partial credit for corrected exam Qs w/accompanying explanation

Often in active learning, the activity is the assessment
Ex: Student presentations scored with a rubric

Should I use student-reported or objective data? Both!

Assessment of Student Learning

Cognitive
Ex: Explain, graph, compare, evaluate, create...

Affective
Ex: Student perceptions, attitude, motivation, confidence, interest...

Cognitive “Skills”
Ex: Reading primary literature, experimental design, lab methods, working well in teams...

Assessment Examples

Exs aligned with Bloom’s taxonomy:
https://www.cmu.edu/teaching/design/assessments.html

Student Assessment of their Learning Gains (SALG),
Colorado Learning Attitudes about Science Survey (CLASS)

Experimental Design Ability Test (EDAT)
Group teamwork reflections
Some Resources:
Get inspired by looking at a chart aligning assessments with objectives for ideas. 
https://www.cmu.edu/teaching/designteach/design/assessments.html

Consider going through the modules at: An Online Tutorial for Faculty in Assessment & Instructional Alignment. 
http://www.ucdenver.edu/faculty_staff/faculty/center-for-faculty-development/Documents/Tutorials/Assessment/index.htm

The Field-tested Learning Assessment Guide (FLAG) web site contains: an Assessment Primer; a discussion of matching teaching objectives to classroom assessment techniques (CATs); CATs; and resources. 
http://www.flaguide.org/

The Student Assessment of Learning Gains (SALG) instrument is a survey tool designed for instructors of all disciplines who want feedback from their students about how course elements are helping their students to learn. 
http://www.salgsite.org

Activity: Assessment methods
CIRTL Learning Outcomes: Find or develop assessment (measurement) tool(s) that are aligned with the learning objectives of the teaching and learning project.

Reminder: Ensure assessments include both lower and upper levels of student learning (Bloom’s; Appendix C).

Consider the following questions as you outline your assessment strategy and methods:

<table>
<thead>
<tr>
<th>Question</th>
<th>Specific Examples</th>
<th>Additional Questions or Resources needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>What will constitute credible evidence that will allow me to determine whether my students have achieved the learning objectives?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What assessment techniques will I use to collect information about student learning?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How will I analyze this information and determine what students have learned?</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>NOTE:</strong> Think about data analysis in the context of designing assessment instruments. What do you want to be able to say about student learning?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>When will I collect what, and what will I compare to determine student learning?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>→ Sketch out a timeline and consider comparisons</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
D. Activities to promote student learning

The final step in the case study involves strategizing ways to improve student learning by modifying the instructional approach. Once you have identified your question and any key issues (e.g. student motivation, podcasting, etc.), you will want to outline the instructional approach you plan to use. This might involve:

- Developing instructional materials that incorporate active learning that will be integrated into a standard lecture course, or
- Designing a new lab that uses up-to-date technology in the discipline to help students learn about a topic.

Work through the activity below to help you plan out your project. Keep in mind: Align learning objectives, activities and assessment data in order to draw conclusions about the effectiveness of your instructional approaches.

Activity: What are your planned activities?
CIRTL Learning Outcome: Developing a teaching plan (a hypothesis) to accomplish learning objectives.

1) From my literature review, what activities are most likely to address the problem originally identified in my student context? (e.g. addressing misconceptions for photosynthesis; motivating nonscience majors)

2) Which are most feasible and interesting to me?

3) From my literature review, what are the best practices for this activity? (e.g. best practices for group work)

Activity: Aligning learning outcomes, assessments & activities

<table>
<thead>
<tr>
<th>Learning Goal(s)</th>
<th>Evidence of Success</th>
<th>Activities for Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>What should students be able to do?</td>
<td>How will I collect and analyze information to determine what the students have</td>
<td>What will I do to enable students to achieve the learning objectives?</td>
</tr>
</tbody>
</table>

→ Complete the above table, and draw arrows between columns or otherwise indicate how these align. This is at the core of your project, and this table is a required element of your proposal.

Some examples from past projects:
## Delta Internship Project Proposal Development

<table>
<thead>
<tr>
<th>GOAL</th>
<th>ASSESSMENT</th>
<th>ACTIVITY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DEMONSTRATE</strong> correct</td>
<td><strong>Conceptual biomedical knowledge:</strong> multiple choice questions regarding basic medical knowledge</td>
<td>Online virtual patient modules with and without Self-Explanation Prompts</td>
</tr>
<tr>
<td>diagnostic approach</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>LOCALIZE</strong> disease</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CONSTRUCT</strong> a differential</td>
<td><strong>Strategic knowledge:</strong> vignette case with long answer question</td>
<td></td>
</tr>
<tr>
<td>diagnosis list</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>FORMULATE</strong> an appropriate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>diagnostic plan</td>
<td><strong>Conditional knowledge:</strong> vignette case with long answer question</td>
<td></td>
</tr>
<tr>
<td><strong>DESIGN</strong> an initial</td>
<td></td>
<td></td>
</tr>
<tr>
<td>treatment plan</td>
<td><strong>Affective domain:</strong> Likert-scale post-survey</td>
<td></td>
</tr>
<tr>
<td><strong>JUSTIFY</strong> clinical</td>
<td></td>
<td></td>
</tr>
<tr>
<td>approach based on</td>
<td></td>
<td></td>
</tr>
<tr>
<td>underlying biomedical</td>
<td></td>
<td></td>
</tr>
<tr>
<td>knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GAIN</strong> overall confidence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>in diagnostic abilities</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Overarching goals

<table>
<thead>
<tr>
<th>High-order critical thinking skills</th>
<th>Describe and apply nature of science</th>
<th>Move toward growth mindset</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quiz to test skills (pre, post)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rubric applied to written proposals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reflection essays</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SALG survey: pre, mid and post-semester</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Assessments

<table>
<thead>
<tr>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group written proposals</td>
</tr>
<tr>
<td>Instructor guided peer review of written proposals</td>
</tr>
</tbody>
</table>

---

7
Activity: Putting it all together

What would your assessment data look like if your hypothesis about student learning is true?

→ Sketch out what your data from the above assessments might look like, e.g. post-pre averages, or a table of frequency counts from qualitative data

Will the data that I plan to collect allow me to “answer” the question(s) that I posed (remember, the one that is the foundation of your project)? If not, what changes in my approach do I need to make?

How would you use that data to make future instructional choices?

What are important covariates (e.g. student background knowledge, time on task) and how can you address them?

E.g. To consider using previous year as a proxy for a ‘control’: Compare current and previous year cohorts, such as via student background initial survey (incoming GPA, # of previous science courses)

E. Integrating the Delta core concepts

This is your opportunity to take the classroom learning you have done in other Delta courses and put it into practice. The action plan you detailed above addresses many aspects of the Teaching-As-Research process. In this next activity you will focus on how to incorporate the Learning-Through-Diversity and Learning Community pillars into your project.
### Activity: Integrating Learning Communities

**CIRTL Learning Outcome:** Integrate one or more LC strategies into a teaching plan so as to accomplish learning objectives and learning-through-diversity

<table>
<thead>
<tr>
<th>Learning Communities</th>
<th>Question</th>
<th>Examples of specific teaching &amp; learning approaches &amp; activities that you plan to use</th>
<th>Resources needed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>How will I promote <em>shared discovery</em> and learning among learners?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>How will I support the <em>meaningful interactions</em> among learners which are necessary to achieve the learning objectives?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>How will I <em>connect</em> my materials and activities to other related topics and experiences?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>How will I create an <em>inclusive</em> learning environment?</td>
<td></td>
<td></td>
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</tbody>
</table>

### Activity: Integrating Learning-through-Diversity

**CIRTL Learning Outcome:** Create a teaching plan that incorporates content and teaching practices responsive to the students’ backgrounds. Integrate one or more LtD techniques and strategies in a teaching plan so as to use students’ diversity to enhance the learning of all

<table>
<thead>
<tr>
<th>Learning-Through-Diversity</th>
<th>Question</th>
<th>Examples of specific teaching &amp; learning approaches &amp; activities that you plan to use</th>
<th>Resources needed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>How do participants’</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Delta Internship Project Proposal Development

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>different <strong>backgrounds</strong> and learning styles influence how they learn?</td>
<td></td>
</tr>
<tr>
<td>How will considering &quot;diversity&quot; influence how I practice my teaching, and what I decide to include as content?</td>
<td></td>
</tr>
<tr>
<td>How can the diversity of individual participants <strong>help other participants learn better</strong>?</td>
<td></td>
</tr>
<tr>
<td>How will I identify and address the <strong>inequities</strong> that exist in my teaching environment?</td>
<td></td>
</tr>
</tbody>
</table>

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Delta Internship Project Proposal Development

The Process of Developing and Implementing a Teaching-as-Research Project

**Get Inspired!**
- Bring your ideas or consider our existing opportunities

**Define and Refine Project**
- Learning goals, Assessments, Activities

**Obtain Human Subjects (IRB) Approval**
- Approval

**Perform a Literature Review**
- What have others published that can inform your proposal?

**Define Methods**
- What data do you need to answer your question?

**Analyze Data**
- Report, Reflect & Iterate

**Implement Project, Collect Data**

**Optional: Continue to the Certificate Program**

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**Workshop I**
- **Workshop II**
- **Write Project Proposal**
- **Internship Seminar (1.5 hrs/wk)**
- **Certificate**

**Requirements**
- Dates are a guideline.
- Timing might differ for your particular project.

- Complete at least one Delta or CIRTL course
- Identify your project and faculty partner
- Human Subjects Protection Certification (IRB)
- Abbreviated IRB protocol
  - By 8/15/16
- Project proposal
  - Draft for peer review: July 15
  - Review two peer drafts: Aug 1
  - Submit: Aug 8

- Apply by 8/15/16
  - Submit:
    - Application
    - Proposal draft
    - CV
    - Advisor approval form

- Submit Draft:
  - Reflective statement
  - Summative report or poster
  - Lead discussion group

- In your T&L Portfolio:
  - Reflective statements
  - Summative report

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If full UW IRB review needed is needed: at least 8 weeks before planned data collection. By 7/1/16 for 7/15/16 IRB meeting.
Delta Internship Project Proposal Development

Appendix A - Teaching-As-Research proposal instructions

Your answers to the questions throughout this worksheet will transfer directly to your proposal. You are welcome to complete your proposal in Q&A format.

Submit a brief proposal outlining the internship experience. Section I of the proposal should be jointly developed by the intern and partner; the entire proposal should be written by the intern. It should be no more than 5 single-spaced pages in length (12 pt font) and should include the following items:

FIGURES/TABLES (which you can refer to in the text rather than rewriting)

**Required:** A table showing and aligning learning objectives, assessments and activities

**Recommended:**
- A sketch of study design showing the approach (e.g. current vs former cohort; different sections; descriptive correlations)
- A timeline of activities and data collection
- Sketches of potential data results

**Text SECTION I: PROJECT DESIGN**

1. Provide a description of the classroom or informal science education-related issue/challenge you are addressing

2. What is your Teaching-As-Research question?

3. What is your hypothesis? It should be based on the literature cited, and framed around the relationship of evidence-based and inclusive instructional practices and the accomplishment of learning objectives. Ex: [Intervention] will [outcome] as measured by [instrument] in [context]

4. What is known from the literature about this learning issue?
   a. What have others tried? What has worked, and what hasn’t?
   b. In your project, how will you build on what is known about the issue?

5. Describe your planned approach
   a. Course description:
      i. What undergraduate or graduate course will be impacted by your project (e.g., Biomechanical Engineering BME 545)?
      ii. On average, how many students are in the course?
      iii. What is the course structure? (e.g. lecture/lab; discussion capstone seminar)
   b. Identify your desired learning objectives and outcomes. What will students/participants be able to know, value and do (knowledge, attitudes and skills) as a result of your intervention? (see Appendix C: Learning outcomes should be achievable, measurable, and student-centered – e.g. not “understand X”)
   c. Evaluation. Describe how students/participants will demonstrate what they know, value and can do.
      i. What assessment techniques/approaches will you use? Explain (justify) your choice of assessment approaches.
      ii. How will you collect the data? (e.g. rubric applied to student presentations)
      iii. How will you analyze the data? (e.g., qualitative analysis)
      iv. Explain how the assessment approach effectively addresses the research hypothesis.
      v. Explain or refer to the table/figure to show how the learning outcomes are aligned with the project assessments and activities.
   d. What instructional strategies, resources and learning experiences will you use to help students/participants reach your learning objectives and outcomes?

6. Integrating the Delta pillars.
   a. Provide examples of specific teaching & learning approaches & activities that you plan to use to develop and use learning communities to promote learning in your project.
      i. Provide a clear rationale for including (or not including) Learning Community elements in the project.
Delta Internship Project Proposal Development

ii. Describe how these Learning Community ideas fit with the project’s design, implementation and analysis.

b. Provide examples of specific teaching & learning approaches & activities that you plan to use to engage participant diversity to promote learning.
   i. Provide a clear rationale for including (or not including) Learning through Diversity elements in the project.
   ii. Describe how these Learning through Diversity ideas fit with the project’s design, implementation and analysis.

7. Project logistics:
   a. What roles and responsibilities will both you and your partner have in the project?
   b. Provide a proposed timeline for project activities

SECTION II - PERSONAL

1. What are your previous teaching experiences?
2. What are your current career aspirations?
3. What do you hope to gain from the internship experience that will advance you toward your career goal(s)?

SECTION III – CONCEPTUAL UNDERSTANDING

1. What is your understanding of each of the three terms below AND how would you use each concept to improve learning?
   a. Teaching-As-Research
   b. Learning-through-Diversity
   c. Learning Communities
2. How have you developed your understanding of diversity? Please provide an example.
Appendix B – Literature Review Resources (A Starting Point)

**UW-Madison Teaching and Learning Research Guide for STEM & SBE**
Click ‘Guide Contents’ for Article databases, Journals, Books, Online resources & tools
http://researchguides.library.wisc.edu/teaching_learning

**UW-Madison electronic educational databases (through e-resource gateway)**
ERIC - Educational Resources Information Center: http://digital.library.wisc.edu/1711.web/eric
Education Full Text : http://digital.library.wisc.edu/1711.web/educationfulltext
JSTOR: http://digital.library.wisc.edu/1711.web/jstor

**Educational journals examples:**

<table>
<thead>
<tr>
<th>CBE Life Sciences Education</th>
<th>Journal of Chemical Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational Studies in Mathematics</td>
<td>Educational Technology, Research and Development</td>
</tr>
<tr>
<td>Journal of College Science Teaching</td>
<td>New Directions for Teaching and Learning</td>
</tr>
<tr>
<td>Journal of Women and Minorities in Science and Engineering</td>
<td>Physics Education</td>
</tr>
</tbody>
</table>

**Previous TAR projects:** http://www.cirtl.net/tarprojects

**UW-Madison teaching and learning resources**
Center for Biology Education: http://biology.wisc.edu/
Institute for Chemical Education: http://ice.chem.wisc.edu/
Engineering Learning Center: http://www.engr.wisc.edu/services/elc/

**Online teaching and learning resources**
University of Washington DO-IT: Disabilities, Opportunities, Internetworking and Technology:
http://www.washington.edu/doit/

National Center for Case Study Teaching in Science has resources and collections of cases ready to use:
http://sciencecases.lib.buffalo.edu/cs/

*fabulous resource* An Online Tutorial for Faculty in Assessment & Instructional Alignment:
http://www.ucdenver.edu/faculty_staff/faculty/center-for-faculty-development/Documents/Tutorials/Assessment/index.htm

The Field-tested Learning Assessment Guide (FLAG) web site contains: an Assessment Primer; a discussion of matching teaching objectives to classroom assessment techniques (CATs); CATs; and resources.
http://www.flaguide.org/

The Student Assessment of Learning Gains (SALG) instrument is a survey tool designed for instructors of all disciplines who want feedback from their students about how course elements are helping their students to learn.
http://www.salgsite.org

Carl Wieman's Science Education Initiative: http://cwsei.ubc.ca/. The Resources pages include videos, brief papers & how-to’s and instructor guidance on topics from motivation to best practices and what not to do

**Books on teaching & learning**
Check out these and other titles for free from the instructor’s resource library in room 118 of 445 Henry Mall! Scientific Teaching, Handelsman et al. 2007; Assessment in the College Science Classroom, Dirks et al. 2014; Teaching Undergraduate Science: A Guide to Overcoming Obstacles to Student Learning, Linda Hodges, 2015

**Examples of videos of talks that might inspire you**
Eric Mazur Confessions of a Converted Lecturer: http://www.youtube.com/watch?v=WwsIBPj8GgI
Carl Wieman Taking a Scientific Approach to Science Education: https://youtu.be/aBEPXfY7Elw
The words we choose are important as we articulate both what we want students to learn and what we want students to do on an exam or other assessment. The verbs are particularly important since they indicate the level of learning. Levels from “applying” and higher are considered to be problem-solving levels.

Learning outcomes need to be measurable. Outcomes fall into three traditional areas: Cognitive (mental) domain, Affective (attitudes, values), and Skills (“psychomotor”). We tend to focus on the cognitive domain, but decades of research indicate the importance of the affective domain for learning. Your objectives might look like these: At the end of this learning experience, students will be able to:

- List the key elements of...
- Describe the process ...
- Calculate the ...

Bloom’s taxonomy action verbs:

Format: An objective is [verb] and [specific task]. Several verbs can be in more than one level of learning.

Objectives: Note that some verbs indicate goals, not measurable objectives: understand, appreciate, know.
# Delta Internship Project Proposal Development

## Rubric for Teaching-As-Research Projects

<table>
<thead>
<tr>
<th></th>
<th>Comprehensive</th>
<th>Developing</th>
<th>Unacceptable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Literature</strong></td>
<td>Demonstrates a <strong>critical consideration</strong> of the education literature (within their field and possibly beyond) and existing knowledge associated with the teaching and learning project. Concepts from the literature are used and built upon in the project. The literature is cited.</td>
<td>Demonstrates <strong>only partial consideration</strong> of the literature and existing knowledge association with the TAR project.</td>
<td>Demonstrates <strong>no consideration</strong> of the literature or existing knowledge.</td>
</tr>
<tr>
<td><strong>Learning Goals</strong></td>
<td>Project has realistic well-defined, achievable, measurable, and student-centered learning goals. These goals are effectively aligned with the project assessments and activities.</td>
<td>Project has <strong>only some</strong> of the learning goal qualities listed in the comprehensive category.</td>
<td>Project has <strong>none</strong> of the qualities listed in the comprehensive category.</td>
</tr>
<tr>
<td><strong>Hypothesis</strong></td>
<td>Project has a <strong>well-developed</strong> research question and hypothesis based on the literature cited, the relationship of evidence-based and inclusive instructional practices and the accomplishment of learning goals.</td>
<td>Project has a <strong>partially developed</strong> research question and hypothesis.</td>
<td>Project <strong>does not</strong> have a clear research question or hypothesis.</td>
</tr>
<tr>
<td><strong>Learning through Diversity</strong></td>
<td>Learning through Diversity concepts are clearly included in the project design, implementation and analysis. A clear rationale is presented for including (or not including) learning through diversity elements in the project.</td>
<td>While some aspects of diversity may be considered in the project, their implementation or assessment is incomplete.</td>
<td>Demonstrates <strong>no consideration</strong> of diversity elements in its design, implementation or analysis.</td>
</tr>
<tr>
<td><strong>Learning Community</strong></td>
<td>Project intentionality considers learning community ideas in its design, implementation and analysis. Clear rationale is presented for including (or not including) learning community elements in the project.</td>
<td>While some learning community elements may be considered in the project, their implementation or assessment is incomplete.</td>
<td>Demonstrates <strong>no consideration</strong> of learning community elements in it's design, implementation or analysis.</td>
</tr>
</tbody>
</table>
## Delta Internship Project Proposal Development

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<tr>
<td><strong>Assessment approach</strong></td>
<td>Uses an assessment design that is appropriate to and <strong>is aligned</strong> with the</td>
<td>Uses an assessment tool that is <strong>only somewhat</strong> aligned with the learning</td>
<td>Uses an assessment approach that is <strong>not aligned</strong> with the learning goals of</td>
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<tr>
<td></td>
<td>project learning goals. The assessment approach effectively addresses the</td>
<td>goals of the project</td>
<td>the project</td>
</tr>
<tr>
<td></td>
<td>research hypothesis. The choice of assessment approaches can explain and</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>supported.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Data</strong></td>
<td>Rich data is collected directly, analyzed appropriately, and used to draw</td>
<td>Data is collected that is somewhat related to the learning goals, analysis</td>
<td>Incomplete data is collected, not tied to learning goals, not analyzed properly,</td>
</tr>
<tr>
<td></td>
<td>evidence-based conclusions about the impact of the project on the learning</td>
<td>reveals mostly evidence-based conclusions.</td>
<td>and no evidence-based conclusions are made.</td>
</tr>
<tr>
<td></td>
<td>goals. The data is appropriate and effectively addresses the research</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>question.</td>
<td></td>
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<tr>
<td><strong>Application</strong></td>
<td>The project completes a full-inquiry cycle by using the findings to suggest</td>
<td>The project suggests limited or impractical improvements to teaching</td>
<td>The project does not suggest any practical or logical improvements to</td>
</tr>
<tr>
<td></td>
<td>practical and logical improvements to teaching practice. A reflective process</td>
<td>practice. The suggested revisions to the project are incomplete, or will not</td>
<td>teaching practice; no attempt is made to reflect on the project and next steps.</td>
</tr>
<tr>
<td></td>
<td>is used to refine the research aspects of the project, and findings are used</td>
<td>effectively address the research question.</td>
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<td></td>
<td>to inform the design of the next steps in the project.</td>
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<tr>
<td><strong>Project approach</strong></td>
<td>For projects involving classroom or curricular interventions, it is clear the</td>
<td>Activities should be more clearly tied to learning goals and/or project</td>
<td>Procedure is unclear or incomplete.</td>
</tr>
<tr>
<td></td>
<td>instructional framework is based on backward design. As such, activities and</td>
<td>objectives. There are not enough student-centered activities. There is not</td>
<td>Approach does not specifically address the research question.</td>
</tr>
<tr>
<td></td>
<td>assessments are aligned with learning goals.</td>
<td>sufficient use of pedagogies shown to improve student learning.</td>
<td>IRB approval is not sought.</td>
</tr>
<tr>
<td></td>
<td>Alternatively for projects without classroom interventions, the approach</td>
<td>Approach is not entirely grounded in accepted models or methods of data</td>
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<tr>
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<td>employs methods of data collection or models accepted among education</td>
<td>collection. More appropriate or efficient methods have been reported.</td>
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<td>researchers. Project objectives and type of evidence collected are clearly</td>
<td>IRB approval for the project is not done in a way that data can be collected</td>
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<tr>
<td></td>
<td>aligned.</td>
<td>or used.</td>
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<tr>
<td></td>
<td>For both types of projects, IRB approval is sought or obtained.</td>
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