Scholarship of Teaching and Learning (SoTL)

Madeleine Andrawis
Electrical Engineering and Computer Science Department
South Dakota State University
Scholarship Reconsidered: Priorities of the Professoriate Ernest L. Boyer (1990)

- The **Scholarship of Discovery**, frontier research that increases new knowledge within a discipline;

- The **Scholarship of Integration**, applied research that builds on and extends frontier research;

- The **Scholarship of Application**, applied research that directly benefits society; and

- The **Scholarship of Teaching**, later renamed **Scholarship of Teaching and Learning** studies education and uses the results to improve it and involves the constant interplay of teaching and learning.
What is SoTL

• It is the inquiry into student learning processes and use of the findings to implement informed changes and expand the knowledge base of teaching and learning.

• SoTL involves the integration of teaching with the scholarship of research; it is also referred to as ‘classroom research.’

• It is the ongoing and cumulative intellectual inquiry by faculty, through systematic observations and ongoing investigations, into the nature of learning and the impact of teaching upon it.
Scholarly Teaching and the Scholarship of Teaching and Learning

• **Scholarly teaching**: The instructor
  (a) reflects on, assesses, and attempts to improve his/her teaching (classroom research)
  (b) is aware of modern pedagogical developments and incorporates them in his/her teaching where appropriate

• **Scholarship of teaching and learning**: Includes research, publication, and possibly grants on work related to teaching and learning
SoTL Critical Components

• “for an activity to be designated as scholarship, it should manifest at least three key characteristics: it should be public, susceptible to critical review and evaluation, and accessible for exchange and use by other members of one’s scholarly community.”

Schulman (1998)
SoTL Basic Features

- requires a high level of discipline-related expertise
- is conducted in a scholarly manner with clear goals, adequate preparation, and appropriate methodology
- breaks new ground, is innovative
- can be replicated or elaborated
- can be documented and disseminated
- can be peer-reviewed and critiqued
- has significance or impact

SoTL Advances

• SoTL has been advocated by the Carnegie Foundation for the Advancement of Teaching through the Carnegie Academy for the Scholarship of Teaching and Learning (CASTL) Program in Higher Education.
SoTL as Termed by ASEE

Scholarly and Systematic Innovation in Engineering Education
SoTL and ABET Engineering Criteria

• Outcomes-based accreditation system was introduced to improve engineering education
• Engineering students must be equipped with a broad array of technical and professional skills
• Instructors must use a broader range of instructional materials and methods
• Instructors must assess the extend to which the students are acquiring these skills which amounts to determining the effectiveness of the new methods
• The next logical step is for the instructors to share their findings with colleagues through publications and conferences

This is SoTL!!
Guiding Principles for Scientific Research in Education

1. **Question**: pose *significant* question that can be investigated *empirically*
2. **Theory**: link research to relevant theory
3. **Methods**: use methods that permit direct investigation of the question
4. **Reasoning**: provide coherent, explicit chain of reasoning
5. **Replicate and generalize** across studies
6. **Disclose** research to encourage professional scrutiny and critique

*National Research Council, 2002*
Inquiry Process

• What is the “problem?”
• Refining the question(s)
• Searching the literature
• Consider ethical issues
• Design the study
• Collect and analyze the data
Types of Questions

- Instructional Knowledge—components of instructional design
- Pedagogical Knowledge—student learning & how to facilitate it
- Curricular Knowledge—goals, purposes & rationales for courses or programs
Example Questions

- Can interactive exercises increase student learning?
- Do students really learn more in smaller classes?
- Can group work aid individual learning?
- Do examples enhance or confuse student learning?
- Can technology help students do more than recall facts?
- Do student misconceptions persist, and if so, why?
Inquiry Methods

- Content analysis
- Experiments
- Interviews and focus groups
- Observational research
- Questionnaires
- Case studies
- Portfolios

McKinney (2007)
Why do SoTL?

• Examines undergraduate education as an evidence-based and theory-framed endeavor
• Fosters significant, long-lasting learning for all students
• Enhances the practice and profession of teaching
• Brings faculty’s work as teachers into the scholarly realm
• Fosters an interdisciplinary community of conversation and engagement centered on teaching and learning

CASTL project purposes http://www.aahebulletin.com
Challenges to SoTL

- It is not completely clear what is scholarship
- If it is not a science, why do it?
- What is the relationship between SoTL and the discipline it is done in?
- Resistance to change: shifting emphasis between content delivery and teacher to student learning and heterogeneity
Engineering Faculty Leading the SoTL Efforts

• Richard Felder at North Carolina State University:
  http://www.ncsu.edu/felder-public

• Karl Smith at the University of Minnesota:
  http://www.ce.umn.edu/~smith/
Felder’s Resources on SoTL

- "Research on Teaching and Learning in Engineering." A transcript of a lecture on the history, categories, and techniques of research on engineering education.


- "The Scholarship of Teaching and Learning in Engineering." A chapter in an edited volume on educational scholarship that surveys the history and methods of engineering education research.

- "The Scholarship of Teaching." A column that defines the scholarship of teaching and outlines how might it be assessed and rewarded.
Books

McKinney (2007)  
College of Engineering  
ASEE Fall 2009 Meeting

Weimer (2006)
SoTL Journals

- Journal of Engineering Education
- IEEE Transactions on Education International
- Journal of Electrical Engineering Education
- International Journal of Engineering Education
- MountainRise
- International Journal for the Scholarship of Teaching and Learning
- International Journal of Teaching and Learning in Higher Education
- The Journal of the Scholarship of Teaching and Learning
Other SoTL Publications

Magazine
• *ASEE PRISM*

Proceedings
• *Proceedings of ASEE Annual Conferences*
• *Proceedings of Frontiers in Education Conferences*

Books
• *Teaching Engineering* (Wankat and Oreovicz 1993)
• *Tomorrow's Professor: Preparing for Academic Careers in Science and Engineering* (Reis 1997)
Duties of the Council

- Establish a University definition of and criteria for SoTL.
- Identify emerging SoTL ideas and research.
- Foster an environment of support and development of research based teaching.
- Collect and distribute academic literature regarding SoTL in multiple disciplines.
- Assist academic units in creating instruments to evaluate faculty contributions to SoTL for promotion, tenure and salary rewards purposes.
- Support University publication and campus distribution of faculty and staff SoTL initiatives.
- Annually recognize exception University faculty and staff contributions to SoTL.
- Advocate for inclusion of SoTL language in documents and policies that impact creative activity, research, and scholarship.
- Support faculty development efforts focusing on SoTL.
SDSU SOTL Definition

The scholarship of teaching and learning is the systematic inquiry of teaching and learning where results are critically reviewed and made public. This SoTL work:

- encompasses SoTL work at the discipline, institution, program, classroom, learning environment, or institutional level
- clearly states the teaching/learning issue or problem
- includes a relevant literature review (and theory)
- uses appropriate methodology
- complies with the Institutional Review Board (IRB)
- is made public through professional presentations, publications, or other peer reviewed outlets
Faculty Development SoTL Efforts

- Summers 2008 and 2009 Teaching Academies

- Faculty Development Series themes and topics in the last few years

- Faculty Learning Communities in Spring 2008, and Fall 2008
  - In Spring 2009, reading the book: “Enhancing Scholarly work on Teaching and Learning” by Maryellen Weimer
SOTL Council at SDSU

• Formed by Provost Peterson and approved by President Chicoine in Summer 2008.

• Appointed members represent all academic colleges, the Teaching Learning Center, the library, Academic Evaluation and Assessment, and Academic Affairs.
Questions??

Contact me anytime at the TLC: 6413 or in ECS: 4527

Or better yet, email me at:
Madeleine.andrawis@sdstate.edu