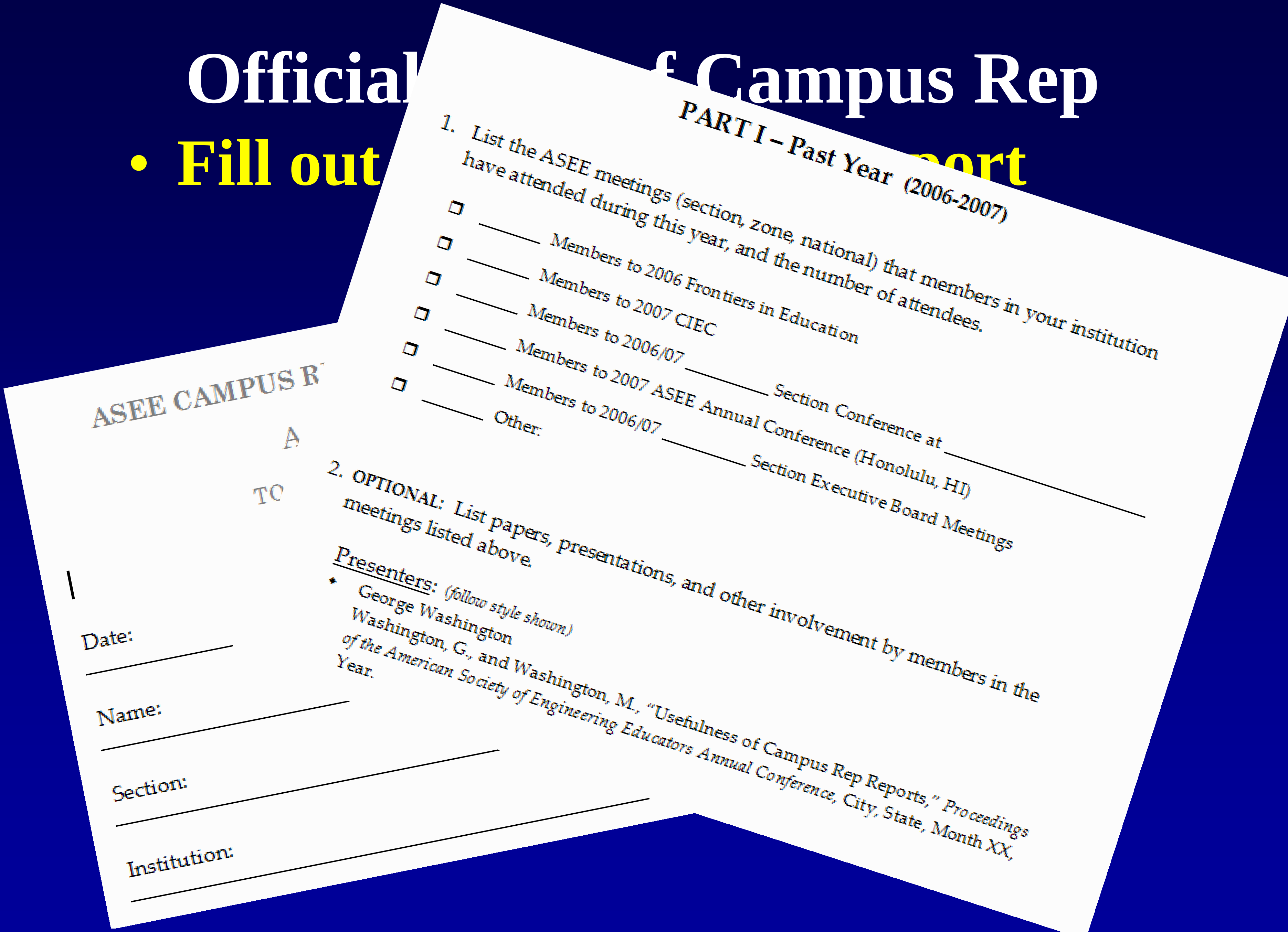
Campus Rep
Lessons Learned at Cal Poly

Brian Self

California Polytechnic State University
San Luis Obispo

Official … f Campus Rep

- Fill out … port



ASEE CAMPUS R…

A…

TO…

Date: __________

Name: __________

Section: __________

Institution: __________

PART I – Past Year (2006-2007)

1. List the ASEE meetings (section, zone, national) that members in your institution have attended during this year, and the number of attendees.
   - ❒ ______ Members to 2006 Frontiers in Education
   - ❒ ______ Members to 2007 CIEC
   - ❒ ______ Members to 2006/07 ______ Section Conference at ______
   - ❒ ______ Members to 2007 ASEE Annual Conference (Honolulu, HI)
   - ❒ ______ Members to 2006/07 ______ Section Executive Board Meetings
   - ❒ ______ Other:

2. **OPTIONAL:** List papers, presentations, and other involvement by members in the meetings listed above.

   Presenters: *(follow style shown)*

   - George Washington

   Washington, G., and Washington, M., "Usefulness of Campus Rep Reports," *Proceedings of the American Society of Engineering Educators Annual Conference*, City, State, Month XX, Year.

My Feeling on the "Duty" of Campus Reps

- **Advance the goals of ASEE on your campus**

Recruitment – Dean's Program

- **Dean pays for first year**
- **ASEE agrees to pay for second year**
- **List of Deans who participate is on the website**

Cal Poly- San Luis Obispo. Campus Rep: Brian Self

AMERICAN SOCIETY FOR ENGINEERING EDUCATION

Deans Program Application, 2007-2008

Return application with payment to:
American Society for Engineering Education; PO Box 18056-A; Ashburn, VA 20146
Or fax with credit card info to 202-265-8504

Campus Rep Name: BRIAN SELF

Mailing Address and Information: ☐ Work ☐ Home

Name ____
Institution ____
Dept. ____
Address ____
City ____ State ____ Zip ____ Country ____
E-Mail ____ Phone ____
Webpage ____ Fax ____
Gender: ☐ Male ☐ Female
Birthdate: __/__/__
Race/Ethnicity (check one): ☐ White, Non-Hispanic ☐ Black, Non-Hispanic ☐ Asian/Pacific Islander ☐ Hispanic ☐ Native American ☐ Decline to participate

Professional Information:
(Please complete the appropriate sections based on your employment)

ACADEMIC
Institution ____
Department ____
Title ____

Academic Rank
☐ Professor
☐ Associate Professor
☐ Assistant Professor
☐ Instructor
☐ Other ____

Highest Degree
☐ Ph.D.
☐ M.S./M.A.
☐ B.S./B.A.
☐ A.S./A.A.
☐ Other ____

Tenure Status:
☐ Tenured
☐ Tenure Track
☐ Non-Tenure Track

NON-ACADEMIC
Employer ____
Department ____
Title ____

Primary Job Function
☐ General Management
☐ Engineering: Mgmt.
☐ Engineering: Technical
☐ Human Resources
☐ Marketing
☐ University Relations
☐ Other ____

Education
☐ Engineering
☐ Engineering Technology
☐ Other ____

Highest Degree
☐ Ph.D.
☐ M.S./M.A.
☐ B.S./B.A.
☐ A.S./A.A.
☐ Other ____

Professional Affiliations: ____

Registered Professional Engineer: ☐ Yes ☐ No

ASEE Publications:
Membership dues include *ASEE Prism* magazine. Other publications are available at $10/year each:

☐ Journal of Engineering Education (quarterly)
☐ Profiles of Engineering & Engineering Technology Colleges (annual)

DPGM11

Recruitment – Dean's Program

- Email out an application in Word to all Engineering Faculty
- I record name, take to Dean's Office, they send in to ASEE with payment
- Only covers the $69 basic membership not division dues or any extra fees

Visit Department Meetings

- **Bring hard copies of Dean's Program Application**

Promote Better Teaching in Your College of Engineering

- Teaching Brownbags
- Send out relevant JEE and/or ASEE articles
- Create a "journal club" on engineering education research and other topics

Teaching Brownbags

- One each quarter, 2-3 speakers from different departments
- Encourage collaboration throughout the college (and beyond)

“Service Learning in Engineering”

“Teaching Engineers to Write Gooder”

“Capstone Design Projects”

Teaching Brownbags
Other Potential Topics

- Technology in the Classroom
- Active Learning
- Computer Programming throughout the Curriculum
- Project-Based Learning
- Tricks of the Trade for New Instructors

Teaching Brownbags

- **Ask your Center for Educational Excellence to co-sponsor**
  - **Did this at the Air Force Academy**
- **See if your Dean will spring for lunch**
  - **He provides pizza and drinks at Cal Poly**

Email Copies of JEE and ASEE Articles to Members

Does Faculty Research Improve Undergraduate Teaching? An Analysis of Existing and Potential Synergies

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Department of Chemical Engineering
North Carolina State University

Rebecca Brent
Education Designs, Inc.

Abstract

Academicians have been arguing for decades about whether or not faculty research supports undergraduate instruction. Those who say it does—a group that includes most administrators and faculty members—cite many ways in which research can enrich teaching, while those on the other side cite numerous studies that have consistently failed to show a measurable linkage between the two activities. This article proposes that the two sides are debating different propositions: whether research can support teaching in principle and whether it has been shown to do so in practice. The article reviews the literature on the current state of the research-teaching nexus and then examines three specific strategies for integrating teaching and scholarship: bringing research into the classroom, involving undergraduates in research projects, and broadening the definition of scholarship beyond frontier disciplinary research. Finally, ways are suggested to better realize the potential synergies between faculty research and undergraduate education.

Keywords: research-teaching nexus, research, teaching

I. Introduction

Research expectations for university faculty have been rising for over half a half a century, to an extent that research productivity has become the dominant and sometimes the sole criterion for hiring, tenure, and promotion at research universities. This trend has been driven by several factors, including the universities' growing dependence on external research funding to support basic operations and the intense desires of their administrators and faculty members for high national rankings. The consequent pressure on faculty members to increase research productivity is attested to by anecdotal reports [1–4], surveys of faculty and administrators [5], and examinations of faculty reward structures [6]. The pressure has led to increased faculty research activity, not only at research universities but also at institutions with teaching as their primary mission [7], and calls for increased scholarly activity have even been heard at the community college level [8–10].

The emphasis on research productivity in the faculty incentive and reward system is often justified by the claim that research enhances teaching. In a debate that has been raging for decades, most faculty members and administrators support this belief [11–13] and others challenge it [14–19]. In our opinion, the problem is that the two sides are debating different propositions: (1) research has the potential to support teaching; and (2) research has been shown to support teaching in practice. Those who argue that research supports teaching offer evidence in support of proposition 1, pointing out all the ways that scholarship might improve instruction, such as keeping course content up-to-date or modeling for students the intellectual curiosity and critical thinking that characterize good research. Most of those who argue the other way readily concede that teaching and research *can be* complementary but take the negative position on proposition 2, citing numerous studies that have consistently shown negligible correlations between research productivity and teaching performance.

As Rugarcia [18] and Felder [14] point out, research and teaching have different goals and require different skills and personal attributes. The primary goal of research is to advance knowledge, while that of teaching is to develop and enhance abilities. Researchers are valued mainly for what they discover and for the problems they solve, and teachers for what they enable their students to discover and solve. Excellent researchers must be observant, objective, skilled at drawing inferences, and tolerant of ambiguity, and excellent teachers must be skilled communicators, familiar with the conditions that promote learning and expert at establishing them, and approachable and empathetic. Having both sets of traits is clearly possible and desirable but not necessary to be successful in one domain or the other. Moreover, first-class teaching and first-class research are each effectively full-time jobs, so that time spent on one activity is generally time taken away from the other. There should consequently be no surprise if studies reveal no significant correlation between faculty research and effective teaching.

That is exactly what *is* revealed:

- Feldman [20] examined 42 studies and concluded that "the likelihood that research productivity actually benefits teaching is extremely small…the two, for all practical purposes, are essentially unrelated."
- Hattie and Marsh [21] examined 58 studies and explored correlations between such measures of teaching as student evaluations, peer evaluations and self-evaluations and a

Inductive Teaching and Learning Methods: Definitions, Comparisons, and Research Bases

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Department of Chemical Engineering
North Carolina State University

To state a theorem and then to show examples of it is literally to teach backwards.

(E. Kim Nebeuts)

Abstract

Traditional engineering instruction is deductive, beginning with theories and progressing to the applications of those theories. Alternative teaching approaches are more inductive. Topics are introduced by presenting specific observations, case studies or problems, and theories are taught or the students are helped to discover them only after the need to know them has been established. This study reviews several of the most commonly used inductive teaching methods, including inquiry learning, problem-based learning, project-based learning, case-based teaching, discovery learning, and just-in-time teaching. The paper defines each method, highlights commonalities and specific differences, and reviews research on the effectiveness of the methods. While the strength of the evidence varies from one method to another, inductive methods are consistently found to be at least equal to, and in general more effective than, traditional deductive methods for achieving a broad range of learning outcomes.

Keywords: inductive, teaching, learning

I. Introduction

A. Two Approaches to Education

Engineering and science are traditionally taught deductively. The instructor introduces a topic by lecturing on general principles, then uses the principles to derive mathematical models, shows illustrative applications of the models, gives students practice in similar derivations and applications in homework, and finally tests their ability to do the same sorts of things on exams. Little or no attention is initially paid to the question of *why* any of that is being done. What real-world phenomena can the models explain? What practical problems can they be used to solve, and why should the students care about any of it? The only motivation that students get—if any—is that the material will be important later in the curriculum or in their careers.

A well-established precept of educational psychology is that people are most strongly motivated to learn things they clearly perceive a need to know [1]. Simply telling students that they will need certain knowledge and skills some day is not a particularly effective motivator. A preferable alternative is *inductive teaching and learning*. Instead of beginning with general principles and eventually getting to applications, the instruction begins with specifics—a set of observations or experimental data to interpret, a case study to analyze, or a complex real-world problem to solve. As the students attempt to analyze the data or scenario and solve the problem, they generate a need for facts, rules, procedures, and guiding principles, at which point they are either presented with the needed information or helped to discover it for themselves.

Inductive teaching and learning is an umbrella term that encompasses a range of instructional methods, including inquiry learning, problem-based learning, project-based learning, case-based teaching, discovery learning, and just-in-time teaching. These methods have many features in common, besides the fact that they all qualify as inductive. They are all *learner-centered* (also known as *student-centered*), meaning that they impose more responsibility on students for their own learning than the traditional lecture-based deductive approach. They are all supported by research findings that students learn by fitting new information into existing cognitive structures and are unlikely to learn if the information has few apparent connections to what they already know and believe. They can all be characterized as *constructivist* methods, building on the widely accepted principle that students construct their own versions of reality rather than simply absorbing versions presented by their teachers. The methods almost always involve students discussing questions and solving problems in class (*active learning*), with much of the work in and out of class being done by students working in groups (*collaborative* or *cooperative learning*). The defining characteristics of the methods and features that most of them share are summarized in Table 1.

There are also differences among the different inductive methods. The end product of a project-based assignment is typically a formal written and/or oral report, while the end product of a guided inquiry may simply be the answer to an interesting question, such as why an egg takes longer to boil at a ski resort than at the beach and how frost can form on a night when the temperature does not drop below freezing. Case-based instruction and problem-based learning involve extensive analyses of real or hypothetical scenarios while just-in-time teaching may simply call on students to answer questions about readings prior to hearing

Journal Club

- Next year we will sponsor a Journal Club on Engineering Education
- Our Center for Teaching and Learning will help establish it
- Expansion of a previous group from EDGE funding (Vanasupa et al, NSF grant)

Administrative Duties

- Forward ASEE announcements and calls to the entire college, not just to members
- Encourage all departments to submit their members for ASEE awards – especially division awards
- Fill out online campus rep report

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Conclusion

- Encourage collaboration within your college (and outside your college)
- Encourage good teaching practices
- Get as many people as possible involved in ASEE