Scholarship in teaching and learning (SoTL) in Canadian post-secondary science: peer-reviewed journal articles, 2000 - 2010

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Evidence for SoTL is diverse

- Peer reviewed journal articles
- Peer reviewed conference proceedings
- Books and textbooks
- Courseware, learning objects, simulations, visualizations
- Curated collections
-

This study is limited to peer-reviewed journals

- Undergraduate science education including science literacy
- One author at a Canadian institution
- 2000 - 2010

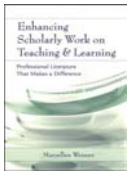
Several Questions

- Where is the body of literature?
- What types of scholarship are represented?
- What are the trends over time?
- What types of collaborations are common?
- What are the funding sources?

Enhancing Scholarly Work on Teaching and Learning: Professional literature that makes a difference.

Maryellen Weimer, 2006

- Wisdom of Practice scholarship
- Research scholarship



Wisdom of Practice: Personal Accounts of Change

Wisdom of Practice: Recommended Practices

Discussion Forum

The Power of Interactive Teaching

Received for publication, December 10, 2008, and in revised form, January 4, 2009

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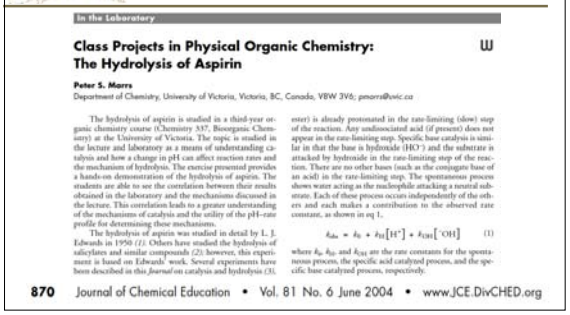
The teaching of the Molecular Life Sciences in most Universities still remains teacher-centered [1–3]. Instructors impart knowledge (terms, facts, concepts) in a didactic fashion and then complement these with "labo-ratories" or exercises to provide practice opportunities and develop skills. In such environments, students play predominantly passive roles [3, 4]. However, results from science education research show that by getting their students actively engaged, they may do more for student learning [5–9]. This suggests that, even though replacing one's way of teaching is not easy, faculty members should move progressively toward the appli-

work" is difficult since little if any reliable empirical evidence is available for most. Providing an extensive list may in fact have the opposite impact on teachers' willingness to change, by creating more insecurity and thus inducing greater resistance to the idea of leaving the lectern.

In this discussion forum, we argue that, rather than focus excessively on choosing ONE particular method, faculty members should be concerned with providing more opportunities for interactive teaching and never to ignore the specific context in which they teach. For

Wisdom of Practice: Recommended Content



In the Laboratory

Class Projects in Physical Organic Chemistry: The Hydrolysis of Aspirin W

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The hydrolysis of aspirin is studied in a third-year organic chemistry course (Chemistry 337, Bioorganic Chemistry) at the University of Victoria. The topic is studied in the lecture and laboratory as a means of understanding catalysis and how a change in pH can affect reaction rates and the mechanism of hydrolysis. The exercise presented provides a hands-on demonstration of the hydrolysis of aspirin. The students are able to see the correlation between their results obtained in the laboratory and the mechanisms discussed in the lecture. This correlation leads to a greater understanding of the mechanisms of catalysis and the utility of the pH–rate profile for determining these mechanisms.

The hydrolysis of aspirin was studied in detail by L. J. Edwards in 1950 (*1*). Others have studied the hydrolysis of salicylates and similar compounds (*2*); however, this experiment is based on Edwards' work. Several experiments have been described in this *Journal* on catalysis and hydrolysis (*3*).

ester) is already protonated in the rate-limiting (slow) step of the reaction. Any undissociated acid (if present) does not appear in the rate-limiting step. Specific base catalysis is similar in that the base is hydroxide (HO^-) and the substrate is attacked by hydroxide in the rate-limiting step of the reaction. There are no other bases (such as the conjugate base of an acid) in the rate-limiting step. The spontaneous process shows water acting as the nucleophile attacking a neutral substrate. Each of these process occurs independently of the others and each makes a contribution to the observed rate constant, as shown in eq 1.

$$k_{obs} = k_0 + k_H[H^+] + k_{OH}[^-OH] \quad (1)$$

where k_0, k_H, and k_{OH} are the rate constants for the spontaneous process, the specific acid catalyzed process, and the specific base catalyzed process, respectively.

Wisdom of Practice: Personal Narrative

AT ISSUE

THOSE WHO WILL NOT LEARN FROM HISTORY...

By Greg Wilson

I ATTENDED A WORKSHOP ON COMPUTATIONAL SCIENCE EDUCATION LAST SEPTEMBER THAT LEFT ME FEELING PESSIMISTIC ABOUT OUR DISCIPLINE'S PROSPECTS. THE ATTENDEES THEMSELVES WERE EVERYTHING ONE COULD HOPE FOR: INTELLIGENT, INVENTIVE, AND PASSIONATE PRACTITIONERS OF THEIR CRAFT, EAGER TO SHAPE A NEW GENERATION OF scientists. But their disregard for both the lessons of history and the issues that really matter to most working scientists left me wondering how different things will actually be in 10 years' time.

The first sign of trouble came when a distinguished British academic stood up to give the opening keynote. As he described how simulation and large-scale data analysis

ished "formalizing intent" under point 11 ("automating intellectual processes").

I'm all in favor of formalization, but there's a lot more to the craft of building software, scientific or otherwise, just as there's a lot more to building a radio telescope than Maxwell's equations. Most computer science departments don't even teach this craft to their own students particu-

Research: Quantitative Investigations

CBE—Life Sciences Education
Vol. 7, 245–251, Summer 2008

Article

Implementing Concept-based Learning in a Large Undergraduate Classroom

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Monitoring Editor: Robin Wright

An experiment explicitly introducing learning strategies to a large, first-year undergraduate cell biology course was undertaken to see whether awareness and use of strategies had a measurable impact on student performance. The construction of concept maps was selected as the strategy to be introduced because of an inherent coherence with a course structured by concepts. Data were collected over three different semesters of an introductory cell biology course, all teaching similar course material with the same professor and all evaluated using similar examinations. The first group, used as a control, did not construct concept maps, the second group constructed individual concept maps, and the third group first constructed individual maps then validated

Research: Qualitative Studies

Sci & Educ (2011) 20:159–172
DOI 10.1007/s11191-010-9298-z

Enhancing Students' Conceptual Understanding by Engaging Science Text with Reflective Writing as a Hermeneutical Circle

Calvin S. Kalman

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© Springer Science+Business Media B.V. 2010

Abstract Students can have great difficulty reading scientific texts and trying to cope with the professor in the classroom. Part of the reason for students' difficulties is that for a student taking a science gateway course the language, ontology and epistemology of science are akin to a foreign culture. There is thus an analogy between such a student and an anthropologist spending time among a native group in some remote part of the globe. This brings us naturally to the subject of hermeneutics. It is through language that we attempt to understand an alien culture. The hermeneutical circle involves the interplay

Research: Descriptive

International Journal of Mathematical Education in Science and Technology, Vol. 40, No. 2, 15 March 2009, 173–181

Taylor & Francis

Mathematics textbooks and their potential role in supporting misconceptions

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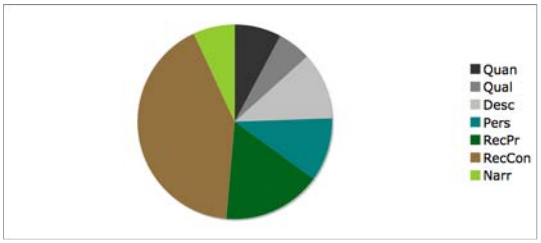
(*Received 28 March 2007*)

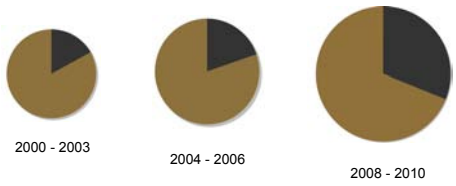
As a fundamental resource, textbooks shape the way we teach and learn mathematics. Based on examination of secondary school and university textbooks, we describe to what extent, and how, the presentation of mathematics material – in our case study, the concept of the line tangent to the graph of a function – could contribute to creation and strengthening of students' misconceptions. Our findings, roughly classified in several categories, raise awareness of non-obvious problems that need to be addressed when teaching

Majority of 350 papers is

Majority of literature is Recommended Content

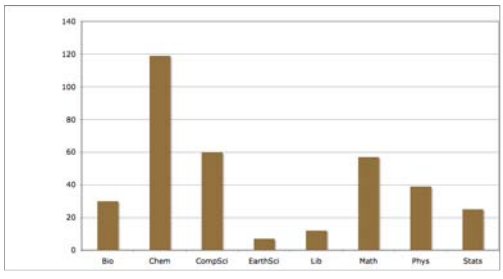


Increasing proportion of research scholarship



Which disciplines . . . .?

Lots of Chemistry!



Information Literacy

- Few articles
- Wisdom-of-Practice Scholarship
- Themes:
  - Relevant student assignment
  - Curriculum integration
  - Faculty-librarian collaboration

Relevant student assignments

[JEP]
the journal of electronic publishing

Home Search Browse About

Electronic Publishing as a Course Context for a Capstone Project on Protein Design

John F. Dawson

Volume 10, Issue 3, Fall 2007

DOI: 10.3998/3336451.0010.304

Permalink: http://hdl.handle.net/2027/spo.3336451.0010.304

Curriculum integration

Journal of Library Administration, 50:373–396, 2010

ISSN: 0193-0826 print / 1540-3564 online
DOI: 10.1080/01930821003667054

Routledge
Taylor & Francis Group

The Embedded Science Librarian: Partner in Curriculum Design and Delivery

PEGGY A. PRITCHARD
University of Guelph, Guelph, Ontario, Canada

ABSTRACT. *Information literacy is essential for success in undergraduate science programs, but teaching faculty are generally ill-prepared or unwilling to provide intentional support in their courses. Librarians are uniquely qualified to help. In this article, the author presents one example of a faculty-librarian collabora-*

Faculty-librarian collaboration

Science & Technology Libraries
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/wstl20

Integrating Customized Information into Science and Health Science Curricula

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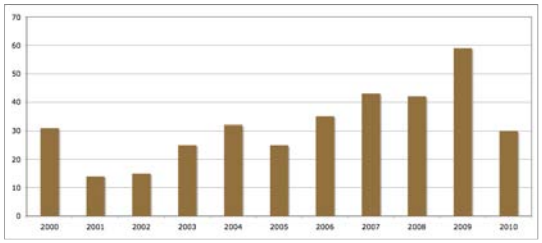
Information Literacy

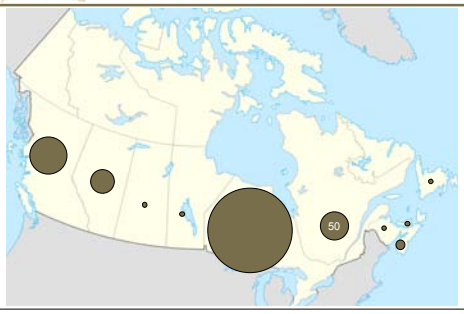
- Relevant student assignments
- Curriculum integration
- Faculty-librarian collaboration

Changing over time . . . .?

Generally increasing over time



Across Canada . . .



Over 125 sources, mostly disciplinary education journals

- *Biochemistry and Molecular Biology Education*
- *Advances in Physiology Education*
- *CBE Life Sciences Education*
- *Journal of Chemical Education*
- *Chemical Educator*
- *Chemistry Education Research and Practice*
- *SIGCSE Bulletin (Comp Sci.)*
- *IEEE Transactions on Education*
- *Journal of Geoscience Education*
- *Reference Services Review*
- *International Journal of Mathematics Education*
- *Alberta Science Education Journal*
- *Canadian Journal of Physics*
- *Physics Education*
- *Journal of Statistics Education*
- *Teaching Statistics*

Next step to engage with you

- *Complete database of journal articles*
- *Expand evidence to include peer-reviewed conference proceedings, books, courseware, on-line resources etc.*