



## Mixing research and teaching

The Chemistry Discipline Network can be a mentor and matchmaker for those new to educational research.

Progress in an academic career relies to a great extent on obtaining grants and publishing the results of research. Learning and Teaching grants are considered in promotion applications, albeit often not as heavily weighted as research grants.\* Engagement with the Scholarship of Teaching and Learning (SoTL) has been shown by educational researchers Angela Brew and Paul Ginns at the University of Sydney to have a positive impact on teaching practice and also allows publication of results, improving academic portfolios. Publication of research into teaching and learning promotes the scholarly aspect of this field.

For many people coming from a typical chemistry PhD program followed by postdoctoral positions and commencing an academic career, SoTL is unknown (see box). Entering this field, with its own research designs, measures of quality in research, grant agencies and funding opportunities, conferences, hierarchy of journals and citation conventions, can be daunting.

Many chemistry academics strive to improve their teaching and their student outcomes through incremental modifications to their teaching and learning strategies, but the results are

only likely to be publishable within SoTL if this is done in a systematic way and suitable evidence of impact is obtained.

In addition, many academics find themselves questioning their professional identity as they contemplate the move into educational research. As Sara Brownell, a biologist at Stanford University, and Kimberley Tanner, a biologist at San Francisco State University, argue, in science, teaching has a lower status than research; they point out in a 2012 paper that:

*Faculty members who want to be perceived as successful and 'real' scientists may have purposely avoided integrating teaching into their professional identities, because they feel it could undermine their scientific status with their colleagues, their departments, and their institutions. These actions might even be subconscious, a natural result of years of being surrounded by other faculty who view research as superior to teaching and hearing the age-old adage 'those who can, do; those who can't, teach'. This contributes to a professional identity that deemphasizes teaching specifically to maintain high professional status, both within the confines of the institution and within the larger context of the discipline.*

The attitude described, which is as prevalent in chemistry as it is in biology, leads to the isolation of teaching-intensive and teaching-focused academics at many institutions. For chemistry academics who are interested in improving the effectiveness of their teaching, and who would like to learn how to execute

\* The recent addition of grants from the Office for Learning and Teaching to the Australian Competitive Grants Register is likely to remove or reduce this discrepancy.

more rigorous educational research design and treat their teaching as part of their research, the Chemistry Discipline Network gives access to friendly guidance and mentoring.

The Network formed in 2011, funded by the Australian Learning and Teaching Council, with the broad goal of improving communication between chemistry academics in Australia. Our guiding principles of openness and inclusiveness have resulted in a broad membership representing all Australian universities. The group currently includes 130 members ranging from level A to level E, almost all of whom hold chemistry academic positions, and including many leaders in chemical education in Australia. At our monthly skype meetings, which are open to all who wish to participate, ideas and information are exchanged between people with diverse experience in teaching and in SoTL.

Participation in the Network is a way for more junior members of academic staff to meet people with a strong track record in this field in order to get started in SoTL. Advice on practical issues such as obtaining ethical permission to conduct the research, designing instruments to measure the impact of an intervention and the choice of journal for publication is readily available through this enthusiastic group. Members are also very helpful with suggesting published work related to research projects, which is very valuable and improves the quality of work undertaken.

Network activity leading to increased SoTL engagement of members is likely to directly improve our teaching and the outcomes for our students. In addition, the Network can be considered a learning community, and the benefits of learning communities in improving teaching practice and enhancing the professional identity of academics have been reported.

Our greatest resource is our members, their experience and expertise, and we have developed a member database, allowing people to find and contact others with similar teaching and sub-discipline interests. It is available on our website ([chemnet.edu.au](http://chemnet.edu.au)), along with other resources and discussion forums.

Since 2012, federal funding for educational research in Australia has been through the Office for Learning and Teaching (OLT). OLT grants are included in the Australian Competitive Grants Register and are considered Category 1 funding. This makes the grants as important as ARC funding for the allocation of Research Block Grants. Co-applicants on several successful OLT grant applications in 2012 became acquainted through the Chemistry Discipline Network, and the current round also includes joint applications from Network members. For people with an interest in SoTL, this is a route to funding and institutional recognition.

Many SoTL grants require the formation of a reference group for evaluation of the progress of the grant, and the network is an ideal way to get to know suitable people. The Science and Mathematics Network of Educators (SaMnet) is also an excellent forum to meet Australian SoTL researchers in science disciplines.

## A view of SoTL

Mark Connolly, Jana Bouwma-Gearhart and Matthew Clifford, from the Wisconsin Center for Education Research at the University of Madison-Wisconsin propose the following components (adapted from their 2007 paper in *Innovation in Higher Education*) that constitute SoTL.

- Drawing upon the work of others, including disciplinary colleagues, education researchers, and students
- Posing an explicit question about the effectiveness of one's practice, and creating and following an explicit design or plan
- Collecting, analysing and interpreting credible evidence to answer the question
- Reflecting and acting on one's findings in an ongoing and cyclical inquiry process
- Documenting and disseminating processes and outcomes of inquiry
- Being principally responsible for conducting the inquiry on one's own practice

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Through connections made possible by the Chemistry Discipline Network, collaborative research can be undertaken, leading to scholarly publications and grant applications, allowing funding of more research, and the furthering of an academic career.

Our next general (face-to-face) meeting will be held at 1 pm on 19 September at the University of Canberra, as part of the Discipline Day of the Australian Conference of Science and Mathematics Education (ACSME). Participation is free and all are welcome. For more information about this meeting, the skype meetings or the Network generally, please contact Madeleine Schultz ([madeleine.schultz@qut.edu.au](mailto:madeleine.schultz@qut.edu.au)).

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