# Enriching the teaching experience at UQ

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*Abstract: In 2006, an informal group was established at The University of Queensland to form a community of staff associated with teaching engineering undergraduates. SIGEE (Special Interest Group Engineering Education) presently has approximately 40 members including academics, tutors, service teachers, and librarians; the group meets approximately 4 times a year and are beginning to tackle big issues such as grade inflation, maths skills, and new teaching technologies. SIGEE has been successful in providing a forum for the teaching community to meet and establish networks. Further work is required to establish a successful repository of information and mentoring service that were part of the original remit.*

## Introduction

Academics are typically singular beasts that work alone on research and have been conditioned, by the current political climate, to release information sparingly until IP or patents are fully established. The introduction of the Research Quality Framework (RQF) has the potential to discourage research into engineering education and building a successful research portfolio leaves little time to improve teaching. This model of academia, particularly in the engineering disciplines, is not conducive to the trial and dissemination of best practice in education as it encourages the building of 'silos'. Academics can often feel as if they need to invent the wheel, if not the text book, to teach the undergraduate cohorts that they have been assigned. In reality, there is usually someone in a building not too far away who has been struggling with the same issues for a number of years and who has developed a number of workable solutions.

The occasional 'corridor' conversation can elicit transference of valuable teaching information but there is a measure of luck attached to such conversations: not only do you need to bump into the right person at the right time but you need to bring up the right topic. In many cases, you find out just too late to be of any use that Student X is a known quantity that needs special consideration, or that a lecturer in a different division has been using a specialised form of peer assessment for a number of years.

This paper documents the successful outcome of an 'over a cup of coffee' conversation between the authors who decided that together they would pool resources to fix the one thing that irked them most about teaching at The University of Queensland (UQ): the lack of communication amongst lecturers within the school and the limited opportunities for this to occur. It has been intentionally written in a conversational manner in order to reflect the nature of the 'Special Interest Group: Engineering Education' (SIGEE) that was the outcome of the initial conversation.

## The need

Communication between the academics teaching undergraduate engineering at UQ is challenged in a number of ways:

- the faculty is split into the School of Engineering (SoE) and the School of Information Technology and Electrical Engineering (ITEE);

- although the SoE operates as a single entity with central administration, academics are spread across a number of different buildings depending on their 'division' (e.g. chemical or civil engineering) thus physically precluding collaboration; and

- there are very few opportunities for the faculty to meet as a whole (6 monthly address followed by a BBQ, and biannual retreats).

In addition, there are more calls on an academics time than ever before making it increasingly difficult to talk in the corridor, reflect on the implementation of teaching innovation, or to engage in the scholarship of teaching. A keynote speaker (Chachra 2007) at a recent conference called on institutions to allow academics a 30 to 60 minute period every day in which they reflected on both research and teaching: their practice, the opportunities and the problems. While this would be nice, where would we find the time … and having found the time, think what else we could be doing in it!

At UQ, and probably also at other national institutions:

- there is an increasingly large 1$^{st}$ year intake into the Engineering program. At UQ undergraduate student numbers have increased from 600 in 2005, to 750 in 2006 and finally to 850 in 2007. This has had a knock-on effect in terms of resources; including rooms and tutors; time allocation; and the way in which courses are delivered. Compounding this is the fact that many students do not have the expected level of mathematical competency and hence require additional teaching support;

- despite financial incentives for 'res-teaching' (i.e giving research-only academics funds for teaching input) the number of academics available for teaching appears to have effectively dropped as student-staff ratios increase;

- increasing student numbers, combined with decreasing tutor numbers, has further stretched tutor support in courses with academics often having to 'fill the gaps' hence increasing teaching duties; and

- there is a real risk that the imminent introduction of the RQF will further move the focus on academic progression and retention on to research. There is a growing perception that academics will need to focus on attracting grant money, establishing international networks and publishing in Tier 1 journals. Where will this leave engineering academics keen to focus on their 'technical' research *and* teaching/education?

Whilst UQ has attracted many national teaching awards, dissemination of this rich resource to the individual academic is patchy. Many excellent teachers work quietly, without public recognition of their teaching achievements. Their skills and knowledge are an enormous potential asset that is often under utilised. Whilst the Teaching and Educational Development Institute (TEDI) provides both workshops and advice, it does not often include "hands on" or "at the coal face" information and experiences. It has been the authors' experience that many engineering academics, whilst having a strong commitment to quality teaching, are often not confident operating from an educational reference point. Additionally, these formal sessions are increasingly difficult to attend as they are usually scheduled during semester and often clash with teaching commitments.

Clearly the need for teaching collaboration has never been more important to not only allow innovations and proven processes to be quickly adopted and implemented, but also to support academics through the provision of a network of similarly challenged people with whom issues can be discussed.

The Instructional Study Group (ISG) is "one way to create and sustain the necessary social and organisational supports needed to improve teaching" (D'Eon 1997, p 109). An ISG meets regularly, has voluntary membership, focuses on the teaching and learning processes, and adheres to the democratic style of internal functioning (Makibbi and Sprague 1991).

## The aim

The aim of SIGEE, which is fundamentally an ISG, is to promote and foster excellence in engineering education by facilitating communication (Guskey 1995) across and within disciplines in the area of engineering education. The group does this by providing:

- a repository for information (best practice and innovation),

- a bi-monthly forum for teaching information dissemination (hot topics, visiting speakers, latest technology, etc),

- a mentor service for new staff and staff with new teaching challenges,

- a teaching staff directory for collaboration and networking providing details such as courses taught, teaching methodologies used, and educational research interests, and

- a place for teaching staff to meet and discuss experiences (the good, the bad, and the downright ugly).

These aims were brainstormed (Figure 1) during the initial SIGEE meeting to ensure all requirements were met.



**Figure 1 Initial SIGEE Discussions (from PowerPoint)**

During the inaugural meeting, the operation of SIGEE (Figure 2) was also discussed in a collaborative manner.



**Figure 2 SIGEE Operation Details (from PowerPoint)**

# Implementation and review

The opportunity to start up an engineering education discussion group/ network was discussed with the then head of school, Prof Jim Litster, the director of studies, A/Prof Caroline Crosthwaite, the head of chemical engineering, Prof Ian Cameron, and the Thiess chair in engineering education, Prof David Radcliffe. Strong support was gained from each of these academics and a 1st meeting was advertised throughout the SoE and ITEE. Initial funding was obtained from within the SoE to offer a 'free lunch' as an added attraction.

The current members of SIGEE number 49 and are formed from: 29 academics within the SoE and ITEE (including the dignitaries of the previous paragraph), 4 academics from other schools, 5 librarians, 5 postgraduates, and 6 administrative and project staff within the SoE.

Table 1 analyses the implementation of each of the initial aims and attempts to measure the success. In many cases, the initial methodologies have already been modified to improve the value of SIGEE.

**Table 1 Analysis of Implementation Methodology**

| Initial Aim | Implementation | Result |
|---|---|---|
| Repository for information | Mk I: Wiki (accessed through the SoE homepage)<br><br>Mk II: Blackboard (accessed through UQ elearning homepage – Figure 3) | The utilisation of a wiki required members to master and use a different technology. This was actually an initial aim which was not achieved; the site was rarely used and even we found it difficult to use and remember procedures when updating the site.<br><br>Blackboard, the current methodology, was not initially selected due to the requirement for an 'instructor' user to enrol new members and its lack of access to non-UQ personnel. However, it is a technology that all academics are familiar and therefore it is hoped that it will be more accessible.<br><br>The Carrick Institute RIN (2007) – Resource Identification Network – has been suggested as an alternative but little is known about availability and function. |
| Bi-monthly forum | Mk I: Bi-monthly<br><br>Mk II: Tri-monthly | We found that time restrictions prevented us from organising bi-monthly forums: tri-monthly was found to be more achievable. We also find that after a couple of months interest has been regenerated and SIGEE members start to ask when the next forum will be held. This also allows sufficient time to properly prepare and present the topic chosen for discussion.<br><br>Each forum has a specific topic and is led by a different SIGEE member. Topics to date have included: Blackboard, wikis, grade inflation, 1st year math skills (or lack thereof), and HP tablet technology. |
| Mentor service | Mk I: Voluntary (Wiki)<br><br><br><br>Mk II: Compilation by RA, school-wide distribution | Only three academics registered to provide a mentor service on the wiki site: the authors plus one other academic. The failure of this may have been due to the aforementioned difficulties with the wiki or perhaps the fact that academics needed to find sufficient time to enrol. Mk II will therefore employ an RA (or similar) to collect and compile this data rather than ask busy academics to enter their details in yet another database.<br><br>The mentoring service was also not advertised to the wider academic cohort in the first instance and therefore only those of us that are 'self reflective' and not in need of the service were exposed to the service. The final database will therefore be distributed through the school network to ensure that it gains |

| | | maximum distribution.<br><br>Interestingly, this was one aspect that was raised during accreditation talks.  Official policy within the school is to allocate a mentor to each new staff mentor to assist mainly with the establishment of research.  However this facility is not available for existing staff members and is patchy with respect to teaching; it this deficiency that SIGEE aims to address. |
|---|---|---|
| Teaching staff directory | Mark I: Informal discussion | The 'Xmas SIGEE meeting' was structured to allow academics to discuss their field of research in engineering education.  This was recorded in the meeting minutes and uploaded to the Blackboard site as a reference. |
| | Mark II: ? | However, we have to admit that this aspect of the initial SIGEE 'lofty aims and good intentions' has not been fully addressed due to the realities of increasingly limited time.  It is proposed that the required information be compiled by an RA and made available through the school rather than the SIGEE Blackboard site to ensure maximum accessibility. |
| Place to collaborate | Mark I: Additional time allowed after each forum presentation | The majority of SIGEE members are still present up to an hour after the formal presentation section of the forum has been completed.  Many heated debates have been held (with positive outcomes or at least a better understanding of view points) and an equal number of actions have occurred as a result.  Currently there are a number of collaborative grant proposals submitted that would not have occurred without this networking opportunity provided by SIGEE.<br><br>There has also been a successful collaboration between the maths department and SIGEE which has resulted in the 1st year maths course containing contextual mathematical problems for engineering students to undertake.  This successful innovation was facilitated through networking between staff after one forum. |

**Figure 3 Webshot of SIGEE Blackboard Site**

There have been a number of further positive outcomes from the formation of SIGEE:

o   recognition and support, in the form of strategic funding, was gained from the Engineering, Physical Science, and Architecture (EPSA) T&L (Teaching and Learning) Committee in 2006 – this funding has yet to be used, and was originally earmarked for bringing out an international teaching 'superstar' for consultation, but the act of writing this paper has identified the need for an RA to compile mentor and teaching staff databases;

o   inclusion in the successful submission for reaccreditation with both Engineers Australia and the Institute of Chemical Engineers in 2007;

o   recent UQ Teaching Grant application by academics from the Divisions of Civil and Chemical Engineering and the School of Mathematics. These contacts developed directly from SIGEE meetings and discussions;

o   ongoing inclusion in current attempts to develop a division or centre of engineering education within the SoE; and

o   uptake of the model by BACS (Biological and Chemical Science) faculty.  The last SIGEE meeting, featuring a brief seminar by Prof Ian Cameron who showcased HP tablet technology, and was attended by members from BACS who had been invited to attend.  These academics were astounded at the turnout and the passion with which issues were discussed; they carried away favourable impressions and immediately began similar proceedings in their faculty. BACS academics now meet weekly for lunch and the authors are often encouraged to attend thus further facilitating dissemination of good teaching practice.

## Future recommendations

Within its first 12 months, SIGEE has established itself within the framework of the SoE and ITEE. SIGEE has received strong support from academics and administration alike.  The objective now is to continue to focus on the original objectives and to further consolidate SIGEE.  With this in mind, there are a number of initiatives that SIGEE intends to address over the coming year:

•   SIGEE membership grows through word of mouth.  SIGEE would like to establish a process of formally inviting new (and existing) academic staff and tutors to attend meetings. We

believe that this will facilitate broader recognition of the mentor facility, especially amongst less experienced academics. The authors would like to see information on SIGEE included in the induction process for new staff in the SoE and ITEE.

- The intention of SIGEE mentors was to provide informal feedback to teaching staff, separate to any formal UQ mentor. Many academics have been reticent to include themselves on the mentor register, partially because uptake of the wiki site was poor, but also because a number did not believe that they were suitably qualified to act as mentors. The authors hope that the use of Blackboard will address the former, and intend to include a SIGEE session on the role of a mentor to address the latter. It appears that many capable academics underestimate their value as teachers.

- SIGEE has been embraced and strongly supported by the SoE/ ITEE librarians. Plans for the future include establishing a dedicated SIGEE area within UQ eSpace, the institutional digital repository for published works.

As with many such initiatives, time limitations are the biggest threat to the continuation of SIGEE. It is the authors' goal to nurture SIGEE to the point that it has enough momentum to ensure its continued growth and success.

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