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Faculty of Science and Institute for Teaching and Learning Tutor and Demonstrator Training: The Management of Small Group Teaching and Learning

Background

In 2002 the Academic Board reviewed the Faculty of Science. The review panel identified the training of tutors and laboratory demonstrators to be inconsistent and patchy across the Faculty. The Faculty was keen to address this by providing a basic level of training to all casual tutors and laboratory demonstrators and also to capitalise on the initiative to enhance the career development of the casual staff. Many tutors and laboratory demonstrators are drawn from honours and postgraduate students. While this cohort has the development of research skills as their main focus, the practice of tutoring is part of their intellectual development and having a demonstrable level of achievement in this area can only enhance their career prospects.

Contextual Issues

Tutors and lab demonstrators play a crucial role in bridging the gap between lecturer and student, and in facilitating student-centred learning. It is important then that these teachers develop the necessary knowledge, skills and attitudes to ensure the students have rich learning experiences. Programs to address the issues of “tutor training” are being developed in many universities, especially in the sciences and health sciences areas and the importance of this is highlighted by the degree of casualisation that has occurred in the higher education sector.

While the professional development of casual staff has received serious consideration in the USA in particular and, more recently, in the UK (Barrington, 1999), the issue is still relatively new in Australia. Questions about how the sector recruits, supports and assures the quality of performance of casual staff must be answered and in particular how do we acculturate casual staff to the new student-focused T&L agenda has been identified (Kift, 2002). Generally speaking casuals are almost routinely excluded from training and staff development opportunities (McAlpine, 2002), and this was identified as a major issue by the National Tertiary Education Union (NTEU) in 2001 (NTEU, 2001). In addition the Australian Universities Quality Agency (AUQA) has begun its five-yearly cycle of institutional quality assurance audits addressing processes for teaching, learning, research and administration/management.

The “tutor training” program was proposed in acknowledgment of the large number of casual staff needed to service the teaching of the sciences, especially in the large first year classes. The proposal was to provide an opportunity for all tutors and demonstrators to gain a clear orientation to the skills involved in undergraduate teaching coupled with a framework that will encourage reflection on their own teaching practice. It was anticipated that this orientation was to be conducted alongside the discipline-based training carried out within the Schools.

- Barrington, E. (1999) Catching Academic Staff at the Start: Professional Development for University Tutors. *Cornerstones: What do we Value in Higher Education?*, HERDSA Conference July 1999.
- Kift, S. (2002) Assuring Quality in the Casualisation of Teaching, Learning and Assessment: Towards Best Practice for the First Year Experience. *The Sixth Pacific Rim - First Year in Higher Education Conference 2002: Changing Agendas - Te Ao Hurihuri*, July, 2002, Christchurch, New Zealand.
- McAlpine, K. (2002) The regulation of casual employment in higher education. AHEIA Conference 2002, *What's ahead? Identifying challenges managing responses*. <http://www.aheia.edu.au>
- NTEU (2001) NTEU – finding out what casual want, *Casuals Update*, Dec 2001 <http://www.nteu.org.au>

Establishing the Program

The Faculty of Science received a Teaching Improvement Fund grant of \$25,000 in January 2003 to establish the program within the Faculty (Appendix 1 – project proposal). A working part from the Faculty of Science (Drs A George, G Kennedy, C Stewart) and UniServe Science (Ms K Placing) was established and met fortnightly to formulate the program. Extensive consultation with Associate Professor Mike Prosser of the Institute for Teaching and Learning occurred as well as input from many members of the Faculty. The result was a joint Faculty of Science – ITL program that was launched for first semester 2003.

Aim and Outcomes

The aim was to establish a sustainable program to provide an opportunity for all casual tutors and laboratory demonstrators in the Faculty to gain a clear orientation to the skills involved in undergraduate teaching coupled with a framework that will encourage reflection on their own teaching practice. It was anticipated that this orientation be conducted alongside the discipline-based training carried out within the Schools. This aims to ensure that all casual tutors and demonstrators in the Faculty are exposed to a minimum level of training. Successful completion of the orientation workshop and the accompanying exercises will entitle the tutor/laboratory demonstrator to a Faculty of Science - ITL certificate.

The Tutor Training Program

There are several aspects to the training program, all of which have to be satisfactorily completed to entitle the recipient to a Certificate of Completion. It is not intended that the Faculty based program replace any of the training already carried out in the Schools but rather to enhance it. The program was designed around several activities, each of which would have a low impact on the time commitments of the participants but which would prompt thought and reflection about the teaching practice they were engaged in.

The structure of the program follows:

- *Orientation Workshop*: this 2 hour interactive workshop, run jointly by the Faculty of Science and Institute of Teaching and Learning, briefly covered general aspects of small group teaching. It modelled small group interaction. The materials provided are supplied in Appendix 2.
- *School based training*: this covers the activities currently conducted in the Schools and will remain entirely the responsibility of the Schools (eg Safety Training where relevant in Schools).
- *Triggers* : participants were e-mailed half a dozen one-line scenarios in week 6 and 9 of the semester and asked to respond, in a few sentences, to one

of the scenarios. A selection of the scenario responses were placed on the web site. Feedback was given to each participant on their response. The scenarios covered typical teaching situations as well as some 'mechanical' aspects associated with teaching. A full list of the triggers are provided in Appendix 3.

- *Program-evaluation and reflection summary*: in week 13 the participants were e-mailed a pro-former on which they were asked how they had reflected on their teaching throughout the semester and how this had helped. Participants were also asked, separately, to complete an evaluation of the program. These tools are provided in Appendix 4.
- *Head of School/Unit Coordinator approval*: before a certificate of completion (Appendix 5) was issued to the participants, approval by the Head of School/Unit coordinator was sought to ensure that the tutor/lab demonstrator performs satisfactorily in the context of the discipline material and the requirements of the School in which they are tutoring.

Teaching Support

Ongoing support for the participants was achieved in a number of ways. Each participant was provided with a hard back folder containing resources at the orientation workshop. Participants were encouraged to use this to accumulate material relevant to their own teaching as the semester progressed. Conference style name badges were provided at the same time and the participants were encouraged to wear these when teaching, particularly in early weeks when getting to know the students. A web site was established providing resource material, a summary of discussion arising from the workshop and examples of responses to the 'trigger statements'. Written feedback was provided to every participant that responded to the trigger statements on their responses.

Timing

The main *Orientation Workshop* for Semester 1 2003 was held 10.30 – 12.30 Tuesday 4th March with a backup workshop at 4 – 6 pm on Thursday 13th March for those that could not attend the main workshop. The *Orientation Workshop* for Semester 2 2003 was held 10.30-12.30 Tuesday 22nd July for new casual tutors and laboratory demonstrators commencing mid year. The program for the orientation workshop is given in Appendix 6.

Exemption

It was recognised that some Schools already have extensive casual staff training sessions. Tutors/lab demonstrators from these Schools were exempted from the ITL/Faculty based program if it was shown that the 'generic' aspects of teaching as well as discipline specific aspects were already adequately covered. These tutors/lab demonstrators were not be eligible to receive the ITL/Faculty Certificate of Completion.

Cost

The budget provided project management and provision of a variety of requirements (photocopying, printing, folders, name tags, special certificate paper, etc.)

Implementation of program, Semester 1 2003

In Semester 1, 2003, the Tutor Training Program ran for the first time. With all casual tutors in the Faculty required to take part, the program received an uncharacteristically large number of participants, ranging from beginner tutors to very experienced faculty members.

This unique cohort of participants strained the program's mode of delivery — a workshop based around small-group teaching - for a class of over well over three hundred tutors was certainly not ideal. The presence of experienced tutors in the group was beneficial for their less experienced peers, but as the feedback outlined below indicates, the program's design did not serve the needs of many of those experienced tutors. Given that this first cohort was unique, and that in the future we expect only inexperienced tutors to participate, the shortcomings of the semester 1 2003 program can be balanced against the strongly positive feedback we received overall.

The Workshop

A total of 481 participated in the semester 1 workshops. This included tutors that had yet to give their first class as well as those that had taught for many years. Not all participants chose to complete the program. The last stage of the program incorporated a survey allowing comment and evaluation of the workshop, teaching scenarios (distributed in weeks 6 & 9), web site and the program in general. There were 212 surveys received. Table 1 gives a breakdown of participants and their disciplines and their response about the usefulness of attending the workshop.

School or Unit	Number attending Workshop	Number surveys returned	Found Workshop useful	Not find Workshop useful
Biological Sciences	67	33	31(94%)	2(6%)
Chemistry	84	34	29(85%)	5(15%)
Geosciences	7	3	3(100%)	0(0%)
History & Philosophy of Science	3	3	3(100%)	0(0%)
Information Technologies	112	45	39(87%)	6(13%)
Mathematics & Statistics	42	22	13(59%)	9(41%)
Molecular and Microbial Biosciences	22	3	1(33%)	2(67%)
Physics	80	36	25(69%)	11(31%)
Physiology	8	4	4(100%)	0(0%)
Psychology	56	30	24(80%)	6(20%)
TOTAL	481	212		

Table 1: Participation in the workshop and percentage finding workshop useful in supporting them in their teaching

Teaching Scenarios and Web Site

Triggers were sent out to participants during the semester. They were expected to respond to the triggers and send their responses in to the project coordinators, who commented on them. The survey asked them if these triggers were useful to them in their reflections on teaching. In addition a web site was maintained for them during the semester. Table 2 shows the responses according to discipline.

School or Unit	Triggers			Web Site		
	Found useful	Not find useful	No response	Found useful	Not find useful	Did not access
Biological Sciences	27(82%)	5(14%)	1(4%)	17(52%)	1(3%)	15(45%)
Chemistry	23(68%)	9(26%)	2(6%)	10(29%)	2(6%)	22(65%)
Geosciences	3(100%)	0(0%)	0(0%)	2(67%)	1(33%)	0(0%)
History & Philosophy of Science	3(100%)	0(0%)	0(0%)	1(33%)	0(0%)	2(67%)
Information Technologies	35(78%)	10(22%)	3(7%)	21(47%)	5(11%)	17(38%)
Mathematics & Statistics	13(59%)	7(32%)	2(9%)	6(27%)	5(23%)	11(50%)
Molecular and Microbial Biosciences	1(33%)	2(67%)	0(0%)	0(0%)	1(33%)	2(67%)
Physics	26(75%)	9(25%)	0(0%)	13(36%)	6(17%)	16(44%)
Physiology	4(100%)	0(0%)	0(0%)	4(100%)	0(0%)	0(0%)
Psychology	17(57%)	10(33%)	3(10%)	9(30%)	3(10%)	18(60%)

Table 2: Responses of participants to the usefulness of the triggers and web site

Qualitative feedback on the program

The majority of participants' comments on the feedback form were generally positive, with many simply indicating that they thought the program was 'good'. Concentrating on the extremes of opinion, then, draws out the aspects of the program that elicited a true response, and so provides true feedback to the organisers.

• Overview

The feedback from participants' written responses may be summarised as:

- Inexperienced tutors saw great benefit, as did some experienced tutors who found it to be a good refresher at the start of the term
- Many experienced tutors resented the program and did not find it of value in their teaching
- Inexperienced tutors enjoyed mixing with other tutors, both experienced and inexperienced, and both from within and outside their disciplines
- Inexperienced tutors found the scenarios and triggers useful, as they presented situations that they had not considered previously. They also benefited from seeing others' responses on the website.
- Generally, the large size of this cohort of tutors was perceived negatively, with many tutors requesting smaller groups for future programs.

Demonstrators in lab-based classes expressed disappointment that this teaching environment was not properly addressed in the program, and that the triggers and scenarios in the workshop were biased towards tutorials.

• Size of program

Many participants said that the size of the workshop was far too large. Some suggested using more interactive exercises, such as online discussion groups instead of 'one-off' reflection triggers. While the first run of this program was uncharacteristically large, we need to be aware that large groups are certainly problematic.

• Experience

By far the greatest factor in polarising participants' evaluations of the program was previous tutoring or demonstrating experience. Many first-time tutors expressed approval for the

workshop and subsequent reflection exercises. A common opinion was that mixing with other tutors, from their own and from other disciplines, was very useful in helping them feel more secure about the semester ahead, and helped prepare them for their first classes:

The preliminary workshop was very helpful in demonstrating the situations that a first-time tutor would be faced with ... It helped to provide a means of dealing with nervousness, difficult or uncooperative students, and helped to establish an organised approach to our teaching. (IT025F)

However, many experienced tutors found the experience to be less useful. Many simply stated that the ideas and scenarios were familiar to them, and so they weren't stretched by the experience.

Most of the information we covered in the workshop was kind of obvious ... perhaps because I had taught already for a year previous to it. (Psych019F)

I found it all a complete waste of time. Most of it was common sense. I have also been demonstrating for years so don't need any assistance. (C032F)

Some were more vitriolic:

It was a complete waste of time and the faculty's money ... (Physics008)

The message here is that the focus of the program was perceived to be on the beginning tutor, and many experienced tutors resented the waste of their time. However, many beginner tutors found the input from their more experienced peers to be valuable.

- **The teaching and learning environment**

Some participants, particularly in Physics and Chemistry, noted that they found the workshop and triggers less useful because they didn't reflect their teaching experience in the lab. They found the examples to be more relevant to a tutorial situation, and expressed frustration that they could not apply many of the ideas, such as the tutorial planning template, because they don't have that sort of control over the laboratory session.

Each department has different focuses and needs for teaching. I think the main focus ... in chemistry is [lab] demonstration and I don't feel the skills required by demonstrators was thoroughly covered by the program. (C008F)

The different styles of tutorial and lab classes are worth considering for future programs.

- **The triggers**

Some participants commented that the triggers were contrived and unrealistic (though just as many enjoyed the 'realistic situations' they were required to consider). A few also admitted that they chose the 'easiest' trigger each time, and that the triggers required little commitment from them. As a result, they felt they didn't learn much from the exercise.

I just chose the easy question! (IT004M)

Felt that the situations were contrived and students do not usually react the way we expect them to react ... (IT032M)

Balancing this, many participants enjoyed the challenge of addressing a new teaching scenario, and then finding out what others thought on the web site. A few suggested making more use of this resource, by tightening the link between the triggers, the feedback and the web site.

I enjoyed reading the responses of other tutors to the scenarios. (Psych019F)

Some people considered totally different strategies to me so that was useful. (IT039M)

Once again, it appears the triggers are of most value to beginner tutors who have not encountered situations like these previously. Many experienced tutors found this component of the program to be 'just common sense'.

- **Summary**

While there were extreme views expressed about the program, the impression received from reading all surveys was overwhelmingly positive. It was clear that the large size of the workshop was an issue and that new tutors found it much more helpful than those that already had tutoring experience. Note that in future years the program will be focused on new tutors and demonstrators only.

Implementation of program Semester 2 2003

In Semester 2, 2003, the Tutor Training Program was attended by a much smaller number of teachers, including those from the medical schools who teach in science programs. The program was essentially the same as in Semester 1. Table 3 gives a breakdown of participants and their disciplines and their responses about the usefulness of attending the workshop.

School or Unit	Number attending Workshop	Number surveys returned	Found Workshop useful	Not find Workshop useful
Biological Sciences	23	18	16 (89%)	1 (6%)
Chemistry	4	1	1 (100%)	0 (0%)
Geosciences	6	5	5 (100%)	0 (0%)
History & Philosophy of Science	N/A	N/A	N/A	N/A
Information Technologies	15	9	8 (89%)	1 (11%)
Mathematics & Statistics	8	5	3 (60%)	2 (40%)
Molecular and Microbial Biosciences	N/A	N/A	N/A	N/A
Physics	N/A	N/A	N/A	N/A
Physiology	23	16	15 (94%)	1 (6%)
Psychology	N/A	N/A	N/A	N/A
TOTAL	79	54		

Table 3: Participation in the workshop and percentage finding workshop useful in supporting them in their teaching

School or Unit	Triggers			Web Site		
	Found useful	Not find useful	No response	Found useful	Not find useful	Did not access
Biological Sciences	14 (78%)	3 (17%)	0 (0%)	5 (28%)	2 (11%)	10 (56%)
Chemistry	2 (100%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	0 (0%)
Geosciences	3 (60%)	2 (40%)	0 (0%)	0 (0%)	3 (60%)	2 (40%)
History & Philosophy of Science	N/A	N/A	N/A	N/A	N/A	N/A
Information Technologies	5 (56%)	4 (44%)	0 (0%)	1 (11%)	6 (67%)	2 (22%)
Mathematics & Statistics	4 (80%)	0 (0%)	1 (20%)	4 (80%)	0 (0%)	1 (20%)
Molecular and Microbial Biosciences	N/A	N/A	N/A	N/A	N/A	N/A
Physics	N/A	N/A	N/A	N/A	N/A	N/A
Physiology	16 (100%)	0 (0%)	0 (0%)	7 (44%)	0 (0%)	9 (56%)
Psychology	N/A	N/A	N/A	N/A	N/A	N/A

Table 4: Responses of participants to the usefulness of the triggers and web site

Completion rates for program

Of the 481 starters in Semester 1, 218 gained a certificate of completion, having responded to the triggers sent out during the semester and the survey, and on gaining approval from their Head of School or Unit. The breakdown by discipline is in Table 5.

School or Unit	Number attending Workshop	Number responding to triggers and survey	Numbers with Head of School approval	Certified tutors % of total attending
Biological Sciences	67	33	30	45%
Chemistry	84	30	30	36%
Geosciences	7	3	3	43%
History & Philosophy of Science	3	3	3	100%
Information Technologies	112	42	41	37%
Mathematics & Statistics	42	22	22	52%
Molecular and Microbial Biosciences	22	2	2	9%
Physics	80	35	35	44%
Physiology	8	4	4	50%
Psychology	56	28	28	57%
TOTAL	481	202	197	41%

Table 5: Completions for semester 1

Semester 2 completions are pending Head of School approval for satisfactory performance. Final completion data will be circulated early next year.

Evaluation of the Tutor and Demonstrator Training Program

The evaluation of the program has been on a number of levels.

- The Faculty group has met to collate information, discuss the program and produce this report.
- Open-ended questions were asked of the participants in a survey sent out towards the end of the program. These are given in the **Qualitative feedback on the program** above.
- Members of the Faculty of Science Teaching and Learning committee were asked for their feedback and impressions of how the program has affected the quality of teaching in their Schools. There was a general feeling that the program was useful and should continue in its present form, at least in the short term. It was recognised that many of the Schools also have their own training programs for casual staff with more focus on the experiments/material to be taught. It was not possible to separate the effectiveness of the Faculty-based and School-based training programs from one another.
- Evaluation of the participants by Schools was also undertaken. Some of these are discussed in the next section. As an example, the format of the demonstrator evaluation survey filled in by students in first year Biology is given in Appendix 7.

Evaluation of the Participants by Schools

For participants to gain a Certificate of Completion, all components of the program had to be successfully completed. One component involved approval of the participant by the relevant Head of School or Unit Coordinator. This was to ensure competency in the discipline area being taught. Schools determined the method of approval.

The approval process for laboratory demonstrators in First Year Chemistry is taken as an example. All new demonstrators in the School have to pass the first year chemistry accreditation program. This is a semester long evaluation that involves attending weekly meetings to review and practice the experiments to be conducted that week. The academic in charge of the laboratory session evaluates the demonstrators for a number of activities on a weekly basis (knowledge & understanding of the concepts involved; marking student's work regularly and accurately; interaction with students; administration; techniques demonstrated; overall progress). Feedback is given to the demonstrators at the time to ensure support and improvement where necessary. The overall result is monitored by the academic in charge of all laboratories and accreditation granted at the end of semester or the demonstrator is required to undergo another semester of accreditation.

The quality of demonstrators is also monitored by end of semester surveys relating to the laboratory program by the question: *The demonstrators offered effective supervision and guidance*. As an example from one unit (CHEM1102) a broadly positive response was returned by 94.7% students (N = 243).

In the smaller classes various *ad hoc* arrangements were in place to evaluate the performance of the teacher. Mostly these were discussions between a senior staff person and the unit coordinator. Some reported performance on a set of criteria; others did not.

Recommendations

It is recommended that:

- the program continue using the same format and that participants be new tutors/demonstrators and that the model be extended across the College of Sciences and Technology where applicable.
- the information web page that gives exposure about the program should be maintained – <http://science.uniserve.edu.au/courses/tutortraining/> (see Appendix 8)
- each semester's program be delivered through WebCT site so that there is the opportunity for participants to use a discussion forum with their peers and to submit their responses to the triggers electronically to a central clearinghouse
- changes to the workshop should incorporate a small section on teaching in a laboratory situation as well as in a tutorial
- on the basis of positive comments from new staff, invite experienced staff to be involved in the workshops as mentors
- feedback on the trigger responses be shared by a larger group of experienced teachers, so that the responses are more timely and the load on any individual is small
- a set of criteria be developed to help Heads of School and Unit Coordinators to evaluate the new teaching staff

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Appendices

Appendix 1 - Project proposal
Appendix 2 - Workshop Handouts
Appendix 3 - Triggers
Appendix 4 - Survey instruments

Appendix 5 – Certificate
Appendix 6 – Workshop Program
Appendix 7 - Examples of Evaluations processes done by Heads of School
Appendix 8 - Pages from web site