

A peer observation program for the professional development of laboratory tutors

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Abstract

As undergraduate allied health programs continue to expand, there is increasing reliance on laboratory tutors, to engage, mentor and teach students. The bioscience laboratory is a specialised, tightly regulated learning environment and a potentially rich learning platform for students, but when the laboratory tutors are inadequately trained, the flow-on effects to the students can produce unfavourable learning outcomes. Traditionally, new tutors attend a generic sessional training workshop offered by the university. Due to the added health & safety considerations and the type of learning (kinaesthetic) that occurs in the laboratory, we identified a need for a specific professional development program for laboratory tutors. Our aim was to develop a program that allowed tutors to work within a framework tailored for laboratory teaching and, in a supportive environment, build teaching skills that promote student learning. Based on Lave's theory of situated learning (Lave, 1991) and the recognised approach of supported reflective practice (Bell, 2001) we placed opportunities for peer observation at the centre of the program. The framework presented here (3P's) was developed specifically for laboratory tutors and served as behavioural guidelines for peer observation sessions. Ten participants volunteered for the pilot program which concluded in 2015. Peer observation records and focus group data were gathered to evaluate the pilot program. Tutor feedback has initiated improvements in the program, and due to its overall success, it has been embedded into the recruitment/induction process for laboratory tutors in our department.

Keywords: *Peer Observation; Laboratory Teaching; Bioscience Education; Professional Development*

I. INTRODUCTION

In the laboratory teaching environment, creating a safe learning space for inexperienced undergraduate students is a significant responsibility for the laboratory tutor/instructor. While the university provides a generic teaching and learning workshop centrally, we identified the need for a specifically tailored framework for training the laboratory tutors. In response to this need we developed

- 1) A framework listing the professional qualities of a laboratory tutor (3P's matrix) and
- 2) An efficient on-the-job training program (peer observation).

A. Laboratory learning environment

The need for discipline-specific academic training programs is gaining recognition, particularly for laboratory-based learning (Good et al, 2015). Due to the

potential hazards encountered in the laboratory environment there is a certain behavioural code of conduct for laboratories that tutors need to teach and model without coming across as 'authoritarian'. Tutors need to be able to coach students as they learn skills kinaesthetically, and guide them to make connections between the laboratory and lecture content.

Situated learning and reflective practice served as the theoretical underpinnings of our peer observation design. In her theory of situated learning, Lave describes learning as a 'social phenomenon constituted in the experienced, lived-in world, through legitimate peripheral participation in ongoing social practice' (Lave, 1991, p64). In addition to situated learning, our approach emphasises reflective practice where activities involving observation '... encourage shared critical reflection on real-life teaching experiences-and can lead to transformation of both perspective and practice.'

(Bell, 2001).

This report details the framework and methodology for implementing this program which was piloted in 2014/2015 and, due to its success, is now embedded in our department as a prescribed training program for novice laboratory tutors.

II. METHODS

Formal ethical clearance was obtained before the commencement of the pilot program. Sessional laboratory tutors/instructors were invited to be part of the professional development program at the commencement of the teaching semester in 2014/2015. Ten tutors (4 experienced and 6 novice tutors)

volunteered for the program.

A. Induction workshop

As part of the program, a specifically designed two-hour induction workshop was delivered to the participants which highlighted effective teaching practices in the laboratory; it also included an explanation of the peer observation process. Two of the project team members (NC and HN) designed a matrix to create some structure for the tutoring role, termed the 3P's framework. 3P's is an acronym for **p**reparation, **p**articipation and **p**rofessionalism, key terms which categorise observable qualities of good laboratory teaching (see Table 1). All the resources (including the 3P's matrix) were made available to the program participants.

Laboratory Tutor Professional Development Matrix			
Competency	Evidence Level C Poor	Evidence Level B Average	Evidence Level A Excellent
Professionalism	Insufficient evidence E.g., <ul style="list-style-type: none"> • Fails to demonstrate respect for and awareness of health and safety obligations • Fails to engage with students in a friendly and professional manner • Does not maintain a professional relationship with fellow tutors • Arrives late • Does not adequately complete course related duties (e.g. marking within a given time frame) • Fails to make an effort to maintain academic integrity among students and/or does not report breaches • Fails to take direction from Course convenor 	Moderate evidence E.g., <ul style="list-style-type: none"> • Adheres to health and safety obligations but needs to communicate and demonstrate this more effectively to students. • Usually demonstrates a friendly but professional relationship with students • Usually demonstrates a professional relationship with fellow tutors • Arrives on time • Completes course related duties (eg. marking within a given time frame) • Mindful of academic integrity and reports breaches • Takes direction from Course convenor 	Significant evidence E.g., <ul style="list-style-type: none"> • Demonstrates and exemplifies respect and awareness of health and safety obligations • Demonstrates a friendly but professional relationship with students • Demonstrates a professional relationship with fellow tutors • Arrives on time and allows time for debriefing • Completes course related duties (eg. marking within a given time frame) and demonstrates interest in course improvement • Communicates the importance of academic integrity to students in a positive manner and reports breaches • Takes direction from Course convenor and communicates useful feedback
Preparation	Insufficient evidence E.g., <ul style="list-style-type: none"> • Fails to identify and address potential learning issues before the session • Does not prepare additional course materials as required • Demonstrates a lackadaisical approach to PPE 	Moderate evidence E.g., <ul style="list-style-type: none"> • Usually identifies and addresses potential learning issues prior to teaching class • Usually prepares additional course materials as required • Demonstrates appropriate use of PPE 	Significant evidence E.g., <ul style="list-style-type: none"> • Identifies and addresses potential learning issues prior to teaching class • Prepares additional course materials as required • Demonstrates importance and appropriate use of PPE and conveys this attitude effectively to the students
Participation	Insufficient evidence E.g., <ul style="list-style-type: none"> • Not always respectful to students • Stands back and talks to fellow teachers • Reluctant to help students • Not interested in getting to know students • Not consistent with information provided to students 	Moderate evidence E.g., <ul style="list-style-type: none"> • Mostly respects students • Sometimes reluctant to provide individualized assistance to students • Sometimes reluctant to get to know students including their strengths and weaknesses • Mostly provides consistent information to students 	Significant evidence E.g., <ul style="list-style-type: none"> • Respects students • Provides individualized assistance to students • Gets to know students including their strengths and weaknesses • Provides consistent information to students

Table 1. 3P's Matrix

B. Formation of the triad

An excel spreadsheet was electronically shared with the participants who filled in times indicating their availability to be observed, and to observe another tutor or peer. Course convenors also made themselves available to observe the participants as an “expert”. Once a triad was formed (observer, observee and expert) the observation session would proceed.

C. Peer observation process

The peer observation process was modelled on the university’s peer review of teaching program (Martin & Double, 1998) which most of the academic team in this program had experienced first-hand. The modified process we developed for sessional laboratory tutors included 3 episodes:

- 1) Observee prepares a summary of the teaching session
- 2) Peer observer and “expert” observer attend the session and observe the tutor and complete the feedback peer observation sheet which includes alignment with the 3P’s matrix and any other comments
- 3) The triad decide on a time to meet and give feedback (30 minutes) which is then followed by a second observation usually 3-5 weeks later.

D. Evaluation

1) *Focus group discussion:* Five of the participant tutors (3 novice and 2 experienced) volunteered to discuss their experience of the program in a 10 minute focus group session which took place the final week of semester after completion of the program. The focus group discussion was recorded, transcribed and analysed for relevant themes. The analytical procedures were based on the Conventional Content Analysis suggested by Hsieh and Shannon (2005).

2) *Peer observation sheets:* The peer observation sheets were analysed for tutor’s observed alignment to the 3P’s matrix.

III. RESULTS

A. Focus group discussion

1) Theme 1- Receiving feedback:

Participants recognized the need to receive feedback on their performance as tutors and agreed that it was a good initiative.

“In previous years there was never any critical feedback on our performance as tutors... and I always wondered how we know whether our performance is good or bad or how to improve...”

“It’s a two-way process...you get feedback when you are

observed, but when I was observing someone I realised that I could learn so much... you don’t just pick up on their mistakes but you can learn new ways of doing things to improve your own teaching”

2) Theme 2- Expectations:

Participants were not sure what to expect from the program.

“I was hesitant about starting the program because I felt that the labs I was going to be observed in I would be very anxious...doubtful in my knowledge and confidence...and I didn’t think I would be able to perform well...but as it turned out I was really calm”

3) Theme 3- Preparation and professionalism:

Participants feel the program helps formalise their teaching and give it meaning.

“One experience I had in one of the first lab sessions was quite negative in that I couldn’t troubleshoot the software problems the students were having...I spent most of the session trying to understand the software because I hadn’t properly prepared myself on how to use it...through that lab so many students were having problems and I felt helpless as a tutor and disappointed in myself...and I don’t think I would have reflected on that experience so greatly if I hadn’t been part of the program...I would have just taken it as a bad run..”

“I received some critical feedback on health & safety issues that I had disregarded...I simply forgot to take notice...usually I am so strict with health & safety... but I had become complacent...”

“I liked the way we had the matrix as something concrete to focus on...”

B. Peer Observation sheets

Based on the peer observation reports, participants were able to demonstrate moderate or significant evidence of the key attributes that we identified as important for the role of laboratory tutor, as defined in the 3P’s matrix. Only in 8 of the 60 observed teaching sessions did the observed tutor demonstrate insufficient evidence of a key attribute. We can infer from these peer observations that on the whole, the tutors had made an effort to model the attributes, and initiate improvements in their approach to teaching.

IV. DISCUSSION

This report details a professional development program

for laboratory tutors which incorporates strategies based on peer observation (situated learning) and feedback sessions (reflective practice). Results show that tutors in the program relied on the 3P's matrix in preparation for the observed sessions (over 90% of the teaching sessions observed showed alignment with the 3P's matrix). This indicates that with the 3P's framework tutors can learn "on the job" and form new practices to improve their teaching; a demonstrable outcome of situated learning. In addition, tutors agree that they "learn something" by observing their peers, another key component of situated learning (Lave, 1991).

Focus group discussions indicate that tutors appreciated the critical feedback regarding their teaching performance which generally resulted in improved performance in the subsequent observations. The feedback sessions encouraged reflective practice, leading to changes in "perspective and practice" (Bell, 2001). Not only did tutors acknowledge errors in their practice but developed confidence in practice initiatives. Such changes in attitude and practice are desirable outcomes in any professional development program.

V. CONCLUSION

This program is innovative as it focuses specifically on the professional development of laboratory tutors. It has fulfilled its primary purpose to create a framework to assist tutors to develop skills for teaching in bioscience laboratories. As we continue to encourage the development of expertise among tutors, experienced academics involved in the program also improve their skills by contributing to what essentially is a community of practice. Future evaluations of the program will incorporate a measurable comparison between the two observation episodes for novice tutors, based on the 3P's matrix. This will more clearly demonstrate, and help quantify, improvements in performance. The overriding aim of this program is improved learning in undergraduate laboratories, and our future course evaluations will target measurable student feedback on laboratory learning.

Notes on Contributors

Helen Naug PhD is a senior lecturer and academic lead for the common foundation year program for the Health faculty. Natalie Colson PhD is senior lecturer in Genetics and program director for the Bachelor of Biomedical Science program. Andrew Pearson PhD is senior lecturer and first year co-ordinator for the School of Medical Science. Grace Qi is a PhD candidate for the school of languages, humanities and social sciences. Eugene DuToit is associate professor and program director for the Bachelor of Biomedical Science with Honours program.

Declaration of Interest

The authors declare that they have no competing interests.

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