



University of Tasmania  
Annual Teaching Matters Conference

# Exploring Possibilities for Practice

7<sup>th</sup> Teaching Matters Annual Conference  
Thursday, 4<sup>th</sup> November,  
Launceston, Tasmania

Suggested format for citing papers:

Author, I. (2008). Title of paper, in J. Skalicky, N. Brown & A. Adam (Eds.), *Proceedings of the 7<sup>th</sup> Teaching Matters Annual Conference. Exploring possibilities for practice* [online], Launceston: University of Tasmania.

© CALT 2008. The works included in these conference papers are the property of their authors and are used by permission. Readers should apply the same principles of fair use to the works in this electronic journal that they would to a published, printed journal. These works may be read online, downloaded for personal use, or the URL of a document (from this server) included in another electronic document. The text itself may not be published commercially (in print or electronic form), edited, or otherwise altered without the permission of the author. As with printed materials, care should be taken when excerpting or referencing text to ensure that the views, opinions and arguments of the author accurately reflect those contained in the original work.

# **An innovative, inter-professional, clinical placement for medical students to teach therapeutics and Quality Use of Medicine**

**Danielle Truscott**

Launceston Clinical School, Launceston, Australia  
danielletruscott@bigpond.com

This paper describes an innovative teaching and learning project, conducted in the Launceston Clinical School at the University of Tasmania (UTAS). A clinical placement was created, utilising home medication reviews to provide an authentic inter-disciplinary learning activity to complement therapeutics teaching. The aim was to better prepare students to prescribe rationally and safely and to enhance their appreciation of Quality Use of Medicine. Thirty final year medical students performed comprehensive home medication reviews in conjunction with a consultant pharmacist, who also taught the class. There was reflection and discussion afterwards with the teaching pharmacist. The innovation was evaluated through student feedback, analysis of student reflections, and through the teacher's own reflective journal. Teaching in this community environment, an increasing area for health care delivery, also modelled to students professional communication and how collaboration towards judicious, appropriate, effective and safe medicine prescribing and patient partnership can lead to significant improvement in patient outcomes. An interpretation of the results concluded that the project was achievable, aligned, and integrated into existing education and enhanced teaching and learning in the discipline.

**Keywords:** Quality Use of Medicine, inter-disciplinary, authentic learning

## **Introduction**

Conservatively speaking most doctors will prescribe approximately two hundred thousand times in their career and medication is the main therapeutic option tried by most doctors (Smith, 2007; Han & Maxwell, 2006). New prescribers need to learn how to contribute to optimising the therapeutic effectiveness and manageability of drugs by preventing, identifying and resolving drug related problems. Yet traditionally, medical students have not been well prepared to prescribe rationally and safely due to little formal teaching of pharmacotherapeutics in the medical curriculum.

While the emphasis placed on therapeutics in medical schools in Australia is variable, interns are expected to be capable of acting as independent prescribers for the management of common conditions from the first day of postgraduate training (Pearson, Rolfe, & Smith, 2002, p. 782).

Therapeutics and prescribing in medical schools are usually taught through watching the behaviour of others (Shakib & George, 2003). Unfortunately the specialists in other disciplines, whom the students observe, often have little interest in teaching therapeutics in their field of practice (Rawlins, 2003). When teaching therapeutics and prescribing, there is a

need to correct for this opportunistic nature of observation, either ward based or in the community. Research suggests that if students are properly educated in rational and safe prescribing, this results in them adopting good prescribing habits after graduation (Iglar, Kennie, & Bajkar, 2007; Walley & Bligh, 2003). Added to this, there is evidence that once a prescriber adopts irrational prescribing it can be difficult to rectify (De Vries et al., 1995) and students not trained adequately are at such risk (Karaalp, Akici, Kocabasoglu, & Oktay, 2003).

It is widely appreciated that in opposition to their beneficial effects, drugs have the potential to cause great harm (Maxwell & Walley, 2003). The Australian Safety and Quality Council estimated back in 2002 that approximately 140,000 hospital admissions each year are related to problems with the use of medicines. Junior doctors spend their early careers in this practice setting. They are the most common prescribers and encounter this regularly, with little recognition of contributing factors and possible preventative strategies. Australian research showed that up to 75% could be prevented (Runciman, Roughead, Semple, & Adams, 2003). It has been widely discussed that in hospitals, junior doctors are responsible for a large number of significant prescribing errors (Tobaigy, McLay, & Ross, 2007). Some hospitals overseas have withdrawn prescribing rights of junior doctors until they can ensure that they can prescribe safely.

Set against critique of current methods of teaching prescribing and therapeutics are significant changes in health care more broadly that also impact on the education of future doctors. There is increasingly a shift from hospital care to ambulatory care reflecting the higher prevalence of chronic disease, the ageing population, work-force issues, cost, and new interventions becoming available. This influences not only health care delivery, but also the experiences available to medical students in training that is predominantly hospital based.

There is now recognition that the patient mix in teaching hospitals, with a high proportion of acute, short-stay patients, is no longer representative of the distribution of disease in the wider community (Prideaux et al., 2000, p. 820).

The shift towards community based care means that older adults living independently in the community are responsible for managing and taking their medicines correctly and safely. A study in 2004 of 1000 patients living in the community identified that the bulk of medication use in Australia occurs within the community and found that ninety percent of patients studied had one medication related problem (Roughead, Barratt, & Gilbert, 2004). There is also the movement towards inclusive and collaborative teams and decreasing professional boundaries. Members of the team need to network and understand the roles, expertise and perspectives of other team members in order to function effectively.

The only way to truly engender integration and interdisciplinary primary care teams is if the educational models for teaching and clinical practice are integrated so that each professional becomes aware of the knowledge, skills, and attributes that colleagues of different disciplines bring with them (Pringle, Levitt, Horsburgh, Wilson, & Whittaker, 2000, p. 86).

Medication review processes are one of the strategies employed in clinical practice to improve the outcomes associated with medication use in the community. Home medication reviews involve communication between patients, pharmacists and doctors which leads to more satisfied, knowledgeable patients who have improved concordance and fewer medication

related problems (Cox, Stevenson, Britten, & Dunbar, 2003, cited in Weiss & Britten, 2003; Gilbert, Barrett, & Roughead, 2002).

The home medication review method offered a worthwhile opportunity to address a number of the shortcomings in more traditional teaching of pharmacotherapeutics. It represents an authentic learning situation, not only through involving real patients in a real environment, but also the opportunity for inter-disciplinarity and for students to practice reflecting on the experience.

In too many schools in the health professions, students are given little or no opportunity to reflect systematically on...real experiences practicing the skills they needs as clinicians (Westberg, 2001, p. 313).

This paper describes a teaching and learning project designed to complement therapeutics teaching in the final year of the Medicine course at UTAS. Aligning with allied teaching, the holistic approach formed patient partnerships because teaching with the patient, not about patients, provides a more stimulating and authentic learning activity for students (Lake & Ryan, 2004).

In this activity, for students, there was personal interest (avoiding a future critical incident such as inappropriate prescribing), it was relevant to medical students responsibilities and allowed active involvement in real world experience at an appropriate level of knowledge and skill for their stage of education. Discussion provided time for feedback and reflection. Thus the project was guided by recognised adult learning principles (Jerram, 2002). Characteristics assumed of adult learners are self-direction, past experience, readiness to learn, problem centred orientation and internal motivation (Smith, 2002).

The experience for students was planned to be personally relevant and to situate them in an appropriate social context. "Bridging the gap between the learning taking place within formal institutions and learning within real-life communities of practice can be difficult for university teachers" (Stein, Isaacs, & Andrews, 2004, p. 239). Although no similar projects in undergraduate medical education have been reported in the literature, a previous study investigating a pharmacist-supported training package in medication review for general practitioners in the UK had reported on an improvement in Quality Use of Medicine (QUM) (Krska, Gill, & Hansford, 2006).

## **Innovation**

The innovative teaching and learning project provided a unique clinical placement opportunity for medical students. Alongside a consultant pharmacist, students visited a patient in their home and performed a comprehensive medication review. The home medication review placement was an inter-disciplinary, authentic learning activity, modelling communication and collaboration between health professionals. Active involvement in the activity allowed for a greater student appreciation of the principles behind QUM: judicious, appropriate, safe and effective medicine use.

Current classroom teaching is where prescribing (drug choice and dosing) is taught. The unique setting in the project acknowledged the increasing proportion of health care delivery in the community. In this environment the project aimed to demonstrate to students that the outcomes of medication management can be improved if doctors, pharmacists, and patients

cooperate. It also allowed for demonstration of issues with administration and concordance. Students unearthed what patients take at home, as opposed to what was prescribed, and their medication taking behaviour. These important components of prescribing are often overlooked in medical school teaching (Caulfield, 2008). It also showed that poor management of ongoing medicine therapy (follow-up monitoring and detection of therapeutic problems) can interfere with quality patient outcomes.

It is not accepted that students only learn the knowledge base of a discipline during their Higher Education experience (Kember & Leung, 2005). In addition to specific issues around improvement in professional competency (e.g., cognitive therapeutic skills) and consolidation of previous learning, active learning in an out-of-class, real world experience provided an avenue for development of generic skills. These include communication, teamwork, interpersonal and problem solving skills. The Review of Australian Higher Education Discussion paper (Department of Education, Employment and Work Place Relations, DEEWR, 2008) reported that such generic skills are not well developed in all graduates.

Figure 1 summarises the competencies students had the opportunity to improve during the project. These are desirable outcomes and articulated with those in the overarching course.

**Students will improve their ability to:**

- Extract information from patient medical records.
- Interview a patient to obtain a current, comprehensive patient medication list.
- Use effective communication skills.
- Use observation skills to determine domiciliary issues that may impact on safe administration of medication.
- Assess a patient's ability to self manage their medication and health needs.
- Prevent, identify or resolve actual or potential drug related problems.
- Set health outcome goals and plan monitoring of outcomes.
- Locate and use resources of information, of high quality.
- Continuously recognise that there are risks and benefits with all drug treatments.
- Individualise management plans, including non-drug options, which meet a patient's therapeutic goals.
- Educate patients and carers about their treatment and medications.

**Students will be more aware of:**

- The use and integration of complementary and alternative treatments.
- Effective communication and collaboration between health professionals about confidential patient information.

**Students will begin:**

- Developing a personal formulary of preferred drugs.
- Applying a rational and safe approach to medication prescribing.
- Reflecting, recognising personal limitations, seeking assistance and planning learning needs.

**Figure 1: Student learning outcomes**

## **Methodology**

### **Planning**

The project idea was conceived and then planned by the therapeutics teacher who is also a consultant pharmacist. Planning was informed by relevant literature (as discussed in the introduction) to support the rationale and purpose of the innovation with an analysis of the current teaching and learning context to ensure the innovation would add value. A collection of planning proformas were merged so that all aspects were addressed. The plan was reviewed by self, peers and external stakeholders prior to implementation.

### **Implementation**

The project involved a number of stakeholders, namely, referring general practitioners (GPs), community pharmacy, patients, academic staff and medical students. General practitioners referred patients that met pre-determined criteria that indicated high risk of medication misadventure (for example, taking five or more medications without a dose-administration aid, advancing age). These patients gave their consent to take part in the project. Thirty final year medical students, individually or in pairs, undertook seventeen comprehensive home medication reviews (each student participated in one medication review). Following the patient home interview, de-briefs were undertaken that allowed reflection, discussion and identification of any potential or actual drug related problems. Medication review reports (feedback and recommendations) were written by the pharmacist and provided to the GPs to discuss with their patients when planning medication management.

### **Evaluation**

The project was more difficult to evaluate than traditional course-work teaching, being a unique activity that had no benchmarks or measures available for comparison and for which no other assessment data could be used. This is not uncommon when evaluating Higher Education teaching. The Review of Australian Higher Education discussion paper (DEEWR, 2008) provides an overview of the difficulties in measuring teaching quality and comparing learning outcomes.

The theoretical position used during this evaluation was one of pragmatism (Creswell, 2003), examining an innovation that was “real-world practice orientated” (p. 6). Case study methodology (Stake, 2000; Bergen & While, 2000) has been legitimated and commonly used in Higher Education research and was used for evaluation. This recognised that the evaluation from planning through to implementation was in context and bounded by time and space, yet complex and dynamic (Stake). Consistent with this methodology, a variety of data sources were used, via mixed methods, to collect evidence. This contributed to validity of the findings from triangulation of data. Elements of participatory action research (Wadsworth, 1998) were also used. There was critical self-reflection by the project leader to inform future planning.

The evaluation focus was student centred and included questions to see if student needs were met, if the innovative teaching activity worked, integrated into the curriculum and had potential to improve learning outcomes. It was considered important to be able to inform and improve future teaching and learning practice. The evaluation strategy included the following techniques to collect data and minimise bias: a researcher’s journal; active involvement in the project; observation of and discourse with students; reflective writing document; and a confidential questionnaire. The latter two were completed by participating students to record their perceptions. It was considered that students could provide a valid source of information (Morrison, 2003). The student questionnaire incorporated both Likert scale response and open

ended questions. Validity of findings was improved by asking questions related to recent activity, writing clear and unambiguous questions (although there may have still been an element of non-recognition or misunderstanding of some questions) and informing the students that their responses were valued.

Four key research questions are addressed in this paper. Table 1 outlines these questions, along with the data sources evaluated.

**Table 1: Research questions**

<b>Research question</b>	<b>Data sources</b>
1. Could the innovation be implemented within the existing context?	Planning documentation Researcher's journal Student attendance data
2. Did participating students find the activity a valuable learning experience?	Student questionnaire Reflective writing document Researcher's journal
3. Did the activity contribute to the achievement of the intended learning outcomes?	
4. Was the innovative teaching and learning activity successful?	

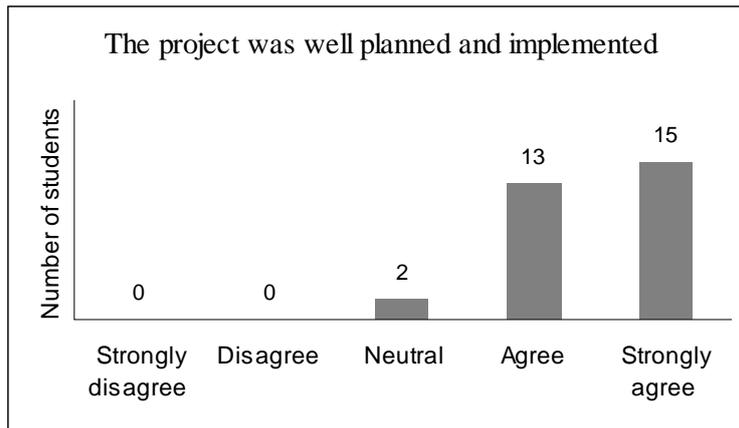
Qualitative and quantitative techniques were used to analyse the collected data. Descriptive statistics were used to interpret Likert scale responses in the questionnaire. Open response questions, reflective writing documents and the researchers journal were all analysed using thematic analysis (Stake, 2000).

It is acknowledged that data captured for analysis was short-term, with no attempt to look at longer term outcomes.

## **Results and discussion**

*Research question 1: Could the innovation be implemented within the existing context?*

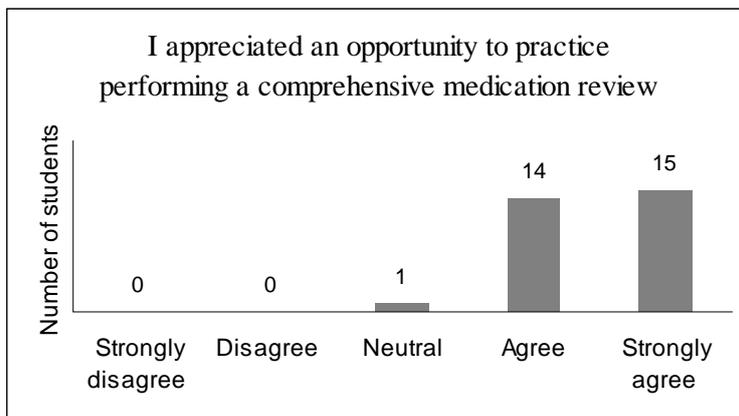
The project was implemented as described in the project plan and feedback from students indicated that they believed it to be well planned and implemented (Figure 2). This was also reflected in the teacher's own journal with only minor recommendations to implementation identified. These were to escort one student per patient, repeat the exercise with a broad variety of patient cases and get the student to write a report on their findings and recommendations (this could form part of formative assessment). The contribution of an encyclopaedic project plan, prior vocational and teaching experience of the teacher and support from the stakeholders are thought to be important contributing factors in this success. In order to implement community based teaching and learning activities, strong partnerships with external parties is important (Blumenthal, Jones, & McNeal, 2001).



**Figure 2: Student survey responses on project planning and implementation**

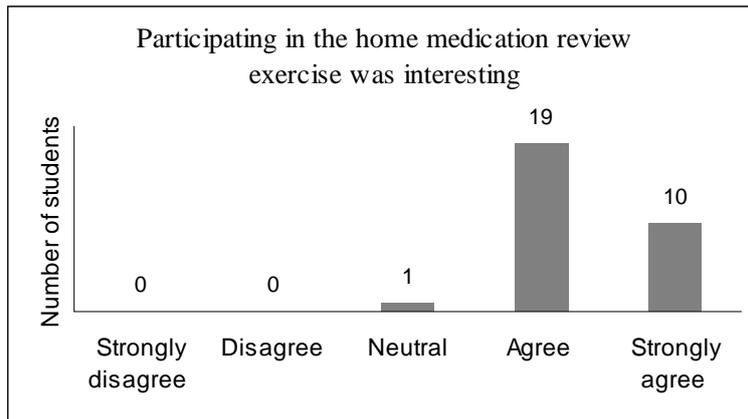
*Research question 2: Did participating students find the activity a valuable learning experience?*

Some students valued the experience more highly than others (Figure 3) and the project’s longer term influence was not investigated. From exposure to community collaborative practice, the student’s interest in primary care medicine may increase. Oneha, Yoshimoto, Bell, and Enos (2001) investigated what students valued from community-oriented education. It was found that the experience for those students increased their desire to pursue a vocational career in primary care, including rural and underserved areas. Students valued “meeting and working with real patients and experiencing the satisfaction of helping people” (p. 265). However, it is expected that there would be some students who expressed disinterest in ‘everyday’ medicine, and common scenarios, and this was supported by the findings (Figures 4 and 5).

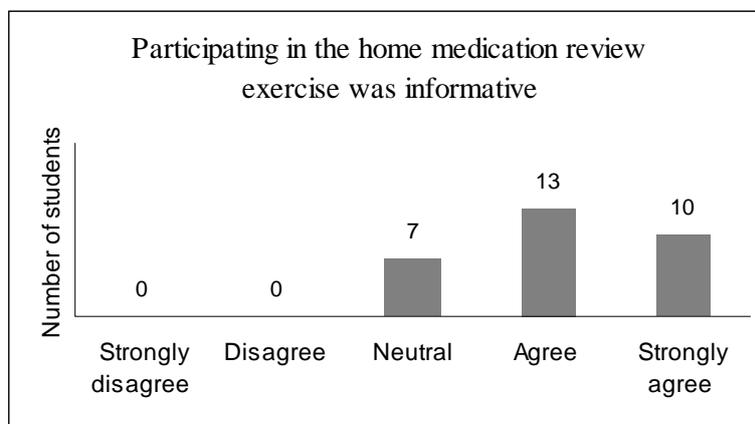


**Figure 3: Student survey responses on performing the exercise**

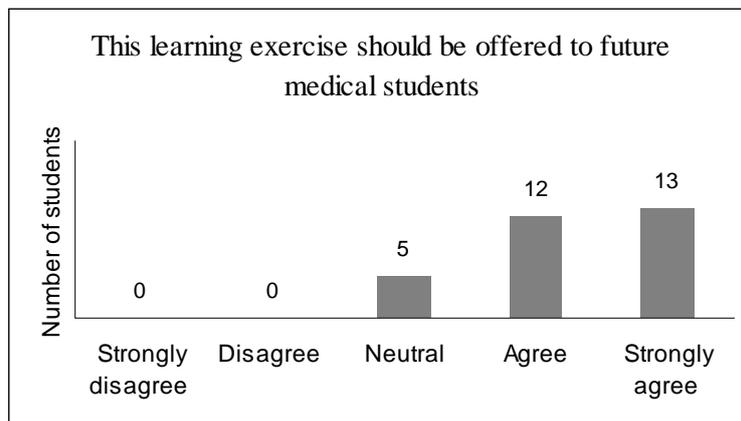
The attention provided to students, along with the necessity for them to become actively involved made the learning exercise interesting, informative and most agreed that the opportunity would be worthwhile for future students (Figure 4, Figure 5 and Figure 6). It allowed for student-centred learning (O’Neil & McMahon, 2005) and close involvement with students stimulated student inquiry.



**Figure 4: Student survey responses on the exercises interest**



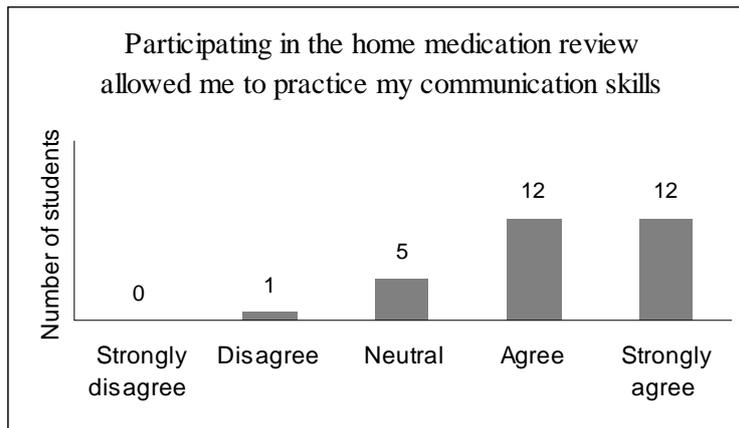
**Figure 5: Student survey responses on the informative nature of the exercise**



**Figure 6: Student survey responses on the benefit to future students**

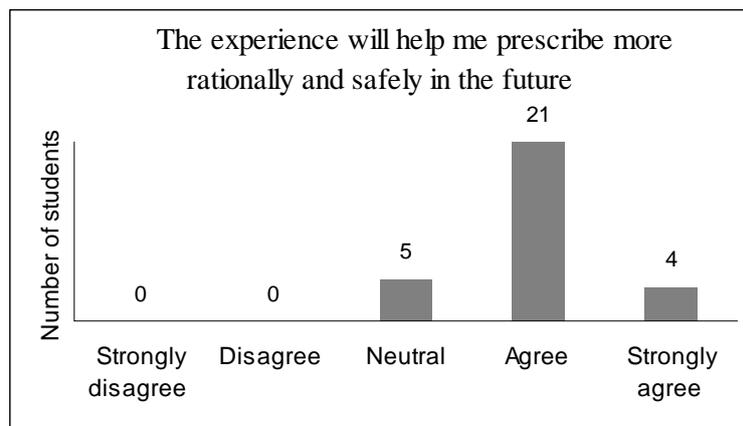
*Research question 3: Did the activity contribute to the achievement of the intended learning outcomes?*

The majority of students agreed that participation in the project allowed them to practice their communication skills (Figure 7). Reducing to a single student per patient interview would further improve the learning experience by allowing them to better practice their communication skills and provide a richer social experience.



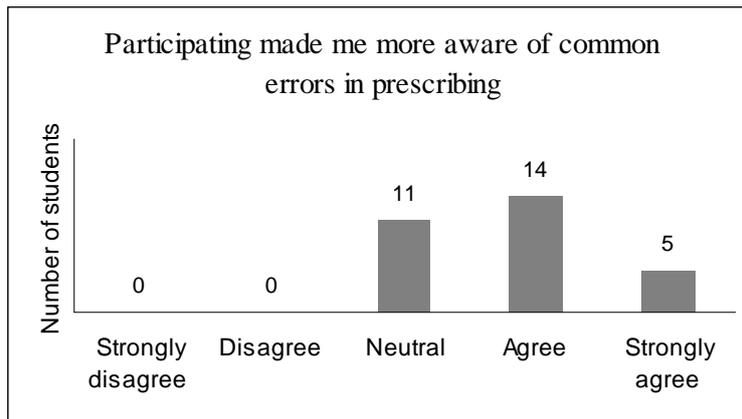
**Figure 7: Student survey responses on communication skills**

Students were asked about the short term impact of the experience on their learning (Figure 8). Students will respond to this against different expectations: student’s self-appraisal of their learning outcomes is not an objective measure and student conceptions of what constitutes learning can vary. They may expect an increase in knowledge or opportunity to apply knowledge, to understand knowledge, or to see something in a different way. The project was not challenging for all students, a reassuring finding considering the students are about to become junior doctors.

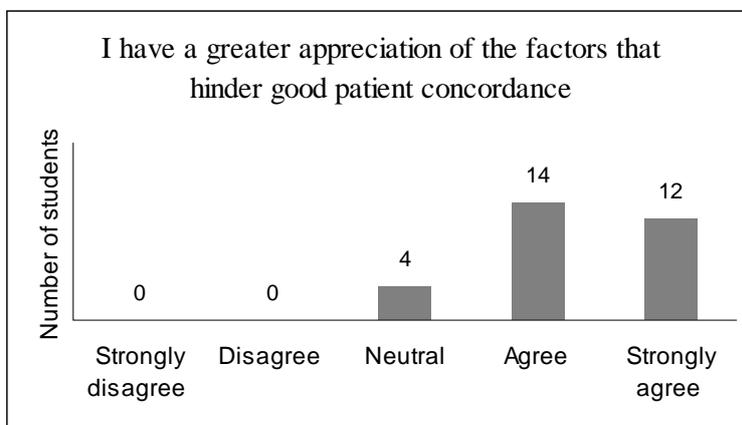


**Figure 8: Student survey responses on prescribing ability**

The selection of patients referred to the project was varied and some cases provided richer learning experiences than others. This variation made results less reliable for the responses outlined in Figures 9 and 10. Medical students need improved understanding of the most common co-medication patterns in the community, more knowledge about drug prescribing and awareness of errors in prescribing. Students expected to find many medication related problems and poor concordance, but fortunately, from a quality and safety perspective, and the GPs’ findings, this was not always the case. Participating patients were taking medications which are implicated in a large number of medication related problems (Runciman et al., 2003). Students were expected to look for preventable drug-related morbidity which includes errors and other problems in drug use and any harm caused by the inappropriate use or under-use of medication (Hepler, cited in Azzopardi, 2007).

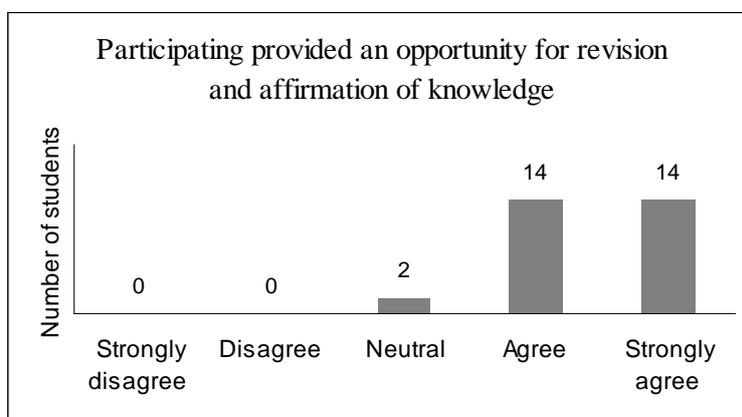


**Figure 9: Student survey responses on awareness of common errors in prescribing**



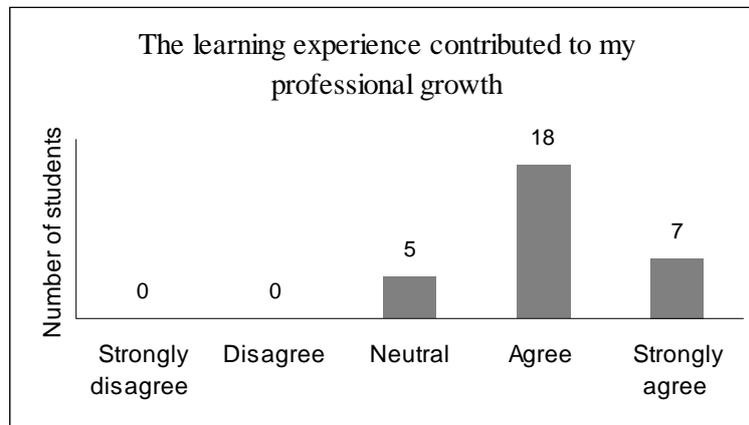
**Figure 10: Student survey responses on concordance influences**

Students had opportunity to revise and affirm their knowledge (Figure 11). It was expected that the students would search and synthesise further information, after the patient home visit, and apply this in the discussion. It was the pharmacists' responsibility to write the report, because of this some students did not fully use their cognitive therapeutic skills.



**Figure 11: Student survey responses on revision and affirmation of knowledge**

Taking education from the classroom and hospital to a community clinical placement in an authentic inter-disciplinary teaching activity facilitated the students to engage in the profession, in real professional practice (Figure 12).



**Figure 12: Student survey responses on professional growth**

Involvement with the students confirmed concerns that students are not fully capable to prescribe drugs (e.g., doses) and was reflected in their responses (Figure 13). Teaching during the project was designed around and reinforced the QUM principles by which students could add to their personal prescribing formulary prior to graduation; this is based on recognised best practice. Multiple opportunities to participate in the learning activity, with a variety of patients, is required to substantially improve prescribing practice. This is an area for project improvement, plus ensuring the patients referred demonstrate issues with complex prescribing, administration and concordance. The students appreciate and understand what is meant by the term QUM from their therapeutics curriculum, hence there was little scope for improvement for all students (data not shown).

Students practiced being a reflective practitioner by documenting, reflective thoughts and feelings on their learning experience (summarised in Figure 13).

**Learning needs identified:**

- Generic and brand names, doses
- The effect of multiple medications (polypharmacy) e.g., interactions
- Prioritising problems

**Personal strengths:**

- Knowing indications of drugs
- Showing respect and developing rapport
- Communicating in a manner the patient could understand

**Overall reflections:**

- Stimulated me to think
- Beneficial learning experience, learning in a practical setting improves recall
- Appreciated the opportunity to review medications, especially in the patient's home, but wished the patient was more complex
- Empathy for patients
- Worthwhile demonstration of factors hindering concordance
- Opportunity to focus on therapeutic issues, especially appropriate polypharmacy versus the potential problems

**Figure 13: Student reflection responses**

The project provided an opportunity for students to develop generic skills needed as future doctors: seeking, reviewing and giving information; communication with patients and other health professionals; identifying and solving problems; and ethical and social responsibility. The themes most commonly found were that students are less capable of considering multiple problems simultaneously and prioritising actions. Remembering the many brand names of each generic drug and the finer details in dosing of medications is a skill yet to be practiced. There was a degree of anxiety about their immediate future responsibilities. Yet, students welcomed the opportunity to discuss their strengths and weaknesses, became more self-aware and the experience directed future learning.

A face-to-face medication review in the patients own environment provided valuable insight into a variety of medication management issues, unearthing patient health experience, belief, attitude, preference, skill and behaviour (data not shown). Medical students need to learn how to develop a therapeutic alliance with patients (Cheng, 2007). This involves the patient and health professional agreeing on goals, how the goals will be achieved (e.g., appropriate use of medications) and the trust and empathy between them.

*Research question 4: Was the innovative teaching and learning activity successful?*

Fortunately, in this case, the teacher was experienced and comfortable teaching in a community environment. This characteristic is not universal across faculty members (Blumenthal et al., 2001). Students need practice at synthesising different disciplines and a teacher from another profession in an authentic environment can better facilitate integration of knowledge, understanding, skills and attitudes from a different disciplinary world (Figure 14). The teacher played a role in enabling students to engage with a specialist discourse (Northedge, 2003). Results from this project indicate that students valued the opportunity to witness how a professional pharmacist performed. One student, weeks later, wrote that they

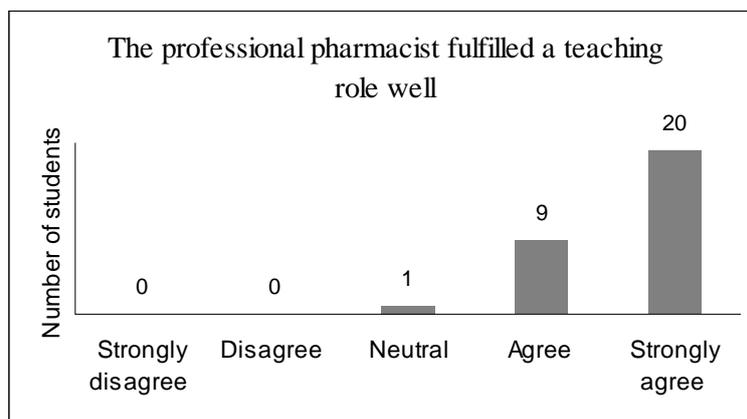
would never forget the way the pharmacist uncovered important information; they had practiced it themselves on a patient pre-operatively and discovered a significant finding in the medication which impressed their superior. “We’re probably going to be the only interns in Australia who think to ask any patches, eye drops, ear drops etc” (medical student). Professional role models can teach a broad range of professional values (e.g., ethics) and skills (e.g., punctuality). Student and teacher learnt together, applying inter-disciplinary philosophy at the educational level (Pringle et al., 2000). Behaving as a professional pharmacist, clinically, and teaching concurrently was more rewarding than teaching in the classroom.

Unless all components are addressed, the teaching can be prejudicial to the students by in effect reinforcing the disciplinary boundaries they operate within and are blinkered by, hence precluding their access to wider knowledge and understandings of how to resolve complex real world issues (Nursey-Bray, 2007).

In this activity, the disciplinary boundary was not reinforced. Another problem that can occur with inter-disciplinary teaching is the difference in preferred student learning styles. In this project this was not identified, perhaps due to the disciplines being adjunctive. The relationship between teacher and student has a significant impact on the quality of learning (Tiberius, Sinal, & Flak, cited by Lake, 2004). In this case the pharmacist had extensive experience in medical arenas and a prior rapport with the students. Students appeared to appreciate the contribution of allied health professionals and this was reinforced:

*My attitude hasn’t changed as it was always very positive for the involvement of other health professionals, they are very influential in achieving better health outcomes* (medical student).

The involvement of other people in teaching and learning also provides the added advantage and option of 360° assessment (opinion from multiple people, pharmacists, etc).



**Figure 14: Student survey responses on teaching role of Pharmacist**

## Conclusion

This teaching and learning project addressed a learning need and current areas of importance in preparing health professionals in Higher Education and is congruent with university teaching and learning priority areas. The vision was to improve the ability of medical students to prescribe effective medicine rationally and safely and increase their awareness of Quality Use of Medicine. Through this project, an authentic inter-disciplinary teaching and learning

activity utilising comprehensive medication review processes in the community, was developed and demonstrated to be achievable. There is the potential to plan similar teaching and learning activities elsewhere, considering the concept of home medication review is applied throughout Australia.

An interpretation of the evaluation concluded that the complementary activity proved to be an effective teaching strategy and aligned and integrated into existing course delivery. It enhanced current therapeutics teaching, teaching and learning in the discipline and health care education. Improved decision making around medicine prescribing will lead to significant improvement in patient outcomes. Therefore the importance of teaching therapeutics and prescribing cannot be underestimated. It is expected that the impact of the teaching and learning activity will continue after the students have graduated or arise if not surfaced at the time of participation (Morrison, 2003). Nevertheless, it is important to regularly critique goals and outcomes of teaching and learning against reality to ensure that students continue to be prepared to meet the challenges they will face as practicing health professionals within the changing health care environment.

## References

- Azzopardi, L. (2007). *MCQs in Clinical Pharmacy*. London: Pharmaceutical Press.
- Bergen, A., & While, A. (2000). A case for case studies: Exploring the use of case study design in community nursing research. *Journal of Advanced Nursing*, 31(4), 926-934.
- Blumenthal, D., Jones, A., & McNeal, M. (2001). Evaluating a community-based multiprofessional course in community health. *Education for Health*, 14(2), 251-255.
- Caulfield, J. (2008). Seeking out a better way. *Australian Pharmacist*, 27(10), 800.
- Cheng, M. (2007). New approaches for creating the therapeutic alliance: Solution-focused interviewing, motivational interviewing, and the medication interest model. *Psychiatric Clinics of North America*, 30, 157-166.
- Cresswell, J. (2003). *Research design: Qualitative, quantitative and mixed methods approaches* (2<sup>nd</sup> ed.). , USA: SAGE Publications.
- Department of Education, Employment and Work Place Relations, DEEWR, Australian Government. (2008). *Review of Australian Higher Education Discussion Paper June 2008*. Commonwealth of Australia. (Retrieved 17/06/ 2008) [www.dest.gov.au/NR/rdonlyres/06C65431-8791-4816-ACB9-6F1FF9CA3042/22465/08\\_222\\_Review\\_AusHEd\\_Internals\\_100PP\\_FINAL\\_WEB.pdf](http://www.dest.gov.au/NR/rdonlyres/06C65431-8791-4816-ACB9-6F1FF9CA3042/22465/08_222_Review_AusHEd_Internals_100PP_FINAL_WEB.pdf)
- De Vries, T., Henning, R., Hogerzeil H., Bapna, J., Bero, L., Kafle, K., Mabadeje, A., Santosa, B., & Smith, A. (1995). Impact of a short course in pharmacotherapy for undergraduate medical students: An international randomised controlled study. *Lancet*, 346(8988), 1454-1457.
- Han, W., & Maxwell, S. (2006). Are medical students adequately trained to prescribe at the point of graduation? Views of first year foundation doctors. *Scottish Medical Journal*, 51(4), 27-32.
- Iglar, K., Kennie, N., & Bajcar, J. (2007). I Can PresCribE A Drug: Mnemonic-based Teaching of Rational Prescribing. *Family Medicine*, 39(4), 236-240.
- Jerram C. (2002). *Applying adult education principles to university teaching*. HERDSA Conference Proceedings 2002, Perth (p. 369-375). Retrieved on September 17, 2006, from [www.ecu.edu.au/conferences/herdsa/main/papers/ref/pdf/Jerram.pdf](http://www.ecu.edu.au/conferences/herdsa/main/papers/ref/pdf/Jerram.pdf)
- Karaalp, A., Akicic, A., Kocabasoglu, Y., & Oktay, S. (2003). What do graduates think about a two-week rational pharmacotherapy course in the fifth year of medical education?. *Medical Teacher*, 25, 515-521.
- Kember, D., & Leung, D. (2005). The influence of active learning experiences on the development of graduate capabilities. *Studies in Higher Education*, 30(2), 157-184.
- Krska, J., Gill, D., & Hansford, D. (2006). Pharmacist-supported medication review training for general practitioners: feasibility and acceptability. *Medical Education*, 40, 1217-1225.
- Lake, F. (2004). Teaching on the run tips: Doctors as teachers. *Medical Journal of Australia*, 180, 415-416.
- Lake, F., & Ryan, G. (2004) Teaching on the run tips 1-12 . *Medical Journal of Australia*, 181(3), 158-159.
- Maxwell, S., & Walley, T. (2003). Teaching safe and effective prescribing in UK medical schools: A core curriculum for tomorrow's doctors. *British Journal Clinical Pharmacology*, 55, 496-503.
- Morrison, J. (2003). ABC of learning and teaching in medicine: Evaluation. *British Medical Journal*, 326, 385-387.
- Northedge, A. (2003). Enabling Participation in Academic Discourse. *Teaching in Higher Education*, 8(2), 169-180.
- Nursey-Bray, M. (2007, November). *E+S=DM: Using science to teach social science and build critical thinking skills*. In Showcasing Innovation, Proceedings of the 6<sup>th</sup> Teaching Matters Annual Conference [online], Hobart, Australia.
- Oneha, M., Yoshimoto, C., Bell, S., & Enos, R. (2001). Educating health professionals in a community setting: What Students Value. *Education For Health*, 14(2), 256-266.
- O'Neil, G., & McMahon, T. (2005) *Student-centred learning: What does it mean for students and lecturers?* Emerging Issues in the Practice of University Learning and Teaching. All Ireland Society for Higher Education, Dublin. [http://www.aishe.org/readings/2005-1/oneill-mcmahon-Tues\\_19th\\_Oct\\_SCL.pdf](http://www.aishe.org/readings/2005-1/oneill-mcmahon-Tues_19th_Oct_SCL.pdf)
- Pearson, S., Rolfe, I., & Smith, T. (2002). Factors influencing prescribing: An intern's perspective. *Medical Education*, 36, 781-787.
- Prideaux, D., Alexander, H., Bower A., Dacre, J., Haist, S., Jolly, B., Norcni, J., Roberts, T., Rothman, A., Rowe, R., & Tallett, S. (2000). Clinical teaching: Maintaining an educational role for doctors in the new health care environment. *Medical Education*, 34, 820-826.
- Pringle, D., Levitt, C., Horsburgh, M., Wilson, R., & Whittacker, M. (2000). Interdisciplinary collaboration and primary health care reform. *Canadian Journal of Public Health*, 91(2), 85-86.
- Rawlins, M. (2003). Clinical pharmacology and therapeutics into the future. *Journal of Clinical Pharmacology*, 55, 483-485.
- Roughead, E., Barratt, J., & Gilbert, A. (2004). Mediation-related problems commonly occurring in an Australian community setting. *Pharmacoepidemiological Drug Safety*, 13(2), 83-87.

- Runciman, W., Roughead, E., Semple, S., & Adams, R. (2003). Adverse drug events and medication errors in Australia. *International Journal of Quality in Health Care*, 15(supplement 1), i49-i59.
- Shakib, S., & George, A. (2003). Prescribing: What's all the fuss? *Australian Family Physician*, 32, 35-38.
- Smith, A. (2007). Competency for new prescribers. *Australian Prescriber*, 30, 58-59.
- Smith, M. (2002). Malcolm Knowles, informal adult education, self-direction and andragogy. The encyclopedia of informal education. Retrieved November 23, 2008, from [www.infed.org/thinkers/et-knowl.htm](http://www.infed.org/thinkers/et-knowl.htm)
- Stake, R. (2000). Case studies. In N. Denzin, & Y. Lincoln (Eds.). *Handbook of qualitative research* (pp. 435-453). , USA SAGE Publications.
- Stein, S., Isaacs, G., & Andrews, T. (2004). Incorporating authentic learning experiences within a university course. *Studies in Higher Education*, 29(2), 239-258.
- Tobaigy, M., McLay, J., & Ross, S. (2007). Foundation year 1 doctors and clinical pharmacology and therapeutics teaching. A retrospective view in light of experience. *British Journal Clinical Pharmacology*. Abstract retrieved 17 July, 2007, from Pubmed.
- Wadsworth, Y. (1998). What is Participatory Action Research? *Action Research International*, Paper 2. Retrieved July 20, 2008, from [www.scu.edu.au/schools/gcm/ar/ari/p-ywadsworth98.html](http://www.scu.edu.au/schools/gcm/ar/ari/p-ywadsworth98.html)
- Walley, T. & Bligh, J. (1993). The educational challenge of improving prescribing, *Postgraduate Education in General Practice*, 4, 50.
- Weiss, M., & Britten, N. (2003). Concordance. *The Pharmaceutical Journal*, 271(7270), 493.
- Westberg, J. (2001). Helping learners become reflective practitioners. *Education For Health*, 14(2), 313-321.