

The impact on clinical practice of a Postgraduate Clinical Pharmacy Programme, incorporating competency-based performance evaluation

JUDITH BURROWS^{1,2*}, CARL KIRKPATRICK^{1,3}, IAN COOMBES^{1,4}, LYNDA CARDIFF², ELAINE LUM²

¹School of Pharmacy, University of Queensland. Level 4. Pharmacy Australia Centre of Excellence. 20 Cornwall St, Woolloongabba, Brisbane. 4102, Australia.

²Medication Services Queensland. Level 1 Lobby 4. 153 Campbell St, Bowen Hills. 4006, Australia.

³Centre for Medicine Use and Safety, Faculty of Pharmacy and Pharmaceutical Sciences. Monash University. 381 Royal Parade, Parkville Victoria. 3052, Australia.

⁴Pharmacy Department, Royal Brisbane and Women's Hospital. Bowen Bridge Road, Herston. Brisbane. 4029, Australia.

Abstract

Background: A goal of the postgraduate clinical pharmacy programme (PGCPP) at the University of Queensland is to enhance clinical practice.

Aims: To evaluate student perceptions of the impact of the PGCPP on practice and the inclusion of a competency-based performance evaluation as a formative component of the curriculum.

Method: In 2010, students completed a questionnaire to evaluate the impact of the PGCPP. In 2011, formative competency-based performance evaluations were conducted as a component of the course and the questionnaire was repeated. Responses, competency ratings and evaluation feedback were collated. Data were analysed using descriptive statistics.

Results: 51/57 (89%) of students completed the questionnaire in 2010 and 2011. Over 90% of students agreed or strongly agreed that the PGCPP enhanced practice, knowledge, confidence and contribution to patient care. Responses were similarly positive after the inclusion of the performance evaluation.

Conclusion: This study demonstrated that the PGCPP is achieving the goal of enhancing the practice of pharmacists.

Keywords: *postgraduate, performance, development, competence, pharmacy*

Introduction

The development of clinical practice as a result of learning is a fundamental aim of postgraduate study in clinical pharmacy. Many authors concur that effective pharmacy education improves knowledge, the ability to reflect and the ability to apply and integrate this into the workplace to develop clinical competence (Black & Plowright, 2008; Blouin, Joyner, & Pollack, 2008; Kaartinen-Koutaniemi & Katajavuori, 2006).

Competence to practice effectively as a pharmacist develops through practice. The American College of Clinical Pharmacy consider competence development to be “the continual learning of new knowledge and the enhancement of critical thinking and problem solving skills through *practice*”. They argue that performance is related to the “amount of patient care practice” included in programmes and report that clinical pharmacist competence is achieved when one possesses “knowledge skills and attitudes to provide direct care to patients to ensure rational medication use” (Burke *et al.*, 2008). Epstein & Hundert propose a similar definition, that professional competence is “the habitual and judicious use of communication, knowledge, technical skills, clinical

reasoning, emotions, values, and reflection in daily practice for the benefit of the individual and the community being served” (Epstein & Hundert, 2002). These definitions of competency emphasise that knowledge and skills alone do not ensure competence and that competence relates to practice in the workplace.

However, teaching and learning at university has not traditionally been linked to the development of clinical competence in the workplace, although entry-level competency tools have recently been developed (Committee, A.P.P.F.S, 2011). The degree to which completing postgraduate study translates to an *improvement* or a *shift* in performance in the work place and how this development could be further enhanced, are key questions posed by stakeholders.

To enhance student access and to reduce contact time, the Postgraduate Clinical Pharmacy Programme (PGCPP) at the University of Queensland (UQ), Australia was remodelled from a face-to-face block delivery (20 days per year) to a flexible delivery in 2009/10 (six face-to-face days per year) by applying sound pedagogical principles. Learning was

*Correspondence: Ms. Judith Burrows, School of Pharmacy, University of Queensland. Level 4. Pharmacy Australia Centre of Excellence. 20 Cornwall St, Woolloongabba, Brisbane. 4102, Australia. Tel: +0 614 28220659; Fax: +0 617 33461999. Email: j.burrows@uq.edu.au

predominantly through interactive online modules and tutorials with the use of a virtual classroom. Group work, written case reviews and presentations, and reflections on practice were integrated into the learning and assessment tasks. While formal and informal feedback regarding the redeveloped coursework was positive, enhancing the application and integration of learning from the PGCPP into the workplace to optimise the development of clinical practice and competence of students remained a key goal.

Competence can be demonstrated using a variety of methods. Miller proposed a triangular hierarchy of clinical competence in which levels of competence are demonstrated via different methods at each layer of the triangle (Miller, 1990). The assessment of the PGCPP prior to 2009 adequately assessed “knows” and “knows how” levels in the triangle, through exams, presentations and assignments. The simulation of a real scenario in an Objective Structured Clinical Examination (OSCE) demonstrated the ability to “show how”. The highest level in Miller’s triangle – “does”, refers to observations of actual practice, which can only be evaluated directly in the workplace and was not a component of the PGCPP prior to the redevelopment.

A programme of competency-based performance evaluation and feedback for pharmacists using the General Level Framework (GLF), adapted from work undertaken in the United Kingdom, was introduced into Queensland Health (QH), Australia in 2006. The GLF tool contains 92 competency criteria, mapped to national competency standards for pharmacists. Pharmacists are rated as ‘rarely’, ‘sometimes’, ‘usually’ or ‘always’ effectively performing each competency, as observed in the workplace. Self-assessment, tailored feedback from a trained evaluator and an agreed development plan are integral components of the process, which takes half a day to complete.

A similar tool to the GLF was developed by the Society of Hospital Pharmacists of Australia (SHPA), the Clinical Competency Assessment Tool (shpaclinCAT) and launched nationally in 2011. In pharmacy practice, use of the GLF has been effective in improving clinical competency and increasing the consistency of performance of pharmacists in both the hospital and community settings (Antonioni *et al.*, 2010; Coombes *et al.*, 2010; Mills *et al.*, 2005). It was anticipated that the inclusion of a competency-based performance development framework into the PGCPP would evaluate the “does” in the workplace, which was crucial to meet the programme goals, to optimise professional practice and link coursework to clinical practice.

In 2011, a competency-based performance evaluation including self-assessment with the provision of structured feedback and an agreed development plan using either the QH GLF or the shpaclinCAT tool was incorporated into the PGCPP curriculum for first and second year therapeutics courses as a formative but compulsory component of assessment, regardless of the clinical setting in which postgraduate students worked. Up to 40% of students lived outside of Queensland and worked in a variety of clinical settings, the majority in public hospitals.

This study was designed to evaluate student perceptions of the impact on clinical practice of the PGCPP and the inclusion of the formative performance evaluation.

The aims of the study were to:

1. Evaluate student perceptions of the extent to which the remodelled PGCPP enhanced professional practice before and after the inclusion of the competency-based performance evaluation in the workplace.
2. Evaluate the feedback and outcomes of the introduction of the competency-based performance evaluation into the PGCPP.

Methods

Approval for the study was granted by The School of Pharmacy Human Research and Ethics Committee in September 2010. Students enrolled in the first and second years of PGCPP in 2010 and 2011 were invited to participate in the study. Students completed a specifically designed and piloted questionnaire containing 31 statements exploring perceptions of the outcomes of learning from specific components of the PGCPP on the development of differing aspects of clinical practice. The questionnaire used a five-point Likert scale. Questionnaires were completed in September and October 2010, and were repeated in 2011, after the inclusion of the performance evaluation into the programme.

Students were provided with information regarding the GLF/shpaclinCAT process at introductory sessions in February 2011. Clinical preceptors in the workplace signed a preceptor agreement to facilitate the work-based evaluation. All students completed a baseline self-assessment using the GLF at the beginning of Semester 1. First year students had a competency-based performance evaluation completed with a trained evaluator during Semester 1, 2011 and second year students during Semester 2. Local trained evaluators were utilised where possible. UQ evaluators completed the evaluations where no trained evaluators were available. Students were required to submit a copy of the evaluation to the course coordinator and provide feedback about their experience of the evaluation.

De-identified student responses from the questionnaires, student feedback on the GLF or shpaclinCAT evaluations, and competency ratings for seven key pre-selected criteria in these evaluations were collated and analysed using descriptive statistics.

Results

Of 109 eligible students, 98 (90%) enrolled in the study and completed the questionnaire; 47 of 52 in 2010 and 51 of 57 students in 2011.

The mean scores for responses to the questionnaires using a five-point Likert scale were chosen for analysis with this small sample size, as the responses were overwhelmingly positive and the median scores were consistently “4” for almost all questions from the 2010 and 2011 cohorts. The mean scores and the range of responses to statements around the impact of PGCPP on clinical practice are summarised in Table I for the 2010 and 2011 cohorts.

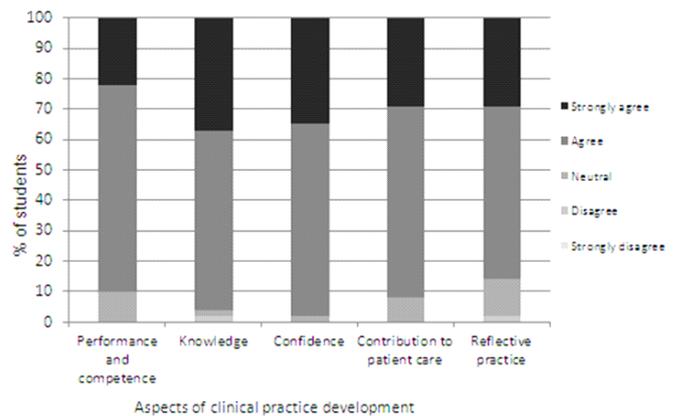
Table I: The impact of the PGCPP on clinical practice

Question- As a result of my learning from the PGCPP	Mean Scores (range) (1 Strongly Disagree –5 Strongly Agree)			
	Not exposed to performance evaluation as part of PGCPP		Exposed to performance evaluation as part of PGCPP	
	1 st Year 2010 n=29	2 nd Year 2010 n=18	1 st Year 2011 n= 30	2 nd Year 2011 n=21
My overall performance and competence as a clinical pharmacist has developed	4.28 (3-5)	4.28 (4-5)	4.2 (2-5)	4.47 (4-5)
My clinical knowledge has increased	4.31 (3-5)	4.32 (4-5)	4.33 (3-5)	4.33 (4-5)
I have developed new skills that I have applied to my clinical practice	4.17 (3-5)	4.11 (3-5)	4.10 (3-5)	4.10 (4-5)
My confidence as a clinical pharmacist has increased	4.38 (3-5)	4.18 (3-5)	4.10 (3-5)	4.38 (4-5)
I have become a more reflective practitioner	3.96 (2-5)	4.12 (3-5)	4.10 (3-5)	4.19 (4-5)
My contribution to patient care as part of the health care team has been enhanced	4.03 (3-5)	4.17 (3-5)	4.10 (2-5)	4.38 (3-5)
My job satisfaction has improved	3.75 (1-5)	3.76 (2-5)	3.73 (3-5)	4.14 (3-5)
My written communication skills have improved	3.69 (3-5)	3.29 (2-5)	3.46 (3-5)	3.85 (3-5)
My verbal communication skills have improved	3.72 (3-5)	3.76 (3-5)	3.73 (3-5)	4.4 (3-5)
I have developed a more patient centred approach to my practice	4.21 (3-5)	3.82 (2-5)	4.13 (3-5)	4.19 (3-5)

The mean ratings were similarly positive for first year cohorts before and after the integration of the performance evaluation into the curriculum. As the first year students in 2010 moved into second year 2011, there appeared to be a trend towards higher mean rating scores and a narrower range of responses for some aspects of practice; in particular overall performance and competence, contribution to patient care, job satisfaction and verbal communication skills. A similar trend was seen for the same criteria for second year 2011 compared to second year 2010, prior to the introduction of the performance evaluation into the curriculum. Not all students perceived that their job satisfaction had improved but the mean rating was 4.14 by the end of second year 2011, indicating a positive trend. Improvements in written and verbal communication skills appeared to have developed slightly less than other aspects of clinical practice although by second year 2011 the mean score for verbal communication skills was 4.4.

The responses for those students enrolled in 2011 (both first and second years) are presented in Figure 1. Over 90% of students either agreed or strongly agreed that their overall performance and competence as a clinical pharmacist had developed as a result of the PGCPP. Over 98% agreed or strongly agreed that their knowledge and confidence had developed as well. Just under 90% agreed or strongly agreed that they have become a more reflective practitioner and similar proportions perceived that their contribution to patient care had been enhanced and that they had developed a more patient centred approach to practice.

Figure 1: Student perceptions of the impact of learning from the PGCPP for 2011 (n=51)



All 35 students enrolled in PHRM 7030 (first year students) completed a competency-based performance evaluation in Semester 1 2011. All but one student were evaluated using the GLF tool as the shpaclinCAT had not yet been launched nationally. A site-specific locally developed version of a GLF was used for this evaluation.

Fourteen of the 35 evaluations (40%) were completed by UQ evaluators. Four of these were in the greater Brisbane area. UQ evaluators travelled to locations outside of Queensland for eight evaluations. Two of the 35 evaluations were conducted in community settings, one in a pharmacy and one during a Home Medicines Review.

During Semester 2 2011, all 23 students enrolled in PHRM 7060 (second year) completed a competency-based performance evaluation. Eleven of the 23 (48%) evaluations were completed using the GLF tool, 2 using the site specific GLF and the remaining 10 using the shpaclinCAT. This meant that 10 of the 11 evaluations outside of Queensland were able to be completed by local trained evaluators as part of their role, although one evaluation in the community setting was funded by PGCPP. In contrast to Semester 1, only five of the 23 (22%) of the evaluations were completed by UQ evaluators.

The responses for the whole 2011 cohort regarding components of the PGCPP that impacted on clinical practice, including perceptions of the performance evaluation are summarised in Figure 2. Seventy per cent of students agreed or strongly agreed that the competency-based performance evaluation contributed to the development of their practice, although this appeared to have less impact than learning from the online modules and tutorials, which are more substantive elements of the curriculum.

The mean scores of responses from the 2010 and 2011 cohorts with respect to the impact of the performance evaluation on clinical practice are summarised in Table II.

Students enrolled in 2010 were very positive about the prospect of being evaluated in their workplace as part of the PGCPP and the actual experience in 2011 was equally positive. Over 80% agreed or strongly agreed that being observed by an experienced pharmacist, receiving structured feedback and identifying learning needs with a plan as part of the competency development evaluation was beneficial to clinical development. However, the perceived benefit of the

Figure 2: Student perceptions of the aspects of learning that impacted on clinical practice for 2011 (n=51).

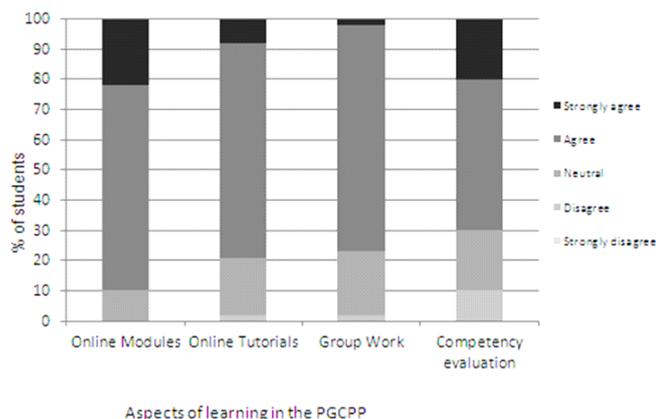


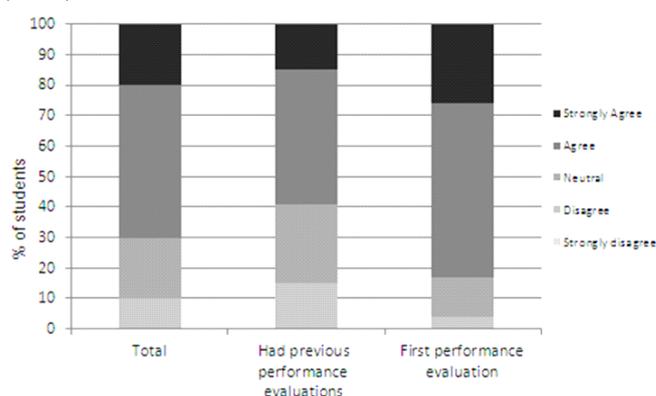
Table II: Aspects of the performance evaluation that impacted on clinical practice.

	Mean Scores (range) (1 Strongly Disagree – 5 Strongly Agree)	
	Not exposed to performance evaluation as part of PGCPP	Exposed to performance evaluation as part of PGCPP
	2010 n=47	2011 n=51
I would welcome having an experienced clinical pharmacist observe my work, provide constructive feedback and help me develop my clinical competence as part of the postgraduate clinical pharmacy Programme. (Yes/ No question)	95% yes	X*
I felt comfortable having an experienced pharmacist observe my work provide constructive feedback and help me develop my clinical competence as a part of PGCPP	X*	4.03
Being observed by an experienced pharmacist in the workplace as part of the competency evaluation was beneficial for my clinical practice	X*	4.19
Receiving structured feedback on my performance as part of the competency development evaluation was beneficial for my clinical development	X*	4.27
Identifying my learning needs and implementing strategies to address these needs as part of the competency evaluation was beneficial for my clinical practice	X*	4.12
My clinical practice has improved as a result of completing a competency –based performance evaluation with a trained evaluator	X*	3.8
The inclusion of a competency- based performance evaluation into the postgraduate clinical pharmacy programme would enhance or enhanced my development as a clinical pharmacist over and above coursework.	3.82	3.96
The inclusion of a competency- based performance evaluation into the postgraduate clinical pharmacy programme will support/ supported and enhance/ enhanced the learning facilitated by the programme.	3.85	3.55

performance evaluation relative to the learning from the whole PGCPP appeared less in comparison.

Just over half of the total number of students had previously experienced one or more competency-based performance evaluations as a routine part of their work, independent of the PGCPP. Many students had never had an experienced pharmacist accompany and observe them in their workplace. While 70% of students agreed or strongly agreed that the performance evaluation contributed to the development of their practice, 60% of those who had a GLF previously responded favourably compared with over 80% of those who had not (Figure 3). This may be interpreted as a plateau in the perceived impact of the performance evaluation on practice observed with repeated evaluations.

Figure 3: Student perceptions of the impact of the performance evaluation on clinical practice in 2011 (n=51).



These results from the questionnaires were mirrored in the written feedback from individual performance evaluations.

Many students who had a GLF in the past were positive about their experience.

“It’s always good to have someone else evaluate what you do. They make suggestions using a different set of eyes - I like to hear other’s approaches.”

“This is my 3rd GLF assessment and I always get to take away some benefit. I feel it is a useful tool for self-improvement of professional practice.”

“Having a competency assessment in the workplace is very important. It is really the only way to tell if this course has changed practice.”

However, some students, who had these evaluations regularly as a requirement of the workplace, identified aspects of the evaluation that may have reduced the perceived benefits.

“Very dependent on assessor, I would prefer more frequent less formal observation and feedback.”

“I did not receive much constructive feedback in my GLFs, although positive has not really added much to my practice.”

In contrast, the comments from students who were being evaluated in their workplace for the first time using a

competency- based performance evaluation tool were overwhelmingly positive.

“I was extremely dubious of the value of the GLF in a private hospital setting, but overall I found it a very positive experience.”

“I enjoyed that every part of my practice was analysed and constructive and intelligent feedback was given.”

“The fact that I found out what I need to improve is very useful. I never had this kind of assessment done, that's why it is a very good experience for me.”

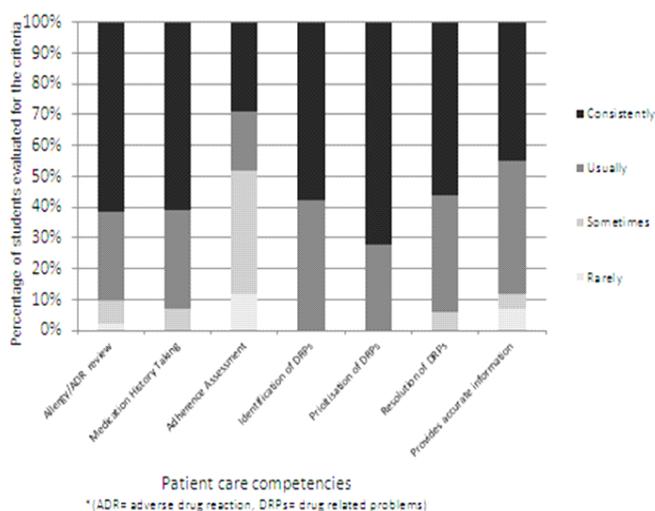
“The whole process is so valuable, as it is very rarely that we get feedback on our day to day practices. I think it is the only true way to see how someone uses their knowledge and skills in practice. Overall a very good experience.”

“As a community pharmacist it is good to see where I stand in the clinical realm.”

“Awesome experience! It was great to have detailed feedback - has given me confidence/reassurance with new processes. It definitely made me stop and think about what / how I do things which I think we could all do a little more of.”

Both the GLF and the shpaclinCAT contain over 90 competency criteria against which performance is rated. Not all criteria were observed for all students during the evaluations. This is consistent with the use of professional development tools both in Australia and internationally. Seven key criteria that relate to patient care, identified by Directors of Pharmacy in QH as key indicators of clinical practice were selected for analysis. These were common to the GLF and the shpaclinCAT. Ratings for these seven competencies for the 2011 students were collated (where they were observed) and are presented in Figure 4. Of these seven criteria adherence assessment was sometimes or rarely observed in over 50% of students. While most students performed well in the other six key competencies, further improvement to optimise practice was often required.

Figure 4: Competency ratings for seven key competencies in the GLF/ shpaclinCAT for the 2011 student cohort



Discussion

Postgraduate clinical pharmacy programmes have a mandate not only to enhance the acquisition of knowledge and skills but to ensure that learning translates into improved performance and competence of graduates, to optimise patient care in a variety of current and future practice roles. This study, where over 90% of eligible students participated, clearly demonstrates positive perceptions of the impact of the restructured PGCPP on both the acquisition of knowledge and skills and improvements in clinical practice. Over 90% of the 2011 student cohort agreed or strongly agreed that improvements in performance, competence, confidence, patient centeredness and contribution to patient care as part of the healthcare team resulted from the learning. These perceived improvements were similar for all cohorts both before and after the inclusion of the performance based competency evaluation into the curriculum. However some trends were seen for higher mean scores for second year students by the end of 2011 in some performance criteria including overall performance and competence and communication skills. The extent to which the performance evaluation in 2011 contributed to this trend is difficult to assess as this was not apparent for the first year cohort in 2011. It is not surprising that student perceptions of the outcomes of the PGCPP did not appear to be greatly enhanced with the inclusion of the performance-based competency evaluation in 2011 as this was a small formative component of the two therapeutics courses, set amongst the learning from online modules, tutorials, and group work from a total of six courses in the two-year programme.

Despite the performance evaluation being a small component of the PGCPP, the majority of students were very positive about all aspects of these evaluations and the impact on clinical practice. However, some students who had performance evaluations previously as part of their routine work were less positive about the impact of this evaluation on clinical practice compared with those who were having the evaluation for the first time. This may be due to familiarity with the process and the provision of feedback on regular occasions, which may have already enhanced practice prior to commencing the PGCPP. The results of formative competency-based performance evaluations demonstrate that further improvement in competency domains is often required and there are always aspects of practice that can be improved, even for more experienced pharmacists.

While these results support the continued integration of a formative competency-based performance evaluation as part of the PGCPP, the perceived overall outcomes from the programme on clinical practice were positive both before and after the implementation of this initiative. The benefits of continuing to include these evaluations as part of the PGCPP must be weighed up against the costs. The costs associated with facilitating this intervention for 2011 were very high, especially in Semester 1, prior to the launch of the shpaclinCAT nationally. In future, many more performance evaluations may be conducted by locally trained evaluators, significantly reducing the workload and costs for the PGCPP. However, increasing numbers of students who work in settings outside of public hospitals, where trained evaluators are not available in the workplace, along with government cuts to health and university budgets will necessitate a review of the viability and sustainability of continuing to include a competency-based performance evaluation in the PGCPP in the future.

Conclusion

Postgraduate study in clinical pharmacy is a key component in the development of a competent pharmacy workforce. We must ensure that educational programmes meet the needs of students and the profession while optimising professional practice to promote the safe and effective use of medicines. This study has demonstrated that the redeveloped PGCPP at UQ as well as the inclusion of a competency-based performance evaluation in the curriculum are indeed achieving these goals. A review of the viability and sustainability of retaining the performance evaluation as part of the programme is prudent, given increasing budgetary constraints in the health and tertiary education sectors.

competency framework for primary care and community pharmacists. *Pharmaceutical Journal*, **275**(7357), 48-52.

References

- Advanced Pharmacy Practice Framework Steering Committee (2011) Professional Practice Profile for Initial Registration as a Pharmacist (online). Available at: <http://www.psa.org.au/archives/6230>. Accessed 5 June, 2013.
- Antoniou, S., Webb, D., McRobbie, D., Davies, J., Wright, J., Quinn, J. & Bates, I.A. (2005) Controlled study of the general level framework: Results of the South of England competency study. *Pharmacy Education*, **3**(4), 201-207.
- Black, P. & Plowright, D. (2008) How postgraduate pharmacy students develop professional understanding: Re-conceptualising deep, reflective learning. *Pharmacy Education*, **8**(1), 29-35.
- Blouin, R.A., Joyner, P.U. & Pollack, G.M. (2008) Preparing for a renaissance in pharmacy education: the need, opportunity, and capacity for change. *American Journal of Pharmaceutical Education*, **72**(2), 42.
- Burke, J.M., Miller, W.A., Spencer, A.P., Crank, C.W., Adkins, L., Bertch, K. E., Ragucci, D.P., Smith, W.E. & Valley, A.W. (2008) Clinical pharmacist competencies. *Pharmacotherapy: The Journal of Human Pharmacology and Drug Therapy*, **28**(6), 806-815.
- Committee, A.P.P.F.S (2011) Professional Practice Profile for initial Registration as a Pharmacist. Pharmaceutical Society of Australia (online). Available at: <http://www.psa.org.au/archives/6230>. Accessed 5 June, 2013.
- Coombes, I., Avent, M., Cardiff, L., Bettenay, K., Coombes, J., Whitfield, K. & Bates, I. (2010) Improvement in Pharmacist's Performance Facilitated by an Adapted Competency-Based General Level Framework. *Journal of Pharmacy Practice and Research*, **40**(2), 111-118.
- Epstein, R.M. & Hundert, E.M. (2002) Defining and assessing professional competence. *The Journal of the American Medical Association*, **287**(2), 226-235.
- Kaartinen-Koutaniemi, M. & Katajavuori, N. (2006) Enhancing the development of pharmacy education by changing pharmacy teaching. *Pharmacy Education*, **6**(3), 197.
- Miller, G.E. (1990) The assessment of clinical skills/competence/performance. *Academic Medicine*, **65**(9), S63.
- Mills, E., Farmer, D., Bates, I., Davies, G., Webb, D. & McRobbie, D. (2005) Development of an evidence-led