Pharmacy Education, 2014; 14 (1) 48 - 56

Pharmacy educators' intention for the curriculum: an Australian pilot study

CHRISTY NOBLE*[1,2], IAN COOMBES [2,3], LISA NISSEN[2,4], P. NICHOLAS SHAW[2], ALEXANDRA CLAVARINO[2]

[1] *Medical Education Unit, Gold Coast Hospital and Health Service, 1 Hospital Boulevard, Southport, Queensland, Australia.*

[2] *School of Pharmacy, School of Pharmacy, The University of Queensland, St Lucia, Queensland 4072, Australia.*

[3] *Department of Pharmacy, Royal Brisbane and Women's Hospital, Brisbane, Queensland, Australia.*

[4] *School of Clinical Sciences, Queensland University of Technology, Brisbane, Queensland, Australia.*

Abstract

Background: Pharmacy educators play an important role in supporting the professional identity formation of students, particularly in relation to their perceptions and strategies for the curriculum and subsequent learning experiences.

Aim: To explore pharmacy educators' perceptions of the purpose of the pharmacy curriculum and how they contribute to students' development as pharmacists.

Methods: A one-off survey using a 20-item questionnaire distributed to all pharmacy educators at a single school of pharmacy who contributed to an Australian undergraduate pharmacy degree program.

Results: Most educators viewed the curriculum and their role from a traditional perspective. The educators felt the key purpose of the curriculum was to develop competent pharmacists by providing students with knowledge and skills. There was a limited emphasis on patient-centredness.

Conclusion: Whilst educators were focused on developing competent pharmacists through the provision of knowledge and skills, important learning opportunities supporting identity formation may be missed.

Keywords: *Curriculum; professional identity formation; pharmacy academics; undergraduate pharmacy education; Australia*

Introduction

It is well recognised that educators of the professions play a significant role in the professional identity formation of students through role modelling and structuring of learning activities (Chalmers *et al*., 1995; Benner & Beardsley, 2000; Weaver *et al*., 2011). Pharmacy educators are charged with the responsibility of ensuring that graduates are appropriately prepared as pharmacists and the curriculum needs to:

> *"Inculcate a solid professional identity in the face of a practice environment that often contradicts many educational ideals."* (Benner and Beardsley, 2000. p.98)

The intentional support of the formation of students' professional identities through the curriculum can assist students to become the kind of professionals they want to be despite the realities of practice (Danielewicz, 2001; Ronfeldt & Grossman, 2008; Bleakley *et al*., 2011; Johnson *et al*., 2012). There can, however, be considerable variation in how educators conceptualise the intention for curriculum and this can result in different, often inconsistent focuses, for example, seeing the curriculum as either teacher-directed or student-centred (Fraser & Bosanquet, 2006). This, in turn, can have either a positive or negative influence on student engagement and how they see themselves as becoming professionals (Dahlgren *et al*., 2006; Newton *et al*., 2009; Weaver *et al*., 2011). Thus educators play a critical role in shaping students' understanding of what it means to be a pharmacist.

Whilst there are several studies and commentaries highlighting pharmacy educators' perceptions of the curriculum, there has been a tendency for these to focus on the content aspects of the curriculum (Florence, 2002, 2004; Broedel-Zaugg *et al*., 2008). There are few studies examining pharmacy educators' intentions for the pharmacy curriculum and the pedagogical approaches taken, that is, their views on the sequencing of learning, students' participation and how they view their contribution to students' development as pharmacists. This paper reports on the findings of a study examining Australian pharmacy educators' intentions for the curriculum and how they believe they contribute to students' development as pharmacists.

*Correspondence: Dr. Christy Noble, *Medical Education Unit, Gold Coast Hospital and Health Service, 1 Hospital Boulevard, Southport, Queensland, Australia. Tel: +61 7410 943148; Fax: +61 75519 8210. E-mail: Christy.noble@uqconnect.edu.au*

ISSN 1447-2701 online

Context

This study was conducted in Australia in a large School of Pharmacy. Before becoming registered pharmacists, Australian pharmacy students either complete a four-year Bachelor of Pharmacy degree or a post-graduate Masters and then participate in an approved one-year intern-training program (Australian Pharmacy Council, 2014).

The Pharmacy Schools' accrediting body - the Australian Pharmacy Council (APC) - determines the pharmacy school indicative curriculum (Australian Pharmacy Council, 2014). However, the pedagogy is not prescribed by the APC. Thus it is the responsibility of the academic staff to determine the most appropriate way of developing undergraduates to become pharmacists.

The four-year Bachelor of Pharmacy under study here commences with a combination of basic sciences and pharmacy specific subjects. As the students progress through the years the subjects become increasingly pharmacy specific and this is supported by experiential placements, which vary from two hours per week (in first year) to four-week full time placements (in fourth year).

Methods

The purpose of the study was to gather the teaching staff's perception about the intention of the pharmacy curriculum. A survey methodology was chosen to assure anonymity and to allow for frank comments (Lodico *et al*., 2010).

This study used census sampling, that is, the entire population of teaching staff (academic and tutoring staff) at the chosen school of pharmacy were invited to participate in the study. Although the results cannot be generalised to other schools of pharmacy, they will describe the educators' thoughts about curriculum and student development (Munn & Drever, 1990; Lodico *et al.*, 2010). When using this approach Munn and Drever (1990) suggests a minimum of 30 participants.

The questionnaire was administered using a commonly used electronic platform 'Survey monkey®'. An email, with a link to the questionnaire, was sent to all pharmacy teaching staff (academics and tutoring staff), inviting them to participate in the study. To enhance participation a follow-up email was sent two weeks later to all pharmacy teaching staff.

As a validated tool has not yet been developed the questionnaire was developed in multiple-stages based on a priori issues identified in a previous study (Noble *et al*., 2011), evidence from the literature and the expertise of pharmacy academics. Professional identity is largely unexamined in pharmacy education and is thus unlikely to be a term 'understood' by participants. Therefore questions were framed as contributing to students' development as pharmacists. The items used are presented in Appendix A.

Participants were asked about their primary degree; length of time working as an academic or tutor; teaching stream and research stream. A series of open ended questions asked participants to comment on their perceptions of the purpose of the degree; how they contributed to student learning and development as pharmacists; factors which facilitated and hampered learning and their perspectives on lectures, tutorials and practicals.

Staff members were asked to respond to a series of eight items focusing on lectures. Responses were scored on a 4-point Likert scale (1 = strongly agree, 4 = strongly disagree). Tutorials: respondents were asked a series of six questions focusing on tutorials. Responses were scored on a 4-point Likert scale (1 = strongly agree, 4 = strongly disagree). Practicals: respondents were a series of six questions focusing on practicals. Responses were scored on a 4-point Likert scale (1 = strongly agree, 4 = strongly disagree).

The validity of the questionnaire was confirmed in two ways: content and face validity (Fink, 2003). Firstly, for the content, we used the theory of social learning (Wenger, 1998) to select items related to student professional identity formation. We also examined the literature for issues known to influence students' professional identity formation in the context of the formal curriculum. Face validity was determined by piloting the questionnaire with three academics from another university. The questionnaire was then amended to reflect their comments. The technical difficulties with Survey Monkey® were rectified before the questionnaire was sent to participants.

The data collected from the online questionnaire were downloaded from the website (Survey Monkey®) into Excel®. Responses from the open questions were analysed thematically (Munn & Drever, 1990; Lodico *et al*., 2010) and Likert items were analysed using descriptive statistics.

Ethical approval (2010/12) was received from School of Pharmacy ethics committee. Information about the purpose of the study was sent out with the invitation to participate, completion of the survey was deemed to represent consent to participate.

Results

Of the 76 pharmacy educators invited to participate in the survey, 34 completed questionnaires were submitted, resulting in a response rate of 45%. Sixty-one per cent of the sample was female. The average respondent can be best described as holding a pharmacy degree (91.2%) and being a registered pharmacist (87.9%) with most respondents having worked in their current teaching role for 2-5 years (35.3%) (Table I). The results are presented in the following manner: First an overview of the findings from the quantitative questions are presented. This is then followed by related qualitative responses in italics. Editorial comments or clarification of discussion points are included in [brackets].

Most of the participants (55.1%) taught into the quality use of medicine (QUM) stream; followed by social and

professional aspects of pharmacy (22.4%). There were only a few participants who reported teaching in areas outside of the school of pharmacy *e.g.* biomedical sciences (6.1%). In terms of areas of research, the most common area was QUM (36.7%) followed by pharmacy education (26.5%) (Table I).

Table I: Demographic and professional characteristics of respondents

Characteristic	N= 34(%)
Gender	
Female	24 (61.5)
Male	10 (29.5)
Primary degree	
BPharm	31 (91.2)
BAppliedScience/Science	3 (8.8)
Length of time in role (in years)	
Less than 2	6 (17.7)
2 – 5 years	12 (35.3)
6 – 10 years	8 (23.5)
Great than 10 years	8 (23.5)
Teaching Stream[1]	
Biological fate of drugs	4 (8.2)
Biomedical Sciences	3(6.1)
Dosage Form Design	8 (16.3)
Drug Discovery	7 (14.3)
Quality Use of Medicines	27 (55.1)
Social and Professional Aspects of Pharmacy	11(22.4)
Other e.g. business management pharmaceutical calculation	3 (6.1)
Research Stream[2]	
Modeling and Simulation	5 (10.2)
Pharmacy Education	13 (26.5)
Pharmacology	6 (12.2)
Quality Use of Medicines	18 (36.7)
Therapeutic Targeting	7(14.3)
Other e.g. medicine; anatomy; science education	9 (18.3)
Been registered as a pharmacist	
Yes	29 (87.9)
No	4 (12.1)
Currently registered as a pharmacist	
Yes	24 (72.7)
No	8 (24.3)
Pharmacy settings worked in[3]**:**	
Community	24 (72.7)
Hospital	20 (60.6)
Industry	2 (6.1)
Military	1 (3.0)
Academic	23 (69.7)
Government	3 (9.1)
Administration	3 (9.1)
Other e.g. consultant pharmacy; drug/poisons information	3 (9.1)

[1]Note adds up to more than 34 because academics/tutors teach into different streams

[2]Note adds up to more than 34 because academics/tutors research in a number of different streams

[3]Note adds up to more than 100% because individuals have worked in more than one setting

Perceptions of the purpose of the degree and development as pharmacists

Respondents were evenly divided over the key purpose of the pharmacy degree, with approximately 40% of respondents indicating it was to develop competent pharmacists. A further 40% felt the provision of knowledge and skills was the key purpose of the degree. Only one participant mentioned patient care as a purpose of the degree:

> *"Teach people to be competent pharmacists, with a modern approach to the profession and comfort in contributing to holistic patient care".* (Respondent 34 Female)

In terms of how the curriculum influences students' development as pharmacists, a diverse range factors were identified by the respondents and these are summarised in Table II.

Table II: Curricular aspects perceived to be influencing students' development as pharmacists

Most important aspects	Least important aspects
• Development of practical skills e.g. communication (including with patients; other health care professionals); counselling; dispensing • Aspects relating to professionalism e.g. empathy • Development of personal attributes e.g. confidence; teamwork; social skills • Cognitive skills e.g. problem solving; clinical reasoning; application of knowledge; accessing information • Provision of background knowledge • Knowledge/content aspects relating to understanding of medicines and nature of evidence-based thinking • Workplace experience e.g. placements • Final year of degree – integration of learning and complex cases	• Provision of information and indepth, technical content not relevant to practice e.g. physical sciences, chemistry, drug discovery, pharmacognosy, biotechnology, research • Laboratory practicals related to drug development • Teaching strategies such as provision of knowledge • Learning strategies adopted by the students e.g. rote learning; assessment focused • Teaching strategies e.g. 'spoon-feeding'; 'ramming facts into students heads' • Aspects don't promote "safe and effective practice" • Early years in the degree

Respondents reported that it was important for students to acquire relevant knowledge, develop practical and cognitive skills, and a sense of professionalism, supported by workplace experiences. Aspects of the curriculum, which were seen as less important for student pharmacist development included provision of technical content deemed not relevant to practice, developments of skills related to laboratory work and pedagogies that promoted

student rote learning. Interestingly, one participant felt that the notion of educators contributing to students' development as pharmacists was 'confounded':

> *"This is a totally confounded thought, as there are many other lecturers/professors who contribute to the students' development. There is no way I could ever identify or believe to identify [that] I change any students' development."* (Respondent 25 Male)

The development of students as pharmacists was seen as a multifaceted process, however, this implied that it was the responsibility of the individual student to make sense of the curricular experience. Three of the 34 (9%) participants were concerned about the lack of integration between the subject matter and suggested that students were left with the task of integrating the subject matter themselves as one lecturer remarked:

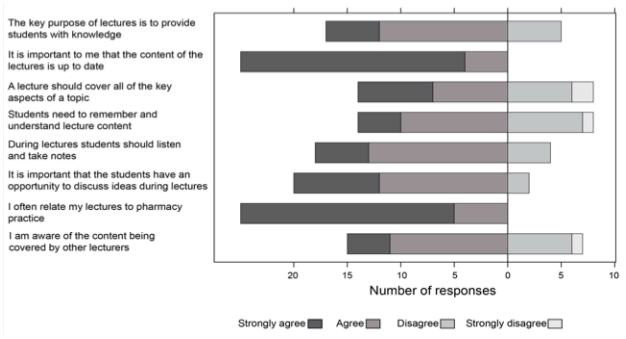
> "[there is a]...*lack of obvious integration between topics along with a heritage of teaching the science separately to the practice of pharmacy, and consequently expecting the students to work out the integration by themselves."* (Respondent 16 Female)

This demonstrates a concern for true integration between science and practice because the science aspects of the degree are taught by academics both outside and inside the School of Pharmacy.

Perceptions of curricular teaching and learning activities

Figure 1 presents the distribution of responses to each of the statements relating to lectures from the 22 participants who indicated that they lectured.

Figure 1: Perceptions of the purpose and experience of lectures



Most of the respondents either strongly agreed or agreed with all statements. However, eight (36%) did not agree that all key aspects of a topic should be covered in class. Overall, the majority of respondents reported traditional views of the purpose of lectures, that is, to provide knowledge. These views were congruent with the qualitative findings. The following response demonstrates this point, in that, the main purpose of lectures are:

> *"...to discuss the key 'knowledge' parts of the curriculum, and provide a basis for students to further explore the areas thus introduced."* (Respondent 24 – Female)

All of the respondents (100%) felt that the lecture content must be up to date and it was important to relate the content to practice. Most respondents felt students needed to remember and understand the content (63%), while 37% disagreed with this. Almost a third (32%) of the participants lacked awareness of the content covered by others. From the qualitative responses, only about a third of respondents described learning in lectures as a student-centred activity. As one respondent reported, the main purpose of lecturing was:

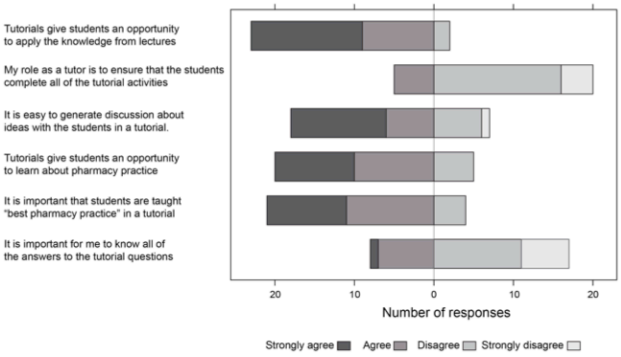
> *"To act as a guide for subject knowledge and provide an opportunity for student interaction."* (Respondent 8 – Male)

A majority of the respondents (81%) perceived that the student role in lectures was a passive one of listening and taking notes. This contrasted with the respondents' apparent intention for lectures, in that, almost all (98%) felt that lectures should provide opportunities for students to discuss ideas. Thus there appeared to be tension between the respondents' intention and the role students' adopted. One participant explained that it could be challenging in the lecture environment to promote student engagement. For example, she said: *"It is difficult to discuss during lectures e.g. the other day I encouraged questions but I often couldn't hear them"* (Respondent 10 – Female). This may explain why most respondents, despite their intention, saw the student experience as passive.

Tutorials

Figure 2 presents the distribution of responses to each of the statements relating to tutorials from the 25 participants who indicated they were involved in tutorials.

Figure 2: Perceptions of the purpose and experience of tutorials



Almost all of the respondents (92%) felt that tutorials enabled students to apply the knowledge obtained in lectures. From the responses it was evident that the educators saw their role as a facilitative one rather than teacher-centred with most respondents (68%) indicating that they didn't need to know the 'answers'. The majority (80%) felt they were not responsible for ensuring students completed the tutorial activities. From the qualitative responses, only a few responses (20%) indicated that tutorials were used to experience the application of knowledge to 'real life' or approximations of this. The following quote demonstrates this:

> *"*[the main purpose of tutorials is to]… *encourage students to put the facts they have had presented in lectures into as close to a real world situation as possible, so they can become aware of gaps in their knowledge or their skills in counselling patients; and so they have an opportunity to put into practice the information they have been taught. For those who don't work in pharmacy this is the closest they will get."*(Respondent 4 Female)

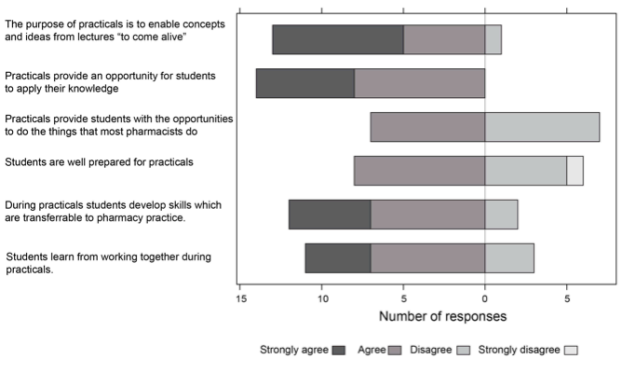
Six respondents expressed concerns about the tutorial experience and these related to large student numbers, tutorials being used to provide new content and the 'scripted' nature of tutorials, in that, questions and answers are pre-prepared.

> *"Tutorials should be a facilitated process, not a scripted process with model answers. This does however mean that you need skilled practitioners (and facilitators) to run tutorials this way."* (Respondent 25 Male)

Laboratory-based practical classes

Figure 3 presents the distribution of responses to each of the statements relating to practicals from the 14 participants who indicated they were involved in practicals.

Figure 3: Perceptions of the purpose and experience of practicals



Almost all (92%) of the respondents felt that the practicals provided opportunities for students to further understand lecture concepts and were seen as opportunities to apply knowledge. Most (85%) respondents felt that practicals enabled students to develop skills, which were transferable to practice. The respondents were equally divided over the relationship between laboratory practicals and pharmacist activities. The positive relationship between practicals and pharmacists activities was explained in the qualitative responses. More than 25% saw it as assisting with extemporaneous dispensing. However, 50% felt that practicals were experiences where students developed laboratory related skills (rather than pharmacist skills) or skills which pharmacists are less likely to use. Some of the respondents were surmising that students' engagement was dependent on how the learning experience relates to their future pharmacist activities. For example:

> *"My observation is that students learn from each other during tutorials (we run mostly group work tutorials) but during practicals, students distract each other and don't all participate in the task every time. Pracs [practicals] provide students the opportunity to do things pharmacists 'can do' but that 'most pharmacists' don't do...resulting in some student frustration on placement and during internship."* (Respondent 34 Female)

Discussion

The findings from this study suggest educators perceive that one of the key purposes of the curriculum was to develop competent pharmacists by providing students with knowledge and skills. There was a limited emphasis on patient-centredness. Whilst most educators felt they supported students' pharmacist development by linking content with practice, some expressed concern that students were being left alone to make sense of their learning experiences. This suggests that whilst the intention was to develop pharmacists, the educators understanding of professional development, meant that identity formation might not be a focus for the curriculum experience.

The educators' conceptualisation of the curriculum suggests a traditional, building block understanding of the curriculum and professional development, that is, provision of knowledge, which then needs to be applied either to problems or practice. Several studies have shown that this approach can delay students' professional identity formation (Niemi, 1997; Dahlgren *et al*., 2006; Taylor & Harding, 2007). Therefore, expanding a pharmacy educator's understanding of their role to one that includes supporting professional identity formation would seem imperative. Such an approach is now being addressed in medical education where the focus is not only on developing competent graduates but also on determining how the learning experiences influence student professional identity formation (Jarvis-Selinger *et al*., 2012).

There were missed opportunities, in the curriculum experience, for enabling professional identity formation. For example, whilst lectures were being used to provide access to pharmacist knowledge, student engagement was limited and largely passive. This may have been due to difficulties experienced by the participants in engaging the students. There is considerable research showing that identity formation is supported through student engagement in learning (Dahlgren *et al*., 2006; Ronfeldt & Grossman, 2008) and that lecture experiences can be an engaging experience (DiPiro, 2009; Blouin *et al*., 2009). Thus student engagement should become a priority for the curricular experience and this may be enabled by using strategies described by Steinert and Snell (1999). For example, use of clinical cases, organizing debates, use of role-plays and simulations.

The tutorials were viewed from a facilitative perspective of learning, that is, a student-centred experience. However, the intention seemed to be on promoting student learning of lecture concepts rather than providing an environment in which students could experience and engage with practice and develop as patient-centred practitioners. Tutorials present an opportunity to create a patient-centred educational context where there is meaningful collaboration and exchange between pharmacists, other health care professionals, pharmacy students and patients (Bleakley, 2012). Such an approach enables students to construct their professional identity with patient interaction at the core of their experience (Bleakley & Bligh, 2008). There is limited evidence of patients being in included pharmacy education settings (Shah *et al*., 2005; Towle *et al*., 2010; Grimes *et al*., 2013). Whilst there are a number of challenges associated with the meaningful inclusion of patients in curricular experiences, such as difficulties sourcing patients with a specific condition and addressing patients concerns, the benefits far outweigh the costs. Therefore efforts need to be made to ensure patients' are included in the curriculum where relevant. In particular, patient engagement will assist students to construct their professional identities through meaningful and authentic interactions with patients rather thanthrough simply learning about aspects of disease state management or service delivery removed from the patient context (Grimes *et al*., 2013).

In practicals, questions were raised by educators about aspects of the curriculum and their relevance to future practice. An interesting finding was that some educators believed that student engagement was dependent on the students' perception of topic relevance. This finding, combined with concerns about the lack of integration of subject matter and educators acknowledging their own lack of awareness of the subject matter presented by others, suggests that the curriculum experience may leave students to form their professional identity in isolation (Dall'Alba, 2009). This suggests that there is an opportunity for supporting the identity formation of students through the promotion of dialogue about what it means to be a pharmacist within teaching and learning activities and in collaboration with peers and experts where the objective is to promote interaction and discussion (Vu and Dall'Alba, 2011).

Limitations

Whilst this study addresses a significant and emerging issue within pharmacy education and provides unique insights and rich descriptions to support further research in this area, there are some limitations with this study. There were 34 participants who completed the questionnaire from a small initial population size. The majority taught into pharmacy practice and worked as pharmacists, and thus may have been more likely to be 'practice' oriented in their intentions for the curriculum. This may have introduced an element of bias.

The data presented are restricted to respondents from one School of Pharmacy, thus limiting generalisability. There would be value in conducting interviews with pharmacy educators from other schools and countries about their perceptions of supporting students' professional identity formation. However, this study used a mixed methods approach to provide a more comprehensive overview of academic perspectives. By combining both quantitative responses with the thick description from the qualitative research data provides important insights into barriers and opportunities for professional identity formation in one curriculum setting.

Conclusion

This paper contributes to an understanding of pharmacy educators' intention for the curriculum, in that, the findings suggest that many pharmacy educators have not begun to consider how learning experiences contribute to professional identity formation and the role they play in supporting this. For the curricular experience to enable the construction of professional identities, educators need to intentionally consider supporting students' professional identity formation.

References

Australian Pharmacy Council (2014) Accreditation Standards for Pharmacy Programs in Australia and New Zealand. Canberra: Australian Pharmacy Council Ltd.

Benner, J. & Beardsley, R. (2000) White paper on pharmacy student professionalism. *Journal of the American Pharmaceutical Association*, **40**, 96-102.

Bleakley, A. (2012) The curriculum is dead! Long live the curriculum! Designing an undergraduate medicine and surgery curriculum for the future. *Medical Teacher*, 1-5.

Bleakley, A. & Bligh, J. (2008) Students Learning from Patients: Let's Get Real in Medical Education. *Advances in Health Sciences Education*, **13**, 89-107.

Bleakley, A., Bligh, J. & Browne, J. (eds.) (2011) *Medical Education for the Future: Identity, Power and Location*, Dordrecht: Springer Netherlands.

Blouin, R.A., Riffee, W., Robinson, E.T., Beck, D., Green, C., Joyner, P.U., Persky, A. & Pollack, G.M. (2009) Roles of Innovation in Education Delivery. *American Journal of Pharmaceutical Education*, **73**, Article 154.

Broedel-Zaugg, K., Buring, S.M., Shankar, N., Soltis, R., Stamatakis, M.K., Zaiken, K. & Bradberry, J.C. (2008) Academic pharmacy administrators' perceptions of core requirements for entry into professional pharmacy programs. *American Journal of Pharmaceutical Education*, **72**, Article 52.

Chalmers, R.K., Adler, D.S., Haddad, A.M., Hoffman, S., Johnson, K.A. & Woodard, J.M. (1995) The essential linkage of professional socialization and pharmaceutical care. *American Journal of Pharmaceutical Education*, **59**, 85-90.

Dahlgren, M.A., Hult, H.K., Dahlgren, L.O., Segerstad, H.H.R.A. & Johansson, K. (2006) From senior student to novice worker: learning trajectories in political science, psychology and mechanical engineering. *Studies in Higher Education*, **31**, 569 - 586.

Dall'alba, G. (2009) Learning to be professionals. Innovation and Change in Professional Education 4. Dordrecht: Springer Netherlands.

Danielewicz, J. (2001) Teaching Selves: Identity, Pedagogy, and Teacher Education, Albany, NY, State University of New York Press.

Dipiro, J. T. 2009. Why Do We Still Lecture? American Journal of Pharmaceutical Education, 73, 137.

Fink, A. (2003) Reliable and Valid Survey Instruments, Thousand Oaks, CA, SAGE Publications, Inc.

Florence, A.T. (2002) The profession of pharmacy leaves science behind at its peril. *The Pharmaceutical Journal*, **269**, 58.

Florence, A.T. (2004) If science does not underpin clinical practice, what does? *The Pharmaceutical Journal*, **272**, 671.

Fraser, S.P. & Bosanquet, A.M. (2006) The curriculum? That's just a unit outline, isn't it? *Studies in Higher Education*, **31**, 269 - 284.

Grimes, L., Shaw, M. & Cutts, C. (2013) Patient and public involvement in the design of education for pharmacists: Is this an untapped resource? *Currents in Pharmacy Teaching and Learning*, **5**, 632-636.

Jarvis-Selinger, S., Pratt, D.D. & Regehr, G. (2012) Competency Is Not Enough: Integrating Identity Formation Into the Medical Education Discourse. *Academic Medicine*, **87**, 1-6.

Johnson, M., Cowin, L.S., Wilson, I. & Young, H. (2012) Professional identity and nursing: contemporary theoretical developments and future research challenges. *International Nursing Review*, **59**, 562-569.

Lodico, M.G., Spaulding Dean, T. & Voegtle, K.H. (2010) Methods in Educational Research: From Theory to Practice, San-Francisco, CA, Jossey-Bass.

Munn, P. & Drever, E. (1990) Using Questionnaires in Small-Scale Research. A Teachers' Guide. Edinburgh: Scottish Council for Research in Education.

Newton, J.M., Billett, S., Jolly, B. & Ockerby, C.M. (2009) Lost in translation: barriers to learning in health professional clinical education. *Learning in Health and Social Care*, **8**, 315-327.

Niemi, P.M. (1997) Medical students' professional identity: self-reflection during the preclinical years. *Medical Education*, **31**, 408-415.

Noble, C., O'Brien, M., Coombes, I., Shaw, P.N. & Nissen, L. (2011) Concept Mapping to Evaluate an Undergraduate Pharmacy Curriculum. *American Journal of Pharmaceutical Education*, **75**, Article 55.

Ronfeldt, M. & Grossman, P. (2008) Becoming a Professional: Experimenting with Possible Selves. *Teacher Education Quarterly*, **35**, 41-60.

Shah, R., Savage, I. & Kapadia, S. (2005) Patients' experience of educating pharmacy undergraduate students. *Pharmacy Education*, **5**, 61-67.

Steinert, Y. & Snell, L.S. (1999) Interactive lecturing: Strategies for increasing participation in large group presentations. *Medical Teacher*, **21**, 37-42.

Taylor, K.M.G. & Harding, G. (2007) The pharmacy degree: The student experience of professional training. *Pharmacy Education*, **7**, 83 - 88.

Towle, A., Bainbridge, L., Godolphin, W., Katz, A., Kline, C., Lown, B., Madularu, I., Solomon, P. & Thistlethwaite, J. (2010) Active patient involvement in the education of health professionals. *Medical Education*, **44**, 64-74.

Vu, T.T. & Dall'alba, G. (2011) Becoming Authentic Professionals: Learning for Authenticity. In *Becoming a Professional* (ed. L. Scanlon), Springer Netherlands, 95-108.

Weaver, R., Peters, K., Koch, J. & Wilson, I. (2011) 'Part of the team': professional identity and social exclusivity in medical students. *Medical Education*, **45**, 1220-1229.

Wenger, E. (1998) Communities of Practice: Learning, meaning and identity, Cambridge, Cambridge University Press.

Appendix A: Copy of questionnaire

Exploring the intention of the pharmacy curriculum – Educators' perspectives

About you:

1. Gender: Male/female
2. What was your primary degree e.g. BPharm, BScience(Chemistry)?
3. How long have you been working in the university in a teaching role?

   Options: <2 years; 2-5 years; 6-10 years; >10 years
4. Which of the following teaching streams do you teaching into? Select all that apply:

- Biological Fate of Drugs
- Biomedical Sciences
- Data Analysis in Pharmacy
- Dosage Form Design
- Drug Discovery
- Quality Use of Medicines
- Social and Professional Aspects of Pharmacy

5. Which of the following research streams do you conduct research in?

- Modelling and Simulation
- Pharmacy Education
- Pharmacology
- Quality Use of Medicines
- Therapeutic Targeting
- Other

General questions about the pharmacy curriculum and learning

The following questions explore your general views about the pharmacy curriculum and your ideas about learning.

6. Please describe what you think is the key purpose of the pharmacy degree program?

7. Please complete the following sentences in your own words:

- I contribute to student learning by…..
- I believe the main factors within the pharmacy degree program which inhibit effective student learning are…….

Teaching and Learning activities

The following questions will explore your views about aspects of curricular teaching and learning activities.

Lectures:

8. In general, what do you believe is the main purpose of lectures in the curriculum?

9. Do you deliver lectures? Yes/No (if no – then don't need to answer following questions)

Read each item below and respond by circling the response, which represents how you feel:

Statement	Strongly Agree	Agree	Disagree	Strongly Disagree
The key purpose of lectures is to provide students with knowledge.				
It is important to me that the content of the lectures is up to date.				
A lecture should cover all of the key aspects of a topic.				
Students need to remember and understand lecture content.				
During lectures students should listen and take notes.				
It is important that the students discuss ideas in lectures.				
I often relate my lectures to pharmacy practice.				
I am aware of the content being covered by other lecturers.				

Any further comments about lectures:

Tutorials:

10. In general, what do you believe is the main purpose of tutorials in the curriculum?

11. Do you tutor tutorials? Yes/No (if no – then don't need to answer following questions)

12. Read each item below and respond by circling the response, which represents how you feel:

Statement	Strongly Agree	Agree	Disagree	Strongly Disagree
Tutorials give students an opportunity to apply the knowledge from lectures.				
My role as a tutor is to ensure that the students complete all of the tutorial activities.				
It is easy to generate discussion about ideas with the students in a tutorial.				
Tutorials give students an opportunity to learn about pharmacy practice.				
It is important that students are taught 'best pharmacy practice' in a tutorial.				
It is important for me to know all of the answers to the tutorial questions.				

Any further comments about tutorials:

Practicals:

In general, what do you believe is the main purpose of practicals in the curriculum?

13. Do you tutor in practicals? Yes/No (if no – then don't need to answer following questions)

14. Read each item below and respond by circling the response, which represents how you feel:

Statement	Strongly Agree	Agree	Disagree	Strongly Disagree
The purpose of practicals is to enable concepts and ideas from lectures 'to come alive'.				
Practicals provide an opportunity for students to apply their knowledge.				
Practicals provide students with the opportunities to do the things that most pharmacists do.				
Students are well prepared for practicals.				
During practicals students develop skills which are transferrable to pharmacy practice.				
Students learn from working together during practicals.				

Student development as pharmacists

The following questions relate to student development as pharmacists and what you believe your contribution is to this.

15. How do you believe that your teaching contributes to the students' development as pharmacists?

16. Please complete the following sentences in your own words:

- The most important aspects of the pharmacy degree program for student development as pharmacists are……
- The least important aspects of the pharmacy degree program for student development as pharmacists are……

Experience in pharmacy

The following questions relate to your experience as a pharmacy practitioner:

17. Are you currently registered as a pharmacist? Yes /No

18. Have you ever been registered as a pharmacist?

    Yes/No

19. If yes, in what settings have you worked as a pharmacist?

- Community
- Hospital
- Industry
- Military
- Academia
- Government
- Administration
- Other:

20. In what year did you last practise as a pharmacist outside the academic environment?