

Discussion

## Complementing a Rural Pharmacy Course with CAM: Reflections from a Decade of Experience

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**Abstract:** Substantial complementary medicines (CAM) use is reported worldwide. Australian consumers use CAM for health maintenance, minor self-limiting disease states, and also for chronic conditions. The increasing use of CAM has required pharmacists to become increasingly more knowledgeable about CAM and the ethics of CAM recommendation. When the first Australian non-metropolitan pharmacy program was started at Charles Sturt University, in 1997, it was decided to incorporate two innovative courses to assist rurally educated students to engage with health consumers who expect pharmacists to be able to assist them with CAM. This discussion traces and reflects on the development, implementation and current situation of the Complementary Medicines for Pharmacy course. Over time, this course has evolved from a final year elective with a focus on familiarization to a mandated course with a phytomedicine focus to an integrated topic in final year with a focus on evidence, quality of evidence and professional decision-making demonstrated in a reflective professional portfolio. Of potentially greater importance, however, has been the introduction of complementary medicines as a topic in every year of the course with the goal of facilitating effective professional engagement with health consumers.

**Keywords:** complementary medicine; natural health products; pharmacy education; rural; curriculum design

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## 1. Introduction

The extent of use of complementary medicines (CAM) and therapies is significant within Australia, historically and increasingly so in more recent years [1–5]. This widespread use by consumers has sometimes challenged community pharmacists as patients expect pharmacists to be able to provide information and advice on CAM to enable informed decision-making [6,7], yet, few pharmacists would have learnt about complementary medicines in their registerable degree studies. In Australia, there are both Bachelor of Pharmacy and Master of Pharmacy accredited degree programs that provide graduates with the knowledge, skills, and abilities to register as interns ready to complete their intern year before completing the necessary assessments to apply for full registration.

In recent years, several providers of post-graduation education have offered training in a variety of complementary medicines to assist registered practitioners to upskill or enhance their knowledge. This may reflect perceptions of need within the practitioners since, during 2005, a sample of Australian pharmacists identified that they felt insufficiently informed about CAM [8], especially herbal medicines. This would be an issue of concern as pharmacists are ideally placed to provide patient education and counseling on CAM, and to discuss and detect potential or actual herb-drug or CAM-disease state interactions.

In 1997, Charles Sturt University developed and enrolled students in the first non-metropolitan pharmacy undergraduate program in Australia. The program was developed to address the relative shortage of pharmacists in rural, regional and remote areas of Australia [9–11], and so particular thought, and consultation with rural pharmacists, was undertaken when developing the individual subjects within the course. Two areas that had not been traditionally taught in Australian pharmacy programs at that time but that were identified as useful for rural practitioners were a business-management subject and a complementary medicines subject, based on research which had established a higher use of CAM in rural areas [2,4,12]. When initially offered, the Bachelor of Pharmacy program was a four year undergraduate program with four standard courses in each semester of every year of the degree. Each standard course was allocated eight credit points, took a full semester to complete and students needed to complete thirty-two courses to be eligible to graduate. Originally this program was only offered on the Wagga Wagga campus in the Riverina region of New South Wales, a State on the Eastern side of Australia. In 2005, the same program was commenced at the Orange Campus in the Central West region of New South Wales. These two campuses are geographically separated by approximately 300 km and, thus, staff teaching in the Bachelor of Pharmacy program are replicated at each campus.

This discussion outlines the development and implementation of a complementary medicines course within an Australian rurally sited four-year Bachelor of Pharmacy program and its evolution from an elective stand-alone course to an integrated and embedded topic throughout the program.

## 2. Course Description

When initially offered, the Bachelor of Pharmacy program was a four year undergraduate program with four standard courses in each semester of every year of the degree. Each standard course was allocated eight credit points, took a full semester to complete and students needed to complete thirty-two courses to be eligible to graduate. Students usually completed 32 credit points per semester and so would be attempting four courses per semester as first offered.

This course was initially offered in 2001 as an eight credit point, second semester, 14 study-week elective within the fourth (final) year of the Bachelor of Pharmacy program. As the program developed, to reflect the benefits of horizontal and vertical alignment of courses, some courses were re-structured into courses of 16 points. As there is not a general agreement as to terminology in higher education and the word “course” may apply to a unit of study sometimes termed a subject, a paper or simply a unit, in this discussion of the complementary medicines unit of study we will use the term “course”, and we will use the term “program” when referring to the degree as a whole.

### 2.1. The Early Years 2001–2006

Complementary Medicines for Pharmacy (PHM404) was offered as an elective course to provide interested students with the understanding, knowledge and skills to identify reputable and credible sources of information on CAM to assist consumers to make informed decisions about including CAM in their personal health management plan. An elective offer was selected as other course development articles had identified that particularly motivated students will select an elective in which they have an interest and may be more open to providing feedback and appreciating that a new course may benefit from further development or re-development.

In the early days of this course, it was coordinated by the second author (HC) and three lectures/tutorials, each of one hour duration, were scheduled every teaching week of the semester. The content was predominantly on herbal medicines used by Australian consumers with a focus on familiarization of history, indications, and known adverse effects or interactions. Course lecture/tutorial topics are outlined in Table 1. The topics were chosen to be the focus of this course due to their relevance in the practice of pharmacy. They are also complemented by topics exploring: biochemical pathways, vitamins and minerals, which are covered in the mandatory course, “Human Nutrition”. As CAM use increased in the Australian population, and pharmacies stocked and provided CAM to consumers [8], it became in 2002 a mandatory course within the pharmacy program to reflect the need of all pharmacists to have the capacity to research, analyze and make a recommendation on CAM use to consumers or other health professionals.

**Table 1.** Indicative lecture and tutorial topics for Complementary Medicines for Pharmacy.

<b>Lecture or tutorial topics may have varied during the years of offer depending on staff availability</b>
(1) History of common herbal dose forms
(2) Phytopharmacology (5 lectures)
(3) Usage, Information Sources, Evaluation of Efficacy, Data collection and Ethical Issues (3 lectures)
(4) Use of Complementary Medicines in Respiratory Disorders
(5) Use of Complementary Medicines in Reproductive Conditions

**Table 1. Cont.**

<b>Lecture or tutorial topics may have varied during the years of offer depending on staff availability</b>
(6) Use of Complementary medicines in Haematological Conditions
(7) Principles of Chinese Herbal Medicine
(8) Principles of Naturopathy
(9) Integrating natural therapies into Pharmacy Practice

### Course Objectives, Assessment and Topics

The objectives for the course were stated as expected outcomes after completion of the course, which are outlined in Table 2. These remained constant across the early years of offer.

Student assessment was performed in a variety of ways throughout the course and was designed to develop professional research, communication skills and decision-making. There were four assessment items as follows: mid-semester examination (45%); customer information leaflet (15%); pharmacist data sheet (15%); and seminar (25%). The mid-semester examination was a formal, closed book 2.5 h examination assessing material presented in weeks one to six inclusive. The customer information leaflet required the student to select one herbal medicine from a supplied list and produce one, double sided, A4 sheet either plain or folded with patient-friendly information about that herbal product. By contrast, the pharmacist data sheet whilst also limited to one double sided, A4 sheet adopted a more professional focus. This task required students to produce information that must include some background information and a significant amount of material based on scientific, peer-reviewed literature, presented in a clear, concise, and correctly referenced format. The final assessment item, a seminar on another herbal product, provided students with experience of working collaboratively in pairs, managing equitably their own contribution to the task and presenting to an audience of their peers.

**Table 2. Objectives of Complementary Medicines for Pharmacy.**

<b>Upon successful completion of this subject, students will:</b>
(1) Have a sound understanding of the history and background of the use of herbal medicines.
(2) Have a sound understanding of formulations and dose forms used in herbal medicine.
(3) Have a general understanding of the constituents and how these may vary in some of the most popular herbs sold in the pharmacies and other retail outlets in Australia.
(4) Be able to pinpoint specific therapeutic information regarding the appropriate use of leading herbs and phytomedicines in Australia, including:
(a) Their specific health benefits;
(b) Contraindications (when known);
(c) Side effects (when known);
(d) Interactions with other drugs (when known);
(e) Appropriate dosage levels;
(f) Other relevant therapeutic guidelines.
(5) Be able to access and utilise the available resources in order to understand the consensus of authoritative references regarding the relative safety of many popular herbs sold in commerce in Australia.

## 2.2. The Transition Years 2006–2008

Whilst initially the learning objectives remained essentially the same, across these years there was a transition of course coordination from a single coordinator (HC) to two coordinators (HC, PK) and then to a merger with Professional Practice 2 (PHM402) to become a single semester 16 point “double course”.

In the 2006 course offering, lecture content was decreased, workshop and tutorials were increased to encourage active engagement, and peer teaching became a substantial component of the course, with student presentations increased from 10 to 25 min. Group size was increased from the initial two students to groups of at least four or five students to more effectively build inter-personal communication skills, to develop a more complete understanding of the task through incorporation of diverse perspectives and to receive social support from their peers. To reflect the change in focus and delivery, additional weight was placed on the peer teaching with 40% of the course mark allocated to this learning activity and the exam now addressing the learning from the entire session attracted 60% of the course marks. Indicative peer presentation topics are outlined in Table 3.

**Table 3.** Peer presentation topics for Complementary Medicines for Pharmacy.

<b>Topics from which students may choose:</b>	
(1)	Disorders of the Skin, Rheumatism and Pain
(2)	Chinese Herbal Medicines
(3)	Disorders of the Cardiovascular System: Heart failure & Coronary Insufficiency
(4)	Disorders of the Central Nervous System
(5)	Disorders of the Respiratory System: non-infectious
(6)	Disorders of the Urinary Tract and Reproductive System
(7)	Immunostimulants
(8)	Disorders of the Cardiovascular System: Arterial disease, Hypo- and Hypertension
(9)	Disorders of the Digestive System: non-infectious
(10)	Disorders of the Digestive System: infectious
(11)	Disorders of the Respiratory System: infectious
(12)	Probiotics
(13)	Functional foods (including Mushrooms)
(14)	Weight Loss Products

In 2007, this course was coordinated by a single staff member (PK) and the desired learning outcomes were identified as the development of knowledge and understanding of the uses of complementary medicines; the dose forms and dose form properties; the phytochemical properties of CAM and interactions between CAM and conventional medicines. To achieve these learning goals, the lecture content reflected a greater proportion of topics in phytochemistry such as polysaccharides; glyconutrients; terpenes, resins and saponins, glycosides, alkaloids, and traditional indigenous medicines.

Four assessment items were re-incorporated into the course: a mid-semester exam and end of semester exam (each contributing 35% of marks to grade); and a customer information sheet (CIS) and pharmacist data sheet (PDS) (each contributing 15% of marks to grade). This return to the original assessment tasks was incorporated to enhance the importance of appropriate professional knowledge, and the ability to communicate that knowledge and understanding to both a consumer and a professional

audience. The peer presentation seminar and the written tasks (CIS, PDS) both developed research and analysis skills, but whilst the written tasks clearly assessed written communication skills to different nominated audiences, the peer presentation seminar arguably did not. Student response to the changed content and assessment was mixed. Some preferred taking individual responsibility for their assessment marks contribution to grade, others reflected a preference for verbal rather than written assessment modalities as communication in pharmacy practice was perceived to be predominantly verbal. The resources to support this subject were updated to reflect a change of prescribed textbook [13] and others were updated as new editions had been released. This was identified as a critical activity as this course was intended to introduce students to suitable CAM resources to support them as students and in future practice. This was strongly valued by the students.

In 2008, this course was structured with a Pharmacy Practice stream and a CAM stream within a single, mandatory course, PHM405 Professional Practice 2. This course was managed by a cross campus course convenor (MS) as this was the first year that fourth year students were present on both Orange and Wagga Wagga campuses. Interactive video teaching (IVT) was utilized to facilitate development of a year cohort rather than site-specific cohorts, and to enhance students learning since both cohorts were taught by the entire course team of four academic staff.

The CAM stream within the course was structured with lectures for CAM for the first three weeks and then peer teaching with students allocated to groups to present on a selected CAM topic. The lecture topics included: Herbal products throughout history; Herbal products in pharmacy practice; Legislation and Counselling for herbal products; and Phytomedicinal compounds (three presentations over six hours). This stream was presented concurrently with the Pharmacy Practice stream which included three lectures each week on Pharmacy Practice topics. These included neurological conditions such as epilepsy and multiple sclerosis; endocrine disorders, such as diabetes mellitus, hypo-, and hyper-thyroidism; emergent and transmissible diseases and professional issues such as pain, stigma, ethics, and legal requirements.

The merging of the two courses provided an opportunity to site CAM within professional practice and to assess professional knowledge, decision-making, written and verbal communication skills. In this first offering of the merged subject, there were five assessment items: a group project (weighted 20%); a mid-semester examination (20%); an end of semester examination (20%); a student presentation (20%); and a CAM-only quiz (20%). The two examinations were closed book assessments of factual knowledge and the application of that knowledge to a patient presentation whilst the CAM quiz permitted students to refer to specified texts. The group project invited assigned groups of students to research and present either a brochure or a poster advising of their pharmacy's chronic disease state management program for one of several specified conditions such as osteoporosis or diabetes. This provided an opportunity to develop and demonstrate capabilities for concise and comprehensive written communication, working collaboratively and effective time management. The seminar presentation of a CAM product by assigned groups of three students was collaboratively presented with each student speaking on an aspect of the topic for five minutes.

In 2009, the teaching team expanded to five academic staff and included some practitioner presentations addressing the philosophic traditions of the Indian, South African, and South-East Asian health practitioners. The assessment items were re-weighted to reflect the greater knowledge, decision-making and integration required in the end of semester examination (30%) relative to the mid-semester

examination (10%), and a reflective professional portfolio was introduced to provide evidence of learning and of the synthesis and integration of CAM knowledge to achieve students' selected learning outcomes. This portfolio replaced the CAM quiz, assisted students to provide evidence of their learning in CAM and prepared them for future National registration and continuing professional development.

### 2.3. The Reflective Professional Portfolio 2010–2013

From 2010, the course has continued to assess the CAM component with a student presentation and a reflective professional portfolio. The professional portfolio content and format has been developed by George John to enhance student learning and work-readiness across many domains. Firstly, the portfolio provides concrete evidence to each student that they have researched, analyzed, proposed a view and reflected on the learning outcomes that have been achieved. Secondly, with the inclusion of a *curriculum vitae*, evidence of learning and of reflection, the portfolio also enables students applying for intern positions to offer potential employers evidence of skills or learning that the student may claim. Lastly, the portfolio provides a basis for demonstrating acquisition of professional competencies and their maintenance and enhancement over time.

Across those years, the number of CAM products that were specified for incorporation into the portfolio was reduced to reflect a realistic student workload. To scaffold students' learning, the pre-requisite course also included the portfolio in its basic format and incorporated a reflection on the Pharmacy Practice stream assessments to hone students' capacity for effective reflection. This was based on student feedback which identified that preparing the structure and format of the portfolio was itself time consuming and added significantly to course CAM evaluation workload when first commenced in PHM405. Over a similar timeframe, the Pharmacy Practice stream lectures and practical sessions included CAM modalities and medicines as a potential management option where evidence to support its use was available. In addition, written tasks provided the opportunity for students to consider what constitutes "evidence", how is "quality" recognized, and how to engage with patients who may be choosing to use CAM in a complementary manner as part of the management plan for chronic conditions or potentially life limiting diseases. This integration and embedding of CAM within pharmacy practice has seen students develop greater awareness of the possibility that their patients may choose to use CAM, the likely choices and issues arising from CAM use such as adverse reactions and interactions with a medication or a disease state. We would propose that this results in richer, deeper learning and arguably better "work readiness" as an intern. Certainly, student feedback as provided through Student Learning Division has established that our students were more confident engaging patients about CAM and stated that they perceived that they had developed the tools, resources and capacity to research, evaluate and offer relevant information to patients and other health professionals.

### 3. Our Journey and Our Reflections

Looking back, the early years were an era in which learning style and format were designed, developed and reviewed in this course as teaching CAM to pharmacy students within Australian was essentially "unexplored territory". Students really valued the texts and resources identified to support the course, appreciated the need for professional knowledge and skills development but struggled with the phytopharmacology as evidenced in students' evaluation of the course. Student comments indicated that

they had not recognized the different approach and learning goals of this course but perceived that it was essentially Medicinal Chemistry, which may have been confounded by the use of the same staff member. Since the subject content was viewed by staff and other stakeholders as useful, in 2004 the didactic lectures were replaced by a more interactive tutorial/ workshop format. In retrospect, it may have been useful to have adopted this approach from the beginning to assist students to engage more actively with the material [14,15] however, lectures were still commonly perceived to be the most feasible way to deliver essential content when the course was proposed and developed, and needed to be re-introduced when a second program offering was introduced.

In 2008, this course was offered across two campuses of Charles Sturt University and this provided opportunities to explore technological innovations to teach concurrently to both campus cohorts. Adoption of new or different technology in many areas of life can pose some challenges and this course was affected by differences between the reality and the expectation of interactive video teaching. It proved difficult for the presenter to engage the distant cohort as there were some technological issues with room microphones and with visual resolution such that the clarity of facial expressions was less than anticipated. In more recent years, the technology has improved and the experience of staff and students has been enhanced as a result. The course team continues to evaluate additional technological options to enhance student learning such as producing more mobile-friendly materials and more time-flexible participation opportunities. In the space of just over a decade, this course has changed significantly from a stand-alone course addressing the topic of CAM through to embedded professional knowledge throughout all years of the program.

#### **4. Conclusions**

CAM has increasingly become incorporated into pharmacy education in Australia to assist pharmacists to develop the knowledge and critical analysis skills to assist consumers to make decisions about the suitability of certain CAM for particular disease states and the suitability of combining CAM with prescribed medicines. This individual course in CAM was initially developed at a time when education in CAM, as opposed to Medicinal Chemistry or Pharmacognosy, was not formally incorporated in the pharmacy programs offered at that time. As time has passed, to reflect need and current practice, this eight credit point course was merged with an eight credit point final year pharmacy practice subject so that students would develop the understanding that CAM is not a separate aspect of practice but rather attracts all the usual considerations of ethics, standards and duty of care. The adoption of collaborative group work early in the course developed useful time management and negotiation skills but the addition of a reflective professional portfolio truly integrated CAM into pharmacy practice.

Student course feedback identified many benefits of the CAM content and portfolio. Students reported that many had thought CAM was safe if not necessarily efficacious but now understood that some CAM could contribute to herb-drug and herb-disease state interactions and that some CAM could also exhibit adverse effects. Students also came to appreciate that in researching and preparing the reflective professional portfolio incorporating CAM, they had developed very relevant skills for their future profession as the same skill set is needed to investigate a new prescribed medicine or dose form. The skill set and deep understanding that students have developed provided us with the impetus

to introduce CAM in the first year course in 2010 and to incorporate it increasingly across all years of the program.

From our experiences with teaching complementary medicines to pharmacy students, we would propose that incorporating CAM from first through final year of a pharmacy program and utilizing a reflective professional portfolio across all years of the course will enhance effective learning in CAM among pharmacy students.

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### Author Contributions

Maree Simpson, Heather Cavanagh and Philip Kerr contributed to the concept of a CAM subject in a rurally-situated Pharmacy program with both Heather and Philip involved in its initial development and offering as PHM404. During and since the redevelopment and first offering as PHM405 in 2008, Heather Robinson, Hassan Obied, Maree Simpson, George John, Philip Kerr and Gregg Maynard all participated in the subject offering, with George John taking primary coordination responsibility of the CAM stream in PHM405 since 2010. Maree Simpson proposed in 2010 writing a group reflective paper at an appropriate time in the future looking back over at least ten years experience of teaching CAM which was supported. Heather Cavanagh, Philip Kerr, George John and Hassan Obied contributed historical documents to inform the drafting of that paper. Maree Simpson, Heather Robinson, Heather Cavanagh and Gregg Maynard drafted and edited the original manuscript which was circulated to and reviewed by all authors.

### Conflicts of Interest

The authors declare no conflict of interest.

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