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The Official Journal of FIP

FIP and WHO establish the Pharmacy Education Taskforce
Following the recommendations of the first FIP Roundtable on Pharmacy Education

23 Hard Questions for Pharmacy Educators
What will they answer?

"Our future impact lies in our concerted, dedicated, and focused collective efforts"
FIP President Dr Kamal K Midha speaks on the future of pharmacy education

The Education Issue

Pharmacy education reform is rising to the top of the global healthcare agenda. This Edition of the IPJ examines the current trends and future prospects for educating skilled, qualified and influential pharmacists

advancing pharmacy and science to the benefit of the patient

IPJ
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The International Pharmaceutical Federation/ Federation Internationale Pharmaceutique (FIP)

FIP has as its mission 'to represent and serve pharmacy and pharmaceutical sciences world-wide' (Statutes, Art. 2.). La FIP a pour mission 'de representer et de servir la pharmacie et les sciences pharmaceutiques a l'echelle mondiale' (Status, Art. 2.)

International Pharmacy Journal

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Dear Reader

A key element to changing the tides of the global pharmacy workforce stands at its core: pharmacy education. With this notion as the driving force, FIP and the World Health Organization have established the Pharmacy Education Taskforce, following recommendations from the first FIP Roundtable Consultation of Pharmacy Education at the Federation's annual congress in Brazil, September 2006. Its mission is to provide a global framework for the advancement of pharmacy education, achieved through a well established and continually evolving action plan. The next FIP Pharmacy Education Consultation will convene upon the 67th FIP World Congress in Beijing, September 2007 where current progress and future directions will unfold.

It has been one year since FIP published the IPJ issue on Human Resources for Health, which evaluated how the lack of pharmacy human resources are affecting the health and welfare of communities on a global level. Since then, FIP and many dedicated partners have aimed at moving past the mere identification of this problem to tangible solutions. The Pharmacy Education Taskforce is in place to support widespread, country-level efforts to bring these solutions to fruition.

In light of these ambitious endeavours, it seemed fitting to dedicate the Summer 2007 issue of the IPJ to Pharmacy Education. The response has been overwhelming. The call for articles stimulated remarkable interest from all walks of the profession from every corner of the globe, indicating a driving force for pharmacy education reform. This rings true from within FIP as well, with FIP President Dr Kamal K Midha making Pharmacy Education a priority from the very onset of his presidency last September.

What this issue of the IPJ offers you is a look at what is changing now in pharmacy education around the world, and what changes are hoped to be realised. Our contributors are academics, students, educators and pharmacists; visionaries building education reform from within, from afar and from the literal ground up, as with the establishment of the first school of Pharmacy in Malawi (page 33). Further to this, this IPJ is pleased to welcome contributions from our partners at the World Health Organization, and bring you reflections from the Federation itself.

And, we are excited to bring with this issue a new look for the IPJ, which we hope gives image to the progress and successes within and associated with FIP.

On behalf of my co-Editor and myself, I hope you find the Summer 2007 International Pharmacy Journal an educating read.

Myriah Lesko, Editor
Lowell Anderson, Co-Editor

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The Pharmacy Education Taskforce

FIP and WHO move forward in developing pharmacy education

Claire Anderson, Ian Bates, Diane Beck, Billy Futter, Hugo Mercer, Michael J Rouse *and* Tana Wuliji

The first FIP Roundtable Consultation on Pharmacy Education was held at the 66th World Congress of Pharmacy and Pharmaceutical Sciences in Salvador Bahia, Brazil. This edition of the IPJ seeks to provoke discussion on the global vision for pharmacy education and direction for its development and that of the profession. The 2007 FIP Pharmacy Education Consultation will be held in Beijing at the FIP congress.

FIP-WHO Pharmacy Education Taskforce and Action Plan

The aim of the first roundtable consultation on pharmacy education was to discuss the development of a global vision for pharmacy education. With this aim, the consultation identified priority actions necessary for the development of pharmacy education and the pharmacy workforce worldwide. Common themes emerged relating to the role of the pharmacist and other pharmacy cadres, purpose of undergraduate and post-graduate education, quality of education, shortage and competence of academic/faculty workforce, and orienting pharmacy education towards health needs. Stakeholders agreed that there was an urgent need to re-examine pharmacy education against a backdrop of changing health needs, health policy, professional roles and the human resources for health crisis (1).

In September 2006 the FIP-WHO Pharmacy Education Taskforce was established. The expert committee set to bring international stakeholders together to form a collaborative strategy to build evidence, synthesise policy and strategy, form guidelines and provide technical support towards the development of pharmacy education. Following the 2006 consultation, the Taskforce prepared an action plan which was formally approved by FIP and WHO in February 2007. Funding is currently being sought from potential donors for its implementation.

This action plan aims to develop an acceptable global framework for the strategic enhancement of pharmacy education. The framework will address undergraduate, postgraduate and continuing education and encompass a vision for pharmacy education that moves towards global competence in order for pharmacists to meet the health and workforce needs of individual countries. An evidence based approach is required and will include research and policy work to particularly focus on the role of pharmacists and competencies for pharmaceutical services, quality assurance and accreditation of pharmacy education and academic or faculty capacity development.

The need for global coordinated focus on pharmacy education

Pharmacists' roles are evolving from compounder and dispenser of medicines to healthcare professional and medicines expert within a multidisciplinary health care team. For many communities, the pharmacy is the most accessible or sole provider of healthcare advice and services and pharmacists have been shown to be willing, competent, and cost effective providers of public health and pharmaceutical care interventions. Internationally, there is wide acknowledgement of the underutilisation of pharmacists for public health roles. The paradigm shift of the pharmacist from dispenser to health professional requires coordinated and multifaceted efforts to advance workforce planning, training and education to prepare pharmacists for these roles and ensure an adequate workforce (2).

> *"Inadequate human resources for health, including pharmacists and pharmacy technicians, is a growing problem that, if unaddressed, threatens to undermine all efforts to strengthen health systems*

and improve healthcare in much of the developing world."

REPORT OF THE UN MILLENNIUM PROJECT TASK FORCE ON HIV/AIDS, MALARIA, TB, AND ACCESS TO ESSENTIAL MEDICINES (3).

There is strong evidence to suggest that pharmacists in community and hospital settings reduce the cost of medicines use, improve health, reduce morbidity and mortality, reduce avoidable hospital admissions, reduce medication errors, improve rational use and prescribing of medicines, and increase access to healthcare and medicines, particularly for underserved populations (4-12).

In developing countries, particularly in sub-Saharan Africa, the pharmacy human resource crisis is at its peak. Training capacity is insufficient and few countries in the region have training institutions to produce pharmacists. There is an urgent need to explore how to strengthen and increase the capacity of training institutions and reflect an education that produces competent pharmacists to provide services that are matched to local health needs.

WHO estimates that nearly one third of the world's population lacks access to basic essential medicines and that prompt diagnosis and treatment with appropriate medicines could save 4 million lives annually. Despite adequate access to medicines, adherence to therapy is poor and averages 50% with even lower rates in developing countries. In many settings, there is also poor integrity of the pharmaceutical supply chain with counterfeit medicines estimated to comprise 25% to 50% of medicines used in developing countries.

Resistance to antibiotics and anti-retrovirals is growing with the emergence of deadly multi-drug resistant strains of malaria, tuberculosis, HIV/AIDS and other infectious diseases. This is attributable in part do the irrational use of medicines and poor adherence to therapy. Resources are wasted through the inappropriate use of medicines and could be countered with the implementation of relatively inexpensive interventions to improve rational use of medicines. Training pharmacists to be active members of the health care team is one of the ten recommended strategies proposed to improve the use of medicines (13).

The aims of the taskforce are:

To develop a collaborative global framework to quantify the required pharmacy workforce levels, develop models to build training capacity for the scaling up pharmacy education and training and provide technical support for country level action and human resources for health planning to ensure the provision of essential pharmaceutical services and care.

Objectives:

1. To quantify the required pharmacist and other pharmacy cadre workforce levels required to provide essential pharmaceutical services and care.
2. To codify data on academic/faculty workforce and training capacity and to develop models that will enable the scaling up of education at national level.
3. To provide advocacy and technical expertise to countries and training institutions for the scaling up of pharmacy education and human resources for health planning.
4. To launch a functional platform for ongoing dialogue, sharing of best practices, resources and tools for pharmacy education and human resources planning.
5. To develop global guidelines for standards, accreditation and quality of pharmacy educational provision.
6. To define and clarify pharmacy practitioner competencies across all settings in relation to country level health, market and workforce needs and other health care workers.
7. To match pre-service educational needs against these competencies and examine the role of continuing professional development.
8. To facilitate stakeholders to move towards an accepted vision for pharmacy education at both global and local levels.

The Taskforce's next consultation will be on Wednesday 5 September at the FIP World Pharmacy Congress in Beijing. Here global pharmacy issues and priorities will be discussed, including scaling up education and the number of academics, and how to push the agenda forward. A number of issues require further consideration, including how many and what sort of pharmacists/pharmacy workers are needed in different settings? What particular competencies do they need in relation to the rest of the interdisciplinary healthcare team? What service delivery models might be developed? How and by whom will these people be trained? Which stakeholders must we engage to effectively move this agenda forwards?

Overall, the Taskforce aims to provide 'evidence and technical support' to aid in the development of pharmacy education and practice. This is an exciting initiative, one that has the potential to steer the future or pharmacy education at a time when WHO, governments and NGOs are evaluating ways to scale up the healthcare workforce and develop new educational models. ■

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Post-Registration and Seamless Education: the need for global reform

IP Bates, JG Davies, DG Webb DG *and* **S Carter**

Recent interest in performance of health care practitioners has to a large extent been driven by media interest, public concern and various governmental responses to public inquiries (for example, in the UK, an investigation of unacceptable paediatric heart surgery mortality [Department of Health 1998]). The resulting "fitness for purpose" approach has significant implications for all health care professions, and in particular the need to develop and maintain competence. This outlook captures the essence of clinical governance and corresponding components of accountability, clinical risk management, remedy of poor performance and continuing professional development. It also ensures that the patient safety agenda is addressed in a pragmatic way.

Delivering patient-centred pharmacy services

The rapid expansion of pharmaceutical roles and duties in health care settings has resulted in an inability to keep pace with the increasing demand for patient-centred pharmacy services. This results in both poor utilisation of pharmacists' expertise and an inconsistent delivery of service. The incidence (Bates et al 1995), costs (both human and financial - Classen et al 1997; Bates et al 1997) and determinants (Leape et al 1995; Lesar et al 1997) of adverse drug events have been well described, and non-compliance with therapy continues to be cited as a major problem (Horne 1993; Carter et al 2003). Political and public concern have driven demands for ensuring the competence of professionals involved in patient care, and this implies a training model that will produce practitioners who are "fit for purpose."

Outlined in Box 1 are criticisms of many formal post-registration pharmacy courses, the result of which is large differences in the competence of pharmacists who complete them, and a general underlying inequality of both access and outcome.

In response, the General Level Framework (GLF) (relating to practitioner competence) was developed for both primary care and secondary care as a result of academics and employers working in partnership (Antoniou et al 2005; Mills et al, 2005) and provides an opportunity for the standardisation of pharmacy practice outcomes. The growing acceptance of this nationally will ensure that employers recruiting a pharmacist with a postgraduate qualification based on the framework will have confidence in the applicants' abilities as a practitioner. A wider project – the Joint Programme Board - is now underway in England, managed by an academic-employer consortium and financed by government (www.postgraduatepharmacy.org).

Box 1:
Deficiencies in traditional postgraduate courses

- Poor correlation between academic outcomes and practice requirements
- Over reliance on traditional non-competency based assessment methods which may increase workload without any direct benefit to practice
- Over reliance on didactic teaching methods and study days based outside of practice
- The separation of career structure training (eg. community and hospital practice treated seperately for largely historical reasons)

What can we learn from medicine?

Recent generic modernisations in many countries (for example "Modernising medical careers", Department of Health 2003) have seen the medical profession providing a clear path from registration to achieving consultant (advanced practice) status, requiring individuals to complete periods of recognised training and to demonstrate their ability to perform at a given level of practice. In pharmacy, individuals currently gather a range of experiences in the hope that this will approximate to employers' requirements when senior posts become available. Selecting candidates on their potential to do a job may be justifiable, if their subsequent attainment is measured, but it rarely is, as no systematic appraisal systems exist.

Towards a practitioner development strategy

Competency is a comprehensive construct, encompassing skills, knowledge, behaviour and other attributes, such as values and attitudes (Spencer & Spencer 1993). In 2002 we first proposed a competency-based approach to fitness to practise (Davies, Webb, McRobbie, Bates 2002), which has been subsequently refined into a four-stage practitioner development strategy (Davies, Webb, McRobbie, Bates 2004). This gives a career pathway from registered to general pharmacy practitioner, advanced pharmacy practitioner and ultimately consultant pharmacy practitioner, and maps against current job profiles in England. It proposes two distinct training phases: general and advanced. Each phase is supported by a competency framework that has been constructed using a recognised process and validated in the practice setting. The general level framework is further supported by empirical evidence of performance improvement (Webb et al 2003). The advanced level framework enables differentiation between those in training, those who have progressed to an advanced level of practice and those who may be recognised as practising at a consultant level (Obiols et al 2005). Both the general and advanced frameworks ▸

are being developed for a broader application to reflect the range of roles in the profession.

What needs to be included in a pragmatic, global strategy for practitioner development?

The strategy must address five main themes in order to be effective:

1. Recognition of different levels of practice

Given the increasingly complex and diverse nature of pharmacists' roles, and the requirements of clinical governance, it is important to recognise formally that there are different levels of practice. In a recent article, our group proposed four levels of practice each with a protected title; a registered pharmacist (immediate post-registration practitioner), a general pharmacy practitioner (GPP), an advanced (or higher level) pharmacy practitioner (APP) and a consultant pharmacy practitioner (CPP) (Davies et al 2004). These tiers are generally consistent with the progression adequately described for medicine and other health care scientists. The nomenclature is not important, and could vary; the concept of levels of practice is significant.

2. Workforce planning

A key aspect of any practitioner development strategy is that the workforce plan determines, at an early stage, the number of individuals required to deliver the service for each level of practice according to local and national needs. Adopting such an approach would ensure that adequate provision is made for succession planning and that appropriately skilled individuals undertake tasks they are competent to perform. A workforce plan could then be used to commission training places at accredited training collaboratives and to secure the funding required to support delivery.

3. Recognised training schemes

A systematic approach to workforce planning allows training resources to be both identified and provided in order to achieve the requisite number of pharmacists at each level of practice. The likely impact would be the emergence of training centres charged with, and resourced to, provide the stipulated learning experience for practitioners.

An important component of the training will be to satisfy two key criteria: delivering a nationally agreed curriculum for practitioner development; and, employing a recognised approach to assess the competency of the individual.

The curriculum to develop practitioners from a registered pharmacist to "GPP" should require individuals to complete a core experience that embraces a range of different pharmaceutical disciplines. A local tutor would regularly monitor the performance of the trainee using a competency framework for general level practice. Our group has designed and validated such a framework based on four competency clusters, each providing a detailed account of the competencies required at a general level of practice, applicable across different health care settings. The performance of the individual is then evaluated using a rating scale (Webb et al 2003; Antoniou et al 2005). The individual would also build a portfolio containing the outcome of periodic competency assessment, alongside additional evidence.

At higher level practice, the specialist curriculum should provide a breadth of experience and expertise. The practitioner would spend up to 3-4 years making satisfactory progress in their specialty, which would be mapped using an advanced competency framework (Meadows 2003; Webb et al 2003). This particular framework consists of six clusters, each containing a range of associated competencies, and allows evaluation of individual performance using a series of descriptors which capture practice at a foundation, excellence and mastery level.

4. Engagement with higher education

Traditionally schools of pharmacy have supported the registered pharmacist by offering a range of postgraduate courses directed at their area of practice. When viewed closely, most of these courses use traditional, mainly knowledge-based, assessment processes.

The new model of work-based training collaboratives – such as the Joint Programme Board (JPB) - has a different emphasis in the role of academia. Whilst the delivery of material would become the province of the accredited training centre, academia would focus on, for example:

- Working with specialist groups to design the curricula and appropriate assessment methods for general and advanced level practice.
- Organising and running the assessment process.
- Ensuring that the practitioners involved in training provision possess the appropriate skills.
- Working with the training commissioners to assure quality of the training using recognised higher education criteria.
- Aligning postgraduate credits to discrete elements of learning to enable the award of a postgraduate diploma or masters (credits) when learning outcomes are met.

This process would ensure that all schools of pharmacy could provide a common, consistent approach to practitioner development.

5. A system of accreditation

Fundamental to this strategy is the concept of a national accreditation process. Accreditation needs to address both the recognition of training centres and protected titles. This will provide employers and patients with the security of knowing the minimum competence of staff. In an earlier article (Davies et al 2004) we suggested that a "Pharmacy Board" concept be introduced in order to determine the mechanism for accreditation of general and specialist training, those who should be responsible for awarding certificates of completion and, most importantly, who should register individuals holding certificates of comple-

tion. This is already the case in some health care settings. Other workers (inter alia Rouse and colleagues 2005) have already done much preparatory work in this area.

Moving forward

One model currently being developed in England is the JPB consortium, comprising the NHS pharmacy agencies and schools of pharmacy from seven universities. The programme is now in an implementation phase, with funding provided via central government.

This post-registration programme has a specific design that:

- Allows standardisation of output competencies and performance (ensuring practitioners are fit for purpose);
- Ensures that the education process maps to training and work-based needs;
- Allows universal access for newly-registered practitioners;
- Empowers appropriately trained and supported practice tutors to assess practitioner-student performance.

The JPB model is an example of work-based learning that fits with work-based needs. Training sites and tutors are accredited and outcomes are standardised through a quality assurance model. External judgment of performance is necessary in assessing the competence of practitioners and performance-based assessment allows the evaluation of a practitioner's ability to translate knowledge into practice. In addition, assessments are linked directly to competence and performance which will be robust for future reforms of health care or regulation. The model can be flexible according to locality infrastructure, but maintaining uniformity in output.

This, we believe, is of greatest importance to employers and the public, and is transferable to other health care settings. We should now ensure that we move towards the goal of a global pharmacy workforce that is fit for purpose. The tools are available, adaptable and have been tested; it is now time for the diplomats to provide leadership towards this goal. ■

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Quality Assurance of Pharmacy Education

Developing a Global Framework

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While some core aspects of the pharmacy profession may apply globally, pharmacy practice, pharmacy education and quality assurance systems for education differ from country to country. Over the past two to three decades, however, a global vision for pharmacy practice has begun to emerge; one in which pharmacists have a much expanded patient care role in the overall delivery of healthcare. As such, the pharmacy profession as a whole and pharmacy practice and education in particular are undergoing unprecedented changes; the extent of which is likely unmatched in the major health professions. While the diversity referred to earlier is diminishing as a result of endorsement of this new vision and role for pharmacists, it is still significant when considered on a global scale.

In essence, pharmacists are transitioning from a primarily product-focused role to a primarily patient-focused role or, to use another term, pharmacists are becoming recognised as the "medication use specialists." Not only are countries at different stages in this transition, but within countries the practice of pharmacy may well differ from site to site or setting to setting (for example, comparing community pharmacy practice and hospital practice). Due to the dynamic interplay between education and practice, pharmacy education is also undergoing major reform on a global level.

National quality assurance systems for pharmacy education also differ. In some countries systems are well developed; in others they are still emerging. For many countries, quality assurance is a direct or indirect function and responsibility of government, although more independent and autonomous models are becoming more common. Most people would probably agree that every country should have its own national system of quality assurance and standards for education that reflect contemporary pharmacy practice and education. These must be appropriate to the overall system of healthcare delivery and must meet the specific needs of the country. Yet, while assuring "fitness for purpose", quality assurance systems should also play an important role in advancing pharmacy education, to ensure that professional services provided in the future contribute to better healthcare outcomes at both individual patient and population levels.

The changing role of pharmacists and the expanded scope of pharmacy practice require a significantly different educational approach throughout the continuum of pharmacy education. Furthermore, it is unlikely that any country has found or developed the perfect solution to the opportunities and challenges facing the profession in terms of education and training. We can all learn from others, and everyone/every country has something to offer through unique experiences and perspectives. Such international interaction and collaboration can occur at [at least] three levels: individual to individual; institution to institution; and nation to nation.

In 2001, it was recognised that the annual conference of the International Pharmaceutical Federation (FIP) brought together many people with an interest or involvement in the quality assurance of pharmacy education, thereby providing an ideal opportunity to expand international collaboration in this area. A meeting was held in Singapore and this led to the establishment of what has become known as the International Forum for Quality Assurance of Pharmacy Education. The "Forum" now operates under the auspices of the Academic Section of FIP and its (informal) "membership" comprises over 260 people from close to 60 countries, regional and international organisations. Five subsequent meetings have been held at the FIP congresses 2002 to 2006. The meetings and discussions involved a range of subjects and speakers from several countries.

The objectives of the Forum are:

- To promote excellence in education for the profession of pharmacy;
- To provide an international forum for information exchange, collaboration and cooperation in the area of quality assurance of pharmacy education, both in terms of entry-to-practice degree programs, as well as continuing pharmacy education (CE) and continuing professional development (CPD);
- To facilitate and promote communication between individuals, agencies, associations, and other bodies actively involved in, or interested in, quality assurance of pharmacy education, with a view to:
  - the establishment of systems of quality assurance in countries where no such formal systems exist;
  - the continuous quality improvment of existing systems of quality assurance.

For the past few years, the efforts of the Forum have focused on the development of a global framework for the quality of pharmacy education. Through the focused discussions and exchange facilitated by the Forum, it was soon evident that while notable differences existed in pharmacy practice, pharmacy education, and the systems for quality assurance, it was unlikely that the principles and core elements for quality assurance of pharmacy education differed significantly - if at all - from country to country. Members of the Forum felt that it would be valuable to identify and compile these principles and core elements into a globally-applicable framework for quality assurance of pharmacy education. It was also felt that countries either trying to establish or trying to improve their system of quality assurance could benefit from such an internationally developed and adopted framework. The final product is intended as a "framework" or "template" that can be adapted and built-on to suit local needs and conditions. It will focus more on the elements that need to be included, and how these elements are applied in principle, rather than attempting to be too specific or detailed. The framework will avoid being prescriptive - it will not advocate any specific approach to quality assurance or academic model, and will strive to exclude cultural or systematic biases.

The major part of the framework will focus on the principles and core elements for quality assurance of professional degree programs in pharmacy using a standards-based or criteria-based approach. The principles will be addressed in three main areas: Outcomes, Structure and Process. Outcomes will be covered first, reflecting the trend in the quality assurance community to shift focus from a system that primarily evaluates structure and process to one that includes assessment and evaluation of outcomes.

What is the potential future for the framework, its uptake and application? The first substantive draft of the framework was discussed at the 2006 Forum Meeting in Salvador Bahia, Brazil during the FIP Congress. It is proposed that the second draft will be reviewed by an international panel, with a view to final adoption in Beijing in September 2007. The development of the framework is now on the agenda of FIP's recently established Pharmacy Education Taskforce; a group that has formal participation by and endorsement of the WHO through its Human Resources for Health Department. The Taskforce is also seeking active collaboration with the Global Health Workforce Alliance. It is proposed that the framework will become an official FIP document (a companion piece to its Statement on Good Pharmacy Education Practice) and be translated and disseminated as widely as possible.

The proposed outline of the Framework is provided below:

Part 1: Introduction

- The global vision for pharmacy practice and education
- Development of a national vision for pharmacy practice and education; appropriate roles and competencies for pharmacists
- The philosophy and purpose of quality assurance

Part 2: Principles for structure and governance of the quality assurance body

Part 3: Principles for operations, policies and procedures of the quality assurance body

Part 4: Criteria for quality:

- **Outcomes** – identification of educational outcomes and competencies that should be achieved by graduates; other mission-related outcomes.
- **Structure** – what a school should have "in place;" sub-sections deal with mission, goals, and values; organisation, administration, and leadership; collaborative relationships; curriculum; and resources.
- **Process** – strategic planning; enrollment management; evaluation and assessment; academic policies and procedures; student services; student and alumni representation and input; curricular development and improvement; teaching and learning methodologies; faculty, staff, and preceptor development and evaluation; and research and scholarly activity.

Part 5: Glossary of terms ■

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Trends, Perspectives and Pharmacy Education

Rafael Rotger *and* **Benito del Castillo**

The goal of the Bologna Process is the creation of a European Higher Education Area (EHEA) by the year 2010. Begun in June 1999 by the European Ministers of Education in agreement with Universities Rectors, the Bologna Process is aimed at making European higher education more compatible, competitive and attractive for Europeans as well as for students and scholars from other continents. The need for a more uniform and comparable educational qualification system came from the rights to free circulation of professionals in the EU and globalisation trends. Immigration has always been a significant issue in Europe, and it is nowadays especially important in countries like Spain. The integration of all incoming professionals requires facilitating the comparability of qualifications throughout Europe, America and Asia.

The EHEA adopted a system based on the establishment of the three-cycle system (Degree/Master/Doctorate), a quality assurance system and the mutual recognition of qualifications and periods of study. The European Credit Transfer System (ECTS) has been introduced in most European countries to harmonise studies and to facilitate this recognition and the mobility of students. In fact, mobility is a milestone in the EHEA, and students at all levels are encouraged to broaden their educational and employment prospects through periods of mobility. The Socrates/Erasmus programme has been the main tool to provide this mobility inside Europe, and the Atlantis programme is now broadening the mobility range to the USA. Other similar programs have been established with Canada, Australia and Japan.

Achieving compatibility through Bologna does not mean making courses identical across Europe. Quoting M. Whitehead (Swansea University, UK), "Taken together, the Bologna Process is an unprecedented international movement whose strengths lie in its 'bottom-up', rather than 'top-down' approach" (1). Therefore, different approaches can be planned to ensure compatibility of periods of study. In the United Kingdom, where the three-cycle system was already implanted, Bachelor degree courses can be assigned 180 ECTS, and master courses 90 ECTS. In other European countries with a more traditional two-cycle system, a degree of 240 ECTS followed by a 60 ECTS master can be best accepted. This is the option chosen by the Spanish Government with the exception of degrees that follow their own European Directive regarding formation periods, as is the case for Medicine, Pharmacy, Dentistry, Veterinary and Architecture.

Recognition of Pharmacy studies in Europe was regulated by Directive 85/433/EC (September 16th, 1985) (2), followed by Directives 85/584/EC (December 20th, 1985), 90/658/EC (December 4th, 1990), and 36/2005/EC (3). The diplomas and titles in Pharmacy listed in these Directives were based upon a multidisciplinary integration of basic, natural, and health sciences and technologies with special focus on subjects related to medicines and medical devices in all their domains of usage. The course requirements for the degree should be, at least, equivalent to 300 ECTS (five academic years) and includes a training period stage in Community or Hospital Pharmacy, according to Directive 85/432/CEE and to the present situation in most of the European countries.

The importance of the orientation towards Pharmaceutical Care in the Pharmacy curriculum was outlined in the 2004 Conference of the European Association of Faculties of Pharmacy (EAFP), as well as alternative training in Industrial Pharmacy or other related fields (4).

All these considerations are focused on ensuring a university education in line with the increased demands of present-day society, which can be summarized in the following activities of pharmacists:

- To assure quality of dispensed drugs, medical devices, and pharmaceutical services.
- To negotiate the acquisition and the supply of drugs to prevent the distribution of adulterated or falsified products.
- To provide information to the public on the proper use of drugs.
- To provide technical advice to medical doctors and other health professionals.
- To promote the concept of pharmaceutical care as a capable system to develop the rational use of the drugs and to participate actively in the prevention of illnesses and the promotion of the health.
- To support research programmes and lifelong learning endeavours.

The Pharmaceutical Group of the European Union (PGEU), representing community pharmacists from 29 European countries, has emphasised the needs associated with the longer life of people in developed countries, which is significantly a consequence of the enormous progress made in health sciences, but also demands special pharmaceutical care. People are now treated for multiple conditions, particularly chronic diseases, and new conditions continue to emerge. Community Pharmacy is a basic tool for the management of these patients, and it is essential that pharmacists maintain and further develop their high level of professional competence (5).

Current trends in Hospital Pharmacy are characterized by implementation of telematic systems to ensure an individualised follow up of each drug from the store to the patient, inclusion of pharmacists in the different health teams for the improvement of dispensation and reduction

of side effects and costs, as well as the development of new therapeutic strategies, exemplified in gene therapy. Obviously, these requirements imply an improvement and adaptation of curricular design in matters like experimental pharmacokinetics, molecular biology, pharmagenomics, bioinformatics, etc. Fulfilment of these exigencies can be achieved both by gradual changes in the undergraduate formation and emphasising programs of continuous training (6).

Whereas in Anglo-Saxon countries the pharmacist's education is mainly focused on social pharmacy and pharmaceutical care, in many European countries – as is the case of France, Spain, Portugal, Italy, and Belgium, and especially the Baltic and Central Europe countries – a deeper knowledge in chemistry, biochemistry, microbiology, biotechnology, immunology, pharmacology, food sciences and clinical analysis has been considered essential to fulfil some of the professional tasks required by the pharmacist. In most of the European countries, Community Pharmacy represents only approximately 60 percent of the pharmaceutical employment. In Spain, a postgraduate specialisation programme for pharmacists financed by the National Health System includes a four-year stage in accredited hospitals. This way, postgraduates selected on the basis of a national examination can obtain in a clinical specialization either in Hospital Pharmacy, Radiopharmacy, Clinical Analysis, Clinical Microbiology and Parasitology, Clinical Biochemistry or Clinical Immunology. Other important areas of specialisation, in this case of industrial interest, are Pharmaceutical Technology, Drug Analysis and Quality Control.

The philosophy of this concept is to prepare pharmacists as complete health professionals, capable of working in a variety of fields according to the postgraduate and continuous formation chosen. The first cycle undergraduate Degree in Pharmacy should be broad enough to cope with all these possibilities and, consequently, cover the following areas: Basic sciences, Biomedical sciences, Pharmaceutical sciences, Social sciences and Humanities, and Pharmaceutical practice.

This unitary pharmacy training cycle shall be maintained through the implementation of the Bologna Processes, according to the guarantees set by the aforementioned European Directive 85/432/EC, reviewed and adapted in 36/2005/EC. Nevertheless, if we want to extend these possibilities beyond Europe, a special effort has to be made to harmonise the plans of study of Latin American degrees. Obviously, Middle East and Asiatic countries will also require a similar process.

A quick look at the higher education systems in America first reveals great differences among countries as well as public and private universities. It is perhaps excessive to imagine curricular harmonisation throughout the whole continent considering the substantial political and economic differences from country to country. However, some approaches have existed between the American College of Clinical Pharmacy (ACCP, USA) and several countries of Latin America since 1990, favoured by the Pan American Health Organization (PAHO). Also, the harmonisation of pharmacy curricula was the main objective of the Latin American Conference of Faculties of Pharmacy (COHIFFA, now COIFFA), founded in 1992 in Venezuela. A case-by-case approximation can be useful to begin a normalisation process between specific European and Latin American Universities in order to establish reference centres in each country which could, in turn, develop external systems for quality assurance in other universities of their countries. Lessons learned in the process of harmonization and quality assessment in EU integration candidate countries (or those recently joined) will be of unquestionable value for this process.

Portugal and Spain are logically the European countries that should lead this endeavour in Latin America not only for cultural and linguistic reasons, but also because of their own experience in the integration process and collaboration in the reform of higher education systems of some of the new EU members. It will be necessary to establish agile and versatile mechanisms of collaboration, directed to reduce the effect of the economic delays of the countries and institutions with fewer resources, to promote the exchange of professors and students, and finally, to develop inter-institutional programs of formation that include the mutual recognition of programs in equivalent pharmacy studies. ■

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Pharmacy Education in Finland – a Change of Course

Curriculum reform at the Faculty of Pharmacy, University of Helsinki

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Introduction

European universities have conducted extensive curriculum reforms after the Bologna Declaration in 1999 (1). The Bologna Process, followed by the implementation of the Declaration, aims to create a European Higher Education Area (EHEA) through harmonising the structures of European university degrees, increasing the transparency of the degrees and promoting mobility and cooperation in Europe.

Student-centred learning and the shift from knowledge transmission towards enhancing students' knowledge creation processes are emphasised in higher education today (2). The alignment between curriculum objectives, teaching and learning activities, and assessment of the process and outcomes are also pivotal in curriculum design (3). While higher education is based on science and arts, graduates must be prepared for professional practice in diverse and constantly developing settings (4).

The curriculum reform at the Faculty of Pharmacy, University of Helsinki, aimed at fulfilling the requirements of the Bologna Process and, further, developing pharmacy education to reflect the modern concepts of learning and teaching in higher education through:

- combining courses and forming larger coherent entities
- eliminating unintentional overlap of courses
- improving the integration of theory and practice
- fostering deep-level learning.

Table I
The structure of the reformed Bachelor's degree (180 ECTS)

Strand 1	Scientific thinking and professional development (40 ECTS) Introduction to university studies in pharmacy Practical training periods Bachelor thesis and maturity test
Strand 2	From molecule to drug preparation (56 ECTS) Mathematics Statistics Basics of chemistry Organic chemistry Pharmaceutical chemistry Pharmaceutical technology Pharmaceutical microbiology Biopharmaceutics and pharmacokinetics Pharmacognosy
Strand 3	Patient and medication therapy (40 ECTS) Basics of biosciences in pharmacy Human biology and health Systematic pharmacology Pharmacotherapy Patient education and counselling Phytotherapy Toxicology Biopharmaceutics and pharmacokinetics
Strand 4	Medicines and society (14 ECTS) Pharmaceutical legislation Pharmacy management Medicines in health care
Strand 5	Interaction and communication (14 ECTS) Information and communication technology Foreign language Communication skills Second national language (Swedish/Finnish)
Strand 6	Optional studies (18 ECTS)

The aim of this article is to describe the recent curriculum reform process at the Faculty of Pharmacy, University of Helsinki, and to present the outcomes of the reform.

Context of the reform

The Bologna Process in Finland

According to the Bologna Declaration, the Finnish Ministry of Education instructed universities to adopt a two-cycle degree system and the European Credit Transfer and Accumulation System (ECTS) by August 2005 (5). The two-cycle system would enable students to first obtain a three- year Bachelor's degree and to continue to a conditional two-year Master's degree.

Pharmacy education at the University of Helsinki

Already prior to the Bologna Process, pharmacy education in Finland consisted of a three-year Bachelor of Science in Pharmacy degree and a two-year Master of Science in Pharmacy degree to be conducted after the completion of the Bachelor's degree. The Faculty of Pharmacy accepts approximately 140 students annually for the Bachelor's and 55 for the Master's degree programmes (6).

The Bachelor's degree is designed to prepare the students for professional practice and must include a six-month practical training in a community or hospital pharmacy. The Bachelor's degree has traditionally been structured with little elective studies. The Master's degree aims to further develop students' scientific skills and must involve a six-month research project at the end of the degree. In Helsinki, the fourth year (first year of the Master's degree) has traditionally consisted of compulsory courses, while during the fifth year the students have conducted advanced studies at the Division of their choice.

Over the past decades, education at the Faculty of Pharmacy has continuously been developed based on external and internal evaluations (7-10).

Reform process

Cooperation in curriculum development

To enhance the commitment of the entire organization, collaboration amongst teachers and between the teachers and students was highlighted. While a curriculum reform working group was responsible for coordinating the modifications in practice, all personnel, students and stakeholders in Finnish pharmacy were encouraged to contribute throughout the reform process.

Evaluation of teaching and learning

The curriculum, syllabus and teaching were assessed considering previous research on teaching and learning at the Faculty. Students found the previous curriculum fragmented and considered relating the theoretical studies into practice challenging. Trends of surface-level learning were also demonstrated (8). However, the six-month practical training was suggested to enhance students' deep-level learning and facilitate linking the theoretical studies into practice (10), but great variation in the quality of mentoring in pharmacies was reported (9).

Based on the assessments, key issues were emphasised: improving the integration of theory and practice, forming coherent and logical course entities, developing the practical training and fostering deep-level learning.

Core content analyses

In 2004, the Bachelor's and Master's degrees were evaluated utilising core content analyses (5). The contents of courses were divided into three categories: core content, additional content and special content, the core content being essential scientific or practical knowledge and skills. Appropriate teaching methods and possible overlapping were also assessed. Based on ▸

the assessments, courses were categorised to form larger coherent entities.

Assessment of workload

The ECTS system for defining the scope of courses and degrees was implemented (5). A year corresponds to 1600 hours and grants 60 ECTS units. Half of the workload of each course was designed to be performed in contact with teachers and the other half independently.

Results of the reform

Curriculum structure

The curriculum was sustained as a five-year entity (Master's degree) that includes a three-year Bachelor's degree. The reformed structure of the Bachelor's degree consists of six broad entities, strands, that are spread over the entire Bachelor's programme (Table I). Within the strands, teaching is provided collaboratively by multiple disciplines.

Table II
The structure of the reformed Master's degree (120 ECTS)

General studies (34 ECTS)	Basics of analytics Drug development process • Drug discovery and development • Non-clinical research • Drug formulation • Clinical phases and introduction to biostatistics • From development to drug use Personal study plan Economics and leadership
Optional studies (16 ECTS)	
Advanced studies (70 ECTS)	One of the following subjects: Biopharmaceutics Pharmacognosis Pharmaceutical Chemistry Pharmaceutical Technology Pharmacology Social Pharmacy Master's thesis

In order to improve the integration of theory and practice, the six-month practical training was divided into two three-month periods at the end of the second and in the middle of the third year. During both training periods, students are instructed to relate theory into practice and reflect their learning through assessments in a training manual.

The structure of the Master's degree is presented in Table II. A large module entitled "Drug development process" was incorporated into the fourth year. The module is taught collaboratively by all Divisions and aims at providing an overview of the drug development process from drug discovery to pharmacovigilance.

Fostering deep-level learning

To direct students' learning process, the aims, core contents and assessment of each course are presented in the Faculty's study guide and website. Evaluation matrices for Bachelor's and Master's theses were constructed to harmonise evaluation practices and assist students in setting goals for their writing process.

Personal study plans were incorporated into both degrees to assist students in planning of their studies, support their learning abilities and prevent delays in graduation. The annually updated plans serve as learning portfolios that enhance students' self-reflection skills for lifelong learning.

Based on continuous assessments of students' approaches to and experiences of teaching and learning (11), students receive feedback and advice on developing their learning skills. At the end of Bachelor studies, students evaluate their development and set goals for continuing professional development.

Future directions

Currently the results of the reform are being evaluated. Ongoing assessments teaching and learning will reveal how the education at the Faculty level has developed. The implications of the modifications in the practical training will also be studied.

The Faculty continues its systematic development of pharmacy education beyond the evaluation of the reform. Procedures to foster co-operation among teachers and increase student-participation in education design are being developed. As teachers' approaches to and conceptions of teaching have been suggested to affect students' approaches to learning (2, 12), pedagogic training of teachers and improved teaching practices are currently being emphasised.

In May 2007, the University of Helsinki awarded the Faculty of Pharmacy with a grant and status of high-quality educational Unit for its ongoing efforts to improve pharmacy education. The award encouraged the Faculty to further develop pharmacy education based on scientific evidence from Finland and elsewhere. ■

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From BSc to Pharm D
Pharmacy Education in the United States

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Founded in 1900, the American Association of Colleges of Pharmacy (AACP) is the national organisation representing pharmaceutical education in the United States (US). AACP's mission is to serve member colleges and schools and their respective faculties by acting as their advocate and spokesman at the national level, by providing forums for interaction and exchange of information among its members, by recognising outstanding performance among its member educators, and by assisting member colleges and schools in meeting their mission of educating and training pharmacists and pharmaceutical scientists. As of the fall of 2006, there were 48,592 students enrolled in doctor of pharmacy (PharmD) degree programs across 96 colleges and schools of pharmacy with 4,340 full-time and 534 part-time faculty (1-2)**.**

Doctor of Pharmacy Degree (PharmD) Curriculum

The adoption of the PharmD as the sole professional pharmacy degree by academic pharmacy was endorsed by AACP member institutions in 1991 in recognition that the 5-year bachelors of pharmacy degree (BS Pharm) was no longer sufficient given changes in the profession, healthcare systems and society. The Accreditation Council for Pharmacy Education (ACPE) reflected the adoption of the PharmD as the singular professional pharmacy degree in their subsequent iterations of the Accreditation Standards and Guidelines for The Professional Program in Pharmacy Leading to the Doctor of Pharmacy Degree beginning in 2000 with Standards 2000 and reaffirmed in Standards 2007 for accredited colleges and schools of pharmacy (3-4). The transition to the all PharmD came to fruition after the final cohort of bachelors of pharmacy students graduated in the spring of 2005.

In an attempt to support and facilitate the efforts of US colleges and schools of pharmacy in the transformation of their respective curricula to ensure that the graduates of such programs could provide pharmaceutical or patient-centred care, AACP initiated a series of initiatives under the Center for the Advancement of Pharmaceutical Education (CAPE) chief of which were the CAPE Educational Outcomes which provided a framework for competency based education, serving as the target towards which the evolving pharmacy curricula should aim (5-6). The most recent iteration, CAPE Educational Outcomes 2004, shown in Table 1, represents a new organisational framework to ensure that the integration of science, interprofessional practice, and professionalism occurs across the three major tenets to contemporary pharmacy education: i) pharmaceutical care, ii) systems management, and iii) public health (6). The new framework provides structure and guidance for curriculum development by including emerging components of contemporary practice and setting expectations for interprofessional collaboration, scientific grounding, evidence-based practice, appropriate use of technology, and integration of fundamental competencies in communication, ethics, professionalism, and life-long learning. CAPE Educational Outcomes 2004 describes the terminal outcomes of a pharmacy curriculum in language that can be interpreted more easily by constituents

Table 1 – AACP CAPE Educational Outcomes 2004 (adapted from reference 6)

1	**PHARMACEUTICAL CARE** Provide pharmaceutical care in cooperation with patients, prescribers, and other members of an interprofessional health care team based upon sound therapeutic principles and evidence-based data, taking into account relevant legal, ethical, social, economic, and professional issues, emerging technologies, and evolving pharmaceutical, biomedical, sociobehavioral, and clinical sciences that may impact therapeutic outcomes. Provide patient-centred care. Design, implement, monitor, evaluate, and adjust pharmaceutical care plans that are patient-specific and evidence-based. Provide population-based care. Develop and implement population-specific, evidence-based disease management programs and protocols based upon analysis of epidemiologic and pharmacoeconomic data, medication use criteria, medication use review, and risk reduction strategies.
2	**SYSTEMS MANAGEMENT** Manage and use resources of the health care system, in cooperation with patients, prescribers, other health care providers, and administrative and supportive personnel, to promote health; to provide, assess, and coordinate safe, accurate, and time-sensitive medication distribution; and to improve therapeutic outcomes of medication use.
3	**PUBLIC HEALTH** Promote health improvement, wellness, and disease prevention in cooperation with patients, communities, at-risk populations, and other members of an interprofessional team of health care providers.

outside the pharmacy educational community and were incorporated in ACPE Standards 2007 (4,6).

Emerging Areas in US Pharmacy Education

In addition to the movement to competency based education through the development of the CAPE Outcomes, there have been several emerging areas in pharmacy education in the United States that have curricular implications. The growing assessment movement and the move towards greater accountability in higher education in general in the United States are reflected in ACPE Standards 2007. ACPE Standards 2007 not only calls for colleges and schools of pharmacy to utilise a variety of reliable and valid assessment methods, but that specific assessments such as student portfolios and curriculum mapping be incorporated as part of their overall assessment plan. The incorporation of various assessment components will continue to pose a challenge to colleges and schools of pharmacy as they work to integrate assessment more fully as part of their curricular process.

Experiential education continues to be a major curricular consideration, comprising at least 30% of the pharmacy curriculum across the US. The introduction of ACPE Standards 2007 requires pharmacy students to have a minimum 300 hours of introductory pharmacy practice experiences during the first three professional years and 1,440 hours of advanced pharmacy practice experiences in the final year of the professional program, prior to graduation. In 2005 with grant support from Merck & Company, AACP launched the Academic-Practice Partnership Initiative (APPI) to help identify strategies and develop resources to both improve the quality of and capacity for experiential education. Resulting from the work of APPI, a Professional Experience Program Resource Library (www.aacp.org) and an Advanced Practice Experience Site Profiling System (APESPS) were created (7).

The emergence of different curricular delivery methods has also impacted conceptions of how pharmacy curricula should or could be delivered. Distance education has increased in use through the use of simultaneous video conferencing with satellite campuses located in a different city from the main campus or Creighton School of Pharmacy which is the only institution to have a first professional degree pathway that is primarily Web-based with the exception of 2 laboratory courses and the experiential component of the curriculum. Efforts aimed at interprofessional education and the use of service learning have also grown in popularity in the academy.

Challenges to Quality Education

The US colleges and schools of pharmacy have made substantial progress in transitioning educational programs to a patient-focused curriculum with work still underway to fully implement the curricular map of the 2004 CAPE Educational Outcomes. Several significant challenges have been identified and serve as the focus of individual and collective program development activities involving AACP and its members.

The rapid enrolment expansion at existing and emerging schools places substantial pressure at the interface between education and pharmacy practice.

It was documented in 2002 that approximately 75% of the advanced practice experience is supervised by voluntary faculty or preceptors (8). The expectation for these final year experiences or rotations is that progressive clinical services will be the model of practice for learning in all settings.

In reality, the delivery of pharmaceutical or patient-centred care is still not the primary focus of US pharmacists' practice. It is a substantial challenge for the directors of experiential learning to identify and maintain sufficient numbers of qualified preceptors and sites where advanced clinical practice is delivered. Based on the last published longitudinal comparison of advanced pharmacy practice experiential programs in the US and Puerto Rico, for the 1994-95 academic year, the median number of rotations scheduled per institution was 210 compared to a median value of 687 for the 2003-04 academic year and promises to continue to grow as enrolments increase (9). The capacity is constrained also by the protracted shortage of pharmacists in all settings. It is essential for both education and practice that we work together to strengthen experiential education and advance practice in all settings to achieve our goals and meet society's needs for medication management.

Other key challenges include recruitment of sufficient numbers of qualified faculty in all disciplines; assuring diversity and cultural competence in both the faculty and student bodies; and attracting strong leaders to positions in academia. AACP is committed to meeting our members' needs in each of these areas through programming, networking and creating a global platform for the exchange of best practices and solutions to the contemporary challenges of pharmacy education. AACP is similarly committed to a strong collaboration with the practice community as we pursue our mutual goals of delivering quality patient care that assures optimal outcomes from medication use. ■

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Educating Pharmacists to be Practitioners, Researchers and Entrepreneurs: The Singapore Experience

Wai-Keung Chui, Sui-Yung Chan, Mui-Ling Tan *and* Li-Lian Wong

Introduction

Singapore has designated its Biomedical Sciences (BMS) industry as one of the main sectors for driving the country's economic development. The BMS industry is composed of the pharmaceutical cluster, the medical devices cluster, the biotechnology cluster and the healthcare services cluster (1)**. To achieve the goal of sustainable growth and expansion in the BMS industry, Singapore now plays host to six of the top ten pharmaceutical conglomerates, key industry players and a growing base of medical technology companies. In addition, a dedicated Research & Development complex, the Biopolis, which is home to five biomedical public research institutions and laboratories from the Agency of Science Technology and Research (A*STAR) has been established** (2)**. On the other hand, the impetus towards healthcare service excellence needs the staffing of competent and dedicated healthcare professionals so that the medical offerings and operational effectiveness at the hospitals and clinics can be further enhanced. Recently, the Singapore Centre for Clinical Sciences was established to embrace translational and clinical research activities for improving patient care. This is yet another initiative that takes the nation a step closer to becoming a medical hub.**

With these exciting developments in the background, the National University of Singapore (NUS) is well positioned to support these national initiatives by aspiring to train manpower for the industry. Therefore, a holistic pedagogic approach has been adopted, together with plentiful of opportunities, to promote free flow of ideas and build synergies between the process of creating, imparting and exploiting knowledge for the students at the university. The Department of Pharmacy, being a member of the academic community and the only place that offers pharmacy education in Singapore, aims to align its mission with that of the university while at the same time fulfilling the obligation to train future generations of pharmacists, pharmaceutical scientists and leaders. As such, the pharmacy programme (Table 1) is carefully designed to provide a conducive learning environment and experiential opportunities to mould pharmacy undergraduates into competent practitioners, innovative researchers and enterprising entrepreneurs.

The philosophy of shaping competent pharmacy practitioners

Pharmacists play an important role in the healthcare system by ensuring that the drug therapies prescribed for patients are safe, efficacious and cost-effective. Therefore competent pharmacy practitioners are essential for realising the national objective of making Singapore an excellent medical hub in the region. As such, the philosophy of the pharmacy curriculum offered at the NUS is one that is competency-based and outcome-oriented. This approach prepares the future generalist pharmacy practitioners to provide quality pharmaceutical care for their patients. The programme uses pedagogic methodologies such as critical thinking and problem solving exercises, case studies and small group student-directed self learning instruction to hone the students' knowledge and skills in patient-centred care. Besides the classroom environment, students are exposed to on-site experiential learning opportunities at the hospital and community pharmacies. These preceptorship programmes offer students an environment to practise what they have learned in the classroom. The professors also endeavour to inculcate a positive attitude towards the commitment to life-long learning so as to maintain professional standards, labour ▸

Table 1 – NUS 4-Year Pharmacy Professional Programme, including Preceptorship Programme & Research Opportunities.

Level	Semester 1	Semester 2	Electives
1000	PR1101 Physicochemical Principles of Drug Action PR1102 Physical Pharmacy AY1104 Anatomy PY1105 Physiology I	PR1103 Pharmacy Practice I PY1106 Physiology II LSM1401 Fundamentals of Biochemistry	PR1301 Complementary Medicine and Health GEK2506 Drug and Society
2000	PR2101 Dosage Form Design I PR2102 Pharmacy Law PR2103 Pharmacostatistics SP1203 Foundation in Effective Communication	PR2104 Pharmaceutical Analysis I PR2105 Pharmaceutical Microbiology PP2106 Pharmacology I PR3107 Pharmacy Practice II	PR2202 Cosmetics and Perfumes LSM2101 Metabolism & Regulation PR2288-89 UROPS in Pharmacy
6-week Preceptorship Programme at a Community Pharmacy			
3000	PP2107 Pharmacology II PR3101 Principles of Medicinal Chemistry PR3102 Dosage Form Design II PX3108 Pathology	PR3103 Pharmaceutical Analysis II PR3104 Pharmaceutical Biotechnology PR3105 Pharmacotherapy I PR3106 Pharmacokinetics and Drug Disposition	PR3288-89 UROPS in Pharmacy
6-week Preceptorship Programme at a Hospital/ 6-week Attachment at a Drug Company/ 1-year NUS Overseas College Programme			
4000	PR4199 Project Work* (selected students only) PR4101 Pharmacotherapy II PR4103 Research Methodology PR4104 Pharmacy Practice III	PR4102 Pharmacotherapy III PR4105 Natural Products PR4106 Dosage Form Design III	PR4201 Pharmaceutical Marketing PR4202 Pharmaceutical Analysis III PR4203 Pharmacy Practice IV PR4204 Special Drug Delivery PR4205 Bioorganic Principles of Medicinal Chemistry PR4206 Industrial Pharmacy PR4207 Applied Pharmacokinetics & Toxicokinetics PR4208 Pharmacovigilance and Regulatory Science

In addition, pharmacy students are required to read and pass 5 modules on General Education to graduate.

market efficiency and equity among the future pharmacy practitioners in Singapore.

Research opportunities to enthuse inquisitive minds

Modules in Undergraduate Research Opportunities in Science (UROPS) are available for second and third year pharmacy students who are keen to explore the realm of research activities available within the department. Interested students may sign up for the module with a professor who has offered a research project. The objective of UROPS is to provide a situation for the student to learn how to formulate a simple research question and carry out experiments to collect data to verify the hypothesis. This module may span over 13 weeks or one semester; however, the project may be extended over another 13 weeks subject to the agreement of the supervisor, while the student continues with the other coursework requirements.

Besides the UROPS module, about 65% of final year students are required to complete an individual Final Year Project (FYP) to graduate. The FYP will normally be conducted over two semesters and constitute the equivalence of three regular modules. For the FYP, the students are required to review an area of research (which may be pharmaceutical science or pharmacy practice), identify knowledge gaps to generate a hypothesis for study. Experiments are designed and carried out to collate sufficient data for analysis so as to arrive at a conclusion that is adequately supported by scientific evidence. The students are required to make three oral presentations, one poster presentation and write a report on the work carried out. Besides the FYP, the whole cohort of students is required to read and pass a module on Research Methodology. This module covers topics such as advance biostatistics and the basics of experimental design.

The abundance of research opportunities offered by the pharmacy programme hopes to enthuse the more academically inclined students to consider graduate study by research upon graduation from the undergraduate programme. In addition, armed with some experience in research, the undergraduates may wish to consider pursuing a career in R&D in the pharmaceutical industry. The

growing collaboration between the department and pharmaceutical companies has offered more joint research opportunities to the pharmacy students who upon graduation may enter the pharmaceutical industry, with some taking up clinical research while others pursuing pharmaceutical science research. This phenomenon is growing due to the striving BMS industry in Singapore where junior research scientists as well as clinical research associates are much sought after by the companies.

Cultivating entrepreneurship in a knowledge-based economy

Entrepreneurs play a vital role in economic development as key contributors to technological innovations and growing businesses. The BMS industry contributes to a knowledge-based economy and is therefore very much driven by the generation of new knowledge and technological innovations. The pharmaceutical and healthcare service clusters within the BMS industry are hovering at a very dynamic stage of the life cycle. The growing influence of managed care, shrinking profit margins and increasing number of mergers throughout the clusters are examples of environmental factors that pharmacists are facing in their respective practice settings. To prepare students who aspire to join the fast-paced pharmaceutical industry, the department offers an elective module on Pharmaceutical Marketing. This module introduces the basics in marketing and is designed to encourage the students to think creatively and entrepreneurially about marketing opportunities and business growth. The pedagogy is structured around the discussion of readings and cases; together with the participation in group project on business development. The project requires the students to present a marketing plan of a new product, idea or service, which they wish to introduce to pharmaceutical or healthcare cluster in Singapore. This module is taught by practitioners with experience and training in marketing of pharmaceuticals or related products.

In addition, there are opportunities for pharmacy students to participate in the NUS Overseas College programme that sends students overseas for a 12-month period to be immersed in the entrepreneurial-academic environment at one of the leading entrepreneurial hubs located in the Silicon Valley (California, USA), Bio Valley (Philadelphia, USA), Shanghai (China), Stockholm (Sweden) or Bangalore (India) (3). Each student intern works in a start-up company where he learns from the founder of the company about the ropes of starting the business and feels the adrenaline rush in the day-to-day operations. The student intern also attends entrepreneurship related courses offered by well-known universities in the vicinity. Upon completion of this stint, the student obtains a minor in technopreneurship in addition to his pharmacy degree.

Conclusion

Pharmacy is one of the most popular courses of study offered at the NUS. Each year, it attracts applications from the best brains in the country. Therefore, the pharmacy programme needs to provide sufficient depth and scope to challenge and stretch these students. Set against a very unique, vibrant and dynamic BMS industry in Singapore, the education of future generations of pharmacists has to be aligned with the growing demands of the pharmaceutical and healthcare service clusters. Hence it is certainly appropriate to educate pharmacists to be practitioners, researchers and entrepreneurs under such environment. ■

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Pharmacy students are moving on – but how was the journey?

IPSF investigates how pharmacy students feel about their education in this second of their Moving On initiatives.

Zhining Goh, Luís Miguel de Oliveira Lourenço, Lesley Zwicker, Tana Wuliji *and* Sarah Carter

Introduction

As changes in the pharmacy profession occur, educational requirements are expected to change to match contemporary and future career expectations. Curriculum design and delivery are as important as curriculum content to ensure that students' expectations are met, effective learning takes place, and competent graduates are produced. Pharmacy students' educational experience is likely to affect their decisions to join or remain in the profession, as well as their attitude towards, and competence in, practice.

Improving the quality of education is one of the United Nations Educational, Scientific and Cultural Organization's (UNESCO) 'Education for All' goals, and the World Health Organization (WHO) has recognised the importance of healthcare professional education in sustainable and quality healthcare.

The Course Experience Questionnaire (CEQ: Wilson, Lizzio & Ramsden 1997) measures aspects of the quality of teaching and learning. Many countries use the CEQ to evaluate universities' performance and provide national data on graduate satisfaction and good practice; for several years it has been mandatory for all Australian universities to survey their students using this measure. Previous studies have evaluated nursing, psychology and pharmacy courses (Trigwell and Prosser, 1991; Richardson, 1994; Quinn, Bates & Cox, 2000).

To the authors' knowledge, there is no published intercontinental comparison of pharmacy students' learning experience.

Aims

The research aims were: to compare and contrast learning experiences of students enrolled in pharmacy degree and diploma programmes (that would lead to the attainment of a pharmacist licence) across the world; and, to examine the quality of education from students' perspectives.

Methods

The CEQ, together with additional items about demographics (age, gender and part-time work), and country and university of study, were completed by pharmacy students.

The CEQs 37 items are grouped into six larger factors relating to: Clear Goals (eg students are clear about what is expected of them); Generic Skills (eg ability to plan work, communication skills); Independence in Learning (eg students have choices); Good Teaching (eg teachers provide feedback to students); Appropriate Workload (workload is appropriate in quantity and intellectual level); and, Appropriate Assessment (eg assessment is relevant and appropriate in terms of style and intellectual level).

The complete questionnaire was piloted, translated if appropriate, and re-validated.

Questionnaires were sent electronically to representatives from the International Pharmaceutical Students' Federation (IPSF)[1,2] in each participating country between March 2005 and May 2006. These representatives then distributed them to pharmacy students, often via local coordinators.

A proforma data collection spreadsheet was designed in Excel® by the IPSF Research Group into which data from each university was entered by the research coordinators. The IPSF Research Group converted the data into the statistical data software programme SPSS for analysis.

Countries were grouped into world regions of North/North West Europe, South/South East Europe, Australia, Asia, North America and Other.

When preliminary analysis was conducted, data from the North American region tended to be significantly different from the rest of the sample. The data consisted of only one university in the United States: Midwestern University Chicago College of Pharmacy and because it made up over 11% of the whole sample the decision was made to remove the USA data, for fear of it biasing the results of the study. Subsequent analysis therefore

Table 1 – Countries from which data was collected

World region	Countries	Number of universities from whom data was collected	Sample size (n)	Percentage of total sample (%)
N/NW Europe	Finland	3	672	14.4
	Germany	2	178	3.8
	Iceland	1	63	1.4
	Netherlands	2	28	0.6
	Switzerland	3	171	3.7
	UK	3	512	11.0
S/SE Europe	Croatia	2	107	2.3
	Czech Republic	1	315	6.8
	Portugal	5	223	4.8
	Romania	3	100	2.1
	Serbia	1	150	3.2
	Slovenia	1	90	1.9
	Spain	1	270	5.8
Australia	Australia	4	411	8.8
Asia	Bangladesh	2	224	4.8
	India	2	71	1.5
	Israel	1	80	1.7
	Malaysia	2	41	0.9
	Nepal	2	143	3.1
	Singapore	1	524	11.2
	Taiwan	1	94	2.0
Other	Canada	6	76	1.6
	Ghana	1	75	1.6
	Jamaica	1	42	0.9
Total		51	4660	100
Excluded: **N America**	USA	1	513	

omitted USA data. Countries were also assigned a category of income status: high, higher-middle, lower-middle or low, according to the World Bank Economic Countries grouping.

Table 1 shows the countries in each region from whom data was collected.

Results

Demographics

Seventy five percent of the sample was female. The mean age of participating students was 21.6 years with 80.8% of the sample between 19 and 23 years of age. There was a relatively equal distribution of students in each year of the pharmacy degree programme: 25.5%, 30.2%, 21.4% and 20.4% in the first, second, third and fourth years respectively. The remaining 2.5% consisted of missing data or respondents who were in fifth, sixth or seventh years of their degree or who had graduated.

Comparison of CEQ scores between world regions

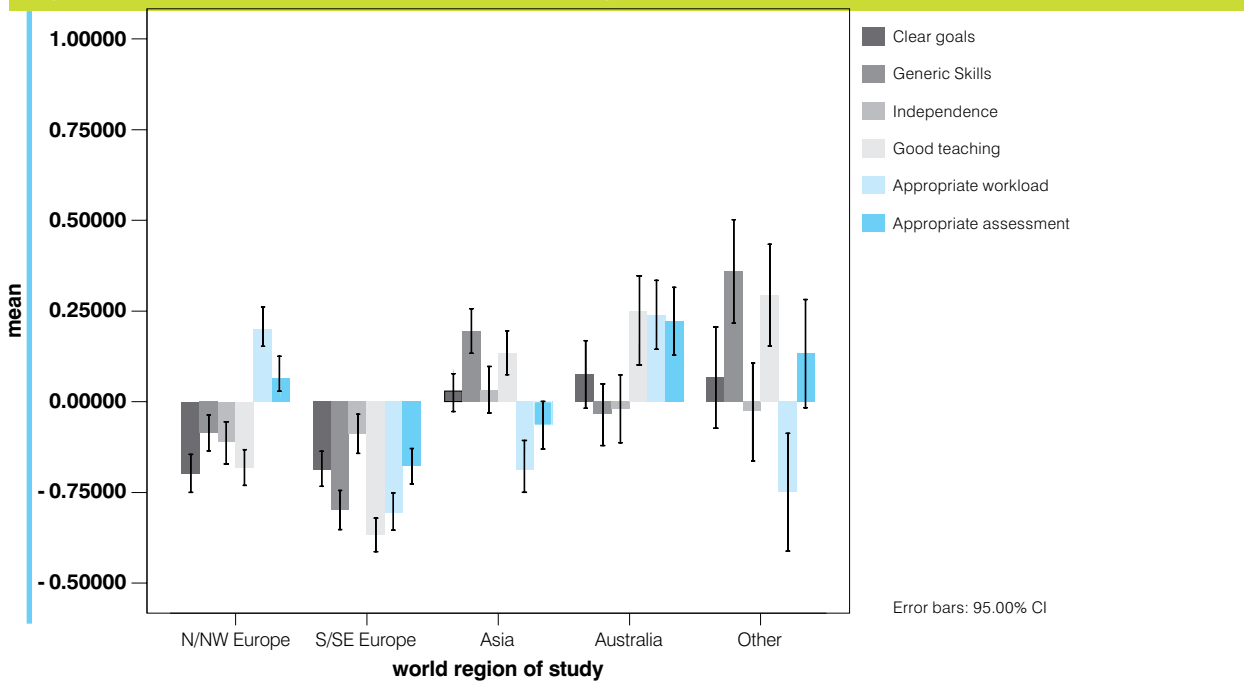
The six CEQ factors were calculated from the data, then standardised as z scores, and compared across world regions. Figure 1 shows how CEQ factor z scores differed between world regions.

Overall, students studying in Northern and Southern Europe had a less positive experience of their Pharmacy course than any other region of study ($F = 19.21$, $p < 0.0001$; $F = 52.34$, $p<0.0001$; $F = 3.84$, $p = 0.004$; $F = 71.00$, $p<0.0001$; $F = 62.87$, $p<0.0001$; and, $F = 19.27$, $p<0.0001$ for Clear Goals, Generic skills, Independence in Learning, Good Teaching, Appropriate Workload and Appropriate Assessment, respectively). ▶

1) IPSF was founded in 1949 and is a non-governmental, non-political and non-religious organization representing around 250,000 pharmacy students and recent graduates in over 60 countries worldwide. It is the leading international advocacy organization for pharmacy students with the aim to promote improved public health through provision of information, education, networking as well as a range of publications and professional initiatives. In addition to promoting the interests of pharmacy students and encouraging international co-operation, IPSF conducts original research on issues relevant to the profession and education.

2) Not all Pharmacy Schools or Departments within these countries submitted data.

Figure 1 – CEQ factor z scores between world regions



Further analysis was conducted in order to investigate whether this may be due to educational reforms at the time of the study. Data from Switzerland, Czech Republic, Netherlands and Finland were grouped into a category of countries going through reform. They made up 25.5% (n = 1186) of the sample. The CEQ factor z scores of this group were then compared to those of the other countries (see Figure 2).

T-tests show reforming countries had significantly less positive experiences of their course in terms of Goals ($t = -3.74$, $p<0.0001$), Generic Skills ($t = -11.63$, $p<0.0001$), and Good Teaching ($t = -9.81$, $p<0.0001$). However, reforming countries had more positive experiences concerning Appropriate Workload ($t = 10.32$, $p<0.0001$) and Assessment ($t = 4.76$, $p<0.0001$) than non-reforming countries.

Comparison of CEQ scores between countries of high income

As the high income countries made up the bulk of the data (14 countries contributing 75.6% of total data), they were separately analysed as a group.

The six CEQ factor z-scores were compared between countries of high income using ANOVA. Countries of high income differed significantly from each other for each CEQ factor ($F = 6.23$, $p<0.0001$; $F = 11.99$, $p<0.0001$; $F = 16.91$, $p<0.0001$; $F = 12.36$, $p<0.0001$; $F = 58.33$, $p<0.0001$; and, $F = 8.59$, $p<0.0001$ for Clear Goals, Generic Skills, Independence in Learning, Good Teaching, Appropriate Workload and Appropriate Assessment, respectively).

Students from The Netherlands consistently scored higher in all CEQ Factors, indicating a greater positive experience with their pharmacy course. Canadian and Australian students also tended to have a better course experience than other countries within the high income group.

Discussion

Why do European students have less positive course experience?

Non-European pharmacy courses may be matched better to the roles that pharmacists engage in when qualified, such as industry roles, as well as associated remuneration rates.

Alternatively, the results may relate to educational reform being undertaken at the time of the study in some countries which may have disrupted students' pharmacy courses and led them to feel dissatisfied. Further analysis showed students from reforming countries felt significantly less positive about their course than students from non-reforming countries in areas relating to goals, generic skills and good teaching. However, they felt more positive about the workload and assessment.

Why do Dutch, Canadian and Australian students have a better course experience?

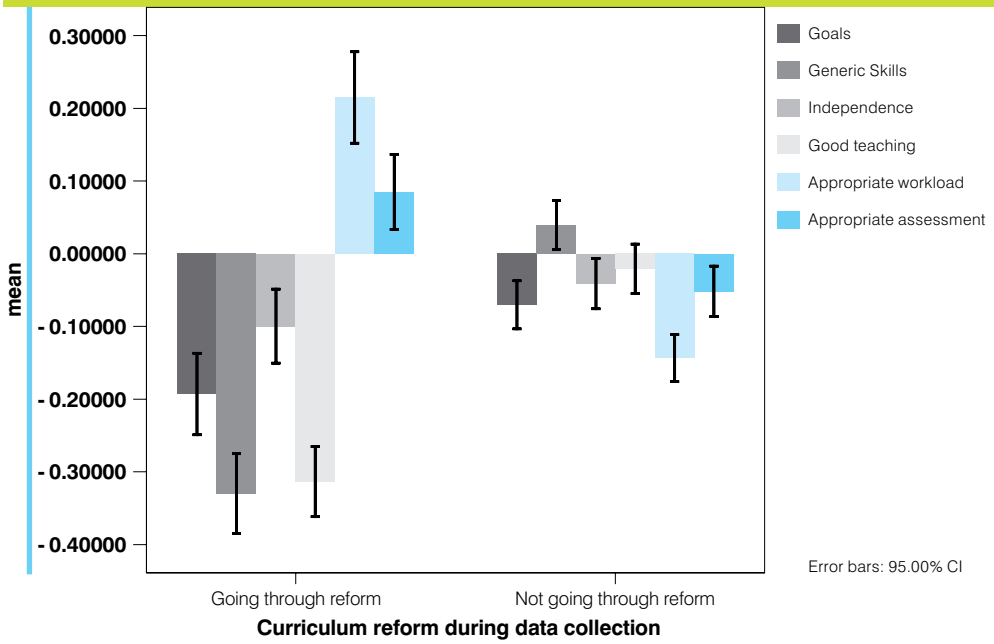
Significant proportions of Dutch, Canadian and Australian students in the sample held part time jobs (46.4%, 39.5% and 57.4% respectively) which may have been related to pharmacy. It is possible that being able to apply knowledge at work, and apply their experience at university brings about a more positive experience of their degree.

However, the Dutch and Canadian samples were relatively small (n = 28 and n = 76 respectively) and therefore may not represent the whole student population for that country.

Limitations and future research

This is the largest known international study of pharmacy students' experi-

Figure 2 – Comparison of CEQ factor z scores between countries going through educational reform at the time of data collection, or not.



ence of their degree programmes. However, participating students do not necessarily represent all students from that university, or indeed country. Students who attend pharmacy-related conferences may have more enthusiasm and commitment to the profession and may have different perceptions of their learning experiences than non-attendees.

Future work could include a programme of research surveying more representative groups of students from each pharmacy course in universities around the world in order to provide a more complete and reliable dataset.

Larger – or more representative – samples of pharmacy students should be surveyed in order to clarify some of the issues raised here.

More detailed investigation into other areas such as the experiences of students in universities undergoing education reform, and the impact of experiencing pharmacy outside university could also be undertaken.

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Interprofessional collaborative patient-centred practice is growing in importance as a more effective and efficient way of delivering health care (Hall and Weaver, 2001). As a result, inter-professional education (IPE) has been identified as a necessary antecedent, to allow students to develop competencies required to function effectively in team settings as practitioners (Hean and Dickinson, 2005).

Future Doctors, Future Pharmacists: cooperating, independent equals?

First year medical students' opinions of pharmacy students and pharmacy education

Zubin Austin *BScPhm MBA MISc PhD and* **Paul AM Gregory** *BA MLS*

IPE aims to "change the culture" of health professional interaction to "…a system of cooperating independent equals who contribute to a common vision of health" (Hall and Weaver, 2001). A frequent theme in the IPE literature relates to the devolution of responsibilities and powers across team members as an important tool for team building and improving quality of care. What is generally left unsaid, however, is that the individuals from whom these powers and responsibilities are devolved are almost always physicians, and that 'team building' frequently translates (to physicians) as containing the privilege and prominence of medical doctors.

The extent to which health professional students are already encultured to a system that confers unique privilege and prominence to physicians has not been clearly identified. While it appears reasonable to assume that well-educated students understand the different status, power, and privilege conferred to different health professionals within the health care system, the ways in which this may affect (or interfere) with interprofessional education have not been elucidated. In particular, research examining health professionals' opinions of one another, their roles, and their responsibilities has been undertaken, but there is scant literature focused on health professional students.

Smith et al (2002) have reported on physicians' expectations of pharmacists and noted limited support for expanding roles or scopes of practice that may be seen to interfere with the physician's self-defined unique relationship with patients. Bailie and Romeo (1996) have reported that physicians in their study did not support limited prescribing and health screening services provided by pharmacists, though no specific reasons were provided. Muijrers et al (2003) examined attitudes of both pharmacists and physicians and found that while there was general agreement that the pharmacist was an important source of information regarding medications and medication use, there was little agreement on the role this expertise should play in physicians' prescribing practices or in direct patient care. In accounting for this finding, the authors suggested that, from the physicians' perspectives, there was a belief that pharmacists laced the training and experience to correctly interpret a diagnosis or to participate in clinical decision making. Tanskanen et al (2000), in researching physicians' opinions regarding community pharmacists counseling patients receiving psychotropic medications found that the majority of physicians were critical of this role, and instead wanted to maintain this function as a physician-patient privilege.

Studies such as these suggest that, despite rhetoric associated with interprofessional collaboration and care, physician-patient privilege is still a core belief for many medical doctors. Of interest, there is little published literature examining this issue from the perspective of students. As the 'next generation' of the health care system, and as individuals who are just beginning their professional enculturation, there is some expectation that IPE may alter attitudes and opinions. However, there is little empirical data to identify what these attitudes and opinions actually are, and how they may shape initial, formative interprofessional education experiences.

Objectives

The objective of this study was to examine and describe first year medical students' beliefs and attitudes towards pharmacy students and pharmacy education.

Methods

Given the paucity of available literature in this area, a qualitative research methodology was utilized, to provide a vehicle for exploring these issues in greater detail in the future.

Participants were all first year medical students, who were invited (as part of an interprofessional education event) to take part in this study, pursuant to an approved research protocol. All participants provided signed, informed consent and were provided with the study objectives, as well as an indication of how their confidentiality would be maintained (through use of anonymized transcripts). The study itself consisted of a series of focus groups, consisting of 6-8 students and a facilitator. Focus groups were audio taped and subsequently transcribed, and field notes were maintained.

Following completion of transcription of audio tapes and field notes, data analysis was undertaken using an iterative approach. Notes were analysed to identify key themes; all notes were reviewed and coded by two independent raters who conferred if disagreement regarding coding occurred. Based on this analysis a series of themes were generated and subsequently confirmed through transcript verification.

Results

Four focus groups were convened, with a total of 27 first year medical students (15 female, 12 male, average age 26.2 years). All participants had at least a bachelors degree prior to entry into the medical program, and several had advanced (i.e. masters or PhD) degrees. None of the participants had previous education or experience as a health care professional.

Based on the discussion, the following themes emerged:

a. Medical school/education is of higher status than other health care professional programs

Most students commented that, from their perspective, pharmacy education was a useful "back-up" option should medicine not be available; indeed over half of the participants indicated that they had also applied to pharmacy school in case they did not gain acceptance to medicine. Even for those who did not apply to pharmacy programs for admission, there was a clear belief that a hierarchy exists within health profession programs, with medicine being the premier, prestige program.

> *"Everyone knows it, there's a pecking order. First there's medical school. Then, if you can't get in here and you really want to, I don't know, just make a lot of money, you apply to dentistry. If that doesn't work out you can always try out for pharmacy or physio(therapy) or something else."*
>
> (MALE, AGE 26)

b. Students enrolled in other health professional programs would generally have preferred to be in medicine.

Students commented that most of them had taken undergraduate courses in life sciences with many students, all of whom appeared to be competing to enter medical school. Students who selected to enter other programs (including pharmacy) generally did so because they either realised medical school was not a realistic possibility or for other reasons (e.g. financial constraints, desire to have a family, etc.).

Of particular relevance, there was little appreciation of the notion that other students selected different health professional fields because they actually wanted to pursue these professions. From the participants' perspective, there was a strong belief that medical education was most students' primary goal, and that if this goal were foiled or unattainable, an alternative needed to be identified.

> *"It's really strange, you see it from [year one in life sciences]. Everyone wants to get into medicine, but then, when the grades start coming in and you see some people getting the 80s and 90s and some people getting the 60s and 70s, well, people have to start to change their dreams. Not everyone can get in so you sometimes have to settle for what's possible."*
>
> (FEMALE, AGE 29)

c. The highly competitive and selective nature of medical school admissions ensures only those most suitable for medicine become physicians

Participants commented on the arduous nature of the medical school admission process and the sacrifices that were required of them in order to achieve their dream. There was general belief that the competitive nature of the admissions process itself provided a somewhat Darwinian advantage in ensuring that only those most intellectually and attitudinally suited towards medical practice were admitted – and consequently that those who may not be as fit-for-purpose were excluded. To participants, this competitive process was essential at ensuring the quality of the medical profession.

> *"It's totally survival of the fittest, and I think that's important. We've only been [in medical school] for 5 or 6 months but already anyone can tell you how hard it is. It's not just about being smart, you have to have stamina, confidence, problem solving. It's not for everyone, so the admission system has to be brutal to make sure only those who can make it get in."*
>
> (MALE, AGE 25)

Discussion

A prominent theme throughout the focus group discussions related to the hierarchy within health professions programs, and the idea that, from these participants' perspectives, medicine was the "top of the heap". Clearly, the notion of physician privilege and prominence is a message that students had internalized and translated into a notion of medical student privilege and prominence. Given the fact that most of these focus groups occurred within the first 4-5 months of admission to the medical program, it is ▸

difficult to know whether this attitude was pre-existing, or whether it is part of the socialization process of medical students.

It is important to note that all students described the competitive nature of the admission process as an important experience in shaping their attitudes and opinions. The notion that they needed to "beat" or best other students (intellectually, through extra-curricular activities, or in other ways) in order to gain admission sets the foundation for a world-view that places medicine (and by extension medical education) at the pinnacle, and reinforces the notion that other health professions are second-best or back-up alternatives to be considered only in the event of failure. Importantly, most students in this study did not describe and could not conceptualize the notion that students in other health professional programs truly wanted to become something other than a physician. From their perspective, such a decision was merely a default, something to be considered only when it became clear that medicine was not an option.

These findings raise disturbing implications for interprofessionalism and interprofessional education. The highly competitive admissions process may be breeding an attitude of superiority or exceptionalism that may, in the first instance, be antithetical to the spirit and values of IPE. For students who have arrived at medical school through, what they perceive to have been, as a justifiably competitive winnowing process that clearly delineates 'those who can be doctors' from those who can't, a predisposition to truly respectful interprofessional collaboration may be in question. Despite attempts to refine medical school admission practices to include more humanistic indicators, if medical students themselves perceive the pathway to medicine involves beating or besting others (who may eventually become colleagues in other health professions), the extent to which collaboration (built upon mutual respect for one another's abilities and contributions) is possible must be questioned.

Limitations

As a qualitative study, this research does not purport to be generalizable nor applicable to all settings. As the participants in this study represent only one medical school in one city in one country, other socio-cultural and unique factors may contribute to these findings and limit applicability in any other jurisdiction. In addition, interpretation and analysis of data to identify themes was based upon independent coding by two separate raters; while this is a relatively standard process in qualitative research, additional raters would potentially have broadened interpretation of data.

Conclusions

Interprofessional education holds the promise of providing health professions' students with the competencies required to truly engage in collaborative care respectful of each others' knowledge, skills and abilities. In examining 1st year medical students' opinions of pharmacy students and pharmacy education, a clear hierarchy and privileged exceptionalism appeared, mirroring that seen in the broader health care system. The extent to which this was pre-existing or was part of the early socialization process of these students is unclear; however, in order to achieve the aims of interprofessionalism, it will be necessary to undertake more research to examine how such attitudes and opinions affect or potentially interfere with interprofessional collaboration and education. ■

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Training the Humanitarian Pharmacist
Humanitarian Pharmacy Training at Pharmacists Without Borders, Canada

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Pharmacists Without Borders, Mali

Introduction

Pharmacists Without Borders is an international constellation of branches, each providing the movement with unique and valuable assets, through individualized sets of goals and objectives. The Canadian branch has decided to focus its activities mainly around Human Resources, with the aim of becoming an important player in the field of specialized pharmacists in humanitarian work. As of September 2005, a new committee was formed within Pharmacists Without Borders Canada, named the Training Committee. It oversees an important project consisting of a training module offered to pharmacy students in the last years of their program, entitled "Introduction to the Humanitarian experience". It is hoped that this new option will be integrated into the curriculum of pharmacy programs in Canada, starting at the Université de Montréal. The foundation of this ambitious project is an annual internship developed by Pharmacists Without Borders Canada, taking place in Mali, and described in more details herein.

Our long-term goal is to establish a program that will be integrated into undergraduate programs across Canada, which will allow graduating students to participate in an internship abroad. We plan to institute a 45-hour preparatory course and to find environments that would benefit from the aptitudes of pharmacists following a humanitarian vocation, and offer safe and interesting training milieus to pharmacists in training.

The 2006 experience

The pilot project held in 2006 benefited from the participation of two third-year pharmacy students from the Université de Montréal, and consisted of a month-long internship in Mali under the supervision of an experienced Canadian humanitarian pharmacist and founding member of the training committee.

Prior to their departure, the students underwent training at Mer et Monde, a non-governmental organization specializing in sustainable development in Senegal, a country that borders Mali. This training program dealt primarily with various aspects of humanitarian aid and sustainable development, but also included familiarization with the local culture, geography, politics and traditions. The training was overseen by the accompanying pharmacist, who supplied the two students with further vital information concerning essential medications, the proper use of medical supplies warehouses (inventory, filing, etc.), the rational use of medication and proper pharmacy practices.

Acting as the internship supervisor, Emmanuelle Gallay worked along with two major partners: Sahel 21, an onsite organization providing all the technical and logistical support for the mission, and the Fondation Marcelle et Jean Coutu, the sole sponsor of the pilot project.

The objectives of the pilot program were:

- to ascertain the possibility for an annual internship program in this country;
- to evaluate the environment and analyse future possibilities;
- and to establish contacts with various key local people.

Following our initial evaluation, Mali was found a favourable ground for future internship programs. Furthermore, the pilot project in Mali has allowed us to:

- Establish contacts with the following people involved in the pharmaceutical community:
  - Key person responsible for Sahel 21
  - The dean of the faculty of pharmacy at the University of Bamako
  - Personnel at several community health center and at the University Hospital of Bamako
  - The president of the national council of the Mali College of Pharmacists
  - Several local pharmacists and pharmacy students both in community pharmacies and at the University of Bamako.
- Evaluate the needs of Mali in terms of pharmaceutical expertise;
- Understand the Mali health system, both in rural and urban settings;
- Understand the university curriculum related to pharmacy studies in Mali;
- Consider acting as a bridging organization between the Université de Montréal and the Université de Bamako;
- Be better prepared to face eventual medical challenges, such as hospitalization.

Through the realisations of the pilot internship project, we have established professional relationships with various key contacts in Canada and abroad. The collaboration between Pharmacists Without Borders Canada and its partners opens possibilities to a multitude of concerted projects.

The 2007 experience

In October 2006, the possibility of enrolling in an internship with Pharmacists Without Borders was announced and has received much attention from the student community. As the number of participants was restricted to six, students had to be selected, and only the most meriting were chosen. The screening process included motivational questionnaires, individual and groups interviews, and required consent of the selected participants to undergo a 6-month training program.

Furthermore, the viability of the project required the recruitment of internship supervisors, formed in humanitarian work and in student supervision. Two such candidates were selected, each with a different background. The first was specialized in community pharmacy work, and the second in hospital pharmacy practice, to ensure that students would benefit from a maximum of expertise.

Pharmacists Without Borders, Pilot Project 2006, Mali

The goals of the training program, developed specifically to target health issues in Mali, were two-fold: (1) to develop student awareness to the realities of developing countries and be able to face the cultural shock, and (2) to focus on local pathologies and healthcare possibilities, with an emphasis on prevention, non-pharmacological treatments and availability of local pharmacological therapies.

To ensure student participation and render the learning process interactive, students were asked to present, in 30 to 60 minutes, on selected topics relevant to Mali health issues. An expert was asked to complete the information presented by students, in no more than 2 hours, thus resulting in 3-hour bimonthly class. Six topics were selected and included warehouse management (list of national essential medications and inventory control); HIV, AIDS and sexually transmitted diseases; malaria, tuberculosis and parasitoses; malnutrition, dehydration and laboratory monitoring; infant illnesses and the Malian vaccination schedule; and issues in pregnancy, breastfeeding and birth control. Class objectives included the identification of the pathology and physiology of these diseases, recommendation of preventive measures, identification of non-pharmacological and pharmacological treatments, and ability to provide pharmaceutical care in the Malian context.

The training committee also saw fit to include two weekend-long sessions, which focused on the socio-cultural, political and economical realities of Mali. During these sessions, subjects such as the cultural shock, communication with patients of different cultures and languages, and the meaning of international collaboration and sustainable development were approached. These week-

ends also proved effective to develop a team spirit, and to elaborate projects to be implanted in Mali. These include warehouse management of rural health centers, public health awareness programs in both rural and urban health centers, and an information session on the importance of hand washing in a hospital center.

The 2007 group of pharmacy students and supervising pharmacists will leave in June 2007, for a duration of 8 weeks. The group will then be separated in two, and will spend 4 weeks in either urban or rural milieu. The groups will then switch settings to allow students to experience humanitarian work in both regions. As a consequence, each welcoming structure will benefit of 8 weeks of uninterrupted pharmaceutical expertise and all students will have the chance to interact with healthcare professionals in both settings.

Conclusion and future direction of the program

The realisation of the 2007 project will be a crucial step in the evolution of our program. Preliminary steps have been completed to potentially include the current internship opportunity in the upcoming Pharm. D. program at Université de Montréal. Furthermore, the partnerships Pharmacists Without Borders Canada has acquired, both logistic and financial, have proved highly beneficial to all parties included. In the close future, the main challenge will remain to match the demand from students with the limited number of positions we can offer abroad. Overall, this is a highly inspiring project for the pharmacy community, as it is specific to pharmacy students (unlike other humanitarian programs that train larger eclectic group of students) and introduces them to a new career possibility.

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Malawi goes to Pharmacy School
Establishing the First School of Pharmacy in Malawi

Mike Berry *and* **Brian Lockwood**

Aims of the project

Malawi is one of the poorest countries of Africa, with a well documented AIDS epidemic. The population of 12,884,000 is estimated to have a per capita gross national income of $620, with government health expenditure of $16 per capita, making it the poorest country of southern Africa (1). The economy of Malawi is mainly agriculture, with subsistence farming making the major source of employment.

It was decided in January 2005 to set up a School of Pharmacy at the College of Medicine, University of Malawi, at Blantyre, Malawi. Until January 2006 there was no School of Pharmacy in Malawi, and practicing pharmacists were trained either in Europe or neighbouring African countries. The main reason for setting up a School of Pharmacy was due to the wholly inadequate number of pharmacists, 60 for a population of about 10 million. The consequence of this was that most of the population did not have access to legitimate medicines, particularly in rural areas, but also in urban hospitals. Central Medical Stores, which is responsible for administration and distribution of medicines on the Malawi Essential Drugs List (EDL) requires more staff. Although medicines are free to patients in the government healthcare scheme, many problems exist regarding supply to the patients.

Funding

Teaching facilities and staff salaries in the new School are covered by government funding National AIDS Commission (NAC) Global Fund monies, but that is likely to cease at the end of the 5 year period from January 2006. On paper, the Department of Pharmacy is well funded, but having money and being able to spend it appropriately within the time frame is complicated due to staff not being appointed despite being good applicants, due to the University of Malawi appointment policy, which slows the uptake of resources. One example of this problem relates to Malawians without an M.Sc, who are senior members of the profession with great experience, but cannot be appointed to Lectureships.

Course planning, accreditation and staff procurement

A number of suitable modules presently taught to the 1st and 2nd years of the MBBS students in the College of Medicine were suitable as foundation courses; additional pharmacy modules have been written and the degree course accredited by the University of Malawi. Teaching these modules requires trained pharmacy staff, as does virtually all 3rd and 4th year modules.

The Faculty of Pharmacy at Muhimbili (Tanzania) have been very supportive and have offered help in the teaching of Pharmaceutical Chemistry and Pharmaceutics.

Specific requirements of the course

The courses run by both the College of Medicine and School of Pharmacy are intended specifically to address problems caused by the AIDS epidemic. In addition, there is a large incidence of tropical disease requiring continual intervention. The Malawian government has concentrated its pharmaceutical procurement policy on its Essential Drugs List (EDL), in order to make available the most cost effective treatment for these ailments. These medicines are available in government hospitals and also in mission hospitals, but outside these sites patients rely on health centers and district assembly health facilities in the rural areas. A large section of the population uses these latter centres and cooperation is planned between doctors, pharmacists and local leaders in these establishments. This specific provision of healthcare is currently being addressed by the MBBS course, and also forms a major part of the pharmacy course, requiring cooperation between all healthcare workers.

Comprehensive community health modules integrated within and throughout the pharmacy curriculum are designed to address this need. In addition to controlling supply of medicines, pharmacists will be required to educate the local population about indiscriminate supply and widespread usage of single doses of medicines currently commercially available, which are inadequate for disease treatment and probably lead to resistant infections. In addition to this problem, there is a long standing use of traditional Malawi plant medicines, particularly in rural areas. This latter phenomenon is possibly beneficial, but no regard is paid to adverse effects and interactions with conventional medicines. These issues are now being addressed in the curriculum, by examining the evidence base available to substantiate current use of these traditional medicines. The aim is to produce a series of Monographs giving basic botanical information (morphology & anatomy, Thin Layer Chromatography) for the major plant drugs used across Malawi.

In addition to these requirements for local healthcare, a concerted effort is being made throughout the course to integrate teaching between medicine and pharmacy students so that they will become colleagues right from the start of their training. Particularly during the 1st year of their courses, and also to some extent in the 2nd year, both groups of students will be taught together in modules relating to foundation sciences, no-

tably anatomy, physiology, biochemistry and pharmacology, and also in community health modules throughout the 4 years of the course. For the remainder of their course, pharmacy students will learn traditional pharmacy subjects, but will also be trained in the culture of effective procurement, distribution, and supply of the medicines on the EDL. The course is planned to include practice placements in hospital pharmacies, community pharmacy, CMS, and rural health centers, this latter in conjunction with medical students, where they will equally share in the decision making process of supply and delivery of medicines. This 10 day placement involves living in the rural community and taking a responsible role, and is already in place for the medical students.

The Ministry of Health has requested cooperation with the School of Pharmacy in establishing a Drug Information Service in the Queen Elizabeth Hospital in Blantyre.

It is envisaged that a number of selected experts in these organisations will be keen to teach as guest lecturers, particularly in the area of teaching Pharmacy Law modules.

Progress

In January 2006 the first 8 students were enrolled, and a further 18 have started in January 2007. The newly appointed Head of School, Associate Professor Mike Berry, who has recently retired from the Liverpool School of Pharmacy, has widespread academic experience in both Nigeria and Malaysia, as well as the UK.

Since writing a number of articles, press releases, and a BBC Radio 4 interview on the subject of Pharmacy education in Malawi, in addition to advertising, we have had over 25 requests for full time academic posts, and a number of voluntary placements worldwide.

The Head of School is currently planning to appoint up to four academic staff, probably with experience and qualifications from Malawi or other southern African countries. Unfortunately many applicants are unsuitable, being mostly Malawians with Teaching qualifications (B.Sc in Education Science) or Environmental Scientists (B.Sc). However, a number of Malawian pharmacists are keen to become involved in the venture, particularly members of the Pharmaceutical organizations in Malawi responsible for the laws governing Pharmacy (Pharmacy, Medicines and Poisons Board (PMPB), and the Malawi Pharmaceutical Association). Visiting volunteer staff can hopefully be of tremendous benefit in supplying current knowledge in the Practice of Pharmacy.

Minor delays have taken place in new buildings which include a general Teaching Block, Pharmacology/Pharmacy, Physiology and Biochemistry units and Animal House. These developments have been well funded through NAC for equipment, much of which has arrived and awaits installation in new buildings.

Additional expenditures, not usually required for the establishment and running of a School of Pharmacy, have been required for building and running dormitory accommodation for the students and purchasing essential textbooks for inclusion in the "book bank". The dormitory accommodation is essential as the students are not from local areas and travel would be impossible from their parental homes. The "book bank" is a practical way of supplying all the required texts for the students' studies. The scheme is administered by the College of Medicine library; a list of essential books for each year of study has been collated and copies purchased and supplied to all the students. At the end of the year the books are returned for distribution to the following year of the student body, and books for the next year are then supplied to the progressing year. This scheme is essential as the cost of the books is far too high for purchase by the students.

Conclusions and Future aims

The School of Pharmacy will now be able to start producing numbers of pharmacists with a four year BPharm degree specifically trained to deal with Malawian healthcare provision in an environment of equally shared participation and responsibility between pharmacists and medical officers. This joint effort between the School of Pharmacy and the College of Medicine will hopefully be able to make a dramatic effect on the crippling effect of HIV/AIDS on both Malawian individuals, and on the national economy, and supply previously unattainable pharmacy input into the healthcare of the country.

The maxim previously quoted for successful establishment and running of the College of Medicine in Blantyre (2), "The economic constraints of a very poor developing country like Malawi act as a stimulus to ingenuity rather than a hindrance to academic development, and one of the key strategies for the immediate years is to encourage wide linkage with other academic institutions at home and abroad, and encourage research collaboration similarly", will be followed to the letter by the current Head of the Pharmacy School. ■

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Educating Pharmacists, Educating Patients
Involvement of Patients in Pharmacy Education in Ghana

Frances Owusu-Daaku, Kwame Ohene Buabeng, Anto Berko Panyin, Mahama Duwiejua, Rita Shah *and* Felicity Smith

Introduction

Patient focused education is rapidly becoming an essential component of pharmacy undergraduate education in the UK. At the School of Pharmacy (SOP), University of London, experiential learning is achieved by organising hospital and community placements and by having patient visits to the School in the first, third and fourth year (Shah, 2004). Interviewing patients enables students to consider how patients' concerns, priorities and beliefs may influence their use of medicines. Additionally students have a chance to communicate with patients in a learning environment and identify and solve some pharmaceutical care issues. The programmes in London are effective in achieving learning outcomes and are shown to be valued by students (Shah, 2004).

A feature of many undergraduate pharmacy programmes in developing countries is that they remain influenced by traditional pharmaceutical sciences with limited application of knowledge to patient care. However, pharmacy education has seen change in Ghana with the development of a Department of Clinical and Social Pharmacy in 2000. This has enabled the introduction of more diverse approaches to learning and application to practice.

For a number of years, SOP has been collaborating with the Faculty of Pharmacy and Pharmaceutical Sciences at Kwame Nkrumah University of Science and Technology (KNUST) in Kumasi. One recent initiative, described here, was a programme to invite patients to the Faculty to participate in an educational programme for undergraduate and postgraduate pharmacy students. This article describes the programme, issues relating to its feasibility and evaluation.

The programme

The objectives of the programme were to: provide students an opportunity to develop skills needed to take accurate drug histories; develop skills needed to communicate effectively; and reach a greater understanding of the impact of illness and treatment on patients.

Before interviewing patients, each group of students was given an opportunity to discuss how they would conduct the interview. At this stage they knew nothing about the patient they would be meeting.

Students were responsible for conducting the interview in an appropriate manner. Should any medication or other problems arise during the interview, students were informed not to advise, but to refer to the course tutor. Each interview lasted approximately 45 minutes after which students were asked to make a presentation to the class, based on the information they had gained and the experience of conducting the interview.

The evaluation review was based on an evaluation form completed by students and an interview conducted with patients by course tutors.

Feasibility and issues in setting up the programme

Recruiting patients

A number of different sources can be used to recruit patients: local pharmacies, surgeries, hospitals and self-help groups. Local pharmacies and hospitals were used as a source for this programme. In one case, permission had to be obtained from a senior executive which was not possible in the time frame. Establishing and maintaining relationships with practice settings are invaluable in developing new initiatives to patient-focused education.

Consent from patients is also needed. Varying literacy levels lead to additional difficulties in ensuring patients have information to consider if they wish to be involved and in obtaining informed consent.

Language

In common with other African countries, in Ghana many different languages and dialects are spoken. A number of issues arise as a consequence. To recruit patients and obtain consent requires effective communication, by someone who can speak their language. An inability to include patients who speak different languages reduces the pool of possible recruits.

Some matching of language between students and patients is necessary. Whilst patients who speak English may be desirable from the point of view of the teaching sessions, this will reduce cultural diversity of recruited patients and who students may be expected to serve as pharmacists.

Due to the necessity to match the language skills of students and patients, there was an imbalance in the size of the groups in the programme, with a large group interviewing the patient who spoke English.

Medicines and special needs

An inclusion criterion for involvement in the study was that the patient was taking regular medicines. Patients with chronic rather than acute illnesses were recruited.

Disability may make it difficult for patients to participate in the programme. In Ghana no patients with disabilities were recruited. However, if it is possible to accommodate the special needs of patients, this promotes diversity and enhances students learning.

Genuine patients

That patients are genuine is essential and this needs to be verified. For this programme, recruitment was undertaken personally by a member of Faculty staff.

Transport

It is not financially viable or practical to recruit patients who come from far distances.

Payments to patients

Patient volunteers were paid the equivalent of US$10 for a visit. It was used as an incentive for patients to attend the session. In London, patients are not given any monetary payment, but their travel expenses are reimbursed and lunch is provided at the School.

Patients and the programme

The recruitment of patients can be a time-consuming activity. However, it will be lessened if links with hospitals and pharmacies are established. There is always an element of uncertainty as to how many and which patients may or may not attend on the day.

In this instance, six patients were recruited. Some patients refused consent because they had to travel a considerable distance to participate. Others consented, but failed to come but the reasons for this were never elicited. Some patients declined to participate as they considered it a waste of time as they would not derive any short or long term benefits on their health.

The ages of the patients were 12 (a child accompanied by his mother), 14, 38, 56, 63 and 65. The two younger patients had sickle cell anaemia; four patients had hypertension of which one patient also had diabetes mellitus. There were 3 females and 3 males. Only one patient spoke English, whilst the rest spoke Twi (a Ghanaian language).

Evaluation of the Programme

Fifty-five of the 93 participating students completed an evaluation form. Students commented on operation of the programme, how it supported development of their communication skills and understanding illness and medicines from the perspective of patients.

Students viewed the programme as enjoyable and effective. Their responses where also supported by similar comments volunteered, in which they focussed on the value of contact with 'real' patients. Students were positive about the opportunity to focus on their communication skills. However, a lower student:patient ratio and a more balanced group size may enhance this experience. Students saw this opportunity to see health and medicines from the patient's point of view and realising the importance of identifying patient's information needs, as complementary to their pharmacy education.

Students were keen for further development of the programme: the opportunity for one-to-one interviews, and/or interviewing patients in much smaller groups, allowing students to give advice to patients and increasing the time allocated to interviewing the patient. Students were keen to see hospital placements as part of the degree programme.

Patient views

Patients reported finding the session enjoyable and worthwhile. They claimed that they gained increased knowledge and understanding of their health and medicines and increased awareness of the role of a pharmacist.

> *"I find this exercise to be useful because the doctors usually have little time to talk to you about your condition and medications but today I have had enough time to interact with pharmacists who have given me very useful information about my health and my drugs."*

Similar positive feedback from patients has been documented in London (Shah R et al, 2005).

Postgraduate Programme

This programme as also introduced to MSc in Clinical Pharmacy students. Here the emphasis was to identify and solve pharmaceutical care issues. This session was successful in achieving this aim.

Conclusion

The aim of the programme was to develop patient centred education in Ghana. In particular, we were keen to investigate one type of patient centred education in this setting, which has been very successful in London. The main objective was to explore ways of introducing patient focused education and to identify issues in the feasibility of its operation and its effectiveness and value from the perspective of participants.

The programme was a success enabling students to learn and practice various clinical skills and put theory into practice. Patients also found the programme worthwhile and were keen to participate on future occasions. This mode of patient focused education is versatile, in that it can be adapted to students at all levels in their degree programme.

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23 Hard Questions for Pharmacy Educators

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The advent of pharmaceutical care (1) provided the profession with a new paradigm. The focus moved from product to patient (2), a change so significant that it may still not be understood or appreciated by some. The paradigm revolution started in the mid 1980's. It arose from efforts to prepare Pharmacy for the 21st century (3).

Pharmacy educators are gatekeepers for entry into the pharmacy profession. Their role is pivotal in developing competent, life long learners in pharmacy. Since 1989, The International Pharmaceutical Federation (FIP) has developed policies to guide pharmacy educators to facilitate the transformation (4,5,6).

How have the educators responded to the paradigm change? Have they led the way or have they been the anchors that held back progress? We raise some provocative questions to encourage reflection and debate.

Professional Status

Pharmacists and educators share a common link – they are both professionals. Professional status is governed by generic criteria. These include showing a commitment to satisfying the unique, complex and specific needs of clients, and demonstrating the competence to do so. Society awards professional recognition based on evidence – no evidence, no professional status (7).

Professional interventions are evaluated at macro and micro levels. For example:

- Educators are recognised for the part they play in developing each learner, and their contribution to the community.
- Pharmacists are expected to contribute to the quality of life of each client (by identifying, resolving and preventing their medicine-related problems) and the community (e.g. by ensuring access to safe, cost effective pharmacotherapy).

So:

1. Why should society consider pharmacists and educators as professionals?
2. What evidence have they provided?

Role change

The pharmacy profession has had to re-invent itself in the face of 50 years of technological, economic and social change. It has done this very effectively. One success indicator is the critical international shortage of pharmacy personnel – a shortage that has been predicted to increase (8).

The role change should be understood in terms of a positive/normative dichotomy. This compares practice (what is being done) with theory (what should be done). Despite the pharmaceutical care paradigm shift, many pharmacists continue to follow a product-oriented approach (9).

Trained as pharmacists, they practice as technicians using few cognitive skills.

3. Why choose pharmacy as a career? – Fascination with science? Entrepreneurial interests?
4. Will role change only occur when learners want to help people?

Maintaining the Status Quo

Pressures for change are countered by restraining forces. The traditional remuneration through mark-up, and no accepted international model for rewarding cognitive services are powerful anchors.

Historical tasks such as dispensing still have to be performed. In the absence of trained technicians or automated equipment, pharmacists soldier on. Swamped by routine, there is no time for change.

5. What have educators done to challenge the status quo?

Education for change

So what has been the role of pharmacy educators in fostering change? How much credit can they claim? Which barriers have made it difficult? (Table 1) Are educators part of the solution or are they the problem? (10)

Can we assume that:

6. All training institutions refer to pharmaceutical care in their vision/ mission statements?
7. The vision of pharmacy practice includes pharmacists accepting a measure of responsibility for the outcomes of pharmacotherapy?
8. Curricula are aligned and integrated around the need to detect, prevent and resolve medicine-related problems?
9. Learners are aware of the pharmacological, social and behav ioural factors that influence medicine use in their specific country?
10. Learners are able to identify and explain country-specific reasons for the most significant:
    - Unmet medicine-related needs?
    - Potential and actual medicine-related problems?
11. Pharmaceutical care permeates through the criteria used by accrediting agencies, and is rigorously applied during evaluation?
12. How many discipline based academics can explain the concept of pharmaceutical care and demonstrate how they have in-

tegrated it into their teaching programme.

Accountability of Educators

Rigorous quality control systems check the quality, safety and efficacy of orthodox medicine. Although the tablet that cannot be checked is the one that is swallowed by the patient, industry is accountable for the performance of this tablet.

Table 1 – Change hurdles

Leadership crises within institutions – too busy, limited administrative support, diluted focus on key issues (e.g. recruiting, lobbying, monitoring pharmacy education developments).
Discipline focus discourages integration and development of broad based competencies.
Publish or perish – faculty are "income generating assets". Too little recognition for professional involvement, community engagement and educational innovation.
Professional standards for pharmacists and educators – limited interest by discipline based academics.
Little evidence of change to inspire prospective learners; existing learners are discouraged.

This principle does not apply to pharmacy training institutions. Campbell (11) suggested that training institutions be held accountable for the professional performance of their graduates. i.e. if they do not deliver appropriate pharmaceutical care services, the accreditation of their alma mater should be withdrawn. As he points out "*If students and graduates are required to accept responsibility for outcomes of care, a dose of the same medicines seems only fair for academicians*".

Could this principle be extended to Continued Professional Development? Should accredited institutions also provide evidence that they maintain the competence of their alumni?

13. Would training institutions, faculty members and their peer reviewers become serious change agents if this level of accountability was imposed?

Evolution in Teaching, Learning and Assessment

Education is no longer chalk, talk and regurgitate. Outcomes and process have triumphed over content. In pharmacy these outcomes have been defined as the competencies needed to enter and stay in the profession (12).

Assessment does not rely on a written exam. Specific pharmaceutical care competencies are assessed through OSCE/OSPEs [2], and reflective portfolios. Teaching has moved from laboratories and lecture theatres to experiential and cooperative learning, using portfolios to identify mode 2 knowledge. Mentoring is an integral part of the learning process. Information Computer Technologies (ICTs) promote blended learning and facilitate communication and assessment.

Educational developments have been taken so seriously that the WHO/FIP have prescribed criteria for Good Pharmacy Education Practice (5). This was preceded by an IPSF report setting out their vision for pharmacy education (13).

It is reasonable to ask:

14. Are all faculty members aware of the criteria for good pharmacy education practice?
15. Have these criteria been incorporated into the quality assurance systems at universities – for the faculty as a whole and each individual?

Social Priorities

Caring pharmacists are needed to deal with medicine-related issues such as old age, poverty, AIDS, TB and malaria. Experiential learning strategies have potential to internalize social needs and create socially committed learners.

So what are the social priorities of training institutions?

16. Recruit learners who are committed to making a difference in their own communities?
17. Develop teaching and learning-strategies to provide pharmaceutical care services for specific social and economic groups?
18. Develop internationally reputed scientists?

Role of Vision

Mapping the future is made more coherent when there is a clear, shared vision. It provides a mirror to reflect the beliefs, values and norms that frame the vision. It is the rainbow that inspires progress, not in the sense of obligation but rather a missionary commitment to achieve what others might feel is impossible.

19. Do pharmacy educators have a clear vision of the pharmacists they are preparing for the future?
20. Is the vision shared amongst all faculty members?

The Final Questions?

Should pharmacy educators adopt a new paradigm of teaching and learning based on learning care – i.e. being committed to and competent to identify and resolve the learning-related needs of learners and accept responsibility for outcomes?

Might the learning process be based on:

21. Developing a learning diagnosis, a teaching and monitoring plan for each learner?
22. An educational alliance between the learner, faculty members and other significant role players? ▸

2) OSCE = Objective Structured Clinical Examination
OSPE = Objective Structured Practical Examination

23. A climate of trust in which the educator and learner are jointly responsible and accountable for attaining the learning outcomes?

Why not?

Conclusion

These pharmacy practice changes are not transactional – i.e. a case of – "*I'll change if there are incentives to do so*". They are transformational – a social need has been identified that pharmacists are uniquely positioned to serve.

Educators play a critical role in socialising their learners' attitudes towards future practice. The curriculum must aim to produce competent professionals who can and want to provide the pharmaceutical care services that are so desperately needed by society. Informed by an appropriate educational philosophy, educators must aspire to meet or beat the good pharmacy education practice standards. Country specific needs must take priority. Surely this is not asking too much?

Those who have not or do not change are sentencing their learners to a future that no one can afford – neither the profession, nor the learners, nor the country in which they practice.

The Way Forward

Those who want to change need encouragement. They need role models, champions, mentors and incentives. Those who lack skills need assistance. Where resources are limited, these should be made available. In terms of quality assurance, expectations must be clarified.

With the advent of ICTs, all this is possible in a cost effective way. Having raised awareness, we intend to create interest, stimulate desire, nurture commitment and provoke action If you are interested in being part of this future, or simply want to express an opinion, we welcome hearing from you. ■

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As dedicated partners in recognising the value of pharmacists the world over, FIP is pleased to welcome contributions from our collaborators at the

World Health Organization

Quality Assurance of Health Education

Addressing the need through new directories

Hans Karle *and* **Hugo Mercer**

A brief summary of the existing WHO Directory of Medical Schools

Education for health professionals and associates has been one of the major concerns of the World Health Organization since its inception. At the first World Health Assembly, an Interim Committee was established to investigate the available resources for the training of medical and other staff essential for public health services (2). In 1948, the Interim Commission made a recommendation on technical education as "*All inter-national programmes in technical health education are considered …… The objectives of such programmes would be to gather information on all aspects of tech-nical health education and to facilitate the exchange of such information*" (3).

One of the first results of this WHO concern was the development of a Directory of medical schools, essentially aimed at enlisting those that were recognized by the governments of the countries in which they were established (4).

During its initial decades, the Directory served an audience of national health authorities and deans and faculties of medical schools. More recently, the audience shifted to different types of users (private firms, employers, students, families) as well as national health authorities and professional regulatory bodies.

The seventh edition of the Directory lists institutions of basic medical education in 157 countries or areas. It also provides information on the conditions for obtaining the license to practice medicine in 14 countries or areas that do not have medical schools. The information presented in general reflects the situation during the academic year 1995-96, and is based primarily on answers to two questionnaires designed by the World Health Organization and sent: (i) to ministerial authorities requesting information of a general nature on medical education and conditions for practice in the country; and (ii) to all medical schools of whose existence the World Health Organization has been informed by the national government, either by confirming existing lists or by providing specific information (5). The current status of the World Directory of Medical Schools shows that 1731 institutions are already included. It is estimated that 86% of existing medical schools are already in the Directory.

Reasons for developing new and improved Directories

The last World Health Report 2006, "Working together for health" (6) highlighted the fact that during recent decades there has been an impressive increase in new educational schools for the health professions, however some regions remain far from the required level of health worker production. More than 50 countries, concentrated mainly in the sub-Saharan region, are suffering from a severe shortage of health workers.

Considering the fact that most existing institutions are concentrated in developed countries, the current distribution of educational institutions is highly unbalanced; there are many countries and regions that need to considerably increase their educational and training capacity.

In response to the magnitude of the health workforce crisis the 2006 World Health Assembly adopted a Resolution (WHA 59.17) which:

Table 1 – Existing medical schools by WHO Region and estimated coverage of the Directory

Region	N° of Medical Schools	Estimated coverage
AFRO	77	75%
AMRO	468	98%
EMRO	145	80%
EURO	445	98%
SEARO	242	85%
WPRO	354	80%
Total	1731	86%

Source: WHO, World Directory of Medical Schools. 2002

URGES Member States to affirm their commitment to the training of more health workers by:

1) Considering the establishment of mechanisms to mitigate the adverse impact on developing countries of the loss of health personnel through migration, including means fro receiving industrialized countries to provide support for the strengthening of health systems, in particular development of human resources, in the countries of origin;

2) Promoting training in accredited institutions of a full spectrum of high-quality professionals, and also community health workers, public health workers and paraprofessionals;

3) Encouraging financial support by global health partners, including bilateral donors and priority disease and intervention partnerships, for health training institutions in developing countries;

4) Promoting the concept of training partnerships between schools in industrialized and developing countries involving exchanges of faculty and students;

5) Promoting the creation of planning teams in each country facing health-worker shortages, drawing on wider stakeholders, including professional bodies, the public and private sectors and nongovernmental organizations, whose task would be to formulate a comprehensive national strategy for health workforce, including consideration of effective mechanisms for use of trained volunteers;

6) Using innovative approaches to teaching in industrialized and developing countries, with state-of-the-art teaching materials and continuing education through the innovative use of information and communications technology.

School Directories as a tool for quality improvement

Within the era of globalisation, which not least affects the health professions, there is a clear need for safeguarding the quality of education of health professionals. In response to this development, there is an increasing understanding of the needs for definition of national and regional standards for educational institutions and programmes, using international guidelines (7) as a template.

Furthermore, concerns regarding the quality of educational programmes for health professions, underlined by the fact that many educational institutions for health professions do not follow appropriate accreditation practices, have emphasized the need for systems of international recognition, especially because some institutions have been established on insufficient foundations and of necessary educational resources. The disquiet concerning this situation is further exacerbated by the fact that higher education is undergoing a transition from an altruistic oriented activity to a for-profit trade commodity with obvious consequences for the quality of education and training.

One important expression of the need for recognition is the increasing use of proper accreditation. In medicine for instance, there is now a rapidly growing acceptation of using accreditation based on international recommendations (8). However, accreditation is not the only way to ensure quality. Some countries have traditionally used other quality assurance instruments, such as rigid selection procedures; entrance examinations; centrally regulated curricula; self-evaluation and inspections without a formal accreditation procedure; use of external examiners and national licensing examinations.

It should also be underlined that proper accreditation – using profession-specific standards, procedures based on institutional self-evaluation and external review and publication of authoritative and transparent decisions – is an expensive process. It also has potential pitfalls such as uncertainties regarding the independence of the accreditation council; objectivity and proficiency of assessors; outside political pressure and questionable reliability of information presented to assessors; and by selectivity in the choice of departments/disciplines demonstrated at site visits. There is therefore a need for a broader debate on how to define adequate principles and methods for international recognition of education institutions for the health professions and their programmes. One instrument which could be operational in ensuring safe information and thereby enhancing quality of educational institutions will be the Directories of Health Professions Education Institutions.

It has recently been decided that, through a variety of channels, WHO will continue collecting (i) information on health profession educational institutions; and (ii) gradually encompassing information on educational institutions for other academic health professions, including dentistry, pharmacy, public health and academic schools in nursing, midwifery and physiotherapy. It is the intention that detailed information on schools will be used to publish Directories of Educational Institutions for the Health Professions, which will include not only addresses, but also information concerning the number of admissions and graduates, teaching language, degrees awarded, entrance requirements and the duration of courses as well as management, ownership and funding sources of the institutions. With respect to international recognition, it will be of great importance that the Directories provide

Health Professional training institutions, by WHO region

WHO region	Medical	Nursing and mid-wifery	Dental	Public health	Pharmacy
Africa	66	288	34	50	57
Americas	441	947	252	112	272
South-East Asia	295	1145	133	12	118
Europe	412	1338	247	81	219
Eastern Mediterranean	137	225	35	8	46
Western Pacific	340	1549	72	112	202
Total	1691	5492	773	375	914

Source: Mercer H, Dal Poz MR. Global Health professional training capacity (background paper for The World Health Report 2006; http://www.who.int/hrh/documents/en/).

information about accreditation status, including the accrediting agency, standards used, procedures and the decision-process.

A Memorandum of Understanding between WHO and the University of Copenhagen, Denmark will be signed, which means that the University of Copenhagen will take over responsibility for publishing the Directories assisted by the WFME. A Steering Board, which will comprise the University of Copenhagen and the WHO, will be assisted by an international Advisory Committee, comprising main stakeholders, including regulatory agencies and federations of health profession educational schools and other international organisations with responsibility for health professions education. The Advisory Committee will advise on the definition of guidelines and assessment criteria for the Directories considering quality, accuracy, accessibility and user satisfaction.

It is envisioned that in the future the presentation of educational institutions and their programmes in the new Directories will offer better information regarding their quality and be a basis for international recognition.

During the discussions which took place in planning this new development, the International Pharmaceutical Federation (FIP), contributed and showed interest in being included in the work with the Directories. We hereby welcome FIP to this important progress in aiming to ensure the quality of educational institutions for the health professions. ■

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From Treatment to Health Promotion

The role of the Pharmacist in the Community

Kwok Cho Tang *and* **Sabine Kopp**

The concept of the "seven-star pharmacist" was introduced by WHO and taken up by FIP in 2000 in its policy statement on Good Pharmacy Education Practice to cover the diverse roles of a pharmacist: care-giver, decision-maker, communicator, manager, life-long learner, teacher and leader. (WHO, 1997; WHO-FIP, 2006). In brief, pharmacists provide caring services, communicate information on health and medicines to the public and assist with the education and training of future generations of pharmacists and the public. They are also able to manage resources and play a role in setting medicines policy. Moreover, in multidisciplinary caring situations or in areas where other health-care providers are in short supply or are non-existent, the pharmacist is obligated to assume a leadership position in the overall welfare of the patient and the community. It is as such imperative that pharmacists learn how to keep their knowledge and skills current, and become aware of other roles they may assume in order to effectively promote health in a community.

What is health promotion?

Health promotion is the process of enabling people to increase control over, and to improve, their health (WHO, 1986). It empowers people and enables decision-makers to undertake actions to change the many conditions that affect health.

It aims to increase people's healthy literacy largely through health education and social marketing as well as to create an environment conducive to health mainly through changes to policies and physical environment to reduce environmental hazards and improve access to goods and services. It also aims to address social determinants of health through expansion of life opportunities in key areas, among others and most notably, education and work.

To be able to more effectively change the many conditions that affect health, a combination of bottom-up and top-down approaches has often been used. The focus of the bottom-up approach is on people empowerment. To empower means to work with people through personal development for self esteem and actualization, and to create opportunities for people to exercise social and political influences. To facilitate change, particularly, structural support from decision-makers is essential. Decision-makers must, therefore, be able to undertake actions for change. Such support can be acquired through decision-makers gaining a better understanding of the value and effectiveness of health promotion.

To reduce cigarette smoking, it is important to improve people's knowledge, for example, about the harmful effects of tobacco, how the tobacco industry promote sales through advertising and what options are available to help quit smoking and how. However, regulations and legislation are more effective means of tobacco control. Tobacco use can be more readily reduced through structural measures such as increase in tobacco taxes, ban on advertising and smoking in public places as well as restricted sales of tobacco. Improving people's education and income level can also reduce tobacco use as people of a higher level of education and income smoke less.

The 1986 Ottawa Charter for Health Promotion established the basic principles and action strategy for modern health promotion and set health promotion on track to address the root causes of poor health and inequity in health. To these ends, five Action Areas were identified. Health promoters are urged to promote health through the use of combinations of the five Action Areas: to develop health public policy, create supportive environment, develop personal skills, strengthen community action and re-orient health services

To build on the Ottawa Charter, the Bangkok Charter identified major challenges in a globalised world and also commitments and actions that need to be undertaken to meet the challenges (WHO, 2005). It adds value to health promotion practice worldwide (Tang et al, 2005). The four commitments identified are to make the promotion of health: central to the global development agenda; a core responsibility for all governments; a key focus of communities and civil

society, and a requirement for good corporate practices. The Charter also expands the Ottawa Action Areas to strengthen health promotion. Five action strategies have been proposed and they are: advocate for health based on human rights and solidarity; invest in sustainable policies, actions and infrastructure, build capacity to promote health; regulate and legislate to ensure a high level of protection from harm; enable equal opportunity for health and wellbeing for all people and partners; and build alliances with public, private, nongovernmental and international organizations and civil societies

What have pharmacists been doing in health promotion?

There are at least two types of opportunities for pharmacists to play a role in health promotion: one is to address the "demand" side issues which focuses on behavioural change of individuals such as medication compliances and dietary observances; the other relates to "supply" side issues which focuses on policy changes in the area of the supply of medicines, including availability, affordability and quality of medicines.

Consistent with the concept of a seven-star pharmacist, a preliminary review of literature reveals that the bulk of health promotion being undertaken by pharmacists can be grouped into three categories: direct patient care and home care; immunization management and chronic disease management; and screening and prevention at the country level (Canadian Pharmacists Association, 2004). In the recently released WHO-FIP publication "Developing pharmacy practice" the pharmacists' role in health promotion and disease prevention is described as "delivering clinical preventive services", "surveillance and reporting of public health issues", and "promoting safe medication use in society".

Pharmacists are also active in playing a regulatory role to protect patients from harm, for example, through development of legislation, policy and guidelines related to achieving safety and quality of medicines, promoting rational use of medicine, as well as improving standards of practice among pharmacists.

There are also pharmacists who engage in formulation of policies relating to behavioural risk factors such as tobacco use, obesity and sedentariness, international development through provision of technical assistance and services to health professionals and communities in countries which currently lack the necessary infrastructure and health system.

More recently, pharmacists have been increasingly active in promoting access to essential drugs, which has included the following:

- Procurement and supply of medicines
- Detecting and eliminating counterfeit drugs
- Donation of medicines
- Providing information for disadvantaged groups
- Addressing issues in producing generic drugs
- Providing information about the interchangeability of multisource products

What can pharmacists do in health promotion?

There are many other roles pharmacists can play to promote health in a community and those include:

Researcher: The pharmacist must be able to use and expand the evidence base
Consumer advocate: The pharmacist can help prevent chronic diseases and provide access to affordable quality medicines.
Policy analyst: The pharmacist can monitor and formulate policies on safety and use
Adviser: The pharmacist can promote international exchange of information and provide technical assistance to aid projects
Regulator: The pharmacist can improve standard of health practice.
Pioneer: The pharmacist can devise innovative measures to combat circulation of substandard and counterfeit drugs.

It is important for pharmacists to continue to work with and for people in the community to address the demand side issues. With equal importance, pharmacists will need to tackle supply side issues. In this respect, they may need to secure increased state patronage such as gaining representation on statutory bodies through advocacy, media influence and community mobilisation. This will allow the supply side issues to be more effectively addressed and pharmacists to become the guardians of medicines' safety for people in the community.

Implications for practice

To optimize the contributions of pharmacists to the achievement of health and wellbeing of people in the wider community, pharmacists must be ready to act. Thus a good understanding of the good practices that are being undertaken by colleagues and the innovations that are available elsewhere is necessary.

Innovations are new products and practices and usually carry a positive connotation. They must be diffused within and between communities and countries. A new product or practice can be the use of a near-infrared spectrometer to detect counterfeit medicines, a new policy or a set of new guidelines for the production of generic drugs, new regulatory criteria for determination of interchangeability of multi-source medicines, new technology to trace medicines in a supply and distribution system. It can also be the use of an outcome approach to enhance medication compliance with methodological rigor if the approach and rigor have not yet been adopted in the community or country.

There are a handful of factors that influence the success and speed within which an innovation is adopted by a pharmacist, in a community or country. It was found that the innovation could be more successfully diffused if ▸

the following criteria were met: fit with the intended audiences and ease of use of the innovation as well as the visibility of results after the innovation is used (Nutbeam and Harris, 2004).

The increasing emphasis on addressing the supply side issues will require the adoption of the structural approach to promote health. It also implies a shift in the focus of capacity building, from targeting diseases and risks to health to the underlying causes of poor health, from targeting people's behaviour to organisational behaviour and from using the knowledge and skills predominantly from health sciences to those from social and political sciences.

While it is important to note that the roles that pharmacists should play vary, taking into consideration the needs of the community, the community's social, economic and political context and the competency of pharmacist, to decide what role pharmacists should play to promote health in the community at the country and global levels, strong leadership is required and professional associations at the national and international levels need to take the lead. ■

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Building the global bridge

Dr Agathe Wehrli

Pharmabridge is a voluntary run initiative supported by FIP, aimed at strengthening pharmacy services in developing and transitional countries through coordinated support from the pharmacy establishment and individual pharmacists in the developed world.

Some may ask, why Pharmabridge?

During my visits to developing countries on World Health Organization (WHO) missions I was often struck by the insufficiency of pharmaceutical services and the high motivation of individual pharmacists despite difficult working conditions. They lacked – and many still do – for example access to such basic needs as up-to-date reference books and also to training opportunities. It was against this background that in 1999 I created Pharmabridge, after my retirement from WHO.

Dr Agathe Wehrli

There were and are, of course, other support systems in place to target these needs, but they are usually limited to institutions. While Pharmabridge also includes them, it does not leave out the individual pharmacist. I was well aware that the success of Pharmabridge would depend on people's willingness to support it. This soon happened, although some activities have taken more time to materialize. The project really took off thanks to the inclusion of a questionnaire in the Newsletter of the Commonwealth Pharmaceutical Association (CPA), which was soon followed by a FIP press release.

Now, FIP has adopted Pharmabridge as one of the activities of the Board of Pharmaceutical Practice. Apart from CPA and FIP, the American Society of Health-System Pharmacists (ASHP) has provided support right from the start by offering a complimentary copy of the AHFS Drug Information book to every Pharmabridge newcomer from a developing country. Book donations remain the backbone of the project, the vast majority coming from the USA, from ASHP, the American Pharmacists Association (APhA), individual pharmacists and pharmacy students. For a few years, the Ohio Northern University students supported over 30 parties in developing countries with book donations, and even computers under an optional credit programme on Pharmabridge.

As the initiative grows, the programme is now also in a position to place pharmacists from developing country into pharmacy practice sites thanks to offers again mostly from the USA, but also from the UK and Canada, These experiences are usually associated with schools of pharmacy and generally last for 1 month, with individuals training in hospital/clinical pharmacy or drug information. This year alone 6 people could be placed and sponsored.

Pharmabridge also promotes the sponsorship of on-site training courses in developing countries. This is made possible through individual pharmacists donating their time and expertise to these on-site visits. So far, Good Manufacturing Practice (GMP) courses could be run in Sri Lanka, Nigeria and Ghana, with another one planned for Mongolia. A training course in drug information in Nigeria is in the pipeline, as well as the visit of a team of US pharmacist experts to India.

Of pinnacle importance to the project is overall contact between pharmacists from around the world, from all demographics of practice and health. Because of the Pharmabridge network, many pharmacists have been able to meet with colleagues when traveling abroad; some of them given the opportunity to participate in local pharmacy events and make presentations. Up until now over 600 people have registered with Pharmabridge and direct communication amongst them will soon become possible through an e-mail address list on www.pharmabridge.org.

Through Pharmabridge, I truly believe that we are building a global bridge for pharmacy opportunities, resources and knowledge, and it has been my privilege to work with many others in bringing this project to fruition. ■

There will be a Pharmabridge meeting during the FIP Congress in Beijing on Tuesday, 4 September, 17.00 – 18.00 in Room 101 where updated information will be provided, and where all our welcome to mix, mingle and network.

Dr Kamal K Midha addresses the Pharmaceutical Sciences World Congress in Amsterdam

In April of 2007, the FIP Board of Pharmaceutical Sciences hosted the 3rd Pharmaceutical Sciences World Congress in Amsterdam, The Netherlands. FIP President Dr Kamal K Midha took to the podium with these words to welcome all to this pinnacle world event in the pharmaceutical sciences.

"In this year's world congress, we, the pharmaceutical scientists, have the opportunity and responsibility to commit ourselves to discovering and developing approaches which directly addresses these global challenges..."

As President of FIP, I am honoured and delighted to warmly welcome you – more than 2,000 strong – to this 3rd Pharmaceutical Sciences World Congress chaired so ably by Professor Crommelin. It is now three years since many of us last met together at the 2nd PSWC in Kyoto, Japan under the Chairmanship of Professor Sugiyama, which was another successful congress like the 1st PSWC in San Francisco under the Chairmanship of Professor Benet. Both Professor Sugiyama & Professor Benet are in this meeting and I hope they would continue to provide advice and guidance in future PSWC. Our meetings are great opportunities for us to celebrate and share together our common professional expertise, concerns, fellowship and commitments to world health care.

This 3rd Pharmaceutical Sciences World Congress represents our global interests and concerns as Pharmaceutical Scientists. Appropriately the Congress this year is focused on the theme of Optimising Drug Therapy: An Imperative for World Health. For many of us, medicinal therapy represents a relatively standard, taken-for-granted health care intervention that involves diagnosis and treatment. Supporting this personal and public orientation toward health care and wellness is the enormous research and development activity involved in bringing new health care strategies to successful practice. In the experience of most persons who are consumers, medicinal therapy is a very focused and limited activity in their lives, available as needed for chronic diseases and quality of life concerns.

For us as pharmaceutical scientists, medicinal therapy represents a huge investment of our time and resources, personal and financial, not only in the development of treatment strategies, but also in translating these strategies into effective practices which are affordable, deliv-

erable, and available to consumers based on need and demand.

What I have said, however, is true for only part of the world and some of its people. The developing nations and their people still suffer immensely from the double jeopardy of acute infectious diseases as well as chronic illnesses. These nations and their people lack the critical medicinal therapies to control and find cures for these diseases. They also lack the basic infrastructure of personal and financial resources to even begin the process of helping the needy. These nations and their people carry an intolerable disease burden without affordable and available medical interventions for effective health care. This situation must not be accepted by any one of us.

In this year's World Congress, we, the Pharmaceutical Scientists, have the opportunity and the responsibility to commit ourselves to discovering and developing approaches which directly address these global challenges of rampant infectious diseases – and more precisely "Neglected Diseases" which I believe affects neglected populations. All these are threats to millions of people and to world health itself. We must individually and collectively ask ourselves what should be done now, and in the future. We must seek creative ways of financing such developments and delivery of treatments which bring together public and private collaboration through partnerships to deal with Neglected Diseases (such as Malaria, TB and others) These creative approaches of public and private partnerships could save millions of people from death and destruction. We should also be most vigilant of the counterfeit medicines as their potential use can have frightening consequences for patients and divert them from the controlled market.

The 20th century witnessed the tremendous growth in the Physical Sciences:

- The shrinking of the world into what McLuhan called the "global village";
- In the birth and daily reality of truly global communications;
- In the spread of and dependence on global knowledge;
- In international transportation of millions of people daily.

The 21st century will become the century of the Life Sciences where people will live longer and healthier lives. In less than one hundred years, we have seen a doubling of the average life expectancy – with a greater emphasis on and expectation of "quality of life" issues. In the developed nations, chronic illness is still our greatest challenge, while we spend an inordinate amount of our resources on "quality of life" medicines. Meanwhile in developing and neglected regions of the world where more than half the people of the world live, the daily struggle continues to even to get essential care. Their struggle continues to control devastating infectious and neglected diseases for ▶

"Our Pharmacy Profession nurtured with good science is a dynamic, health caring profession. FIP's efforts are already showing positive impact and meaningful outcomes as seen through the increasingly prominent roles Pharmacists and Pharmaceutical Scientists are being called upon to play in Global Health and Wellness."

some of which effective medicines may be known but in reality are unavailable. FIP supports the enormous and critical challenge through advocacy of the competencies put forward in WHO's publications as well as by working with our other Health Alliance Partners. The competencies supported by FIP include:

(i) Patient centered care,
(ii) Partnering,
(iii) Quality improvement of health and health care delivery,
(iv) Information and communication, and
(v) Public health perspectives of moving from a single patient to populations.

This PSWC will provide information and platforms for discussion of all five of these competencies. The efforts of the "Friends of PSWC2007" have directly attempted to address a number of these competencies by providing financial scholarships to some of you from all parts of the world with the hope that you the young generation of Pharmaceutical Scientists are able to contribute, network and learn. We and our world need your knowledge and commitment from early on in your scientific careers.

I believe that although drug discovery may be largely confined to certain regions of the world, the process of drug development is a GLOBAL activity and that Pharmaceutical Scientists have been able to mount an international platform and forum, such as this World Congress, in order to explore the issues and concerns. This is why since 2000 we began to hold Pharmaceutical Sciences World Congresses to promote both the values and the practices involved in establishing and strengthening global networks. This should foster and facilitate effective dialogue, hopefully leading us to be more creative in discovery and development to achieve our cherished goals. With all of these efforts and hopes in mind, I welcome you once again to Amsterdam, to the 3rd PSWC, and to the challenges and opportunities you will have. Make the most of your four days and enjoy the beautiful city of Amsterdam and the fellowship of your friends and colleagues.

Dr. Kamal K Midha
FIP President

" Our future impact lies in our concerted, dedicated, and focussed collective efforts from all stakeholders to educate and prepare future leaders through proper education and on the job training."

World Congress of Pharmacy and Pharmaceutical Sciences 2008

68th International Congress of FIP

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