

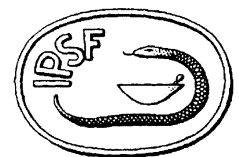
# Pharmacy Education A Vision of the Future

*A Comprehensive Collaborative Study by  
Pharmacy Students Worldwide of Essential  
Developments in Pharmacy Education.*

Prepared on behalf of:

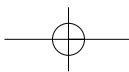
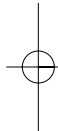
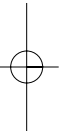
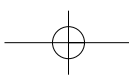


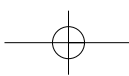
the European Pharmaceutical Students' Association and



the International Pharmaceutical Students' Federation.

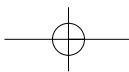
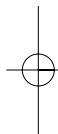
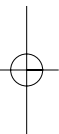
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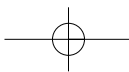
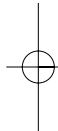
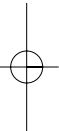
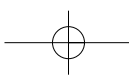




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# Foreword from UNESCO

UNESCO is pleased to write this foreword for the document *Pharmacy Education - A Vision of the Future*, prepared by the European Pharmaceutical Students' Association (EPSA) and the International Pharmaceutical Students' Federation (IPSF).

EPSA currently represents 35 pharmacy student associations across Europe, and has been working in the field of pharmacy education for over two decades now. The organisation has achieved a niche in Europe as a forum through which the opinions of European pharmacy students are surveyed and published annually. This niche enables EPSA to project the opinions of its members on an increasing number of issues, to policy-forming organisations, including the European Commission.

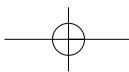
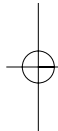
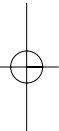
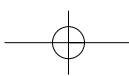
IPSF, comprising over 200 000 pharmaceutical students and recent graduates in 61 countries world-wide, but maintaining a network of contacts extended to 89 nations, works with similar aims in a global scale and is a dynamic partner of UNESCO in our quest for the principles to orient the renovation of higher education in the third millennium. This was the objective of the World Conference on Higher Education (Paris, October 1998) which was attended by over 4000 stakeholders. These included a strong presence by student organisations whose views provided a welcome and fresh stimulus to the debate.

Advanced learning prepares students for their roles as citizens and professionals in a changing world. The new millennium will be an era of enhanced internationalism and of education and training in order to deal with the knowledge society already in evidence. Since graduates must be able to address the challenges of a global and multicultural world, student organisations have a major responsibility in this regard. They must be a full and critical voice in shaping the future of their chosen profession so as to enhance its quality and relevance.

In drafting this new *Pharmacy Education - A Vision of the Future*, EPSA and IPSF are assuming this role and we are reminded that health and education are logical and complementary partners in the development process. UNESCO congratulates EPSA and IPSF for this initiative.

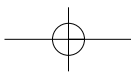
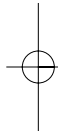
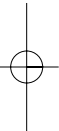
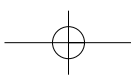


**Komlavi F. Seddoh**  
*Director, Division of Higher Education*  
**UNESCO, June 1999**



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# Introduction

Education is empowerment. It is a means to foster individual, social, professional and economic development and it shapes the difference between the world of today and that of tomorrow.

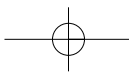
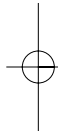
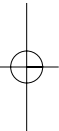
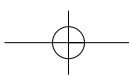
The issue of quality in education becomes therefore an essential concern, not only to those directly involved in the formal educational processes (such as students and educators), but also to society as a whole, policy-makers, professional bodies, parents and other stakeholders. In addition, one of the major changes to deeply mark the 20th Century has been the shift from a social attitude of *independence* to one of *interdependence* between individuals, organisations and societies. The world has become increasingly aware that mutual understanding and partnerships are essential in every aspect of life, if we are to optimise the results of human endeavour and improve quality of life for every citizen.

In health care particularly, the need for professional interdependence has become increasingly apparent, as new priorities in public health and new demographic trends emerge, generating the necessity for multidisciplinary approaches involving all health care providers as well as social scientists and practitioners.

Also, due to great developments in scientific research and the increasing (and changing) social demands in terms of health-care, the profession of pharmacy has been forced to undergo a radical process of evolution with great shifts in its public mission in the last hundred years. Having changed firstly from the formulation to the dispensing of medicines, the role of the pharmacist has more recently evolved towards direct patient care and the assurance/optimisation of therapeutic results. However, pharmacists maintain a level of expertise about drugs that is valuable at all stages of the development, production and delivery of medicines.

In this scenario, it becomes clear that pharmacy education needs to react to and even anticipate professional and social change, renewing its mission in terms of graduate profiles and learning objectives. Here again, interdependence and partnership amongst all stakeholders in pharmacy education has become a necessity, in order to ensure positive development. It is now clear that all stakeholders, including students, have a responsibility to encourage and facilitate change and must show leadership in the movement for an improved pharmacy education.

Representing pharmacy students in Europe and Internationally, EPSA and IPSF recognise the importance of responsible, informed and effective contributions by all stakeholders in the renewal of pharmacy education. Following thorough research of methods, trends and innovations in pharmacy education, higher education in general and healthcare, and ongoing consultation,



this joint effort 'A Vision of the Future' has been completed. At each stage of its preparation, pharmacy students from all over the world have been reviewing and commenting on the document, and every effort has been made to involve other international pharmacy student organisations in the work. In addition to the endorsement of the EPSA and IPSF General Assemblies, a 'full blessing' of the document has been received from the Federation of East African Pharmacy Students' Associations at the time of writing.

The aim of this document is twofold: to state the international point of view of pharmacy students on essential developments in pharmacy education and, more importantly, to provide students, educators and other stakeholders with a valuable resource for positive change in pharmacy education at local, regional, national and/or international level.

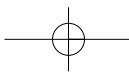
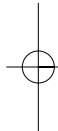
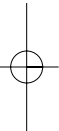
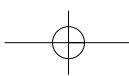
The document is divided into four chapters:

- I An Evolving Profession - Challenges and Responsibilities
- II Evaluation for Quality and Positive Change
- III Learning Processes and Outcomes
- IV Content of Pharmacy Education - Flexibility and Relevance

These are four major areas in which we believe that more action may be needed, in broad terms.

By sharing this information and ideas, EPSA and IPSF aim to develop pro-active leaders, who are able to responsibly interact with the school community and other stakeholders in a climate of mutual recognition and interdependence. By compiling the views of students around the world in this *Vision of the Future*, we hope that individual students, educators and other stakeholders will recognise the need for change and work together to bring it about. In this way, we look forward to a reality where pharmacy education will continually produce graduates who are responsible and participating citizens and dynamic members of a relevant profession.

***European Pharmaceutical Students' Association  
International Pharmaceutical Students' Federation  
July 1999.***



# *Chapter I*

## *An Evolving Profession - Challenges and Responsibilities*

### **Challenges to Healthcare and the Pharmacy Profession**

In the 20th century, in all parts of the world, priorities and challenges facing pharmacy and healthcare in general have changed considerably. The World Health Organisation estimates that by 2020, leading causes of the burden of diseases are likely to be ischemic heart disease, depression and road traffic accidents, while health trends are likely to be dominated by four factors: the ageing of the world's population, the unfolding of the HIV epidemic, the epidemic of tobacco-related mortality and disability and the expected decline in childhood mortality from infectious diseases<sup>1</sup>. As noted by the former President of the Commonwealth Pharmaceutical Association, the pharmacy profession should be concerned with these issues. It should be concerned that "about a third of the world's population still lacked access to essential drugs, that about half a billion persons contract malaria every year, and that one million people would die this year (1999) from tuberculosis because of drug-related problems, for which pharmacists should assume responsibility"<sup>2</sup>.

Pharmacy, as a profession has its own obstacles to face in trying to meet these challenges. Recruitment is a significant problem both in developed and developing countries in all fields<sup>3,4,5,6</sup>. The total number of drugs is constantly increasing, and the cost of drugs for many illnesses is beyond the budget of huge numbers of payers, especially in developing countries. Countries struggle to make quality drugs available and affordable, and this may mean seeking to achieve national self-reliance in pharmaceutical production, despite opposition from license holders<sup>7</sup>. Elsewhere, community pharmacies are forced to rely on the sale of OTC medicines, due to opposition to separation of prescribing and supply from the medical profession<sup>8</sup>. Primary health care has been recognised as the way to reach the WHO 'Health for All' target and the role of pharmacists in this context needs serious attention. Each country faces its own unique combination of assets and challenges.

***the profession is in a  
dynamic and  
evolving period***

In most developed countries, the profession is also in a dynamic and evolving period. In some countries, limited prescribing powers are now available to pharmacists as well as to other health professionals<sup>9</sup> and pharmacists are employed increasingly to work with physicians in general practices<sup>10</sup>. The rapid growth of the Internet has led to increased sales of medicines across national barriers and a proliferation of information, reliable or not, to patients, not least through advertising of medicines (prescription and OTC) to the public in the media<sup>11</sup>. Remuneration margins for traditional dispensing activities are under pressure while payers look to the profession to prove the value of their professional activities using outcomes measurement and pharmaco-economic models. This pressure, and the increasing cost of drug-related problems, estimated recently at US \$76 billion for the USA<sup>12</sup>, have been the inspiration for the movement towards pharmaceutical care, or 'the responsible provision of drug therapy for the purpose of achieving definite outcomes that improve a patient's quality of life'<sup>12</sup>.

## **Professional Responsibility**

A mutual linkage exists between the profession of pharmacy and the schools of pharmacy that prepare future pharmacists<sup>13</sup>. Professions by their nature are exclusive and self-governing and society provides for their continuation by supporting an extensive education for the professional student. In addition, privileges and a high position in society are awarded to professionals on the basis that they are applying their unique specialised knowledge and skills to provide a service. It is therefore appropriate and compelling that a right fit exists between the needs of society with regard to pharmaceutical services and knowledge, the aspirations of the profession as a whole and the capabilities and philosophies of schools of pharmacy<sup>14</sup>. Simply stated, pharmacy education must produce graduates capable of responding to the challenges of society's needs and professional evolution, and educational institutions cannot be solely responsible for the moving pharmacy education to this goal.

***professional bodies  
must take  
responsibility for the  
education of their  
members***

It is the duty of all stakeholders to ensure that educational efforts made result in individuals who can provide that service to society by practising with the highest possible standards of professionalism and expertise. The ability of professional organisations in pharmacy to control standards for the achievement of professional status varies between countries. We believe nevertheless, regardless of the challenge facing them, that professional bodies must take responsibility for the education of their members, both prior to entry and in continuing professional development. Additionally, consumer and patient associations have a valuable voice in the development of pharmacy education since they represent the society that we must ultimately serve as professionals.

The importance of including representatives of all aspects of the profession in each and every review of pharmacy programmes that is carried out has been emphasised previously. It is no longer acceptable for a national professional body to be involved only in recognising the end-results of education, pharmacy organisations from all disciplines must become involved with and partly accountable for the whole process. Representative organisations must undertake this task with due care and diligence, committing adequate time and resources to the investigation and observation of education practices and their evolution in both a global and local context. In addition, the position of such groups at the forefront of each area of practice gives them an ideal perspective from which to understand fully the implications of developments within the profession at the earliest possible stage. They have therefore, a vital role to play in ensuring that the education of pharmacy students reacts to and indeed anticipates such changes. At the heart of this process is their involvement in the continual review of the objectives of educational programmes, in the light of progress within the profession.

## Student Responsibility

*students must  
assume  
responsibility for  
their own futures*

While many factors combine to slow the pace of educational improvement, it is noted that pharmacy students themselves may not react to changes in the positive manner that they were intended. They must assume responsibility for their own futures and attempt to contribute in a constructive and mature manner to educational development. The openness and accessibility of the faculty staff will help this. Students must recognise that the quality of their education is dependent on previous improvements and it is their duty therefore to work for further benefits for the next generation. Change, though often uncomfortable, is essential to progress and students should welcome it in this context.

## Professional Leadership

*the quality of  
professional practice  
must be  
unquestionable*

Professionals have a further role to play in providing students with their image of what it means to be a pharmacist. What students experience of the profession will be what forms their impressions. Thus, the quality of professional practice must be unquestionable, and should stand up to analysis at any stage. Even with the highest standards of current practice, the rapid pace of change in healthcare systems means that contemporary practice in many areas is not entirely reflective of the direction in which the profession is moving. In these situations, professional bodies must show leadership. Every effort must be made to ensure that students base their decision to study pharmacy not only on the work of their contemporaries, but on their understanding of probable developments. This can be achieved by closer co-operation between the professional organisations and schools' career advisory services.

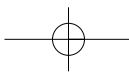
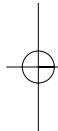
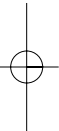
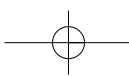
Once students are committed to pharmacy as their chosen course, ample opportunity must be provided for them to hear about and experience examples of top quality innovative practice. Students should be shown the opportunities which exist to take initiative, to be responsible and dynamic, to move pharmacy towards an exciting future in all fields. This kind of work can be included as part of the curriculum, extra-curricular lectures/symposia, competitions, publications, practice visits etc.

Keeping students informed of the work of the professional organisations is an excellent way to give them a feeling for the issues and responsibilities in their profession. No student should graduate without some idea of the wide scope of their profession, just how much they can contribute and just how important their role can be. If pharmacy is to survive, pride and enthusiasm in the profession must be cultivated in students from the very first day of the programme. A small investment of time and effort in this area on the part of concerned professionals will yield untold benefits for graduates, the profession of pharmacy and the society that we serve.

Part of that pride in our profession must fuel the confidence required to work effectively with other professionals. Professional bodies should lead the way by working closely with other healthcare organisations, and by promoting examples of productive co-operation. Additional co-operative skills must be taught by means of practical experience. Joint seminars and clinics with other health professionals would give all involved a clearer picture of the value of the individual expertise and abilities of their colleagues, and would inevitably build for future collaboration.

The future of this profession does not only depend on those who are willing to practice pharmacy to the highest standards; it also relies heavily on those who are willing to give of their time and energy to work for the profession in general. All pharmacists benefit from the campaigns of professional bodies and the many volunteers who ensure the voice of pharmacy is not lost in the clamour to be heard. Students should be encouraged to contribute to the promotion and development of the profession by working in pharmacy student organisations and other bodies. We believe that academic and professional organisations have a role in recognising and supporting the work of these students and the organisations that they serve.

- <sup>1</sup> Fenk, Julio and Murray, Chris, WHO Press Release WHO/2, January 25, 1999 as reported in the International Pharmacy Journal, Vol. 13, No. 2, March/April 1999.
- <sup>2</sup> Sesay, Murtada, during the Commonwealth Pharmaceutical Association Conference, as reported in The Pharmaceutical Journal, Vol. 262, No. 7036, March 13, 1999
- <sup>3</sup> Baggot, Colette, "An Overview of Pharmacy in Zimbabwe", Irish Pharmacy Journal, Vol. 77 No 2. February 1999 p.406
- <sup>4</sup> Murdock, Andrew, "Pharmacy's Recruitment Crisis Must be Tackled", The Pharmaceutical Journal, Vol. 262, No 7032 p.229, February 13, 1999.
- <sup>5</sup> "Hospital pharmacist vacancies rate three times greater than nurses", The Pharmaceutical Journal, Vol. 262, No 7029 p.99, January 23, 1999.
- <sup>6</sup> Buckley, Declan, "The Pharmaceutical Industry - What should be done about skills' shortages?", Irish Pharmaceutical Union Review, Vol. 24, No 7/8, July/August 1999
- <sup>7</sup> Weerasuriya, Krisantha, "AIDS and essential medicines and compulsory licensing", International Pharmaceutical Journal, Vol. 13, No. 3, May/June 1999
- <sup>8</sup> Kawahara, A, "Reaction from Japan", Discussion paper for the Third WHO Consultative Group on the Role of the Pharmacist, Vancouver, Canada, 27-29 August 1997.
- <sup>9</sup> "Crown review paves the way for pharmacists as "dependent prescribers" ", The Pharmaceutical Journal, Vol. 262, No. 7036, March 13, 1999.
- <sup>10</sup> Noyce, P, "New Challenges for the Profession: The Case History from the UK", Discussion paper for the Third WHO Consultative Group on the Role of the Pharmacist, Vancouver, Canada, 27-29 August 1997.
- <sup>11</sup> Fitzgerald, Niamh, 'Expensive Propaganda or Essential Education", European Pharmaceutical Students' Association Newsletter, Vol. 6, No. 3, March 1999.
- <sup>12</sup> Johnson, J.A., Bootman, J.L., "Drug-related morbidity and mortality and the economic impact of pharmaceutical care", American Journal of Health System Pharmacists, 1997, 54: 554-558.
- <sup>13</sup> Hepler, C.D., Strand, L.M., "Opportunities and responsibilities in pharmaceutical care", American Journal of Pharmaceutical Education, 1990, 53 (Winter supplement):75-155.
- <sup>14</sup> Manasse, Henri P., "Perception of the Profession Regarding Future Role - The Role of the Schools of Pharmacy in Responding to Social Need", Discussion paper for the Third WHO Consultative Group on the Role of the Pharmacist, Vancouver, Canada, 27-29 August 1997.



# Chapter II

## *Evaluation for Quality and Positive Change*

### The Background to Educational Evaluation

These are exciting and fast-moving times<sup>1</sup> and educators worldwide are being called upon to react. As governments have lessened their control of universities in many countries leading to demands for increased accountability, it has become expected of colleges and universities to be responsible for carrying out their own extensive and internal evaluations of their activities. No respected, successful pharmaceutical company would consider beginning any production process without ensuring that meticulous quality assurance procedures were in place. Is not the education of a generation of health professionals at least equally important? The continuous evolution of the profession and society for which pharmacists are being educated highlights the need for every faculty/school of pharmacy to implement a thorough, documented and ongoing system of evaluation of their education in order to improve quality and achieve explicit, agreed objectives.

Most faculties attempt to monitor the quality of the pharmaceutical education that they provide, however the manner and systems of their evaluations vary enormously in scope, depth and indeed, actual value. Many neglect to adequately assess each aspect of the programme, including students, staff and environment and so fail to result in the implementation of the changes required to enhance quality and relevance. Curriculum development should not focus solely on the content of the programme, a properly designed evaluation addresses all parts of the educational process, of which the content is only one element.

*Well-organised systems of evaluation provide answers to important questions*

Well-organised systems of evaluation provide answers to important questions that cannot be solved by considering only quantitative data such as throughput, expenditure breakdown and examination results. A well-planned system can provide valuable answers to questions such as the relevance of the programme in the future careers of graduates, and the effect of a longer practice period. These answers not only create a system for allocating resources, but more importantly lead to greater certainty about the value of efforts made and identify what needs to be modified, changed or updated. A further advantage of concentrating on evaluation for the purpose of improving activities is that it inspires public confidence.

## A Target of Quality

Consideration of our evolving profession suggests that the evolution process in pharmacy is unique to each environment and the professional profile of the pharmacist in that area. Consequently, it becomes apparent that no one system of pharmacy education is universally valuable. Harmonisation of education is only valuable in so far as it guarantees quality in pharmacy graduates regardless of their place of study. It is therefore vital that each learning institution develops its own plan for *continuous* quality development specific to the faculty or school of pharmacy in question, taking into account local conditions, needs and primary expectations<sup>8</sup>.

***The establishment of complete, clearly stated goals/intentions is crucial***

The establishment of complete, clearly stated goals/intentions that are widely known and exist with reasonable consensus across students, staff and other stakeholders including patients, is crucial to the continued success of any educational programme. Educational goals must be clear and specific and stated in useful terms, regarding skills, attitudes, knowledge and values. All evaluations must compare actual to desired performance and establish plans to bridge the gap.

## Evaluation Systems

The choice of which evaluation system or combination to use depends on the approach needed. Metfessel and Michael<sup>3</sup> describe an eight step system that takes the evaluation right from the point of setting objectives, and may be particularly useful where a structured system of quality assurance is being implemented for the first time (Figure I).

Figure I

<b>Metfessel and Michael – Eight step model<sup>3</sup></b>	
1.	Involve members of the total community.
2.	Construct broad goals and specific objectives.
3.	Translate specific objectives into forms that are communicable and that facilitate learning.
4.	Develop measurement instrumentation.
5.	Carry out periodic measurement.
6.	Analyze measurement data.
7.	Interpret analyzed data.
8.	Formulate recommendations for program change or modified goals and objectives.

A precursor to the Eight-Step Model is the goal attainment approach described by Tyler<sup>4</sup> which involves the careful formulation of educational goals from three sources - the student, society, and subject matter. Goals are then transformed into

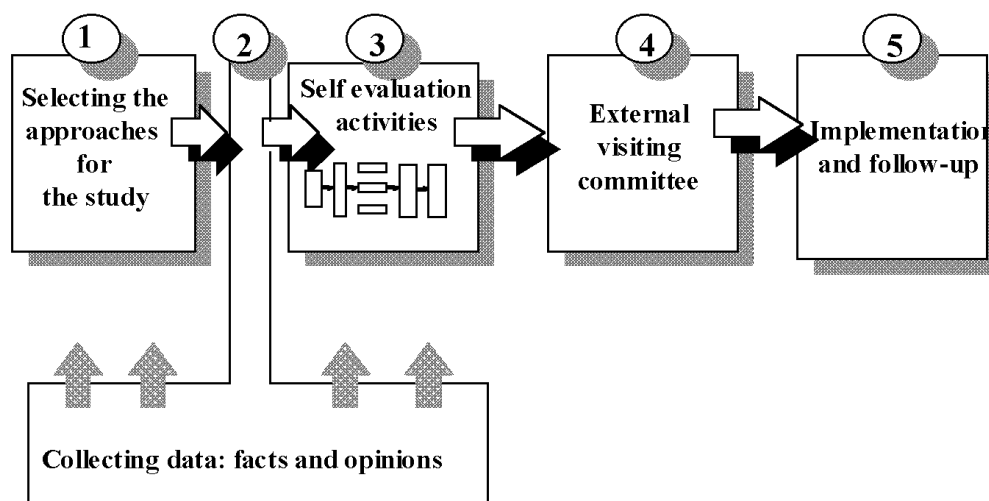
measurable objectives and students are assessed at the end of their training to establish how well the goals have been achieved. Unattained goals are assumed to reflect inadequacies in the instructional program and goals can also be altered if it is determined that they were inappropriately selected.

Hammond's (1973) model<sup>5</sup>, based on Tyler, also focuses on the achievement of expressed objectives. His multi-step model places greater emphasis than Tyler's on the impact of institutional factors on the achievement of objectives. All of the above systems are described in Popham (1988)<sup>6</sup>.

A more general system for improvement (in any organisation) is known as the 'FOCUS-PDCA Process'. It consists of nine steps and is most useful for the improvement of specific and definable problems in a programme<sup>7</sup>.

The process of evaluation itself is comprehensively described in a recent publication by Nilsson and Kells<sup>8</sup>. The five step process (Figure II), is intended to be used cyclically, so that Step 5 should lead the institution towards selecting approaches for further evaluation in a continuous quality improvement drive. It gives guidance on planning ongoing quality assurance and selecting approaches for any study and describes and suggests solutions for the potential problems of an evaluation process.

Figure II:  
Nilsson/Kells  
Five-step Evaluation  
Process.



### Step 1 - Selecting Approaches

In describing the first step in the process, Nilsson and Kells emphasise the importance of establishing a working group of 'interested, knowledgeable volunteers, complemented by someone with technical evaluation experience', including both academic staff and students. The approach for evaluation should be selected on the basis of the strengths and weaknesses of the institution.

***The approach for evaluation should be selected on the basis of the strengths and weaknesses of the institution.***

The authors detail the variations that might be needed to adapt the process to individual faculties. For example: if great change is sought incentives such as travel and research steps could be used to get the participation of those who must carry out the change. Similarly, if the programme is very large, phased evaluation may be wise. The greater the need for improvement and change, the greater the need for participation of key staff, variation in activities, exposure to new ideas, and most importantly, feedback from students and staff.

**Step 2 - Collecting Data.**

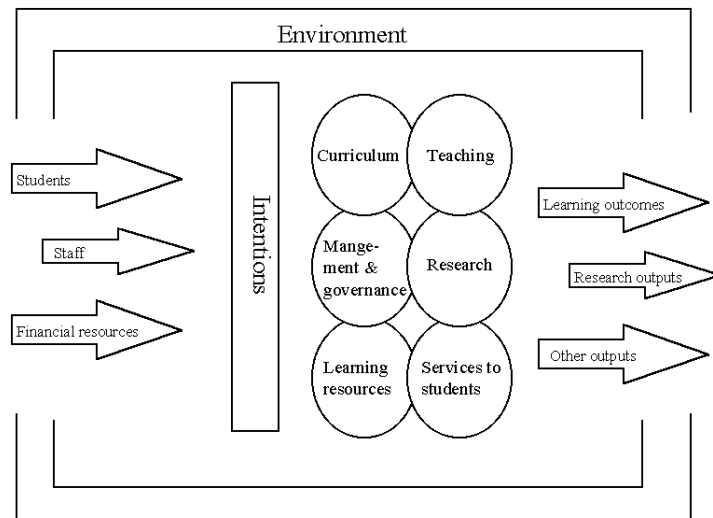
In the second step of the Nilsson/Kells model, the authors recommend the compilation of relevant data. Information that is already available may be considerably more useful than the collection of a mass of data. It is important that data is used only as a starting point, collected as early as possible and used to fuel the discussions rather than becoming the major focus of the process. Surveys and interviews to gather opinions often yield the most insightful and powerful change-related information but they require some effort and expertise. Institutions must be willing to provide this expertise to ensure the success of the process.

**Step 3 - Self-Evaluation**

Nilsson and Kells place the most emphasis on this self-evaluation step of the process. It is the point at which the programme should be explored using appropriate data and the opinions of students, staff, graduates, professionals and society in general to evaluate goals and to allow problem areas as well as strengths to be identified and responded to in a developmental and beneficial way. Every aspect of the programme, inputs, outputs and the environment as in Figure III must be considered using a SWOT (strengths, weaknesses, opportunities, threats) analysis to form a development plan. Nilsson and Kells' text provides excellent guidance for self-evaluation work, listing detailed and insightful questions to be considered under each heading. These questions would also be a valuable resource for the development of goals and objectives or in the implementation of any of the other evaluation processes described above.

***Every aspect of the programme, inputs, outputs and the environment must be considered***

Figure III: Topics for Self-evaluation - Inputs, Outputs, Content and the Environment.



#### Step 4 - External Review.

The penultimate step is to employ outside input to ensure objectivity and to make improvements in educational efforts as comprehensive as possible. A well-chosen external review committee provides unbiased validation and additional insight. External committees should review goals, functions and the quality of the proposed changes.

#### Step 5 - Implementation

*if recommendations  
are not implemented  
the whole process  
will fail*

The final step in the Nilsson/Kells model, that of implementation, is the most important and may often be the most difficult. It is vital that the evaluation activities themselves are not seen as an endpoint, but only as a means to improve the quality of education in the learning institution. No matter which evaluation system is used, if recommendations are not implemented the whole process will fail in its efforts to improve outcomes. Implementation may be the most difficult step, but it can be made considerably easier if the evaluation activities have been open and involved all of the stakeholders. At this point especially, Deans of faculties and Heads of departments need to throw their weight behind the process, and ensure the decisive implementation of the ensuing recommendations. All changes implemented must be assessed on the basis of real improvement in learning outcomes achieved. The evaluation of education cannot be an isolated incident: it must be a continuous process and valued feature of all faculties.

<sup>1</sup> Webb, Malcolm, "Europe in a Period of Education and Change - the Role of Higher Education", keynote address, CRE/CEPES European Regional Forum, Palermo, 24-27 September 1997.

<sup>2</sup> Fitzgerald, Niamh, Pharmacy Education from the Student Perspective - European Pharmaceutical Students' Association, World Congress on Pharmacy Education, April 7-9th 1998, New Orleans, USA.

<sup>3</sup> Metfessel, Newton S., Michael, William B., "A Paradigm Involving Multiple Criterion Measures for the Evaluation of the Effectiveness of School Programs," Educational and Psychological Measurement, 27 (1967), 931-43.

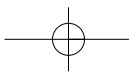
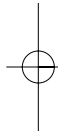
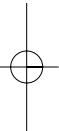
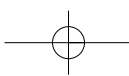
<sup>4</sup> Tyler, Ralph W., "General Statement on Evaluation," Journal of Educational Research, 35 (1942), 492-501.

<sup>5</sup> Hammond, Robert L., "Evaluation at the Local Level." - in Worthen, B.R. and Sanders, J. R. Educational Evaluation Theory and Practice. Worthington, Ohio: Charles A. Jones, 1973, pp. 157-69.

<sup>6</sup> Popham, W. James, "Educational Evaluation", 2nd Edition, Prentice Hall, Englewood Cliffs, New Jersey, 1988

<sup>7</sup> <http://www.nmimc.med.navy.mil/toolkit/cqi/index.htm>

<sup>8</sup> Nilsson, Karl-Axel, Kells, Herb R., "Evaluation for Quality Assurance and Improvement", Fritzes, S-106 47 Stockholm



# Chapter III

## Learning Processes and Outcomes

As technology develops and research advances at an unprecedented rate, the speed with which knowledge is generated negates any possibility of one person covering all available knowledge at any one time. Thus it becomes clear that no faculty can impart nor student learn everything that is needed for their professional career over the course of an undergraduate education.

In undergraduate pharmacy studies, some schools already struggle with increasing student numbers and over-stretched resources. These and other factors hinder the institutions in their attempts to adapt to the growing knowledge base and the dynamics of the pharmacist's professional role. These factors challenge the institutions to optimise resources and efforts to ensure excellence in the education of future pharmacists. Many institutional changes do not imply a major financial burden to the faculties/schools and this is the case with most changes in pedagogic approaches.

*the educational process, that is how we learn and not the content of our education or what we learn, assumes greater significance*

The experience of pharmaceutical education varies for each student, for each school and for every country. Pharmacists can be found in a multitude of different roles, and in every role they are faced with a multitude of different situations, working and dealing with public and professionals alike, as a vital member of the healthcare team. In this context, the educational process, that is how we learn and not the content of our education or what we learn, assumes greater significance, and indeed the very concept of curriculum gains a new definition. This definition, being a much broader one, addresses all parts of the educational process, of which the content (syllabus) is but one component of learning<sup>1</sup>. Among other elements in this concept of curriculum, methodologies for teaching, learning and assessment of learning outcomes are important factors.

### Teaching and Learning Approaches

Educational re-orientation in pharmacy is necessary in many schools and the strategies by which students learn, as well as the context for the learning process should be a primary focus for review. The concepts of "learning" and "teaching" are two aspects of the educational process that are often mistaken and too often,

teaching, rather than what students actually learn, tends to be emphasised when pedagogical reform is planned or made.

Orthodox lecturing and other passive teaching methods do not encourage adaptation to new situations in professional life or inter-relation of knowledge from different areas. Also, individuals who experience an orthodox education generally do not have the orientation for life-long learning as a means to continuous professional development. What society needs are pharmacists who can provide rational and adequate solutions to individual health problems. For that, pharmacists should be able to assess problems competently and have the skills to find the available knowledge and process it through a multidisciplinary approach. There are learning methods and teaching approaches that can better provide students with the skills, attitudes and knowledge they need to achieve these skills. Innovative methods develop graduates' skills in understanding and processing information and provide them with orientation for life-long learning. This has been proven by experience in some schools of pharmacy and is demonstrated by published literature related to the education of health care professionals, including pharmacy.

One such method is Problem-Based Learning (PBL). PBL is a method that uses real-world problems as the stimulus for an in-depth investigation of core content by students. While investigating, students develop important skills, such as reasoning and persistence in their self-directed search for solutions, becoming better problem-solvers<sup>2</sup>. The primary focus of PBL is on the student as the centre of the learning process which, is developed in partnership by the students and the tutor. In PBL, learning is a continuous and mutual process practised by both parties. Contrary to this perspective, orthodox methods have their main focus on the teaching itself, while the student tends to be a passive collector of the information provided by the lecturer.

***that students,  
through  
self-questioning and  
critical thinking,  
learn how to learn***

The main advantage of such methods is that students, through self-questioning and critical thinking, learn how to learn. They also allow students to adjust their own learning to their earlier knowledge (helping to reduce differences due to secondary education backgrounds). Students learn how to argue and substantiate their points and they become aware of their own skills in relation to other professionals and the importance of life-long learning.

Teachers need to be prepared to embrace a new role as educators, promoting, facilitating and guiding a critical and self-directed learning process, rather than trying to provide students with all the answers to the problems they might be faced with in a distant future. To assume this role, teachers would need specific pedagogical training to complement their scientific or practical knowledge.

Experience has shown that in many cases, professors will actively resist dramatic changes in the curriculum, their professional role or teaching methods. On the other hand, in institutions that have adopted new learning and teaching methodologies, staff members have viewed change as part of their personal and professional development, and have consequently increased their intrinsic motivation for teaching and learning. This means that the method and time frame of implementation of any new educational approach is crucial to its success, and any changes should be carefully chosen. As these changes imply quite often the adoption of a slightly different institutional culture, they should be preceded by a well-planned preparatory period, as well as careful orientation of students and staff (see also Chapter II).

## Assessment of learning outcomes

Changes in student learning and study methods are important but they retain little value if the assessment of learning outcomes continues to focus mostly on memorised information, rather than on understanding, processing and applying knowledge. Assessment methodologies must be coherent with the learning process that was practised and they play an important role in defining how students will approach their learning and establish their objectives. When confronted with an inadequate assessment system, students may simply regard their studies as a means to obtain a positive result and this becomes their aim in education rather than long-term skills development.

***Assessment cannot  
be regarded as an  
end in itself***

Assessment cannot be regarded as an end in itself, but as a vehicle for educational improvement, and must reflect an understanding of learning as a complex process that is multidimensional, integrated, and revealed in performance over time.

Assessing what students learn is only partly as important as evaluating how the learning process occurred, how the student applies the knowledge acquired, their attitude towards knowledge and the cognitive skills they have developed. By assessing these experiences in an ongoing manner, teachers can continually seek to improve the students' educational experience and their own teaching performance. Exams cannot be seen as obstacles that need to be passed, only for the information to be then forgotten. They are better viewed as a route to understanding that can be applied in real practice. It is essential that the educational process focus on developing professional responsibility and a high level of skills and knowledge, while promoting the attitudes necessary for future healthcare leaders.

While many students would benefit from considerable methodological change in the education process in their faculty, there are many useful tools for improving the quality of learning, that do not require major changes, and should be an increasing feature in educational processes.

- Active participation of students should be encouraged. For this educators should be given adequate pedagogical training and should accept new educational approaches which prove to be beneficial to students' learning.
- Educators should also be approachable and available as experts and mentors to advise and assist students in their studies when required;
- Adequate study literature should be made available to students in order to help them actively study and process the information they receive from the educator;
- Laboratory classes and practical activities should lead students to develop such skills that will enable them to deal with real problems and propose effective solutions for them.
- Project and research work should be promoted, as it enables students to work both independently and in groups and challenges them towards independent thinking;
- Co-operative projects and activities with students from other health professions should be a regular feature in educational programmes, as these contribute to breaking down the communication barriers that are currently found in healthcare practice;
- Practical experiences facilitated by professionals should be introduced in the curriculum, in an increasing level of complexity, to facilitate the contact between the student and the professional practice. This would help them develop skills and attitudes, to take greater advantage of the contents of the curriculum and to acquire a higher sense of social responsibility.
- Curriculum design should reflect the way in which learning should occur. Therefore, it should ensure that basic sciences are intimately related to applied and clinical knowledge, and that the various subjects are not seen as closed compartments of information, but rather as different contributions to the understanding of situations.

Curriculum designers should be careful not to mistake innovation for quality, when it comes to teaching methods. Computer-Aided Learning (CAL), for instance, can be a very useful tool in education but it can also be a misleading method as far as the learning process is concerned. If it is true that information can be displayed in a more vivid and attractive manner by computers, it is also true that machines cannot replace the pedagogical role of the teacher as a facilitator of learning. The Internet and computer programs are indispensable tools and sources of information, but they play no more than an improved role than that of the books that are currently used.

## Student and Staff mobility

One other aspect that can have great influence on the graduate's profile is the learning environment. In particular, the exposure of individuals to a variety of educational/practical experiences has a significant impact in their adaptability to different situations, both professionally and in life. In this context, student and staff mobility programmes should be promoted, as they represent an experience that complements the educational process itself.

***Mobility is a vital and valuable addition to any educational programme***

Although the mobility of students and staff has achieved a higher priority in educational circles in recent years, opportunities currently available are far from adequate, particularly in professional degrees such as pharmacy. Mobility is a vital and valuable addition to any educational programme and should be available to pharmacy students and staff at all levels.

The importance of mobility should not be underestimated. In the first place, a period of education spent in another faculty encourages individual independence, helps students to mature, and frequently provides the chance to improve language skills. These benefits are small however, in comparison with the professional development of the student or staff member that results from such opportunities.

The exchange of experiences and ideas at this level is an excellent catalyst for educational improvement, as the participants can share the best of those experiences with their own institution. Mobility is an important tool for ensuring broad co-operation in pharmacy, vital at a time when more and more decisions are made at a global or regional level. These contacts bridge social, institutional and political differences, and are inspirations for future professional and academic co-operation.

These benefits should be taken into account by governments, professional organisations, foundations and educational institutions themselves, which should invest in mobility to provide students and staff with the necessary support, both administrative and financial. Programmes allowing mobility between developing nations and more developed ones should be established and encouraged by all international organisations, in the spirit of inter-national co-operation and promotion of peace, democracy and inter-cultural understanding.

***broad exposure to varying pharmacy environments results in more dynamic, enthusiastic and active professionals***

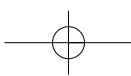
Perhaps most importantly, exposure to other cultures and practices, whether through mobility or through encouragement of inter-student and inter-faculty contact, makes people think. It makes them question their own experience, the situations that prevail in their own country, and stimulates them to compare and contrast practice and education. This forces them to think about what is good

practice and what is not, to be deep thinkers, and to seek to improve the status quo. Furthermore, we believe that broad exposure to varying pharmacy environments results in more dynamic, enthusiastic and active professionals.

Despite the importance of mobility, where systems are currently available, there appears to be a poor uptake by pharmacy students despite an apparent demand and in most schools, no official arrangements are available at all. To a certain extent, an over-emphasis on harmonisation of education has contributed to insistence on the exact or near-exact equivalence of the content of the time spent studying at another university. This approach has ensured for many years, that the availability of mobility during study is minimised. Increasing globalisation means that students (and staff) should be encouraged to spend time (part or full-time) at another faculty, and not be penalised on their return by having to redo courses or exams. Educational institutions and accrediting bodies should shift the emphasis towards harmonisation of the quality of the pharmaceutical education process with a view to mutual recognition. Once quality is assured, differences can be recognised and accepted. After all, it is only when confronted by differences that we are forced to assess and develop our own ideas and practices. As such, it is the differences that bring about the most valuable result of the process.

Flexibility is the key to improving mobility. Faculties should communicate with each other, preferably through a liaison member of staff who is appointed with specific responsibility (and enthusiasm) for mobility. In this way, a network can be created to allow institutions to co-ordinate exchanges in the easiest possible way and promote an open and dynamic learning environment. We believe that students must be given the opportunity to spend some time away during academic periods, or for part of the practice period, or any research periods that are included in the programme. Academic institutions and accrediting bodies should be proactive and put in place the simple procedures to facilitate mobility for students and staff that will go on bringing benefits to our profession well into the 21<sup>st</sup> century.

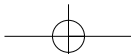
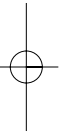
These are issues in higher education that need to be addressed urgently. Educational research has proposed approaches to learning and to assessing student outcomes that are more effective than orthodox methods, particularly in view of the increasingly complex, integrated and vital role that pharmacists occupy in society. It is important that the preparation of future pharmacists aims to go beyond knowledge in the various disciplines, assuming a clear role in shaping skilful, competent and creative individuals, capable of thinking independently and interacting with other health-care providers and with society in general<sup>3</sup>.

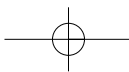
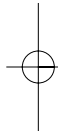
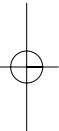
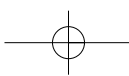


<sup>1</sup> Bates, Ian; Re-Orienting Pharmacy Education and training, Proceedings of the Third European Meeting of Faculties of Pharmacy, Edinburgh, September 14, 1996.

<sup>2</sup> Checkley, Kathy; Problem Based Learning - The Search for Solutions to Life's Messy Problems, Curriculum Update, Association for Supervision and Curriculum Development, USA, 1997.

<sup>3</sup> UNESCO, World Declaration on Higher Education for the Twenty-First Century: Vision and Action, Article 9c; France, 1998





# *Chapter IV*

## *Content of Pharmaceutical Education*

Professions exist to serve society and the pharmacy profession must address the needs of society and individual patients throughout the world. In considering the content and therefore the mission of pharmaceutical education, it is useful to reflect on the service that pharmacy provides. The pharmacy profession plays a major role in the discovery, development, production and distribution of drug products and in the creation and dissemination of related knowledge<sup>1</sup>. In addition to these traditional roles, pharmacists are becoming increasingly involved in direct patient care and are taking responsibility for the resolution of drug therapy problems of individuals. In these ways, several broad responsibilities relating to the needs of society are fulfilled.

### **A Solid Foundation**

Pharmacy education is responsible for preparing students to enter into a career in pharmacy and function as professionals and responsible citizens in changing healthcare systems. Fulfilling these functions requires a dynamic, challenging, and comprehensive curriculum, which includes a foundation in the biological, biomedical, clinical, pharmaceutical and physical sciences, clear focus on application and use of knowledge in practical settings, and a general education in healthcare systems, ethics, management, professional issues, communication, and practice skills.

Among other healthcare providers, pharmacists are unique in their detailed and comprehensive understanding of physical, chemical and biological interactions on the outcomes of drug therapy. Pharmacists in all settings require an understanding of the chemistry of drug entities, the delivery characteristics of dosage formulations, the disposition of drugs within the body, the physiological and pharmacological outcomes of drugs' interactions and aspects of modern drug development and production, that are the basis for expertise in all aspects of medication.

## Stimulating Learning

*students must be challenged to consider the broader relevance of their study*

In providing this solid scientific foundation for future professionals emphasis must be placed on application and comprehension of information. A variety of methods must be used to teach the context of each topic both in terms of how the knowledge was generated and how it can be applied in practical situations. Applied subjects such as clinical therapeutics and industrial syntheses; for example, should not only be included, but should be taught in parallel with the corresponding basic science subjects (pharmacology and pharmaceutical chemistry) in order that students be challenged to consider the broader relevance of their study. Even such a simple change in sequence may have huge implications for student interest and motivation since it is likely to lead to greater understanding by students of why they learn each subject and the role of their knowledge in the world.

The ability to think critically and examine issues logically is vital for all graduating professionals and since much of professional practice is problem-solving students need to develop analytical skills to make decisions in both familiar and unfamiliar circumstances. The kind of applied approach described above should support the concept of evidence-based practice and students should be stimulated to learn how to distinguish between well-supported and unsound claims in published works. Critical thinking skills must be fostered throughout the education in all fields and educators must encourage students to have a questioning attitude, considering all information on its merits. Recognising that it is clearly no longer feasible to learn in any curriculum all that will be required for a future career, instilling in students a spirit of intellectual enquiry and curiosity will lay the groundwork for lifelong learning.

*how to learn*

It is important that the concepts and principles of and commitment to lifelong continuing education and professional development should be introduced in undergraduate courses and supported throughout a pharmacist's career. In addition, the pharmacy curriculum should equip students with the skills that they need in order to learn throughout their professional lives. In other words students must learn how to learn. Part of this ability comes with practice, and as such is a function of the educational process itself, but it is important that students are confident and capable in managing information. They should be comfortable using computers for record-keeping and information retrieval, communication with colleagues and patients, and the maintenance and integration of data.

## Communication and Language Skills

*pharmacy students must be comfortable and capable in communicating about health with non-experts*

Since pharmacists work directly and closely with members of the public in many settings, pharmacy students must be comfortable and capable in communicating about health with non-experts. They must be given the training that is necessary to work effectively with patients, to listen and elucidate primary drug-related needs and expectations and to impart information. In the context of cultural diversity in many countries, and increasing professional mobility, students should be facilitated and encouraged in the learning of languages in addition to their own. They should gain some understanding of how to approach the variety of cultures and social groups in which they may work in the future, as well as some knowledge of the ways in which various cultures deliver and respond to healthcare. The curriculum should also provide grounding in the concepts of management and leadership and the necessary skills to effectively use resources, physical, fiscal and human.

## Ethics

Graduates must be able to fulfil their roles in society with an understanding of their ethical responsibility to patients, and as pharmacists are increasingly called upon to deal with a growing level of complex ethical choices, students need formal training in ethical decision making. Students should be guided to develop value systems and ethical standards that guide their behaviour, allowing them to face choices and responsibilities and to appreciate the consequences of their actions<sup>1</sup>. These educational requirements are not unique to pharmacy but help to form citizens capable of making a valuable contribution to their society and are essential for all professionals.

## Healthcare Organisation

In order for pharmacists to fulfil their roles and responsibilities in society, graduates will require a broader knowledge of the healthcare system and environment in which they will function. They should learn how healthcare is organised, delivered and financed in their own country and gain a broad comprehension of innovations, issues and developments in healthcare worldwide. They should understand the challenges facing healthcare both locally and globally, and the factors that influence its delivery and effectiveness, including the major causes of morbidity and mortality, primary and secondary care and the balance between them, public health initiatives, pharmaco- and health economics, how research is organised and financed, and economic issues for individual patients. They should have an initial understanding of epidemiology and its relevance to population based treatment guidelines, prevention programmes and public health education.

## Professional Identity and Interdependence

*future professionals are likely to be required to function, communicate and work effectively in multidisciplinary teams*

Within the context of emerging developments in healthcare, future professionals are likely to be required to function, communicate and work effectively in multidisciplinary teams. Therefore, comprehension of the intertwining roles of each healthcare professional and the pharmacists' place within the healthcare team is essential, as is understanding differing perspectives, and professional and legal obligations. In order to be able to function confidently and effectively in such settings however, students must gain a sense of professional identity and pride over the course of their education. Professional identity cannot be taught in a specific course or lecture and yet may be considered crucial to the motivation of individuals and therefore the success of the profession. If it is apparent however, in the attitude of the staff and how they relate to the students, in the very atmosphere of the learning institution, and encouraged by the example of professionals, it will be passed on to the students, who will lead the profession in the future.

Faculties would do well to consider how they equip students to understand current and developing roles in pharmacy, and the responsibilities and opportunities that exist for pharmacists in a broad range of areas appropriate to the environment. Recent investigations in Europe suggest that a large proportion of students feel they do not receive enough information on career and further education opportunities for pharmacists and would appreciate help from their faculties to help them in their choices<sup>2</sup>.

## Practical Experience

*A good curriculum will help to develop students' own values and skills, but good experience in practice will cement those values and skills*

Experiential education (through practice periods, internships etc) is a fundamental part of the educational experience of future pharmacists, and in many ways, one of the most important aspects of the undergraduate training. Indeed, when arranged carefully, with trained tutors and assessed in ways appropriate to the setting, the practice period offers a vital reinforcement of many of the concepts described above. It is during this time that the students are presented with the most powerful example of what it means to be a pharmacist, how the profession works, how knowledge is applied, how to act in a professional manner etc., in a real setting. A good curriculum will help to develop students' own values and skills, but good experience in practice will cement those values and skills. The practice period should form part of the undergraduate programme and be organised by the learning institutions in co-operation with professional and where necessary, governmental bodies. Given the wide variety of professional settings in which pharmacists are found, at least some of the practice placements should offer the chance of training in any of these areas in order that students might form some idea of their own career preferences. A positive practice experience is also a powerful catalyst for increased student learning and for this reason we conclude

that it is not ideal to have the apprenticeship only at the end of the training, but that periods of practice should be spread throughout the programme as well as at the end. Experience should be offered in real life practice environments, with other healthcare professionals (both pharmacists and others) where students can learn from qualified mentors in the nurturing environment of supervised training. Ideally, students in later years who are expected to contribute as full time staff members during their practice placements should be supported where feasible with a basic wage<sup>3</sup>.

## Incorporating Change

All of the above must be considered important for the formation of well-rounded pharmacists, and we recognise that in some cases this might require a longer undergraduate course. Such an extension should be welcomed where necessary to include these elements, but we believe that in many cases a full review of the curriculum will allow for positive change without requiring an extension. Many universities maintain traditional syllabi, with over-emphasis on some chemical and technological subjects, long botany courses or less relevant information. As the amount of knowledge increases overtime, selection of the most important and most relevant information becomes even more necessary. It is worth remembering too, that an in-depth understanding of scientific method and reason in a few applied areas can be more valuable than a breadth of understanding of too many different subtopics. It is the responsibility of each professor to ensure that his/her lectures keep pace with developments in knowledge and practice.

## Flexibility and Choice

While a broad undergraduate education is necessary to provide future pharmacists with the essential formation for working in a variety of different roles, students should be given the opportunity to gain a deeper understanding of areas that interest them particularly. We believe that the pharmaceutical curriculum should consist of a core curriculum to be undertaken by all students, followed by a period in which the students could in effect choose their own subjects, from a pre-determined list of options. Allowing flexibility in this way would make students aware of all of the topics covered above and ensure that many graduate roles could be catered for. They would have the chance to be educated particularly for their preferred working field, but could also gain some preparation for others. Such a model would make the curriculum more inspiring and interesting for students without being prohibitive in length and would provide an ideal foundation for competitive and adaptable pharmacists ready for the needs and challenges of the future<sup>4</sup>.

## In Conclusion:

These are times of enormous change in healthcare and the pharmacy profession and pharmaceutical education must prepare students to enter into the practice of pharmacy, in whatever areas are appropriate to the environment. The curriculum must be constantly assessed and evaluated to be in line with and even ahead of professional practice and must be flexible enough to allow students to achieve a broad education in accordance with their interest. Special attention must be given to the sequence in which courses and the practice period are found in the programme. The content of courses must be carefully considered, to ensure that they are relevant and up to date and special consideration must be given to the application of knowledge, communication, language and patient care skills, health system organisation, the development of professional identity, critical thinking, and lifelong learning. Finally, we believe it is vital that universities and teachers recognise their responsibility in preparing, not only vital members of the healthcare team, but valuable members of society, who must have top quality scientific and professional skills, and an unquestionable sense of ethics.

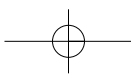


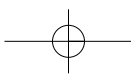
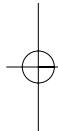
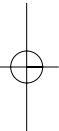
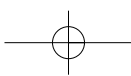
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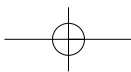
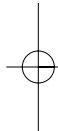
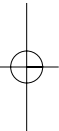
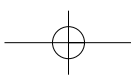




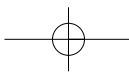
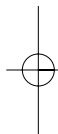
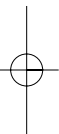
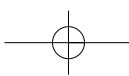
# Acknowledgements

**The European Pharmaceutical Students' Association (EPSA) and the International Pharmaceutical Students' Federation (IPSF) wish to thank the following people for their contribution to this document.**

- Achoki, Eric; Kenyan Drug Education Programme
- Akinleminu, Titilola; EPSA President 1996/97
- Bates, Ian; School of Pharmacy, University of London, Senior Lecturer
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- EPSA Executive 1998/99
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- Franken, Arthur; EPSA President 1999/2000
- Gafa', Michael; EPSA Education Sub-Committee 1998/2000
- Hamada, Akira; Department of Int'l Health Policy and Planning, Graduate School of Int'l Health, University of Tokyo, Instructor
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- Stavik, Evy; EPSA Vice-president 1997/98
- Strand, Linda M.; Peter Institute of Pharmaceutical Care, College of Pharmacy, University of Minnesota
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Niamh began the work on this document after her election in April 1997, and has continued to work with its development through to publication. During this time, she has attended and spoken at a number of meetings including a symposium of the European Association of Faculties of Pharmacy and the FIP/WHO World Congress on Pharmacy Education.

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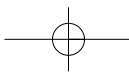
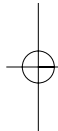
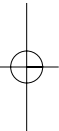
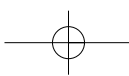
At the 44th IPSF General assembly in Helsinki, Finland (August 1998) he was elected IPSF President and in October of the same year, he was a delegate of IPSF to the UNESCO World Conference on Higher Education. In the two years he served as an Executive member of IPSF, he worked on the production of this document and endeavoured to direct the Federation placing a strong emphasis on its work in Education. He will be graduating in the first semester of the year 2000.

## Mitja Kos

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At the 44th General Assembly in Helsinki, Finland he was elected IPSF Chairperson of Information and Education and Chairperson of the Scientific Sub-Committee for the year 1998/99. He attended FIP/WHO World Congress on Pharmacy Education and represented IPSF at the UNESCO World Conference on Higher Education. He was actively involved in the preparation of this document and co-ordinated the 6th FIP/IPSF Students' Day, 1999 on the theme "Pharmacy Education: A New Mission, A New Approach", including the launch of this document.

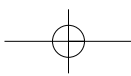
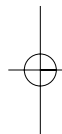
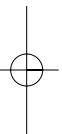
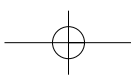


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