

**BASIC PHARMACEUTICAL EDUCATION PLAN FOR THE 21st CENTURY:
A proposal for discussion**

VII Pan American Conference on Pharmaceutical Education
Porto Alegre, Brazil, 24–26 May 2010

I. Introduction

The social and economic scenario that characterized the final decades of the past century and the early 21st century we are witnesses to determined that in the universities and their professional schools, reflections about the relevance of the curricula, employability of graduates, and the need for education are based not only on knowledge but also on skills, abilities, and values, and respond to a concept of lifelong learning. The task has focused on construction of dynamic, flexible, light, and student-centered curricula, in which the teacher is a facilitator of the teaching-learning process. In this way, the educational programs are expected to facilitate achievement of learning outcomes that contribute to the education of professionals and persons. The question asked of graduates today is not *“What did we do to receive the degree?”* but rather *“What we can do now that we have received it?”*

Particularly with regard to pharmaceutical education, the new patient-centered professional approach, technological advances, development of biotechnology and genetic engineering, and the increase in the pharmacological arsenal, in addition to the opening of borders and the phenomenon of globalization, have become the basis for redesign of the curricula in harmony with its professional practice and environment. The traditional role of the pharmacist in supplying drugs and as an administrator and supplier of inputs has been replaced by an active role with regard to drugs and their action on the patient, forming part of multidisciplinary groups and being jointly responsible for drug therapies. At present the pharmacist is identified as an expert in drugs for treatment of diseases and promotion of health, from drug development to their final benefit for the individual and society as a whole. In other words, the pharmacist should be capable of consolidating his solid scientific education with the practical integration of knowledge.

According to this approach, initial or undergraduate educational activities, as well as continuing education, graduate education, specialization, and research, should respond to the needs of society, favoring harmonization between the public education and health policies in each country. This new concept in organization of the pharmacy curriculum should consider not only the introspective academic perspective. Rather, it should also include the active and increasingly numerous participation of pharmaceutical professionals and health teams who do not work at the university, but participate actively in actions that promote and support the education of future professionals. It also requires the contribution of employers, graduates, and the students

themselves. Furthermore, it is necessary to dedicate special attention to the recommendations of the professional councils and international pharmaceutical associations.

To date, many activities have been conducted in the past, particularly in recent years, on these subjects. On the international level, the International Pharmaceutical Federation (IPF) recognizes that dispensing prescription drugs is an essential and important part of pharmaceutical services. *The recently licensed pharmacist is expected to have sufficient knowledge and abilities to begin practicing the profession competently in the different areas of performance, including community, hospital, and industrial pharmacy. With regard to continuing education, it is considered that it should be a lifelong commitment for each pharmacist who practices the profession.* These basic principles, which form part of the education of the pharmacist, are also shared by WHO/PAHO, the Pan American Conference on Pharmaceutical Education, and the Latin American Conference on Schools of Pharmacy (COIFFA). On the continental level, the European Association of Faculties of Pharmacy (EAFP) and the Coordinating Entity for Academic Units in Pharmacy and Biochemistry of Argentina, Brazil, Paraguay, and Uruguay (ECUAFyB) are noteworthy.

Specifically, WHO has described the role of the pharmacist in the health system in detail. Subsequently, in the report by the advisory group on the *Education of Future Pharmacists*, seven minimum essential competencies that the pharmacist should have in his work in health systems on the worldwide level were identified, and referred to as the *seven stars* to be considered in the graduation profiles of the pharmacy programs. The roles and responsibilities mentioned are: provide the professional care required; make appropriate decisions; and be a communicator, leader, manager, a lifelong student, and an educator.

Likewise, based on these aspects, in 1999 a working group formed by PAHO, with the participation of academic representatives from Argentina, Brazil, Chile, Costa Rica, United States, Mexico, Panama, Peru, Venezuela, and PAHO itself, proposed the *Basic Plan of Pharmaceutical Education* that on this occasion, within the framework of this Seventh Pan American Conference on Pharmaceutical Education, is being reviewed for an update.

Some characteristic problems shared by the pharmacy curricula in our countries are their rigidity, segmentation, excessive hourly load, which generates a high retention index of the initial years in the long term, and the evident prolongation of studies compared to that which is stated formally.

Undoubtedly, the matter is complex. Therefore, in order to continue the work initiated in the previous conferences, we must first respond to questions such as:

- Is it necessary to update the PAHO Basic Plan document (1999)?
- If the answer is affirmative:
 - Why should it be updated?

- To this end, is it necessary to have an *American area of higher education* that is dedicated to proposing the changes that should be made based on questions such as:
 - What objectives and results are expected at the undergraduate level (Bachelor's degree in pharmacy or similar degree)?
 - What abilities, skills, and values, as well as knowledge, should a pharmacy student have after completion of his education?
 - Should there be a system of credits or a curriculum unit that is understandable for all regardless of the university or country of origin (transferable system of credits)?
 - How should the system for evaluation of students be organized (e.g., examinations, practical training periods, personal work)?
 - How can the quality assurance of the programs be ensured?

Nevertheless, it is essential to:

- Adopt a participatory approach, associating the different protagonists (as we have been doing up until now)
- Establish a work methodology with a program, goals, and time periods

Taking into account all of the work presented at the different Pan American Conferences on Pharmaceutical Education (First-Sixth), the following statements made at conferences prior to this one are suggested as support for discussion of the subject of the **Basic Plan**:

1. Magaly Rodriguez de Bittner: *Recommendations of the Pan American Conferences on Pharmaceutical Education* (Sixth Conference: Montevideo)
2. Carl Trinca: *Pharmaceutical Education without Borders: Towards a Global Pharmacist* (Fifth Conference: Miami)
3. Virginia Sánchez: *Innovation and Harmonization of Undergraduate Curricula for Chemistry and Pharmacy Studies in an Academic Cooperation Network* (Sixth Conference: Montevideo)

Also, from FEFAS 2007 – Asunción, Paraguay:

4. Marc Desgagne: *Pharmacy Curriculum in Canada 2006-2007*

NOTE: The agreements reached at the Sixth Pan American Conference on Pharmaceutical Education, in the Basic Plan workshop, and the contributions received with regard to the Basic Plan of Pharmaceutical Education (WHO/PAHO, 1999) are attached to this document.

**SIXTH PAN AMERICAN CONFERENCE ON PHARMACEUTICAL EDUCATION
WORKSHOP 2: SELF-EVALUATION AND BASIC PLAN**

According to the agreements reached at the Sixth Pan American Conference on Pharmaceutical Education in Workshop 2: Self-Evaluation and Basic Plan, the following document represents a compilation of the contributions made by some countries (Costa Rica, Paraguay and Chile) and is a proposal for discussion at the upcoming Seventh Pan American Conference on Pharmaceutical Education to be held in Porto Alegre, Brazil from 24-26 May 2010.*

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A. WORKSHOP 2 WORKING COMMITTEE

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B. AGREEMENTS AND CONCLUSIONS*

1. Have a glossary of terms that will be proposed by the working group based on an initial proposal that includes terms such as: graduate profile, syllabus, pensum, competencies.
2. Review the PAHO/WHO *Basic Plan of Pharmaceutical Education: Working Group Proposal, Lima 1998* document so that it is reconsidered in terms of what the student should learn rather than what should be taught (i.e., student-centered curriculum).
3. For all purposes, within the framework of the work conducted in this workshop, it is agreed to maintain the basic definition of the pharmacist indicated by WHO (i.e., an expert in drugs) as reference. The workshop participants will include the characteristic elements of each country and the emphasis that makes each university noteworthy.
4. Propose an ongoing working methodology.
5. Prepare a list of the treaties and/or agreements signed by the countries of the workshop participants that involve professional services.
6. Each participant will collect information about the graduation requirements and modality and the curriculum indicators. The calculation will be based on the number of hours.
7. Perform the analyses through establishment of working teams or networks, considering the universities, professionals, and the government if possible.

* The order of the agreements has been reorganized to facilitate drafting of the document.

B.1. GLOSSARY OF TERMS

Ability Capacity to perform certain tasks or solve certain problems. It is not the mere attitude or aptitude but rather it includes the faculty of resolving or executing as well as possible, with skill and speed.^a

Academic credit A measure of the work time of students to reach the learning targets. It facilitates comparison and recognition of studies completed at different institutions.

Accreditation

1. Process voluntarily undergone by the courses of studies committed to continuous improvement and the search for quality, which entails an evaluation performed by a competent body supported by the State. It is an integral evaluation that takes into account structure as well as operation, considers guidelines on the work performed and its results, and establishes itself as a dynamic process.
2. Procedure with the aim of recording the degree of conformity of the object analyzed with a set of conventionally defined standards accepted by the counterparts involved: the accrediting party and the accredited party. Accreditation is a proof of credibility. It does not intend to construct equivalents based on similarities, but rather to record the conformity of an institution or program with regard to general standards of excellence.^a

Admission profile

1. Set of knowledge and competencies defined that students recently admitted to the education program must fulfill.^b
2. It explicitly states the set of general competencies, specialized competencies, ethical aspects and values that are inherent to the professional to be educated.
3. Set of requirements that a subject must fulfill in order to be admitted to an educational institution, so that he is considered to be capable of completing a given school cycle or degree. Some of these aspects are: psychological, knowledge and skills.^a

Competency

A set of identifiable and assessable abilities of knowledge, attitudes, and interrelated abilities that allow satisfactory performances in real work situations, according to the standards used in the occupational area.

Competency

^a Glossary of terms, Mexican Association of Schools and Faculties of Pharmacy (AMEFFAR)

^b García Rocha, J.A. 2005. Glossary of basic terms in regulation and accreditation of higher education.

1. Individual capacities that facilitate performance of tasks or attainment of certain achievements efficiently and effectively. Its components include knowledge, abilities, skills, attitudes, and personal characteristics.^c
2. The combination of abilities, attributes, and behaviors that are directly related to successful performance at work.^d
3. Actual ability to achieve an objective or result in a given context.^e

Compulsory subject A subject that the student must take since it is established by the curriculum.^a

Core subjects Set of fundamental subjects that a student studies in order to acquire an essential and uniform education that later allows him to select the studies of his preference.^a

Criteria The referents or attributes of the component on the basis of which the judgment is made.

Curricular structure or study plan It is a structural component of the curriculum. It should consider up-to-date scientific, technological and sociocultural knowledge of the different systematized knowledge included in the curriculum and the prospective nature of professional education. It should establish mechanisms for adapting the curriculum that are appropriate for the design, characteristics of the discipline, and the needs of the students, in order to facilitate learning.ⁱ

Curriculum

1. It is the design of the subjects studied. It involves a set of activities, lessons, and practical training that should be performed in order to complete a study cycle and receive a degree. These activities should be relevant, so that the student acquires responsibility for his future as a professional and is aware of its social implications.
2. Basic standard that, in conjunction with the subjects studied, supports the teaching work of the institution and is a fundamental guide in the work by teachers and students.^a

Curriculum or curricula

1. Interrelated set of educational concepts, policies, guidelines, propositions, and strategies that direct and explicitly guide the teaching-learning processes for development and integral education of students in higher education.^f

^c RAICES. 2007.

^d Self-Evaluation Guide. National Council of Evaluation and Accreditation of Higher Education of Ecuador (CONEA), 2004.

^e Mario Letelier. 2003.

^f Kofi Annan, UN. 1999.

2. Synthesis of cultural elements that form a political-educational proposal. In this sense it is a process of construction and reconstruction of knowledge by different academic subjects, which contribute their visions of the world in a relationship of dialogue.^b

Curriculum (pensum) In English, curriculum, and in Spanish a synonym of *plan de estudio*. It comprises all those contents (courses or subjects) and activities organized systematically in quarters, semesters, years, or modules, which must be passed as a degree requirement. It is dynamic, which means that it can be changed depending on the social circumstances.

Degree Diploma or certificate that guarantees that a complete curriculum has been successfully completed. It refers to a course of studies or a specialty. It is a synonym of degree (i.e., the diploma obtained by a student) but also of studies or program. The degree suggests the existence of a prepared curriculum.^c

Degree holder Person that has completed the curriculum and fulfilled all of the requirements established by an educational institution in order to obtain the corresponding degree.^a

Distance education Modality that facilitates transmission of knowledge through the information and communications media and different combinations of computer science. It is characterized by its flexibility in use of time and space.^a

Dropout rate Quantification that indicates the percentage of students that fail, change studies, or drop out before obtaining the degree. It is usually measured in the first years of a course of studies and it is defined empirically in several different forms. Also called desertion.^c

Education Environment essential to acquire, transmit, and increase culture. It is an ongoing process that contributes to development of the individual and transformation of the society. It is a determinant for acquisition of knowledge and in order to educate the human being.^a

Educational program Set or list of contents that should be taught and are part of the curriculum. It is considered to be a synonym of *syllabus*.

Effectiveness Capacity to achieve the expected quality results, regardless of the means used, according to the proposed goals and objectives and with the quality standards defined. In another meaning it can be understood as the social value of the product, the result, in the first place of the educational, with regard to the current cultural, political, or economic models.^a

Efficiency Capacity to optimize the resources available for achievement of a given objective.^c

^b Leonard Mertens. Competencia laboral: sistemas, surgimiento y modelos. Montevideo: Cinterfor, 1996.

Ethics Set of moral standards that regulates human behavior.^a

Evaluation

1. Process with the objective of performance of a study of an institution or program, which concludes making a judgment or diagnosis after analysis of its components, functions, processes, and outcomes, for possible improvements. An evaluation includes the systematic collection of data and statistics related to the quality of the institution or program. The quality agencies usually divide their action into two related tasks: evaluation and accreditation.^c
2. Process that, based on a situational diagnosis, seeks to optimize the action; analyze the data in order to resolve the problems of a given situation, with the aim of managing the functionality of that which is evaluated.^a

Feedback

1. Function of permanent maintenance of the action of a system through continuous information on the behavior of each and every one of the elements of the system, as well as the results obtained.
2. In the educational system, it facilitates circular communication between all of the elements involved and, consequently, improvement of the system.ⁿ

Graduate Student that has fulfilled all of the requirements established in the curriculum.^a

Graduate follow-up Evaluation of the professional and work activities of graduates with regard to the studies completed.^a

Graduation profile

1. Characteristics acquired and assumed to be developed in a student at the end of the learning process. Such profiles also facilitate establishment of courses of action for preparation of plans and programs.
2. Component of a curriculum consisting of the definition of the academic and professional characteristics that must be fulfilled by students that complete their studies. It is the model prepared by an educational institution that establishes its aims with regard to what its graduates should be, the specific forms technical training should have (theoretical and practical), the value focus to be achieved in them, and the type of social needs they should fulfill.^a

Higher education Level after high school education or equivalent, which includes the bachelor's degree and graduate studies.^a

Higher education quality system Documentary evidence that shows the set of policies, plans, organizational structure, resources, responsibilities and procedures that they fulfill satisfactorily for the purpose they were intended and directed.^a

Higher education system Set of tertiary education institutions with different dimensions and characteristics, such as autonomous public universities, schools and universities with technological orientation, professional schools, technical training centers, and state as well as private normal schools that are recognized by the State.

Index Value that an indicator has at a specific time. It is the proportion that a figure has in comparison to another figure. It can have two modalities: quantitative and qualitative. Some examples of higher education indices: admission-graduation (terminal efficiency), admission-degree, graduation-degree, rejection.^a

Indicator

1. Quantitative or qualitative evidence that indicates the value or condition of the criterion
2. Expression of the value of two or more properties of a phenomenon.^a

Infrastructure and equipment Set of material resources used in the educational processes: buildings, classrooms, laboratories, computer media, facilities, from the standpoint of the actual possibility of their use by students and teachers, in correspondence with the curricula and programs.^c

Learning

1. Process by which the subject integrates or adapts an experience to his present knowledge or skills. It is an essential motif of the educational act.^h
2. Process of acquisition of knowledge, abilities, and skills. It can be differentiated by its level of formality as formal, non-formal, and informal.ⁱ

Learning results Formulations that express what the student is capable of doing or demonstrating at the end of his experiences.

Mission Statement in which the generic purpose or reason for existence of an organization is described, identifying the value that the organization creates with its activity.^c

^h Proposal for Self-Evaluation of the National Technological University document No. 4 (s.f.), glossary of terms and expressions used with a particular meaning. Argentina. Universidad de Caldas. Academic Council 2002.

ⁱ University of Costa Rica. Vice Rector's Office of Teaching. Center of Academic Evaluation. 1999. The process of self-evaluation for accreditation

Mobility Option by which the students, teachers, or administrative and services personnel spend a given period studying or working in another national or foreign institution of higher education.^c

Modules Set of activities planned to facilitate the results of learning. The teaching-learning interaction process is organized based on well-defined and assessable educational objectives.

Monitoring Periodic supervision or follow-up of the expected performance of an activity with regard to delivery of inputs, work hours, and other required actions and expected outcomes. Its objective is to establish the level of compliance in order to perform timely actions to correct the deficiencies detected.^{j 10}

Optional subject A subject that can be selected by the student from the options offered by the curriculum and that, once it has been selected, must be passed.^a

Pharmaceutical care The active participation of the pharmacist in patient care by dispensing and monitoring pharmacotherapeutic treatment, and cooperating with the physician and other health professionals in order to achieve results that improve the quality of life of the patient.^a

Pharmacovigilance Set of procedures and activities for detection, evaluation, recording, circulation and prevention of adverse drug reactions, as well as any activity that tends to establish the probable causal relationship between drugs and the onset of adverse reactions.^a

Planning Administrative process organized by the executive management through which a vision of the future is established and in which the objectives, goals and strategies to attain it are defined. It involves different social actors and analyzes different scenarios in order to achieve the vision. One of the principles for eligibility for accreditation is that there should be a planning process in the higher education institution or program, and evaluation of its performance.^c

Process Dynamic manifestation of a situation that leads to successive transformation of the situation. In the educational area, teaching and learning are considered to be continuous processes that favor achievement of self-realization, as is education (ongoing development of a person towards more autonomous and mature behaviors).^m

Profession Exercise of specialized knowledge acquired through formal studies, which usually requires recognition by the State.^a

Professional Graduate of a course of studies that accredits having fulfilled all of the academic requirements and is authorized to practice the profession.^a

^j National Model for Accreditation of Higher Education. ANEAES, Paraguay.

Professional degree Official document that supports the studies that grant the academic level of bachelor's degree or the degree as such.

Professional ethics Systematic ordering of principles, standards, and rules established by a professional group in order to regulate and direct the moral behavior of its members.^a

Professional profile

1. Set of capabilities and competencies that identify the education of a person in order to accept responsibility for performance of the functions and tasks of a given profession in optimal conditions.
2. It is a summary of the knowledge and competencies that a graduate should acquire during his studies. The knowledge and competencies should provide the student with a solid basic education, both theoretical and practical, that can be applied in different professional environments.
3. Set of requirements that a person should fulfill in order to be considered capable of practicing a given profession.^a

Quality

1. Degree to which a set of differentiating features inherent to higher education fulfill an established need or expectation.^k
2. Property of an institution or program that fulfills previously established criteria in a system of evaluation and/or accreditation.^a

Quality assurance Form of ensuring that an educational institution or program is appropriate for its purposes. It comprises the quality of the teaching and research. It is assumed that it is made explicit in writing and publicly.^c

Relevance Correspondence between the aims sought by the institution and the requirements of the society it is part of.^j

Relevance Refers to the major educational aims of the institution (i.e., why it educates). It is usually expressed through the orientations of the curriculum, definition of teaching policies, and the professional profile of the graduates.^j

Research One of the substantive functions of the university that allows generation and transfer of knowledge. It is usually associated with graduate studies and it is one of the areas of essential analysis in the evaluation and accreditation processes.^c

Results Changes that occur in the target population and its environment as a result of implementation of the educational project.^j

^k Proposal based on UNICEF definition. 1992

Social impact Influence that the studies have externally, the contributions and transformations it has in its social context in response to the needs of the environment, through its graduates and the activities of extension, research, and linkage with scientific or cultural companies and institutions.⁹

Sources of information Set of documents, databases, surveys, and other elements that provide valid and reliable background with regard to the indicators.¹

Standardization Adjust to a standard or level. It also implies a system of equivalencies.^c

Standards

1. Quality levels or references predetermined by a given agency or institution. The standards of quality or excellence for higher education programs or institutions are established previously, usually by an accreditation agency. It implies a set of requirements and conditions that the institution must meet in order to be accredited by that agency. It also usually requires that the institution has established its own systems of quality control. The traditional standards are organized according to the functions of the organization: mission, government, faculty, programs, and curricula, student services, library, other physical resources, and economic resources. This leads to a global evaluation of the institution or program.^c
2. Parameters that are considered to be necessary and satisfactory for the indicators and are taken as reference. They can be used to evaluate the level of compliance of these indicators. They will be established by the accreditation agency or body designated by the Ministry of Education through a consensus with referents for the studies.

Standards

1. Set of standards applicable to a given subject or activity^m
2. It establishes or proposes a moral standard. It refers to how one must actⁿ

Studies Set of courses and practical training that prepare a person to practice a profession or occupation.^a

Subject

1. Each of the teaching units that administratively make up a curriculum. Academically, it is a component of a field of study. Each subject usually has credits assigned based on the

¹ Real Academia Española. Diccionario de la Lengua Española, 22ª ed.

^m Diccionario de Ciencias de la Educación. 5ª ed. Aula Santillana, S.A. Madrid, España. 1996.

ⁿ ANECA Self-Evaluation Guide.

teaching hours or the total work hours of the students. There are different types of subjects: core, compulsory, optional, elective, common and specific, as well as others.^c

2. Contents of a discipline considered in the curriculum plan that has an official code designated by the institution.

Subject program Methodological guide that includes the learning objectives, teaching methods, breakdown of subjects, references, and the methods used for evaluation of a subject.^a

Syllabus Educational program of each of the courses, subjects, practical training sessions and/or activities that are included in the curriculum. It is a document that is used for the institutional report. For the students it is a “contract” and for the teacher it is used as a guide for daily planning.

System of transferable credits (STC) Model of academic credit that can be used to recognize different forms of learning through measurement of the actual load of the student. It is a contextualized instrument in a policy of curriculum renewal. It is common to all universities that adopt it and its objective is integration and interconnection between universities and curricula. The system can facilitate the legibility of the different curricula and the mobility of students outside of their universities of origin.^o

Terminal efficiency Relationship between the number of students that graduate from the institution of higher education after passing all of the curriculum requirements for the course of study, within the stipulated time, and those of the same generation that are admitted.^a

Tertiary education Tertiary level education (levels 5, 6 and 7 according to the International Standard Classification of Education, ISCED) includes universities, professional schools, technical training centers, and higher normal and professional schools.^a

University extension Set of activities of an institution of higher education through which its action is projected towards the social environment and, consequently, knowledge and culture are circulated.^c

Validity

1. Degree of exactitude between a measurement and the feature or attribute to be measured
2. That which has been verified using an empirical or experimental method.^m

Virtual university Characteristic of the new information and communication technologies (ICTs) in which the physical space and the need for synchronism are not present.^a

^o System of Transferable Academic Credits of the Council of Rectors of Chilean Universities (CRUCH).

B.2. Review of *Basic Plan of Pharmaceutical Education: Working Group Proposal. Lima 1998* document

The document reflects the reality of a period and recounts what occurred at that historical time. Therefore, it is valuable input for the work intended to be performed at the upcoming Seventh Pan American Conference on Pharmaceutical Education since it still contains current elements of pharmacy studies. Another noteworthy element is the working method used, which enabled the group to achieve results that resulted in a publication that would become a reference document as of that time for ongoing consultation and orientation on pharmaceutical education.

However, as a result of the turn of the century and the concurrent change in the socioeconomic, cultural, and scientific paradigms, changes must be proposed that should be reflected in a *new proposal of Basic Plan of Pharmacy Studies*.

Some elements to consider in this review in order to update the document are as follows:

- Definition of a graduation profile for the pharmacist
- Expansion of the fields of professional practice, closely related to the previous item, which in turn leads to changes in the curriculum activities and, consequently, the contents of the curriculum
- Education by competencies and adaptation of the curriculum for significant and autonomous learning
- New teaching-learning methodologies and use of information and communication technologies (ICTs)
- Introduction of the concept of quality education and establishment of indicators and measurement instruments

In accordance with the aforementioned, one of the first aspects to be agreed on at the upcoming meeting is to recognize the value of the 1998 document and consider it to be one of the inputs of reference for drafting a new proposal.

It is a fact that the limited time will not allow for an in-depth discussion and even less so to perform an updated review of the existing documents. Therefore, this Seventh Conference will be the opportunity to receive the additional contributions set forth by the participants themselves, which will be added to those sent to the undersigned during this period by some schools. All of the above can serve as a basis for preparation of the new proposal, which should be the responsibility of a working group that organizes and systematizes the information compiled.

B.3. Definition of Pharmacist

Some definitions of the professional pharmacist are as follows:

*The pharmacist is the professional who is an expert in drugs, educated as a member of the health team, decision-maker, communicator, leader, administrator, lifelong student and teacher, with high ethical and humanistic values, committed to research, quality, and professional excellence, in order to provide adequate pharmaceutical care that contributes to national development.*¹⁴

*A health professional who is a specialist in drugs and other biologically active substances, has solid knowledge of the chemical and biological sciences, with special emphasis on the pharmaceutical sciences, and is trained to participate in actions related to drugs and their use in individuals in order to promote the rational use of drugs and participate in promotion of public health and improvement of quality of life.*¹⁵

It is necessary to have more definitions that reflect the work of the pharmacist in the different countries that form part of the Pan American Conference, so as to enrich the proposal that is developed later with regard to the definition of the profile of the pharmacy graduate and the frame of reference for a new Basic Plan of Pharmacy Studies.

B.4. Working method*

The following working method is proposed:

1. Definition of conceptual and referential framework for work
2. Harmonization of the concept of “*pharmacist*” based on the contributions of each participating member
3. Reach a consensus on the new activities of the pharmacist in the different areas of professional practice
4. Definition of new areas of professional practice with inputs from the previous item
5. Drafting of a new Basic Plan of Pharmaceutical Education document with the contributions from the activities in items 2, 3, and 4
6. Discussion and approval of the Basic Plan of Pharmaceutical Education document
7. Definition of the minimum indicators of the pharmacy studies curriculum for the region
8. Establishment of guidelines or conceptual explanations for the indicators that reflect the intended level
9. Discussion and approval of the final document with the self-evaluation indicators

* Proposal made by the Schools of Pharmacy of Costa Rica.

B.5. List of treaties and agreements that involve professional services signed by the countries of the participants

Chile

The current regulation in Chile does not require membership in the Pharmacists' and Biochemists' Association in order to practice the profession. Therefore, membership in the professional association is voluntary.

Chile, through its Ministry of Foreign Affairs, has signed a series of treaties and agreements with several countries and communities. This document only includes those that are stated to be related to the subject and involve countries in America and particularly Spain.

Table 1 Treaties and agreements signed by the Government of Chile with American governments and agencies involved in professional services and/or higher education:

Type of standard	Date enacted	Title	Country/ agency involved	Type of agreement
Decree 818	08-Nov-1989	Cultural Agreement with El Salvador signed in 1981	El Salvador	Bilateral
Decree 161	07-Feb-1992	Cultural and Educational Cooperation Agreement with Mexico signed in 1990	Mexico	Bilateral
Decree 1016	30-Aug-1993	Basic Cultural Integration Agreement with the Republic of Venezuela	Venezuela	Bilateral
Decree 1065	27-Nov-1993	Basic Technical and Scientific Cooperation Agreement with El Salvador signed in 1991	El Salvador	Bilateral
Decree 111	01-Feb-1994	Basic Scientific and Technological Cooperation with the United States signed in 1992	United States	Bilateral
Decree 1753	14-Oct-1997	Scientific and Technical Cooperation Agreement with the Caribbean Community signed in 1996	Caribbean community	Bilateral
Decree 596	22-Apr-1998	Memorandum of Understanding on Education with the United States signed in April 1998	United States	Bilateral
Decree 70	21-Jan-1999	Basic Technical and Scientific Cooperation Agreement signed with the Republic of Nicaragua in 1992	Nicaragua	Bilateral
Decree 30	13-Jan-2000	Agreement of Partial Scope for Cooperation and Exchange of Cultural, Educational, and Scientific Goods and Protocol of Adhesion to the Agreement adopted in 27-Oct-1998 by ALADI		Multilateral
Decree 389	09-May-2001	First Additional Protocol and its two Annexes, to the Partial Scope for Cooperation and Exchange of Goods in the Cultural, Educational, and Scientific Areas adopted on 5 March 1997 with the Republics of Argentina, Bolivia, Federal Republic of Brazil, Colombia,	Argentina, Bolivia, Brazil, Colombia, Cuba, Ecuador, Mexico, Paraguay, Peru, Uruguay, Venezuela	Multilateral

		Cuba, Ecuador, United Mexican States, Paraguay, Peru, Eastern Uruguay and Venezuela		
Decree 236	25-Aug-2003	Basic Technical and Scientific Cooperation Agreement with the Republic of Peru signed in 1998	Peru	Bilateral
Decree 65	23-Mar-2005	Additional Protocol to the Cultural Cooperation Agreement of 1975 with Argentina on Mutual Recognition of Certificates, Titles, and Academic Degrees of Higher Education	Argentina	Bilateral
Decree 26	15-Jan-2008	Protocol of Educational Integration and Recognition of Certificates, Titles, and Primary and Middle Level Studies with the Republic of Bolivia	Bolivia/ MERCOSUR	Multilateral
Decree 42	02-Mar-2009	Strategic Association Agreement with the Eastern Republic of Uruguay within the framework of the Basic Technical and Scientific Cooperation Agreement signed in 1993	Uruguay	Bilateral
Decree 133	31-Aug-2009	Supplementary Agreement to the Basic Technical and Scientific Cooperation Agreement with El Salvador	El Salvador	Bilateral

Table 2 Selected free trade agreements ratified by Chile as an example of its integration with the global economy

Type of standard	Date enacted	Title	Country/ agencies involved	Type of agreement
Decree 1151	06-Sep-1991	General Treaty of Cooperation and Friendship and Economic Agreement annex to the Treaty with Spain signed in October 1990	Spain	Bilateral
Decree 1020	05-Jul-1997	Free Trade Agreement and its annexes, appendices and notes signed in 1996 with the Government of Canada	Canada	Bilateral
Decree 1101	31-Jul-1999	Free Trade Agreement, its annexes, and appendices signed with the United Mexican States in April 1998	Mexico	Bilateral
Decree 14	14-Feb-2002	Free Trade Agreement between Chile and Central America, adopted with the Republics of Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua	Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua	Multilateral
Decree 312	31-Dec-2003	Free Trade Agreement with the United States	United States	Bilateral

Table 3 Agreements with importance for higher education in Chile that involve countries of the Americas

Type of standard	Date enacted	Title	Country /agencies involved	Type of agreement
Decree 30	08-Feb-2002	Agreement with United Nations Development Programme on the Education and Human Development Project of the Government of Chile	UN	Multilateral
Decree 236	18-Oct-2004	Agreement with United Nations Development Programme on amendment of the Education and Human Development Project Agreement of the Government of Chile	UN	Multilateral
Decree 294	28-Dec-2007	Agreement with the United Nations Development Programme on the Project to Support Strengthening the Quality of Education	UN	Bilateral

Costa Rica

The current regulations in Costa Rica require that in order to undertake the professional practice of pharmacy one must be duly granted membership in the Pharmacists' Association of Costa Rica. There are treaties, particularly with Central American countries, that only involve recognition of the degree of pharmacist. If a pharmacist from Central America wishes to practice in Costa Rica, he should make use of the right granted by the aforementioned treaty, presenting his supporting documents to the National Council of Rectors (CONARE), which in turn will submit it to the School of Pharmacy of the University of Costa Rica. Once the degree has been recognized, he can join the Pharmacists' Association.

There is also a treaty with the Republic of Argentina, which allows partial recognition of the knowledge of pharmacists. In this case the applicant must pass an examination of the contents that were not covered by the curriculum in his country. After passing this examination, he can become a member of the Pharmacists' Association of Costa Rica and practice as a pharmacist.

B.6. Graduation requirements and modality, curriculum indicators

Chile

In Chile the degree of Chemist-Pharmacist is awarded. There are currently ten courses of study for chemistry and pharmacy. In spite of the number, the curriculum usually presents similar core subjects, including the requirements for the degree, in which there is a basic cycle, a pre-professional cycle, and a professional cycle. In these cycles there is also a distinction between the practical training in the curriculum: the practical training in community pharmacy, which is mandatory, and a second area of practical training in any of the different areas of professional practice.

The mission and curricula for each of these are available on the following Web sites:

Universidad de Chile	http://www.facigyf.uchile.cl
Universidad de Concepción	http://www2.udec.cl/farmacia
Universidad de Valparaíso	http://www.uv.cl/facultades/farmacia
Pontificia Universidad Católica de Chile	http://www.quimica.uc.cl/es/pregrado/carreras-de-pregrado
Universidad Austral de Chile	http://www.ciencias.uach.cl/escuela/quimica_farmacia
Universidad Andrés Bello	http://facultades.unab.cl/medicina/carreras/quimica-y-farmacia/presentacion
Universidad Arturo Prat	http://www.unap.cl/admision/carreras/pregrado
Universidad Católica del Norte	http://www.ucn.cl/programa_estudios/detalle_carrera
Universidad San Sebastián	http://www2.uss.cl

Costa Rica

The University of Costa Rica has established a regulation for final graduation projects that indicates that in order to obtain the Bachelor's degree the student must fulfill all of the requirements established by the Organic Statute and the curricula, and complete a final graduation project. The options for the final graduation project in the School of Pharmacy include: graduation thesis, graduation project, or an internship in the clinical or industrial area. Some private universities such as the University of Medical Sciences (UCIMED) offer two possible modalities of graduation: completion of a thesis or clinical internship. Other universities only offer performance of research as a graduation requirement.

ANNEX 1

Curriculum Indicators

NOTE: The development of the subject of curriculum indicators by **Chile** and **Costa Rica** is included. According to the statements made in this document, it should also be a subject for discussion in this group.

Chile

The following documents available on the Web site of the National Accreditation Commission are attached to this document:^p

1. General criteria for evaluation of professional studies
2. Criteria for evaluation of chemistry and pharmacy studies

Costa Rica

According to the proposal made by the National System of Accreditation (SINAES)** in Costa Rica,“ the quality criteria that can be used for evaluation of the factors must have an operational definition that gives them meaning, specifying the required activities or operations so that they can be verified. This operational definition is referred to as an “indicator”.

a. Curriculum indicators

- Existence and knowledge of the mission, aims and principles of the university, the purposes and objectives of the academic unit, and the purposes and objectives of the studies or program
- Compatibility between the mission, aims and principles of the university, the purposes and objectives of the academic unit, and the purposes and objectives of the studies or program
- Correspondence between the university standards and policies for the curriculum and the study plan
- Correspondence between the needs and demands of the society and the curriculum of the studies or program
- Existence of a prospective definition of the curriculum

^p CNA Chile: <http://www.cnachile.cl>
<http://www.cnachile.cl/docs/materiales/criterios/profesionales.pdf>
<http://www.cnachile.cl/docs/materiales/criteriosespecificos/quimicayfarmacia.pdf>

** National System for Accreditation of Higher Education (SINAES) 1998. Guide for self-evaluation of studies and programs. SINAES Technical Support Unit, San José, Costa Rica.

- Inclusion of the processes and outcomes of research activity in the curriculum
- Presence of universal referents in the curriculum
- Updating of the contents of the curriculum
- Existence and implications of graduate follow-up studies
- Interrelationship of the curriculum components of the study plan
- Correspondence between the system for admission to studies and its requirements
- Compatibility between the graduation requirements and academic level or degree issued
- Achievement of goals with regard to the duration of the studies
- Existence, knowledge, and application of policies and mechanisms for curriculum review and updating
- Inclusion of at least 800 hours of supervised practical training in any of the areas of professional practice of pharmacy
- In the pharmacy studies curriculum, the values and competencies established by the Vancouver Conference with regard to the “seven star pharmacist” should be implicit.
 - Existence of at least one course on ethics in the academic programs for pharmacy studies
 - Existence, knowledge, and application of mechanisms to increase the flexibility of the curriculum, approved by the authorities of the studies
 - Harmonization of the percentages of distribution of contents with those established by the Latin American Commission on Pharmaceutical Education (COHIFA)

b. Teaching indicators

- Compatibility between the course requirements and the number of credits
- Use of teaching resources to conduct teaching
- Number of educators with the degree of pharmacist
- Availability of teaching staff
- Management of pharmacy studies or program should be performed by a pharmaceutical professional
- Existence of evaluation mechanisms for improvement of teaching

c. Academic personnel indicators

- Existence of educators with the education and experience required by the pharmaceutical discipline
- Existence of procedures for training and updating the teaching personnel
- At least 50% of the academic personnel for courses in the studies should have at least 3 years of academic experience in the university
- At least 30% of the academic personnel should have at least 3 years of professional experience depending on the type of studies
- 100% of the educators in the pharmacy studies or program should have at least a university bachelor’s degree
- Academic solvency recognized in the area of their specialty in at least 50% of the educators for the courses

- Academic renown of the educators
- At least 25% of the academic personnel should have graduated from other national or foreign university institutions at the graduate or postgraduate level

d. Student indicators

- The students in the pharmacy studies or program should have at least 3000 hours of academic education in subjects relevant to pharmacy, according to the scope of professional practice in each country
- Approval of a final graduation project as a requirement to receive the degree
- Existence, knowledge and compliance with a system for student selection and admission that ensures equality of admission opportunities
- Availability of space, time and resources for extracurricular activities
- Existence, knowledge and fulfillment of a system for mobility of students and educators

e. Organizational and administrative indicators

- Existence of an academic administrative structure
- Existence and compliance with the standards for teaching the curriculum
- Existence and application of policies and standards for acquisition and use of financial, physical and material resources
- Flexibility of hours according to the needs and characteristics of the students

ANNEX 2***

SUGGESTIONS

Dr. María Luján Flores

(Pharmacy – Faculty of Natural Sciences
Universidad Nacional de La Patagonia San Juan Bosco)

PHARMACY STUDIES

TOWARDS LATIN AMERICAN ACCREDITATION

WORKSHOP 2. SELF-EVALUATION AND BASIC PLAN

CONTENTS

**Summary of the Sixth Pan American Conference on Pharmaceutical Education Workshop,
Montevideo, Uruguay**

- **Suggestions for item 3.1.**
 - Comparison Doc. PAHO/WHO 1999/ Res. No. 566/04 MINCYT Argentina
 - Qualities of the Pharmacist

- **Suggestions**
 - For item 3.2.
 - For item 3.3.

*** Personal work performed by Dr. María Luján Flores as member of the *Basic Plan Workshop* held at the Sixth Pan American Conference on Pharmaceutical Education. Dr. Flores is a professor at the Faculty of Natural Sciences of the Universidad Nacional de la Patagonia San Juan Bosco.

ECUAFYB, through its president Dr. Claudia Balagué, will inform about the Argentinian standards at the Seventh Pan American Conference.

**SIXTH PAN AMERICAN CONFERENCE ON PHARMACEUTICAL EDUCATION
19-21 November 2008, Montevideo, Uruguay**

WORKSHOP 2: SELF-EVALUATION AND BASIC PLAN****

Coordinator: Patricia Acuña Johnson (Chile)
Secretary: Aldo Álvarez (Peru)

Countries present: Argentina, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Honduras, Mexico, Paraguay, Peru, United States, Uruguay, Venezuela

AGREEMENTS AND CONCLUSIONS

1. It is necessary to have a glossary of terms that will be defined by the group based on an initial proposal, which will include terms such as graduation profile, syllabus, pensum, and competencies.

2. Agreement is reached on the basic definition of pharmacist by WHO (i.e., expert in drugs). Each of the workshop participants will include the characteristic elements of each country and the emphasis given by each university.

3. Work methodology:

The analyses should be performed in WORK TEAMS OR NETWORKS, which consider the universities, professionals, and the government whenever possible.

3.1. Review the PAHO/WHO 1999 *“Basic Plan of Pharmaceutical Education: Working Group Proposal, Lima 1998”* document so that it is **reconsidered in terms of what the student should learn** rather than what should be taught (i.e., **student-centered curriculum**).

3.2. Make a list of the treaties and/or agreements signed by the countries of the workshop participants that involve professional services.

3.3. Each participant will collect information about the graduation requirements and modality, curriculum indicators. The calculation will be based on the number of hours.

**** The suggestions and observations refer especially to the aspects highlighted in “boldface,” which refer to the agreements reached at the end of the Basic Plan Workshop in Montevideo, Uruguay.

SUGGESTIONS Dr. María Luján Flores. Pharmacy – FACULTY OF NATURAL SCIENCES – UNIVERSIDAD NACIONAL DE LA PATAGONIA SAN JUAN BOSCO). Km. 4. 9000, Comodoro Rivadavia, Chubut, Argentina

The statements made below are based on the provisions of the Official Pharmacy Studies Bulletin (Resolution 566/2004, Ministry of Education, Science and Technology). They represent the consensus reached at the appropriate time with regard to the academic units of Argentina, which were established by the national accreditation standards.

Based on this,

FOR ITEM 3.1

Taking into account the background described in the PAHO/WHO 1999 “*Basic Plan of Pharmaceutical Education: Working Group Proposal, Lima 1998*” document, as well as the continuous advances in the professional activity the pharmacist should practice, it is important to propose changes and/or adaptations to the Basic Plan of Pharmacy Studies that consider all contents the student should learn in order to apply them in future professional work.

It is the present-day students who should apply the knowledge acquired during their studies for development of the profession in the future. This means that they should be prepared not only to use the knowledge acquired but also to be professionals that continuously seek to update their knowledge and contribute to generating additional knowledge.

In Argentina, Article 43 of the Law of Higher Education states that the curricula for studies that are professions regulated by the State, the practice of which could affect the public interest, directly placing at risk the health, safety, and property of inhabitants, should take into account the minimum hourly load stipulated by Article 42 of this standard as well as **the basic contents of the curriculum, and the criteria on the intensity of practical training** established by the Ministry of Education, Science and Technology in agreement with the University Council. The Ministry should also establish, with the agreement of the University Council, the professional activities reserved for those who have obtained a degree included in the system of Article 43.

Based on this, Resolution 566/2004 of the Ministry of Education, Science and Technology establishes such contents, the minimum hourly loads taking into account the areas of education of the future professional (i.e., core, social/general and optional/elective activities, practical professional training), the criteria for the intensity of the practical training, the professional activities reserved, and the accreditation standards. All of these aspects were agreed on by consensus based on the activities performed at the meetings of the Coordinating Entity for Academic Units in Pharmacy and Biochemistry (ECUAFyB) of the University Council, and finally established by the Ministry in the aforementioned Resolution of 2004.

I. Conceptual clarifications

The definition of the **contents of the basic curriculum** that should be covered by pharmacy studies is considered to be essential so that the Bachelor's degree in pharmacy and/or pharmacist is recognized with a view to its national validity and is a basic matrix of reference for the different curricula designed by university institutions exercising their autonomy. In this regard, they comprise the conceptual and theoretical information considered in order to attain the competencies they seek to develop, considering the activities reserved for the practice of the professional degree.

In the definition of the contents of the basic curriculum, a space should be set aside so that each institution specifies the desired professional profile when it prepares the curriculum.

All pharmacy studies should ensure that the contents of the basic curriculum are adequate to guarantee the appropriate education for the profile defined. Their presentation in the form of subject areas and different cycles should not generate rigidity that can threaten the required flexibility of the curriculum, which is an essential aspect of the reform.

The definition of other contents in subjects such as the social, humanistic, and economic sciences depends on the criterion of each the institutions. Their design should be consistent with the profile of the graduate they seek to educate.

All pharmacy studies should include contents oriented towards development of an enterprising and proactive attitude, capable of articulating pharmacy as a service and industrial establishment with the chemical-pharmaceutical industry, health and medical care providers, and public consumers, in order to adequately meet the needs of public consumers.

Based on the above, the pharmacy curriculum in Argentina, and therefore at the UNPSJB, is organized in the **cycles** to be taken in the course of studies or the different dimensions it should consider. However, it does not imply imposing the names of subjects, number of subjects, or a specific organization of the studies. Rather, they are a basic matrix for reference in accordance with the principles of Article 43.

II. Cycles

The basic education, biomedical education, professional education and practical professional training cycles, as well as the social and optional/elective subjects, take into account the following general aims:

1. Promote in the student study habits, active learning, and continuing education, and contribute to development of his capacity of analysis, critical judgment, and independence of criterion, his research spirit, innovative capacity and, in general, his creativity.
2. Generate awareness and an ethical and humanistic attitude for the practice of pharmacy and the related academic, scientific, technological, and productive activities.

3. Acquire the knowledge, abilities, and skills that support professional education.
4. Assimilate the contents and the instrumental knowledge of the basic sciences and biomedical sciences.

In order to fulfill these general objectives, **specific objectives for the cycles** are planned:

II.1. Basic education and biomedical education cycles

1. Provide the student the conceptual and methodological bases required for acquisition, generation, and communication of knowledge.
2. Provide the student the knowledge, attitudes, and procedures that are essential so that he can receive, understand and apply the contents of the professional education area.
3. Facilitate application of the scientific method.
4. Promote development in the student of the essential instrumental skills and abilities required for collection, processing, recording, communication, and filing of relevant information and the research product, as well as criteria that enable him to approach and resolve problem situations.
5. Supply the tools required for self-learning, continuing education, and interdisciplinarity.
6. Promote development of an ethical and responsible attitude.

II.2. Professional education cycle

1. Acquire the conceptual, attitudinal, and procedural contents, and the instrumental knowledge required for professional practice integrated in health teams and applied to all activities reserved for the professional degree (see Annex V). This includes knowledge related to the health sciences, humanistic sciences, behavioral sciences, bioethics, public health, and social sciences.
2. Provide the student the knowledge, attitudes, procedures, abilities, and skills required for his professional performance in the different fields of pharmaceutical competence, encouraging application of the scientific method.
3. Develop in the student the essential instrumental skills and abilities required for collection, processing, recording, communication, filing, and retrieval of relevant information.
4. Supply the tools required for self-learning, continuing education, and interdisciplinarity with other professionals and colleagues.
5. Promote development of an ethical attitude in the pharmacist's relations with the community and in research projects.

II.3. Practical professional training

1. Have the essential knowledge and instrumental management skills for performance of the practice of the pharmacist in public and private facilities, and the planned and supervised practical training required for achievement of this objective.
2. Apply the scientific method.

3. Familiarize the student with professional practice, offering him the possibility of acting in the areas in which his preparation qualifies him, under an educational system that is planned and supervised by the academic unit.
4. Apply the fundamental instrumental skills and abilities required for collection, processing, recording, communication, filing and retrieval of relevant information and data produced by research activities in the field of his activity.
5. Supply the tools required for self-learning, continuing education, and relationships with members of the work team.
6. Promote development of an ethical attitude in the pharmacist's relations with the community, the health team, and in research projects.
7. Prepare the student to identify his role in resolution of problems and instill the importance of multidisciplinary teamwork, when appropriate, developing an attitude favorable to this method of operation.

Minimum hourly load for pharmacy studies

For the purpose of better distribution of the hourly load, the different subject areas were grouped into cycles, maintaining the independence of the practical professional training and social/general as well as optional/elective activities.

The contents of the basic curriculum in each subject area can be organized in more than one of the cycles. The hourly load for each group of subjects and cycle is assigned as a recommendation.

Cycle	Subject area	Minimum hourly load per subject area	Minimum hourly load per cycle
BASIC EDUCATION	Mathematics, Physics, Statistics	400	1200
	General and Inorganic Chemistry, Organic Chemistry, Analytical Chemistry, Physical Chemistry	800	
BIOMEDICAL EDUCATION	Biology, Biological Chemistry, Morphology, Physiology, Physiopathology, Microbiology, Immunology	800	800
PROFESSIONAL EDUCATION	Pharmaceutical Botany, Pharmacognosy, Medicinal Chemistry, Nutrition and Food Science, Toxicology, Pharmacology, Quality Assurance of Medicines, Pharmaceutical Technology and Biopharmacy, Hygiene and Sanitation, Pharmaceutical Ethics and Legislation, Clinical and Health Care Pharmacy		1200
PRACTICAL PROFESSIONAL TRAINING			300
SOCIAL/GENERAL			100

OPTIONAL/ELECTIVE	100
TOTAL MINIMUM HOURLY LOAD	3,700

Criteria for intensity of the practical training for pharmacy studies

The practical training will be performed in each academic unit in accordance with the following criteria:

1. The practical training activities should be planned and carried out appropriately with regard to the general aims of the *curriculum* and the profile of the pharmacist it intends to train.
2. The practical training activities should be performed in adequate areas such as: computer laboratories; physics, chemistry, biology, pharmaco-technical, toxicological and food science laboratories; documentation and information centers; community and hospital areas; research centers; pharmaceutical industry; and other productive facilities as well as other facilities related to the professional field.
3. In laboratory work and other types of practical training, development of abilities that facilitate observation and measurement of physical, chemical, and biological phenomena and use of the scientific method for selection and critical analysis of relevant information should be encouraged.
4. The practical professional training will be conducted in university and hospital areas, as well as other public and private centers related to the profession that have been previously accredited based on the teaching requirements.
5. The learning experiences should be planned and developed under the supervision of the educator.
6. The planning should provide for accessibility and availability of adequate resources, coordination of activities, and the teacher-student relationship.
7. The practical training activities should be appropriate for the professional practice of the pharmacist according to the scope of his degree.
8. In the different teaching-learning experiences it should be ensured that the students comply with the ethical principles of the profession.
9. Throughout the training, opportunities should be provided so that the students participate in basic and applied research, and in extension activities duly planned according to the profile of the pharmacist, which favor the integration of multidisciplinary teams.
10. All practical learning experiences should be systematically evaluated.
11. The practical training activities should promote integration of the basic, biomedical, and professional education cycles.
12. The university institutions fulfilling the criteria for the intensity of the practical training indicated above will organize their respective curricula.

PROFESSIONAL ACTIVITIES RESERVED FOR THE DEGREE OF PHARMACIST

1. **Perform exclusively** the following activities:

- a. Technical management of private pharmacies; pharmacies in public, private, and military health care facilities; sterilization services for public, private, or military production or patient care facilities; drugstores; distributors; laboratories or industrial plants that perform research, design, synthesis, development, production, quality control, fractionation, packaging, sterilization, storage, conservation, distribution, import, export and transportation of drugs and products for the health of humans and other living beings. Conduct supervision of technical personnel under his responsibility.
 - b. Prepare pharmaceutical formulations and magistral and officinal drugs; and dispense drugs of industrial origin in pharmacies that directly serve the public (e.g., private, community, social work) or in patient care services (e.g., hospitals, clinics, health centers, dispensaries), performing technical management, similar functions and/or paramedical functions in accordance with the legislation and current regulations in each jurisdiction.
 - c. Participate in research and design, development, production, quality control, packaging, storage, and distribution of drugs mass produced by the pharmaceutical industry, acting as technical director or performing similar functions in accordance with the current legislation and regulations in the national or provincial area.
2. Research, design, synthesize, develop, produce, and control, prepare, fractionate, package, store, conserve, distribute, dispense, and administer drugs and health products.
 3. Conduct pharmacotherapeutic monitoring of products intended to cure, provide relief and prevent disease in humans and other living beings.
 4. Be the professional responsible for technical management of the industrial plants that perform all of the processes listed in item 1. A) with regard to food, veterinary products, disinfectants, insecticides, and biocides.
 5. Conduct pharmacological and toxicological studies in isolated biological systems or living beings.
 6. Extract, isolate, research, identify, and conserve active ingredients, drugs, and nutrients that are natural or obtained by synthetic and/or biotechnological processes.
 7. Form part of the technical personnel for production, control, development, fractionation and storage in pharmacies; pharmaceutical, food and cosmetics industries; and laboratories or institutes related or linked to these.
 8. Advise and participate in accreditation, technical supervision, and categorization in all public or private facilities where the pharmacist practices his professional activity.

9. Advise other members of the health team and the population about the rational use of drugs and other health products.
10. Participate in professional pharmaceutical supervision in different public or private municipal, provincial, national, or international facilities and agencies.
11. Establish the technical, hygienic and safety specifications to be fulfilled by the environments in which technological processes are performed in official, private, hospital or industrial areas used for preparation, storage, distribution, and dispensing drugs and other pharmaceutical, dietetic food, cosmetic, and food products as well as other health-related products.
12. Participate in performance of studies, consultations, evaluations, audits, inspections, expert opinions, and interpretations of subjects of their competence in the legislative and judicial bodies, in public or private agencies from the municipal, provincial, national, and international areas.
13. Participate in health teams that conduct administration, planning, programming, execution and evaluation of health programs and campaigns.
14. Participate in preparation of standards, models of classification, evaluation, and certification related to drugs, food, cosmetics, and other health products for drugs and raw materials that are imported or for export.
15. Participate in preparation, drafting, and updating of the National Argentinian Pharmacopeia, therapeutic formularies, food regulations, codes and any other text or legal provision related to pharmaceutical activity and public health.
16. Organize, act, and manage public or private information centers, supply, management, or control of drugs and health products.

COMPARISON DOC. PAHO/WHO 1999 AND RESOLUTION 566/04 MINCYT ARGENTINA

AREAS OF KNOWLEDGE PAHO/WHO 1999	AREAS OF KNOWLEDGE Argentina (Resolution 566/04)	OBSERVATIONS FCN - UNPSJB
Basic sciences: ➤ Chemistry: General, Inorganic, Analytical, Organic, Physical Chemistry, Pharmaceutical Chemistry, Biochemistry	Basic education cycle: ➤ Mathematics, Physics, Statistics ➤ General and Inorganic Chemistry, Organic Chemistry,	➤ Biostatistics

<ul style="list-style-type: none"> ➤ Biology ➤ Microbiology ➤ Physics ➤ Mathematics ➤ Research Methods 	<p>Analytical Chemistry, Physical Chemistry</p>	
<p>Biomedical sciences:</p> <ul style="list-style-type: none"> ➤ Biostatistics ➤ Anatomy ➤ Physiology ➤ Parasitology (theoretical) ➤ Pharmacotherapeutics ➤ Pharmacokinetics ➤ Physiopathology (includes interpretation of laboratory tests) ➤ Semiology (includes physical examinations) ➤ Immunology ➤ Nutrition (Importance of relation to drugs) 	<p>Biomedical education cycle:</p> <ul style="list-style-type: none"> ➤ Biology ➤ Biological Chemistry ➤ Morphology ➤ Physiology ➤ Physiopathology ➤ Microbiology ➤ Immunology 	<p>In the current plan the following are not available:</p> <ul style="list-style-type: none"> ➤ Parasitology (theoretical) ➤ Genetics (required for Biotechnology, Pharmacogenomics, Genetic Engineering) <p>Some general subjects are planned to be included since the basic concepts are required in professional practice as well as research and development.</p>
<p>Pharmaceutical sciences:</p> <ul style="list-style-type: none"> ➤ Open professorships (pharmaceutical topics, introduction to professional practice) ➤ Pharmacology ➤ Pharmacochemistry (design, synthesis and relation between structure and activity) ➤ Pharmacokinetics ➤ Biopharmacy ➤ Pharmaceutical Technology (includes unit operations; magistral, officinal and industrial production; and drug development) ➤ Toxicology ➤ Quality assurance ➤ Phytotherapy Pharmaceutical Botany/ pharmacognosy 	<p>Professional education cycle:</p> <ul style="list-style-type: none"> ➤ Pharmaceutical Botany ➤ Pharmacognosy ➤ Medicinal Chemistry ➤ Nutrition and Food Science ➤ Toxicology ➤ Pharmacology ➤ Drug Quality Assurance ➤ Pharmaceutical Technology and Biopharmacy ➤ Hygiene and Health ➤ Pharmaceutical Ethics and Legislation ➤ Clinical and Health Care Pharmacy 	<ul style="list-style-type: none"> ➤ Pharmaceutical Microbiology
<p>Social and administrative sciences</p>	<p>Social/ General</p>	<ul style="list-style-type: none"> ➤ English ➤ Reference Management ➤ Epistemology and Research Methods

<p>Integration activities:</p> <p>Seek to integrate concepts of the basic, biomedical, pharmaceutical sciences in order to develop security and confidence in the student, promoting his integration in the health team. They may be courses, workshops, or internships. The aim is for the student to be able to consider his professional work. To this end, case simulations and participation in group activities can be conducted. They should be performed in all stages of education.</p>	<p>Optional/ Elective:</p> <p>In-depth consideration of the aspects of education selected by the students. They include courses, workshops, laboratory activities, seminars.</p>	<p>Includes the following optional/elective activities:</p> <ul style="list-style-type: none"> ➤ Subjects taught in the FCN Pharmacy studies under this modality that students can take as of the third year. ➤ Subjects taught in other FCN studies that students can take as of the third year. ➤ Subjects taught by other schools that students can take as of the third year. ➤ Subjects taught in other institutions that students can take as of the third year. ➤ Courses taught at the UNPSJB or other institutions that students can take with the support of the studies. ➤ Laboratory, research, field activities and workshops that students can participate in and accredit the required hours.
<p>Pre-professional practice:</p> <p>Students should have previous knowledge of first aid, foreign language (usually English), computer skills, and ethics.</p>	<p>Professional practice</p>	<p>Covers 300 h:</p> <p>Performed in hospital pharmacy, sterilization service, or community pharmacy.</p>

QUALITIES OF THE PHARMACIST

The noteworthy qualities of the pharmacist are identified in the Good Pharmaceutical Education Practices (GPEP), and were analyzed and adopted by the working group that drafted the PAHO/WHO 1999 document. These GPEP consider that the pharmacist should have knowledge, attributes, skills, and behavior that support and evaluate his expertise. These qualities are organized in seven results that are associated with the seven star professional (approved by the Vancouver Working Group, 1997):

- 1. Member of health team** that is the provider of an essential and quality service in services that include clinical, analytical, technological, and regulatory aspects. Special reference is made to the fact that the pharmacist is essentially a health care professional. He practices his health activity in all fields of work, including industry, covering all work areas, from community or hospital pharmacy to public health care or the regulatory field.
- 2. Capable of making decisions and accepting responsibility for them** Self-responsibility and shared responsibility for the results of therapy are elements that should be developed during professional training. Moreover, the decision-making capacity is not only linked to the previous knowledge taught (and received appropriately), but also to development of the “ability” to make decisions.
- 3. Communicator** As a result of the ideal position of the pharmacist between the physician and the patient, his (self) confidence is an essential element for performance of adequate educational and informative action in the patient to ensure treatment adherence, towards the prescriber by contributing supporting knowledge that favors rational prescription, and towards the general public, from his work area, but mainly from community pharmacies, promoting the rational use of drugs and supporting development of intelligent self-medication.
- 4. Leader** Accepting leadership of the health team in all aspects related to drugs is directly related to professional training and continuous professional development. This leadership refers to that which should be practiced in multidisciplinary situations, and shown in individual situations with patients, groups of patients, and in any situation in which contributions or interventions are required.
- 5. Manager** Not only in management of human, material, and financial resources, but also information management, and the appropriate transfer of such information to the other members of the health team. In accordance with the trend in the areas of future development, capacity to manage sources of information, analysis, production, and circulation of the appropriate information depending on the recipient are also considered to be an element of focus in the education of the professional.
- 6. Continuous learning** It is not possible to conclude the pharmacy studies and merely aspire to practice the profession appropriately. The principles, concepts, and commitment to the profession should be cultivated throughout one’s professional life. Furthermore, it is also considered to be important to learn how to manage general educational techniques that will serve as support for educational and informative work with other professionals, patients and the general public.
- 7. Teacher (educator)** Participation as a teacher is not only conceived of when teaching knowledge, but also represents a way to acquire new knowledge and skills.

In order to achieve this profile, the curriculum should explicitly include general learning objectives such as development of critical thinking; decision-making; problem-solving; proficiency in oral, written, and computational communication; social interaction (with peers and the general community); self-learning and personal initiative; ethical training and consistency; global thinking; stimulation of research, creation, and enterprising capacities; citizen education; aesthetic sensitivity.

Therefore, the educational unit should ensure that professional training is conducted in an environment of intellectual and personal development characteristic of an academic community.

FINAL REFLECTION AND SUMMARY TAKING INTO ACCOUNT THE GENERAL AND SPECIFIC BACKGROUND

Taking into account that the teaching-learning process should be student-centered, we must ask:

What can we offer our students that enables them to grow and develop as future professionals and persons, so that are they capable of acting as professionals in their art, members of the health team, health educators, and agents of primary care?

In order to respond, the review, revision, and adaptation of the Basic Plan of Pharmacy Studies should be considered to be an ongoing task. Consequently, as the professional advances occur, our students will be aware of them and the changes can be integrated dynamically.

The continuing education objectives proposed in the Delors Commission Report, 1995–UNESCO are very clear. They indicate that students should:

- ***Learn to know***
- ***Learn to do***
- ***Learn to live together and live with others***
- ***Learn to be***
- ***Learn to be ENTERPRISING (Value Added Criterion)***

The aim of all of the above is to train ***pharmacists who are professionals integrated in the health team and community health, with awareness of the reality of the world as citizens. They should also have ongoing concern for continuing education through research and development, and be able to perform community pharmacy, hospital pharmacy, and industrial pharmacy activities as well as supervisory and leadership roles in their own profession.***

For items 3.2. and 3.3 It seems to me that it would be interesting to construct a table such as the following, in which each academic unit/country that teaches pharmacy provides information on its specific characteristics.

Example with UNPSJB:

U.A.- University/ country that teaches pharmacy	Degree awarded	Duration of current plan in years	Total hourly load per cycle						Areas of professional practice	Treaties, agreements, conventions that involve professional services
			B	BM	P	S/ G	O/E	PP		
¹ FCN– UNPSJB/ Argentina	Pharmacist	5	132 0	800	142 5	100	100	300	FC, FH	HRCR, HACR, HCO, CFC, CFCR, Priv Pharm, INTER-U

General Abbreviations

^a**B:** Basic education cycle; **BM:** Biomedical education cycle; **P:** Professional education cycle; **S/G:** Social/general activities; **O/E:** Optional/elective activities; **PP:** Practical professional training.

Abbreviations for U.A.– University/Country

¹ FCN: School of Natural Sciences; UNPSJB: Universidad Nacional de la Patagonia San Juan Bosco/ Argentina; FC: Community Pharmacy; FH: Hospital Pharmacy; HRCR: Hospital Regional de Comodoro Rivadavia; HACR: Hospital Alvear de Comodoro Rivadavia; HCO: Hospital de Caleta Olivia; CFC: Pharmacists’ Association of Chubut; CFCR: Pharmacists’ Association of Comodoro Rivadavia; Priv. Pharm: Private pharmacies.