Teaching and learning methodology

Pharmacists provide their services in a variety of settings in response to a dynamic and evolving set of local, national, regional and international health care priorities and needs. Within this context, pharmacists are medication experts in the treatment of disease and the promotion of health. This expertise, in its broadest sense, includes the preparation, supply, control and quality assurance of desired outcomes of medicines’ use, beginning with the drug development process and continuing through a medication’s ultimate benefit to the patient and society. This expertise has its foundation in the pharmaceutical sciences and its related research, and has its focus on both individuals and populations.

The World Health Organisation has summarised the role of the pharmacist in eight areas¹ (see below), which should be considered essential, minimum, common expectations for pharmacists by national health care systems world-wide. The pharmacist has to achieve excellence in each of eight roles if he is to succeed in pharmacy profession. In order to do its part in preparing the profession to meet these societal expectations, pharmaceutical education must ensure that both students and practising pharmacists possess specific knowledge, skills and attributes. The eight areas that typify the eight-star pharmacist are stated below as well as in the following diagram.

★ Caregiver
★ Manager
★ Teacher
★ Decision-maker
★ Communicator
★ Leader
★ Life-long learner
★ Researcher


**Background philosophy to module construction**

*If we observe the process which we call instruction, we see two parties con-jointly engaged – the learner and the teacher. The object of both is the same, but their relations to work to be done are different.........* [The] essential part, the appropriation and assimilation of knowledge by the mind, can be performed by no one but the learner......[from which]... it follows that he is in fact his own teacher, and....that learning is self-teaching......The Teacher’s part then in the process of instruction is that of a guide, director, or superintendent of the operations by which the pupil teaches himself or herself. (Joseph Payne, 1883)*

**Preamble**

The curriculum is modular and attempts shall be made to have it integrated, both horizontally and vertically as much as possible, given that not everything can be integrated. There are several views of integrating a curriculum as shown in the following table, that have been taken into consideration when developing the curriculum for the BPharm Degree at the University of Limpopo, Turfloop Campus.

**Ten views for integrating curriculum**

<table>
<thead>
<tr>
<th>Fragmented</th>
<th>Connected</th>
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<tbody>
<tr>
<td>This is the traditional model of separate and distinct discipline, which fragments the subject area.</td>
<td>In this case each subject area, course content is connected topic to topic, concept to concept, one year’s work to the next, and relates ideas explicitly</td>
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<tr>
<td>Pharmaceutical chemistry: pharmacognosy, medicinal chemistry, synthetic chemistry, analytical chemistry</td>
<td>Physical pharmacy: From atoms to medicine</td>
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<tr>
<th>Nested</th>
<th>Sequenced</th>
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<td>The student within a subject acquires multiple skills: a social skill, a thinking skill, and content-specific skill</td>
<td>Topics or units of study are rearranged and sequenced to coincide within one another. Similar ideas are taught in concert while remaining separate subjects</td>
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<tr>
<td>Pharmacy practice/social pharmacy:</td>
<td>Bio-pharmaceutics and Pharmacology or Pathological science and Pharmacology</td>
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<tr>
<th>Shared</th>
<th>Webbed</th>
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<td>Shared planning and teaching take place in two disciplines in which overlapping concepts or ideas emerge as organizing elements</td>
<td>A rich theme is webbed to curriculum contents and disciplines; subjects use the theme to sift out appropriate concepts, topics and ideas.</td>
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Physiology of the eye and ocular pharmacology; staff teaching physiology of special senses and ocular pharmacology can team teach.

Rational drug use or Drug utilization (WHO definition)

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<tr>
<th>Threaded</th>
<th>Integrated</th>
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<td>In this approach, thinking and social skills, multiple intelligences, technology, and study skills are threaded through the various disciplines. A study area related to another subject, but goes beyond it in some way. Drug delivery system.</td>
<td>This interdisciplinary approach matches subjects for overlaps in topics and concepts with some team teaching in an authentic integrated model (not quite the same as Shared). In this case more disciplines are involved after identifying a patterning models and approach content through these patterns.</td>
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<th>Immersed</th>
<th>Networked</th>
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<td>The disciplines become part of the student’s lens of expertise: the students filters all content through this lens and becomes immersed in his or her own experience. <em>Research projects: the student is allowed or guided to choose an area of expert interest and to see all learning through that lens.</em></td>
<td>The student filters all learning the expert’s eye and makes internal connections that lead to external networks of experts in related fields. <em>Industrial pharmacy: while making an effort to understand and to adapt pharmaceutical technology for product design, the student networks with experts in the field and expands her knowledge base.</em></td>
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The intention of the Department of Pharmacy is to adopt international best practice derived standards set by the Global Federation of Pharmacists and Pharmaceutical Science and adopted by the South African Pharmacy Council.

Each module content is system based and divided into a number of interdisciplinary blocks and organized according to basic science. For example, for clinical/pharmacology based modules, the module content is system based according to the major organ in the body, and divided into a number of interdisciplinary blocks and organized according to basic science such as anatomy, biochemistry chemistry and physiology; major disease process (pathology and pathophysiology), diagnosis and pharmacotherapy and health promotions planned and taught in a coordinated fashion. The integrity of each subject area, however, remains intact. This will allow continual growth of knowledge which is problem oriented and relevant new subject areas without unnecessary addition to the programme.

For the non-clinical based modules e.g. industrial pharmacy, similar concept is also used where each module content is system based (e.g. good manufacturing practice (GMP) and divided into a number of interdisciplinary blocks and organized according to basic science such as mathematics (pharmaceutical calculations), organic chemistry, etc.
In each module a student will be introduced to pharmacy practice experience. This will involve interactions with other health care professionals, case studies and/or actual clinical cases within the institutional settings, under appropriate supervision. Clinical skills, where resources permit, will be interfaced with didactic course work that provides an introduction to the profession, and continue in a progressive manner leading to entry into the advanced pharmacy practice experiences in fourth year.

**Integrated Learning Model**

Modules are developed in accordance with principles of an Integrated Learning Model which is student centred pedagogy i.e. the activation of self-directed learning that helps the student make connections across curricula. It attempts to bring together traditionally separate subjects in Pharmacy so that the student can grasp a more authentic understanding and helps the student to slowly transit from studying example to solving problems without academic overload. The student, in order to demonstrate interdisciplinary understanding, will bring together concepts, methods, or languages from for example, Pharmacy Practice and Pharmaceutical Sciences or established areas of expertise in order to explain a pharmaceutical phenomenon, solve a problem, create a product, or raise a question. This is crucial to promote scientific thinking and integrative reasoning skills.

Problem based learning becomes very useful later in the learning process. Problems that student will face later, often demand contribution from different subject areas and he/she will learn by experience how information he/she will take from the subjects is interrelated and how it will assist in solving the problem.

The following diagram summarizes the processes to be followed in order to achieve the purpose and rationale of the qualification as stipulated in the SAQA document ID 65130
Non-compartmentalized Subjects

Relevant Level Exit Outcomes

Unit Standards

Integrated Topics

*Detailed Learning Objectives (DLOs)

Important Integrated Linkages

Learning Activities (LAs) including
- Lectures
- Case Studies
- Assignments
- Tutorials
- Practicals/Demonstrations
- Individual Posters Preparation
- Student Directed Learning

Embedded Knowledge
The diagram below shows a concept map describing activities that encourage integrative learning in many universities in the US which helps a student to understand that the world outside of the classroom at the university is not a stand-alone.

**Self-directed Learning**

This form of learning will make considerable demands on the student’s ability to ‘direct their own work. The student has to learn to manage and organize their own learning process, making use of the opportunities for learning, such as case studies, group work, assignments, tutorial and lectures with guided notes. Guided notes are lecturer prepared hand-outs that outline or map lectures but leave ‘blank’ spaces for key concepts, facts, definitions etc. This is to help the student to fill in the spaces with content as part of their activated self-directed learning. The guided notes should also help the student follow a lecture, identify its important points and develop a foundation of content to study and to apply to problem solving and case studies.

**Integrated Assessment**

All over the world educators are increasingly convinced of the following:

….the intent of instruction is to promote student’s abilities as thinkers, problem-solvers, and inquirers.......Assessments, if they are to be aligned with current views on instruction and human learning must more closely resemble meaningful learning tasks and assess the acquisition of high-level thinking and reasoning abilities as integral to subject matter knowledge (International Encyclopedia of Education, 1994:370)

Assessment is going to be part of the curriculum and the learning programme development. We cannot assess in an integrated way if we do not teach and learn in an integrated way, because integrated learning comes before integrated assessment.

Our teaching, learning and assessment activities must be developed as a valid, reliable and coherent process taking into account;
- Purpose/Rationale/Exit Level Outcomes
- Learning and Teaching strategy
- Fields of Learning and assessment criteria
  Assessment strategy.