

OPINION

Challenges in shifting to an integrated curriculum in a Caribbean medical school

P. Ravi Shankar*

Department of Pharmacology, Xavier University School of Medicine, Aruba, Kingdom of the Netherlands

Xavier University School of Medicine (XUSOM) is an offshore Caribbean medical school in Aruba, Kingdom of the Netherlands admitting students from the United States, Canada and other countries to the undergraduate medical (MD) course. Like most other offshore Caribbean medical schools, XUSOM was initially following a discipline based curriculum but shifted to an integrated curriculum from January 2013. Initially the school was following a partially integrated curriculum with the normal human subjects of anatomy, physiology and biochemistry being covered during the first two semesters and the abnormal human subjects of pathology, microbiology, pharmacology and introduction to clinical medicine being covered during semesters 3 and 4. From January 2014 the school has shifted to a fully integrated curriculum with all the basic science subjects being covered in an integrated organ system based manner [1]. Table 1 shows the different systems being learned by students during different semesters. At XUSOM like in most other offshore Caribbean medical schools a semester of study is of 15 weeks duration and there are three student intakes a year in January, May and September [2]. In this article I will briefly discuss challenges faced in shifting to a fully integrated curriculum and how we have tried to address them.

Faculty apprehensions about an integrated curriculum: Based on my experiences in Nepal and Aruba faculty may have apprehensions about possible changes in their role in an integrated curriculum. In a discipline based curriculum there are fewer limitations and restrictions on faculty and they can teach their subject in the manner and sequence they consider best. In the Caribbean since each medical school is a university and

designs its own curriculum there are lesser restrictions on curriculum and what is being taught than in medical schools where the curriculum is dictated by the affiliated university. In an integrated curriculum faculty has to follow the sequence of the organ system and teach according to the logical development of the system. This can sometimes be not entirely 'in sync' with how they would like to teach their subject. For example in pharmacology we often teach the autonomic nervous system (ANS) immediately after completing the topics of pharmacodynamics and pharmacokinetics. But in an integrated system we have to teach ANS during the time allotted to the nervous system and in consultation with the system chair. Another apprehension among faculty is whether they would be allotted the same amount of time to teach their subject that they were getting earlier under a discipline based system.

We have tried to address this issue by taking faculty members into confidence during each stage of the curriculum development process. We have frequent meetings to get faculty inputs and allay their apprehensions. Many senior faculties are members of the curriculum committee and we have monthly meetings of the faculty senate and fortnightly meetings to finalize the teaching-learning schedule where all issues are discussed. The reasons for shifting to an integrated system and the advantages are explained and discussed. Regarding the number of teaching hours we try our utmost to accommodate the requests of the faculty while keeping in mind system requirements.

Student apprehensions about an integrated curriculum: An integrated curriculum though common in the United States (US) and Canada is not common in offshore Caribbean medical schools where the focus has traditionally been on preparing students for the United States Medical Licensing Exam (USMLE) step 1. Our students were apprehensive when the school shifted to an integrated curriculum and initially the

*Corresponding email: ravi.dr.shankar@gmail.com

Received: February 27, 2015; Accepted: April 8, 2015; Published: April 9, 2015

This article is available from: <http://jeehp.org/>

Table 1. Organ systems covered during the different semesters of the basic sciences course at XUSOM, Aruba

Semester	Systems covered	Duration (weeks)	Description
First	Fundamental concepts	7	Important concepts from each subject useful to understand the organ systems
	Musculoskeletal system	8	
	Patient, doctor and society 1	15	Includes early clinical exposure, epidemiology and biostatistics, Critical appraisal of scientific literature (CASL), Medical humanities, Introduction to study of medicine
	Healthcare quality improvement 1	15	Online module on patient safety and healthcare quality improvement offered by Institute for Healthcare Improvement (IHI) and medical ethics
Second	Nutrition and metabolism	4	Includes an online Nutrition in Medicine module offered by the University of North Carolina
	Nervous system	11	
	Patient, doctor and society 2	15	Includes early clinical exposure, epidemiology and biostatistics, CASL, Introduction to study of medicine
	Healthcare quality improvement 2	15	Online module on patient safety and healthcare quality improvement offered by IHI and medical ethics
Third	Gastrointestinal system	8	
	Respiratory system	7	
	Patient, doctor and society 3	15	Includes early clinical exposure, CASL
	Healthcare quality improvement 3	15	Online module on patient safety and healthcare quality improvement offered by IHI, and medical ethics
Fourth	Cardiovascular system	10	
	Hematopoietic system	5	
	Patient, doctor and society 4	15	Includes hospital observership, CASL, cultural diversity module
	Healthcare quality improvement 4	15	Online module on patient safety and healthcare quality improvement offered by IHI, and medical ethics
Fifth	Renal and metabolic system	4	
	Endocrine and reproductive system	9	
	Infection and Immunity	2	Includes antimicrobial chemotherapy, immunity and multi-system diseases
	Patient, doctor and society 5	15	Includes CASL, cultural diversity module
	Healthcare Quality Improvement 5	15	Online module on patient safety and healthcare quality improvement offered by IHI and medical ethics
Sixth	Comprehensive integration of clinical judgment	15	Review of all systems, review of history taking and clinical examination, OSCEs

level of integration that we were able to achieve within an organ system was not always to the level expected by us and the students which added to the problem. Initially the school was following a partially integrated curriculum and this may have helped students better adjust to the process of change. One of the major challenges I have noted both in Nepal and in XUSOM was the challenge for newly admitted students who have to learn various 'subjects' simultaneously under an integrated curriculum. Adding an extra semester to the basic sciences program was helpful as this allowed us to distribute the organ systems to be taught among five semesters (Table 1).

We hold frequent meetings with the students to explain why we shifted to an integrated curriculum and possible advantages of the same. We were helped by the fact that most US and Canadian medical schools follow an integrated curriculum. Another problem area was the increased focus on attitudes, professionalism, and the humanistic and behavioral aspects of medicine in the revised curriculum. There was also emphasis

on critical appraisal of scientific literature (CASL) and on developing critical appraisal skills among students. As an example of assessment schemes followed during the basic sciences, Tables 2, 3, and 4 shows the assessment format followed during the first semester. We have not yet adopted specific standard setting methods to decide the passing score especially with regard to MCQs and use an arbitrary value of 70% as the passing grade. The final score however includes assignments, formative assessments and presentations and provides a holistic assessment of the student.

The USMLE step 1 is increasingly shifting to an integrated focus and there is greater emphasis on critical appraisal skills [3]. Our clinical dean and clinical chairs frequently visit Aruba and emphasize the importance of professionalism, communication skills and critical appraisal skills which is helpful. Visiting faculties from other institutions also emphasize the same. To facilitate greater student involvement in curriculum development and implementation, a student representative to

Table 2. Basic assessment format followed during the first semester (MD1)

Multiple choice questions and short answer questions based exams (70% of final marks)	Assessment during interactive lectures	Assignment
System ending exam (50%) Quizzes = 20%	20% of total marks	10% of total marks

Faculty may conduct oral examinations in their subject and the scores will be added to the quiz scores. Students should obtain 70% overall to pass the course.

Table 3. Assessment format for musculoskeletal system

Multiple choice questions and short answer questions based exams (65% of final marks)	Assessment during small group session (16%)	Assessment during interactive lectures and case presentation (12%)	Assignment and integrated viva/objective structured practical examination (OSPE) (7%)
System ending exam (50%); Quizzes (15%)	PBL sessions (10%); Small group lab sessions (3%); Anatomy practical (3%)	Interactive lectures 10% of total marks; Clinical case presentation 2% of total marks	Assignment 5% of total marks; Integrated viva/OSPE 2 % of total marks

Students should obtain 70% overall to pass the course. Each system has to be passed separately.

Table 4. Assessment format for patient-doctor and society 1

Critical appraisal of scientific literature	15 weeks	One exam, in session assessment
Epidemiology and Introduction to study of medicine (ISM)	25 weeks	Quizzes, exam (70% Epidemiology, 30% ISM)
Early clinical exposure	30 weeks	Objective structured clinical examination + assignment on writing SOAP (subjective, objective, assessment, and plan) notes
	5 weeks	Dr Croes evaluation
Medical humanities	15 weeks	Mentioned in syllabus
Family health visits	10 weeks	Mentioned in syllabus

Students have to obtain 70% marks in each component of patient-doctor and society 1 to successfully complete the course. A letter of module completion will be issued to those who successfully complete the Medical Humanities module.

the curriculum committee is selected from each semester. A three day orientation program is conducted for the newly admitted MD students to familiarize them with the integrated curriculum and learning strategies [2]. We are emphasizing objective structured clinical examination (OSCE) and have introduced OSCE at the end of most organ systems. We have also introduced a comprehensive OSCE at the end of the sixth semester before students appear for USMLE step 1.

Not having a fixed teaching schedule: When the school was following a discipline-based curriculum each subject/faculty had fixed time slots for teaching during the week which made it easier for them to remember the schedule and conduct the session. Also most disciplines were taught only during particular semesters of the program. After shifting to an integrated curriculum each subject is now being taught across all five semesters and the weekly teaching hours are distributed depending on the demands of the organ system. This may make it difficult for the faculty to remember their teaching sessions. We disseminate the weekly teaching-learning schedule through e-mail and also post the schedule on class notes, our student learning system and also display printed copies on different notice boards but problems do occur occasionally. We use the

school e-mail system extensively for communication among faculty and between faculty and students.

Facilitation skills and curriculum management: Under the revised curriculum there is an increased emphasis on self-directed learning and problem solving. Problem based learning (PBL) sessions are being conducted for all semesters. Faculty members play an important role in facilitating PBL sessions and providing feedback. Small group sessions on CASL are also conducted and faculty guide students through the critical appraisal process. There were initial apprehensions about facilitation and PBL and whether students will be able to learn on their own. The school organized sessions on facilitating PBL, writing cases and defining learning objectives. The curriculum is organized as organ systems. Each system has a system chair responsible for collating the syllabus, scheduling the sessions, collecting various student assessment scores, calculating the final scores, and declaring the results. Faculty members grade students during interactive lectures, PBL, CASL sessions, and case presentations using a structured checklist. These activities pose challenges for faculty members and went beyond the traditional boundaries of didactic teaching in a Caribbean medical school. Sessions for faculty to develop these

skills, and frequent meetings to discuss problems and disagreements were conducted. In medical schools like XUSOM following a hybrid curriculum it is a challenge to ensure that topics allotted for PBL sessions have not already been covered during didactic lectures. There is a certain amount of faculty resistance to not teaching the topics covered in PBL but we are planning to cover certain topics exclusively during PBL sessions for the fourth and fifth semester students starting from the summer 2015 (May) semester.

Obtaining feedback: Obtaining student and faculty feedback is important when implementing a modified curriculum. Also during the last two years the school has been visited by different accreditation agencies and feedback is an important area considered. Faculty opinion about the curriculum is obtained during the integration meetings, the faculty senate, and during curriculum committee meetings. Student feedback is collected at the end of each organ system and feedback about each faculty is collected each semester. Student members of the curriculum committee also provide feedback. We had challenges in analyzing the data as most faculties were not trained in data entry and analysis. We were able to provide the required software and also conduct training for involved faculty in data analysis and interpretation.

Number of questions in the integrated exams: In most Caribbean schools the dominant method of examination is multiple choice questions (MCQs) modeled after the USMLE pattern. In a discipline based system the subject faculty has full freedom regarding the number of questions they could incorporate in the exam. With an integrated curriculum the distribution of MCQs among different subjects becomes an important issue. At XUSOM the number is decided at meetings of the system chairs and the subject faculties. MCQs which can test knowledge from a variety of subjects are also being used. In addition to MCQs, short answer questions (SAQs) and assignments are also incorporated. Often the number of questions remains a difficult issue to resolve. SAQs have been introduced to develop the students' ability to logically develop their thoughts and write them down. Assignments and SAQs also develop students' ability to search the literature and identify objective unbiased sources of information. SAQs are mainly used in Epidemiology and Introduction to Study of Medicine. The process of person or P-drug selection in pharmacology is also a structured exercise. Each organ system has an in-

tegrated assignment where a common disease from the system is presented and questions related to the disease condition from different subjects are presented to the students. Recently we sometimes also use non-integrated system ending assignments. All SAQs and assignments are structured. I have briefly highlighted certain of these challenges in a recent article [4].

Thus we have been able to address many of the challenges involved in shifting to an integrated curriculum. With a relatively younger faculty there was/is a greater willingness to be open and adaptive to change. There was also strong support from the higher management and a willingness to discuss and address contentious issues. Shifting to a new curriculum is always stressful and challenging. Our experiences will be of interest to other schools interested in shifting to an integrated curriculum or aiming towards greater integration of an already existing curriculum.

ORCID: P. Ravi Shankar: <http://orcid.org/0000-0001-6105-5636>

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

REFERENCES

1. Shankar PR, Bharti R, Ramireddy R, Balasubramaniam R, Nuguri V. Students' perception of the learning environment at Xavier University School of Medicine, Aruba: a follow up study. J Educ Eval Health Prof. 2014;11:9. <http://dx.doi.org/10.3352/jeehp.2014.11.9>
2. Shankar PR. Designing and conducting a two day orientation program for first semester undergraduate medical students. J Educ Eval Health Prof. 2014;11:31. <http://dx.doi.org/10.3352/jeehp.2014.11.31>
3. USMLE content description and general information [Internet]. Federation of State Medical Boards of the United States, Inc. and the National Board of Medical Examiners. 2014 [cited 2015 Feb 14]. Available from: http://www.usmle.org/pdfs/step-1/2014content_step1.pdf.
4. Shankar PR. Challenges in implementing an integrated curriculum in Xavier University School of Medicine, Aruba. Educ Med J. 2014;6:e74-e77. <http://dx.doi.org/10.5959/eimj.v6i4.290>