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RESEARCH ARTICLE

Student feedback about the integrated curriculum in a Caribbean medical school

P. Ravi Shankar[1]*, Ramanan Balasubramanium[2], Neelam R. Dwivedi[3], Vivek Nuguri[2]

Departments of [1]Pharmacology, [2]Pathology, and [3]Clinical Medicine, Xavier University School of Medicine, Aruba, Kingdom of the Netherlands

Abstract

Purpose: Xavier University School of Medicine adopted an integrated, organ system-based curriculum in January 2013. The present study was aimed at determining students' perceptions of the integrated curriculum and related assessment methods. **Methods:** The study was conducted on first- to fourth-semester undergraduate medical students during March 2014. The students were informed of the study and subsequently invited to participate. Focus group discussions were conducted. The curriculum's level of integration, different courses offered, teaching-learning methods employed, and the advantages and concerns relating to the curriculum were noted. The respondents also provided feedback about the assessment methods used. Deductive content analysis was used to analyze the data. **Results:** Twenty-two of the 68 students (32.2%) participated in the study. The respondents expressed generally positive opinions. They felt that the curriculum prepared them well for licensing examinations and future practice. Problem-based learning sessions encouraged active learning and group work among students, thus, improving their understanding of the course material. The respondents felt that certain subjects were allocated a larger proportion of time during the sessions, as well as more questions during the integrated assessment. They also expressed an appreciation for medical humanities, and felt that sessions on the appraisal of literature needed modification. Their opinions about assessment of behavior, attitudes, and professionalism varied. **Conclusion:** Student opinion was positive, overall. Our findings would be of interest to other medical schools that have recently adopted an integrated curriculum or are in the process of doing so.

Key Words: *Assessment; Caribbean region; Curriculum; Formative assessment; Integrated; Teaching-learning*

INTRODUCTION

Integrated curricula have been implemented in medical in developed and developing countries. Medical schools have shown that it is possible for students to learn basic science subjects in conjunction with clinical medicine and humanistic care, without experiencing a decrease in basic science knowledge [1]. In their implementation of integration, most schools follow an organ system or an approach based on clinical conditions. However, improving and strengthening integration is always a challenge. Xavier University School of Medicine in Aruba, Kingdom of the Netherlands, is a private medical school admitting students from the United States, Canada, and other countries to the undergraduate medical (MD) course. In January 2014, the school switched to a partially integrated curriculum and introduced early clinical exposure (ECE), small-group learning, and problem-based learning (PBL) sessions [2]. A medical humanities (MH) module was introduced for first-semester students; in addition, sessions on critical appraisal of scientific literature (CASL) were initiated. Initially, subjects on normal human functioning, such as anatomy, physiology, and biochemistry were taught during the first two semesters. In the third and fourth semesters, subjects on abnormality, such as pathology, pharmacology, and microbiology were presented, along with an introduction to clinical medi-

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

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cine. Since January 2014, the curriculum was fully integrated and all basic science subjects were taught together in an integrated manner, using an organ system-based approach [3]. The present study was conducted so as to obtain students' perceptions of the integrated curriculum and assessment methods. Suggestions for further improvement of teaching-learning and assessment were also elicited.

METHODS

The study was conducted among first-, second-, third-, and fourth-semester undergraduate MD students during the last ten days of March 2014 enrolled in Xavier University School of Medicine, Aruba, Kingdom of the Netherlands.

All students were informed about the study and invited to participate. Emphasis was placed on the fact that participation in the study was voluntary. Focus group discussions (FGDs) were subsequently conducted with interested students.

Written informed consent was obtained from all the participants. The FGDs were both audio- and video-recorded. The FGDs took approximately 90 to 100 minutes. Each FGD was initiated through a question to the participants about their overall opinions about the MD curriculum and, respectively, two important areas of strength and improvement in this regard. The FGD guide used is shown in Appendix 1. The respondents were asked whether they felt that the curriculum was successful, given its integration of various subjects through organ systems. The respondents' opinions about PBL and other small-group sessions, as well as how these contribute towards integration were also elicited. The respondents were asked to rate the extent to which they felt that the curriculum was integrated, using a scale of 1 to 10.

The respondents were also asked about the advantages that they could possibly derive from studying under an integrated curriculum, in relation to their licensing exams and for their future careers. Their anxiety and concerns during their studies were also discussed. The respondents were asked about the strengths of FGDs and areas needing improvement. Their opinions regarding the integrated system of assessment were elicited through multiple choice questions (MCQs). In addition, there was a discussion on whether the respondents felt that the assessments were based on learning objectives. We also obtained students' opinions regarding formative assessment, assessment of attitude and behavior, and objective, structured clinical examination.

The data were analyzed through deductive content analysis. The recordings of the FGDs were transcribed by the interviewers. The interviews were conducted in English and the transcripts were also written in English.

RESULTS

Of the 68 students (32.3%), 22 participated in the study. The semester of study and the respondents' nationality and gender were noted. Table 1 shows the respondents' demographic characteristics.

The respondents' overall opinion of the MD curriculum was positive. They were of the opinion that the integrated curriculum provided them with a holistic view of the roles of the different subjects in medicine and patient care. The first-semester students who were following a fully integrated curriculum had a more positive opinion of the curriculum than other semester students. A participant stated,

> *"We have to use all the subjects in an integrated manner when we practice in future. Studying the subjects together gives us an advantage. In addition, we have early clinical exposure and exposure to MH, and other sessions (participant 1, P-1)."*

The respondents also stated that repetition of similar topics in different subjects has decreased and that an improved and more holistic view is being promoted. A respondent shared,

> *"We learn all subjects together under an organ system. The normal and the abnormal are learned alongside one another. We learn about normal cellular structure in histology and then cover the same abnormal structure in pathology. So, we can actually see what is happening to the cells in the event of disease. In physiology, we learn about normal functioning and come to understand how abnormal functioning can cause disease. In pharmacology, we also learn about the treatment of diseases (P-7)."*

The students felt that the integration of topics through organ systems was successful. The first-semester respondents had more positive opinions regarding the integration than the respondents enrolled in other semesters and felt that PBL ses-

Table 1. Respondents' demographic characteristics

Characteristic	Classification	Number
Year of study year	MD1	5
	MD2	6
	MD3	5
	MD4	6
Nationality	American	13
	Canadian	5
	Other	4
Gender	Male	12
	Female	10

sions contributed significantly to integration and yielded additional benefits. A respondent mentioned,

"During PBL, we bring all subjects together and apply them to a particular patient problem, which is what we will be doing in future. In addition, we are active during PBL and are actively searching for information. We also work as a team. We learn from each other. Some of us may be good in one subject while others excel in others. During the PBL sessions and preparation for the presentation, we can teach other students a subject that we excel in and they can teach us one that they excel in (P-22)."

There was a difference of opinion among the MD1 students and others regarding the curriculum's level of integration. MD1 students felt that the curriculum should be scored out of 9, or even 10, out of 10, whereas respondents in the other semesters gave it a score of 7 or 8. The MD1 students initially had difficulties learning the various subjects simultaneously, but were later able to adapt and understand the advantages of learning under this system.

"When I first came, I had difficulties... like you have to learn nine or ten subjects simultaneously. My problem was time allocation and management. Then, I realized the advantages of the integrated system, like how it promoted a better understanding of course and how one subject facilitated the learning of another. Now, with my hard work and support from teachers and seniors, I am in a much better position (P-18)."

Most students were aware that most medical schools in the United States (US) use integrated curricula and that Xavier University School of Medicine offers students a state-of-the-art curriculum. Some of the anxieties that the students mentioned were that certain subjects take up more time during the academic schedule and are allocated a larger proportion of questions in the integrated exams. So, the students could perform well in the exams by concentrating only on the high-yield subjects, while neglecting subjects with a lesser percentage of marks.

Students expressed positive opinions about the MH module. However, a concern expressed about the MH ECE, and several other sessions was that these subjects may not be directly relevant for United States Medical Licensing Examination (USMLE) step 1 preparation. A respondent stated,

"Medical humanities will help us be more empathetic doctors and has helped us gain a better understanding of the patient perspective. We know what the patient goes through when he or she is sick. We will certainly apply this in our practice (P-3)."

Students stated that sessions on CASL should be better organized and that faculty facilitators should develop a better idea of the aims and objectives of the sessions and how they should be conducted. With regard to ECE, they felt that more general practitioners (GPs) should participate and expose students to clinical practice. At present, only one general practitioner is involved in teaching.

The most significant strength of the system of assessment used in the institution was the use of integrated exams. The MCQs followed the frame used by USMLE and by testing the students on clinical scenarios, as well as their conceptual knowledge and understanding. The system's final and comprehensive exams have been modeled after the USMLE's step 1 pattern and are divided into four sessions, taking up the entire day. Students' attitudes and behavior are assessed through a structured rubric. Their attendance of lectures and small group sessions, involvement in the learning courses, professional appearance, and professionalism are assessed. Opinions regarding this type of assessment were mixed. Some felt that this method of grading compels them to attend classes. In general, the students were mostly unaware of the educational objectives of the institution and the syllabi for different systems and subjects.

DISCUSSION

Student feedback about the integrated curriculum was positive. The first-semester (MD1) students who learned all the basic science subjects collectively, in an integrated, organ system-based manner expressed more positive opinions than other semester students. The students expressed their appreciation of the integrated assessment system and mixed opinions regarding the assessment of attitudes and behavior.

The distribution of the respondents with regard to gender, semester of study, and nationality corresponds to the institution's student composition. Previous studies examining feedback regarding integrated curricula by both students and faculty showed that the feedback was mainly positive. The perceptions of faculty members in an Asian medical school regarding the first batch of students who had graduated from an integrated curriculum were highly positive. These faculty members were of the opinion that the integrated curriculum produced better graduates [4]. The respondents in our study felt that an integrated curriculum would help them perform better in USMLE. A recent study concluded that students following a discipline-specific curriculum and those following an integrated curriculum obtained similar USMLE step 1 exam scores [5]. In another US medical school, student performance in USMLE step 1 was significantly higher among students following an integrated curriculum, especially those who had

obtained scores that were in the lower quartile of the Medical College Admission Test, than students following a traditional curriculum [6].

In China, a recent survey indicated that many medical schools have shifted to an integrated, organ system-based curriculum, using a PBL-based or hybrid curriculum [7]. Xavier University School of Medicine follows a hybrid curriculum, with the majority of teaching and learning occurring through interactive lectures, and PBL sessions used to supplement learning. PBL sessions are appreciated by students and have several advantages. However, the weekly sessions account for only two of the approximately thirty hours allocated to teaching and learning, which is low, by international standards. In China, a large majority of schools that used PBL did so for less than 50% of the total curricular hours [8]. In the United Kingdom, graduates of the University of Liverpool, who studied under an integrated PBL curriculum, felt that many objectives of curriculum reform had been met and that they were well prepared to enter clinical practice as doctors [9]. However, they felt that their knowledge of basic science was weaker than that of traditional graduates and that they had to work harder to pass postgraduate exams; they stated that they would have preferred a better 'structure' alongside PBL, while studying basic sciences.

Xavier University School of Medicine has been offering the MH module to first-semester students since January 2013. Participant feedback about the inaugural MH module delivered during the 2013 spring semester was positive [10]. Some of the advantages of this module are that it enables a discussion of topics such as death and dying and coping with dying patients, ensuring that students feel safe and objective when sharing their thoughts. MH reminds students of the patient experience and eloquently distills muddy feelings into nuanced words; and the module serves as an anchor for a state of mind that nurtures and promotes reflection [11]. Critical appraisal refers to the skill of reading a research article in a very objective and structured way. Considering the importance of lifelong learning and evidence-based medicine, many medical schools around the world teach students to evaluate scientific literature. Ziauddin Medical University in Karachi, Pakistan offers undergraduate and postgraduate medical students a course on CASL; participating students gave positive feedback about the course [12].

Students spend about two hours every week with a local GP, learning history-taking and physical examination skills. GPs and family medicine practitioners have typically has participated in training medical students in many countries [13]. In accordance with global trends, formative assessment and the assessment of students' attitudes, behavior, and professionalism have been introduced to Xavier University School of Medicine. Students are given regular feedback about their performance in various assessments and each student is assigned a faculty mentor. A recent Pakistan-based article indicates the quality of feedback as the most important factor affecting the success of formative assessment [14]. Formative assessment is one of the most effective strategies for promoting high student performance and developing students' 'learning to learn' skills [15].

For a qualitative study, the response rate was high and the respondents were representative of the student population. The study also had limitations. Student responses were collected through FGDs only, and no other methods were used, so that the results could be triangulated. The FGDs were conducted and recorded by faculty members, which could have influenced the students' responses. Many of the respondents' perceptions about the influence of the integrated curriculum and integrated assessment on their performance in different licensing exams and other types of exams and on their future professional careers can be only confirmed through studies. The overall number of students in the study is low; however, considering the qualitative nature of the study and that the data were saturated, the sample may be representative of the opinions of the students at the school.

In conclusion, the findings of our study would be of interest to other schools that have recently adopted an integrated curriculum or are planning to do so in the near future. The students in our study appreciated the small-group PBL sessions. Sessions on the critical appraisal of scientific literature are important. The students' opinions about the assessment of attitudes, behavior, and professionalism were mixed. The transition to an integrated curriculum from a discipline-based one is challenging, but has significant advantages for student learning and students' preparation for licensing exams and future practice.

ORCID: P. Ravi Shankar: http://orcid.org/0000-0001-6105-5636; Ramanan Balasubramanium: http://orcid.org/0000-0002-3111-5383; Neelam R. Dwivedi: http://orcid.org/0000-0002-9751-5451; Vivek Nuguri: http://orcid.org/0000-0001-7141-1980.

CONFLICT OF INTEREST

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

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SUPPLEMENTARY MATERIAL

Audio-recording of the abstract.

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Appendix 1. Focus group discussion guide

Student feedback about the integrated MD curriculum

- What is your overall opinion about the MD curriculum?
- Can you mention what, in your opinion, are two important strengths of the MD curriculum?
- Can you mention two important areas which need improvement?

Curriculum

- Is the structuring of the integration according to organ systems successful?
- According to you, is the integration strategy involving the arrangement of interactive lectures in an organ system, with one lecture soon after the other successful?
- How do the PBL sessions contribute towards greater integration of topics?
- How do case presentations and case discussions contribute towards integration?
- What is the role of clinico-pathological conferfences in promoting integration?
- According to you, how integrated is the Xavier University School of Medicine curriculum (on a scale of 1 to 10, with 1 indicating 'least integrated' and 10 indicating 'most integrated')?
- Do you have suggestions that could facilitate greater integration of subjects at Xavier University School of Medicine?
- Are you aware of other integrated curricula in the Caribbean and in other regions?
- According to you, what advantage will study under an integrated curriculum offer you in (a) your United States Medical Licensing Examination step 1 exam?; (b) your future career?
- Do you have any anxieties and concerns while studying under an integrated curriculum?
- If yes, could you elaborate on those?
- According to you, going forward, what are the major barriers to greater integration of subjects?
- How do you feel about the Medical Humanities module? How can it be improved?
- What are your suggestions regarding improvement of critical appraisal of scientific literature sessions?
- How do you feel about early clinical exposure and visits to Dr Croes' clinic?
- How can these sessions be improved?

Assessment

- What, according to you, are two important strengths of the assessment system at XUSOM?
- What is your opinion about the integrated assessments involving the use of multiple choice questions?
- What is your opinion about the formative assessment of attitudes and behavior? How do these, in your opinion, contribute towards achieving the educational objectives of the institution?

Are there any other issues?