Review of the Phase I and Phase II teaching programmes in the School of Medical Sciences, Universiti Sains Malaysia

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Summary

The Phase I and Phase II undergraduate teaching programmes of the School of Medical Sciences were reviewed at the end of the 1985/86 academic year. It was found that deviations from the School's philosophy had crept into the implementation process. Modifications were therefore made in Phase I and Phase II programmes with a view to:– (i) reducing content, (ii) promoting integration, (iii) improving clinical examination skills of students, and (iv) providing more opportunities to students for self learning, reinforcement and application of knowledge. The number of assessment items in Phase I and the frequency of assessment in Phase II were also found to be inappropriate and so modifications in assessment were made to rectify this situation.

Key words: School of Medical Sciences, Universiti Sains Malaysia; curriculum review, implementation, assessment.

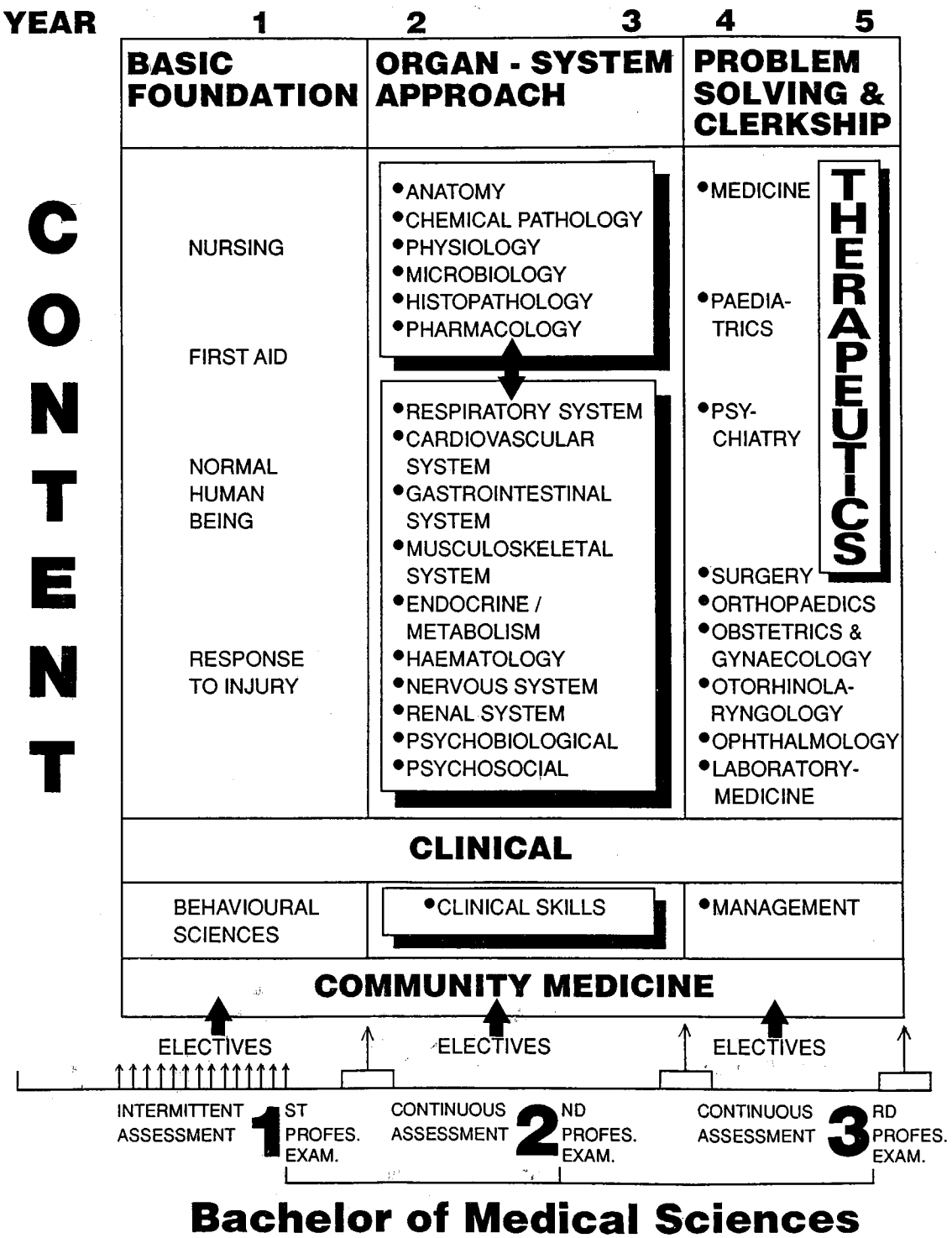
Introduction

The first graduates of the School of Medical Sciences, Universiti Sains Malaysia, received their degrees in July 1986, thereby completing the five year cycle. The philosophy and objectives of the school have been described in a previous communication.[1] And more recently the details of the implementation of the educational programme have been discussed at an international symposium.[2] This communication concerns Phase I and II undergraduate teaching programmes, the gradual changes that have taken place in their implementation and the modifications that have been made subsequent to review of both phases at the end of the academic year 1985/86.

Background

The five year integrated medical/teaching curriculum is divided into three phases (Fig. 1). Phase I covering the first year, is designed to provide the basic foundation. Initially (1981/82 academic

Plan of the USM Medical School Curriculum.



Bachelor of Medical Sciences

year), it was offered in five distinct packages: First aid and nursing; normal human being; response to injury behavioural sciences and epidemiology and statistics. In the subsequent academic year and thereafter, the above subject matter was integrated into 13 blocks namely: Cell and tissues; growth and development; blood; nervous system; locomotor system; cardiovascular system; respiratory system; renal system; digestive system; nutrition; endocrine system; reproductive system, and "host and environment". (see Table 1A) The nursing course, which is conducted by the School of Nursing, is still run as a separate package. The statistics and epidemiology packages run parallel to the blocks.

In Phase II, the blocks consist of cardiovascular, respiratory, genitourinary, gastrointestinal, endocrine, nervous, haematopoietic, reproductive and musculoskeletal systems. Head and neck, psychiatry and communicable diseases. There is also a school programme called the Community and Family Case Study (CFCS) programme which runs parallel to the blocks in Phase II.

Teaching/learning activities in both phases are interdisciplinary and integrated. Teaching/learning activities consist of lectures, small group discussions, seminars, slide tapes and videos.[2] In Phase II, problem based learning (PBL)[3] is emphasised. In addition, the students are exposed to the clinics starting from the first year. In Phase II, clinicals are an integral part of the blocks.

In Phase III (year four and five) clinical work and hospital attachments account for a high percentage of the student's time. The Phase III programme is arranged into a general block and specific blocks. The general block covers common topics outside the scope of the specific blocks. For example, forensic medicine, therapeutics and other topics that are best implemented as one group. Specific blocks are divided into medical based blocks and surgical based blocks respectively. During the implementation of specific blocks the students are divided into groups and these groups rotate through the various disciplines.

During the Phase II programme which started in the 1982/83 academic year, students were sequentially exposed to the various blocks within a period of two years. The first year of Phase II comprises of six blocks and the second year of Phase II another six blocks. However, this was modified in 1984/85 to accommodate the second and third year students as one class. This arrangement requires three blocks to run concurrently. For example, the haematopoietic, reproductive and musculoskeletal. And a student group would cover the blocks in three consecutive rotations.

Assessment in Phase I comprises of end of the block assessments, end of term assessments (terms 1, 2 and 3) and a professional (I) examination. End of block assessments are for feedback and remedial instruction only. Assessment in Phase II before the review consists of end of blocks as well as the professional examination. Since Phase II consists of 12 blocks there is a total of 36 end of blocks examinations in Phase II in addition to the Phase II professional examination.

Review of Phase I and II programmes

Analysis: A review of Phase I and Phase II programmes was carried out at the end of the 1985/86 academic year and before the beginning of the 1986/87 academic sessions. It was done through analysis of time tables, examination questions, external examiners reports, feedback from staff and also from the impressions gained from scrutiny of actual teaching learning activities. It revealed the following:

In Phase I: (a) there was a progressive increase in the number of lectures and other teaching sessions, resulting in "overloading" of the blocks. Much of the increase in teaching learning

activities were "information giving" sessions, (b) correspondingly, less time was available for reinforcement, application of knowledge, problem solving and self learning, and (c) both (a) and (b) were reflected in the disproportionately large number of assessment items in the term examinations.

Some of the findings of the Phase II review were very similar to the above findings with the exception of assessment. The main fault in assessment in Phase II was the frequency of assessment, rather than the number of assessment items. In addition, the students who had gone through the Phase II programme, (a) had limited ability to correlate basic sciences to symptoms and signs, (b) had poor clinical examination skills, (c) were good in recall of knowledge but had limited ability to apply knowledge in clinical situations, and (d) lacked initiative and self study habits.

At the time of the review (end of 1985/86 academic year), the first cohort of students had just graduated and it was considered premature to review Phase III.

Modifications

In order to remedy some of the deficiencies, remedial measures were taken to reduce overloading, provide more opportunities for students for reinforcement and application of knowledge, enhance clinical examination skills and encourage students to develop self study skills and initiatives.

This, it is hoped, could be achieved through deletion of some lectures, having more small group discussions, reinforcement sessions, independent study periods, structured self study sessions and problem solving exercises. Appropriateness of content is also critically assessed. Table 1A summarises the number of hours scheduled for various teaching learning activities in the academic year 1985/86, before the review of Phase I. Table 1B shows the scheduled teaching learning activities for the academic year 1986/87. Comparison of Tables 1A and 1B respectively indicate that the number of lectures have been reduced by 76.5 hours and practical demonstration sessions were reduced by 27.5 hours. In contrast, there is an increase in small group discussions, problem solving exercises and tutorials by 39.5 hours. And revision sessions by 18 hours. Structured self study periods and fixed learning modules have also increased by 53.5 hours and 25.5 hours respectively.

In addition to the above changes, measures towards more integration have also been taken. A few examples of these changes in the teaching learning processes are: (i) in the "Nervous System" The three separate lectures originally scheduled on "Synapse and Synaptic Transmission" "Neurotransmitters" and "Axonal Transmission" is restructured into a guided self study followed by a subsequent small group discussion, (ii) the integration of applied and radiological anatomy with gross anatomy in the cardiovascular, digestive and locomotor systems and (iii) the fluid and electrolytes component with self study by students followed by tutorials, which replaced the compartmentalised lectures on "sodium metabolism", "potassium metabolism" etc. of the previous years. Similar modifications were made in the Phase II programme.

The following measures were also undertaken:

(a) A log book system to ensure experiential exposure of the students to history taking and clinical examination.

Table 1A[+]

Number of hours scheduled for various teaching activities in Phase I in the academic year 1985/86

Teaching learning activity	SYSTEM/BLOCK*														
	Cell	Growth	Blood	N. Syst.	Loco-motor	CVS	Resp.	Dig.	Nut.	Renal	Endo.	Rep.	Host	Total	% of total hours
Lecture	24.0	22.0	17.0	54.0	38.0	23.0	22.0	37.5	8.5	19.5	19.0	13.0	28.0	325.5	32.68
SGD**	5.5	9.5	11.0	12.5	7.5	9.0	2.0	9.5	6.0	7.0	12.5	0.0	10.0	102.0	10.24
Self study	17.5	16.5	5.5	23.0	23.5	16.0	8.5	12.0	7.5	12.5	7.0	5.5	3.0	159.0	15.96
Structured self study	4.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.5	0.0	6.0	0.0	2.0	15.0	1.50
Practical/ Demonstration	20.5	14.5	14.0	33.5	42.0	16.5	15.5	23.5	0.0	15.0	4.5	10.0	22.0	232.0	23.29
FLM***	0.0	2.0	2.5	0.0	0.0	0.0	0.0	5.5	0.0	0.0	0.0	0.0	10.5	20.5	2.05
Video, Tape Slide, Film	4.5	9.5	2.5	8.0	4.5	6.0	2.0	2.5	4.5	0.0	0.0	2.0	15.0	61.0	6.12
Revision	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	3.0	0.0	2.0	0.0	9.0	0.90
Remedial Instruction following Assessment	1.5	1.5	1.5	1.5	3.5	3.0	1.5	3.5	0.0	2.0	2.5	0.0	0.0	22.0	2.20
Clinical****	6.0	10.0	0.0	2.5	2.0	3.0	2.0	3.5	0.0	2.5	2.0	0.0	0.0	33.5	3.36
Seminar & Student Presentation	0.0	5.5	0.0	0.0	0.0	0.0	0.0	2.0	4.0	0.0	5.0	0.0	0.0	15.5	1.65
													Grand Total	996.0	100

Table 1B[+]

Number of hours scheduled for various teaching activities in Phase II in the academic year 1986/87

Teaching learning activity	SYSTEM/BLOCK*														
	Cell	Growth	Blood	N. Syst.	Loco-motor	CVS	Resp.	Dig.	Nut.	Renal	Endo.	Rep.	Host	Total	% of total hours
Lecture	17.0	22.0	12.0	37.0	26.0	17.0	19.0	26.5	8.0	13.5	18.0	8.0	25.0	249.0	24.62
SGD**	3.0	13.5	17.0	12.0	7.5	23.0	5.0	15.5	5.5	8.0	12.5	1.0	18.0	141.5	14.00
Self study	35.0	6.0	6.0	20.0	15.0	3.5	14.5	7.0	7.0	8.0	8.0	8.0	10.0	148.5	14.68
Structured self study	4.0	7.0	0.0	12.0	1.0	6.5	0.0	6.5	1.0	12.0	6.0	8.5	4.0	68.5	6.77
Practical/ Demonstration	20.5	8.0	20.0	29.5	39.5	17.0	12.5	25.5	2.5	16.0	4.5	0.0	9.0	204.5	20.22
FLM***	0.0	0.0	4.0	0.0	18.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.5	46.0	4.54
Video, Tape Slide, Film	5.0	9.5	1.5	5.5	2.0	1.0	3.5	3.5	3.5	0.0	5.0	3.0	3.5	48.0	4.75
Revision	0.0	0.0	0.0	9.5	9.0	3.5	0.0	0.0	0.0	3.0	0.0	2.0	0.0	27.0	2.67
Remedial Instruction following Assessment	2.5	1.5	0.0	1.5	3.0	5.0	1.5	1.5	0.0	1.5	2.5	1.5	0.0	22.0	2.17
Clinical****	0.0	16.0	0.0	2.5	3.5	6.5	2.5	3.0	0.0	2.0	2.0	0.0	0.0	38.0	3.76
Seminar & Student Presentation	0.0	0.0	0.0	0.0	0.0	3.0	2.0	2.0	4.5	0.0	5.0	0.0	2.0	18.5	1.83
													Grand Total	1011.5	100

[+]See next page for Legend to Tables 1A and 1B.

Legend to Tables 1A and 1B

Abbreviations for Systems/Blocks as follows:

1.	Cells and Tissues	–	Cells
2.	Growth and Development	–	Growth
3.	Blood	–	Blood
4.	Nervous System	–	N. Syst.
5.	Locomotor System	–	Locomotor
6.	Cardiovascular System	–	CVS
7.	Respiratory System	–	Resp.
8.	Digestive System	–	Dig.
9.	Nutrition	–	Nut.
10.	Renal System	–	Renal
11.	Endocrine System	–	Endo.
12.	Reproductive System	–	Rep.
13.	Host & Environment	–	Host.

**SGD – Small group discussion. Also includes tutorials and problem solving exercises.

***FLM – Fixed Learning Modules.

****Clinical includes hospital visits, physical examination, discussion of clinical procedures/ problems in campus aided by video shows and nursing. Nursing courses takes place in parallel with the 'Cell and Tissues' and 'Growth and Development' blocks.

(b) Staff seminars being replaced by student seminars, to encourage active learning. This will provide opportunities for peer discussions among students.

(c) The fixed learning modules are modified to allow for more 'interactive' type of stations.

These modifications in the Phase I and II programmes necessitated changes in assessment. The number of items in both the term and the professional examinations have been reduced in Phase I. This is shown in Table II. In addition, the frequency of assessments have been reduced in Phase II from three end of block examinations, to one examination at the end of three blocks. This examination covers areas from all the three different blocks. The number of MCQs in the Phase II end of block examinations are similarly reduced, but the number of objective structured clinical examinations increased. This is shown in Table III. The professional examination format in Phase II remains the same.

Discussion

This review was necessary as the objectives for both phases had not been attained as reflected in the performances of students. The findings confirm the need for this review. These shortfalls resulted from a misunderstanding of the concept of problem-based learning. Factors contributing to this include:

(a) The belief that all the normal structures and functions need to be covered in Phase I before students enter Phase II.

(b) Failure to dissociate the first year programme of the Universiti Sains Malaysia Medical School from the traditional medical school curriculum by departments.

(c) Duplication of content through fragmentation of learning modules.

Table II

Changes in assessment in Phase I after the review

Assessment items	1985/86 Academic year		1986/87 Academic year	
	Term	Professional	Term	Professional
MCQ	80–100	200	50	150
Essays	10–12	10–12	5	10
Practical/Spots	20–25	35–40	20	30

Table III

Changes in end of block assessment in Phase II after the review

Assessment Items	1985/86 Academic year	1986/87 Academic year
MCQ	60	33
Modified Essay Question (MEQ)	4	2
Objective Structured Clinical Examination (OSCE)	4	7

(d) The conception (or rather misconception) that students will not learn unless they are lectured.

(e) The role of teacher being a facilitator of learning has been misinterpreted as students requiring no supervision. Students are then left to their own devices.

To facilitate the implementation of these changes, the reduction of the frequency of examinations would relieve the burden of staff having to cope with many assessment items. It is therefore hoped that more time would be available for staff to implement more effective and imaginative teaching learning methods and to produce better quality questions.

Conclusion

It appears to us that even in a programme with clearly stated objectives of commitment to integration and problem solving, the tendency to deviate from the schools philosophy can creep in unless closely monitored and remedied. The establishment of an innovative approach in itself is a difficult process. Equally important is safeguarding the innovations which have been established. For these reasons, new staff need to be initiated to the philosophy of the school and even the older staff need to be reminded of it from time to time. For this reason a continuous staff development programme is going to be implemented at the School of Medical Sciences at USM. It is hoped that the modifications in content, process and assessment that we have introduced, will overcome the overloading of students; provide opportunities to think, to apply knowledge, provide opportunities for review and revision, and prepare the students to meet the challenges of Phase III.

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