

Problem-Based Learning in Undergraduate Medical Education: The NUS Faculty of Medicine Experience

By Problem-Based Learning Committee*, Faculty of Medicine, National University of Singapore

Editor's Note:

This article is only an abridged version and follows from an earlier overview to Problem-Based Learning, published in the April issue of SMA News. The complete article is available on the SMA website at http://www.sma.org.sg/sma_news/newscurrent.html

CURRICULUM REFORM IN THE SINGAPORE MEDICAL SCHOOL

"...the NUS Faculty of Medicine needs to respond decisively and appropriately to the rapid changes in medicine and medical education, to ensure that graduates are well equipped to meet the challenges of medical practice in the years ahead"

"In determining the direction and substance of the curriculum reform, the Faculty of Medicine was guided by the vision of the type of graduate which it aspired to train" (Tan, CC, 1999).

Since its founding in 1905, our medical school recently undertook a most radical, extensive and insightful reform of our undergraduate curriculum initiated by Professor Tan Chorh Chuan, then our newly appointed Dean. Professor Tan undertook the onerous task with strong leadership and clear vision.

Educational objectives relate to: Basic science foundation for clinical practice; Clinical competence; Communication; Appropriate attitudes; Professional development.

Faculty-Directed Curriculum: Overcoming Problems Of Departmentalization

Marked departmentalization of the various (particularly non-clinical) disciplines within the overall medical curriculum leads to the tendency and the temptation to focus on educating the medical student to be a "specialist" in that particular discipline and in the process, tends to lose sight of the overall objective of our undergraduate medical education. In order to overcome this pitfall, the overall organization and delivery of our new medical curriculum is now faculty-directed, including "Faculty-directed integrated examinations ensuring emphasis on core knowledge and principles, and conceptual understanding" (Tan, 1999).

Pedagogical Underpinnings Of

Our New Medical Curriculum:

Shifting The Educational Paradigm
"After examining a number of curriculum models and taking into account local conditions, the faculty elected to adopt an integrated systems-based approach supplemented by problem-based learning methodologies" (Tan, 1999).

Essentially, our new medical curriculum represents a hybrid curriculum with a fundamental shift in the educational paradigm from the traditional highly teacher-centred, discipline-based teaching (lecturing) in a largely passive learning environment (i.e. the sage-in-centre stage approach), to a more student-centred, faculty-directed, active learning environment. In the design of our new curriculum, much more emphasis is focused on encouraging and empowering students to take on greater initiative and responsibility to direct and to manage their own learning and, thus, to involve students in the educational process itself. This is aimed primarily at further enhancing the learning potential of students and in fostering the development of independent, self-directed, life-long learning.

IMPLEMENTING PROBLEM-BASED LEARNING: THE NUS MEDICAL SCHOOL EXPERIENCE

A key feature of our new curriculum is the incorporation of Problem-Based Learning (PBL), not merely as a teaching method, but also as an innovative educational strategy to foster self-directed learning (see April Issue of SMA News). Although PBL occupies only 20% of our overall curriculum time, nevertheless, PBL is a key educational strategy that impacts strongly on the overall curriculum, on student learning and its outcome and on the changing role of the teacher from that of instructor (lecturer) to the facilitator who nurtures the learning process.

Taking The First Step:

Planning For Change

A PBL Committee consisting of 5 faculty staff from different disciplines (biochemistry,

obstetrics and gynaecology, orthopaedics, pharmacology, radiology) was first appointed by the Dean in December 1998 to undertake the responsibility of planning, organizing and implementing PBL in the Year I curriculum in August 1999.

More recently, the PBL Committee has co-opted 4 more new members, representing the disciplines of medicine, surgery, orthopaedics and pharmacology/psychological medicine. This is in preparation for the progressive implementation of PBL in the clinical years (Year III-V) of our medical course, beginning in September 2001. Strong leadership by and continued strong support from the Dean (past and present) greatly facilitated the work of our Committee.

Taking The Second Step: Focusing On Changing The Mindsets

Intensive PBL Workshops were organized separately for teachers and students. Each cohort of new students is required to participate in the PBL Workshops before they attend the first PBL tutorial. At such Workshops, the Dean delivers a brief address in which he reaffirms his support for and the importance of implementing PBL in our undergraduate curriculum. Each Workshop consists of an overview to PBL, video demonstration, hands-on practice and feedback session.

Working Towards A Common Educational Goal: Case Writing And Designing Case Problems

An important aspect in the implementation of PBL is to identify case writers with the appropriate expertise to design case problems with educational objectives consistent with those specified for the course curriculum. Case topics are usually identified by the Curriculum Committee which also reviews the written cases and provides feedback to the case writers. A meeting of tutors with the case writers is then scheduled, during which the case writers present the problem case to tutors for further review, discussion and feedback.

A beneficial outcome of the meetings

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of case writers and tutors is that there is open discussion with multidisciplinary inputs from tutors aimed at achieving a common educational goal. This presents a golden opportunity for medical teachers in our faculty to widen their educational horizons beyond their own specific disciplines. For the basic science teachers, especially, this means that they gain a much broader and clearer perspective of the integration and application of the basic sciences in clinical practice.

Ensuring Availability Of Logistics Support

The seminar rooms should not be arranged in lecture style sitting but, instead, should allow students to sit with and around the PBL tutor to ensure optimum group dynamics to take place during tutorials.

Each tutor is to serve as a 'main' tutor responsible for the conduct of 4 PBL Case Units (Problems) per semester, and as a 'co-tutor' in the other 4 Problem Units of the course. As the common tutor pool consists of teachers from various disciplines (from anatomy, biochemistry and physiology for Year I, and from microbiology, pharmacology and pathology for Year II), this means that our teachers function as "non-expert" PBL tutors with the important role "...to expedite the intellectual and interpersonal process for the group" (Gresham and Philp, 1996).

Implementation Phase: Through Trials And Tribulations

In August 1999, PBL was first implemented in Year I of our medical course and, in August 2000, it was implemented in Year II of the course. In September this year, PBL will be implemented in the Year III course and then, progressively, it will be implemented in Years IV and V.

In the first year that we implemented PBL, we experienced many "teething problems" that could be attributed to a shift from the usual comfort zone of the passive 'transmit-receive' type teacher-student relationship to a much more active-interactive type learning environment. Another genuine concern was that of basic science teachers who, initially, did not feel

confident enough to be tutoring a 'clinical problem'. Also, some teachers felt that the problem cases were not related to their field of expertise and this would mean that they would have to sacrifice their time doing 'extra reading' to prepare for the tutorials. Problems arising also included tutors who still felt compelled to 'teach and tell' rather than to guide and 'goad', tutors with a genuine interest in but who were still lacking in PBL tutorial skills, tutors who were skeptics and critics, and those who simply lacked enthusiasm in conducting PBL tutorials that could be read like a book by their students.

Students also displayed several adjustment problems, especially in adapting to a more student-centred, peer teaching-learning situation which requires the active participation of every student in the learning process. Some students have expressed that they still preferred to 'sit back' and listen to lectures, sentiments which reflect the traditional mindsets originating from the home, school and even within medical school itself. However, many students also displayed their highly effective communication and creative thinking skills during tutorials and presentations of 'learning issues'. This underscores the need to create the opportunities and a conducive forum to allow for self-expression and self-teaching and learning among students. In this respect, tutors have a major role and a responsibility to provide a conducive learning environment for our students.

Implementation Phase: Providing and Obtaining Regular Feedback

In order to overcome many of our trials and tribulations, several members of the Committee also served as observers of ongoing tutorial classes and noted down 'problem areas' which were later shared with all tutors without any tutor who was observed being named individually. The Committee also sought the views of tutors on what they perceived were 'not going right' and which could be improved upon. Formal feedback sessions were also held with tutors and students together with the Dean, including obtaining 'frank testimonies' from representative students and tutors to share with everyone their early experience of PBL. It was through such feedback sessions that serious problem areas were highlighted

and that allowed remedial action to be taken as soon as possible.

Implementation Phase: Appraisal Of Teacher And Students' Performance
Evaluating a teacher's skills and competence in PBL tutorials will become an officially important part in the overall appraisal of teacher performance in our faculty. Since PBL has only been recently implemented in our faculty, a "trial period" of 2 years was allowed to let teachers develop and gain the necessary experience to become skilful in PBL tutoring. In the year 2001, teachers in Year I will be the first group of teachers to be officially evaluated by their respective group of students at the end of each semester. Students will have to complete a questionnaire for the evaluation.

Teachers will also be required to assess the performance (including the quality of discussion and communication, interpersonal skills) of students in PBL tutorials.

CONCLUDING REMARKS

Our faculty has implemented PBL with the aim of enhancing the quality of medical education for our students to ensure that the undergraduate education which we provide will better prepare our students to meet the new challenges of their future medical practice. It has been a useful and invaluable learning experience for all concerned. Although we have achieved reasonable success in the implementation of PBL, we continue our educational journey with cautious optimism. We still need to ensure that we can continue to build upon and consolidate our initial achievement, and avoid the emergence of the Hawthorne effect in which 'success' represents only a short-term gain from participating in something new and novel, and then waning thereafter. Most importantly, we need to be reminded that "All our strengths and skills as teachers will be required. Commitment, determination and teamwork are essential, and above all we need self-knowledge and considerable understanding of the learning process" (Little, 1997). ■

* Members of the PBL Committee:
Prof Matthew C.E. Gwee (Pharmacology)
Prof P. Balasubramaniam (Orthopaedics)
Rethy Chhem (Diagnostic Radiology)
A/Prof Khoo Hoon Eng (Biochemistry)
Prof Kuldip Singh (Obstetrics & Gynaecology)
A/Prof Tan Chay Hoon (Pharmacology)
Mrs Gn Soon Lay (Secretary)