

## EDITORIAL

### **Introduction of a new curriculum method of teaching known as problem-based learning to the University of Papua New Guinea Medical School**

#### **History of medical training in Papua New Guinea**

In 1961 the Papuan Medical College was established next to the Port Moresby General Hospital to train doctors for the Diploma in Medicine and Surgery. In 1965 the University of Papua New Guinea (UPNG) was established and the Papuan Medical College was incorporated into the University as the Faculty of Medicine. The first students graduated from the University with the degrees of Bachelor of Medicine and Bachelor of Surgery (MBBS) in 1973. At that time, Papua New Guinea (PNG) was the first Pacific Island country to set up its own MBBS degree program and attracted students not only from within the country but also from the other Pacific Island countries. The history of the development of medical training in PNG is described in the current Student Prospectus of the School of Medicine and Health Sciences, University of Papua New Guinea. Since its beginning the Faculty of Medicine has produced 850 doctors. Many of these are now in senior positions at the UPNG Medical School, the national Department of Health, in hospitals throughout the country and also in private practice. Many of the doctors from other Pacific Island countries are also in senior positions in the health sector in their own countries. Furthermore, some have taken up employment as specialists in developed countries like Australia and New Zealand.

In 1974, the Faculty of Medicine established the Master of Medicine (MMed) program. The aim of this program is to produce specialist clinicians who are able to deal with clinical problems at specialist levels. To date, there are 110 clinical specialists who have qualified under this program and 60 registrars undergoing training within various specialty programs.

In 1974, the College of Allied Health Sciences was established close to the Medical

Faculty behind the Port Moresby General Hospital. In 1994, the College joined the University to become the Faculty of Health Sciences, offering training courses in the allied health professions.

In 1999, the University of Papua New Guinea underwent a major overhaul with the restructure and reorganization of the university system. As a result of this restructure, the Faculty of Medicine and the Faculty of Health Sciences were amalgamated to become the School of Medicine and Health Sciences. In 1998 the School of Medicine and Health Sciences acquired new buildings including a lecture hall, library extension, and faculty administration, clinical sciences and pathology buildings, as well as new medical and nursing students' accommodation. These changes came about to meet the increasing demand for the training of more medical doctors, allied health workers and post-basic nurses.

The new School of Medicine and Health Sciences conducts degree and diploma courses to train medical doctors, pharmacists, pharmacy technicians, dental therapists, medical laboratory technologists, medical imaging technicians and post-basic nurses. The School also offers courses in Masters of Medicine in internal medicine, surgery, paediatrics, obstetrics and gynaecology, dermatology, psychiatry, ophthalmology, otorhinolaryngology (ENT), anaesthesiology and pathology. Candidates who pursue general practice with a special interest are offered a postgraduate diploma in paediatrics, obstetrics and gynaecology, anaesthesia, ophthalmology, dermatology and ENT. Post-Masters Higher Surgical Diploma qualifications in orthopaedics, urology, paediatric surgery, cardiothoracic surgery and head and neck surgery are offered with external support. Similarly Doctorate in Philosophy (PhD) and Doctorate in Medicine (MD) degrees are offered with external support.

### **Need for change from traditional teaching methods to problem-based learning**

During the past 40 years of training doctors and allied health workers in this country, the Papuan Medical College and the Faculty of Medicine of UPNG used the traditional method of teaching based on lectures, practical sessions, clinical observations, bedside teaching, tutorials and seminars. Over the past 40 years this method of teaching resulted in the development of an attitude of spoon-feeding and production of 'regurgitative' students and doctors. Students were given lecture after lecture, notes after notes, including notes for tutorials and practical sessions, that did not allow them to think through the issues using a sound scientific basis. The lecturer simply transferred information from his or her notes to the students' notes with very little learning process in between. Students on many occasions stopped thinking logically and ended up at final examinations regurgitating most of the information that was delivered to them by their lecturers.

In 1997, the Faculty of Medicine senior academic staff felt that it was timely that the school should seriously look at changing the method of teaching. A Curriculum Review Committee was formed under the chairmanship of Professor Isi Kevau. The Curriculum Review Committee looked at the reasons why the current system was not operating sufficiently well to produce the type of doctors that the changing world of Papua New Guinea needed. The Committee concluded that the type of doctor the country requires in the new millennium is someone competent in problem solving in the clinical field based on professional skills, critical reasoning, identification, prevention and management of illnesses, and understanding of population medicine and who must have self-directed learning attitudes and skills. The Committee was therefore in favour of introducing into the school curriculum a new method of learning known as problem-based learning (PBL).

Representatives from the Committee went to the School of Medicine and Health Sciences of the University of Newcastle in Australia to see how the problem-based learning curriculum design and implementation worked. The task

was to gain some first-hand experience with PBL and to assess the possibility of introducing the problem-based method of learning to the University of Papua New Guinea based on cultural suitability and acceptance within PNG, resource implications and staff training needs at the new School of Medicine and Health Sciences.

### **Process of the PBL development at the University of Papua New Guinea**

In 1998 and 1999, with approval of the Faculty (School) Board the Curriculum Review Committee, now known as the the PBL Curriculum Committee, engaged Dr Jean McPherson (one of the experts in problem-based learning from the University of Newcastle) to assist as a consultant in developing the structure and design of the curriculum and in preparing a proposal to the University Council to introduce PBL to the School of Medicine and Health Sciences for the MBBS program.

The PBL Curriculum Committee processed the proposal through the Faculty Planning Committee, the Faculty Board, the University Planning Committee and subsequently the Academic Board, for final approval by the University Council. In such changes it was quite clear that there was scepticism from the traditional medical education establishment in Papua New Guinea that made implementation slightly shaky at the beginning. Later in the implementation stage the slight problems, in particular course numbering, were rectified and the adaptation process of both staff and students continued smoothly.

### **Experience from overseas of the problem-based learning method**

Problem-based learning has been around for some time. One of the most renowned universities that has been using PBL for 30 years is McMaster University in Canada. The University of Newcastle has been using problem-based learning for the last 20 years. New Mexico and Maastricht Universities are also well-known for adopting PBL. There are other universities in Australia that have adopted problem-based learning, in particular the Brisbane Graduate School of Medicine.

Within the Pacific Island region, the Federated States of Micronesia and Pacific Basin Medical Officers Training Program have been using problem-based learning since 1992 and 1995 respectively. Surveys show that 10% of medical schools throughout the world now use problem-based learning.

### **Fundamentals of problem-based learning**

The big question is why do we want to educate students through this new approach? The outcome at the end of a medical training program is to produce a competent doctor. A competent doctor is one with clinical knowledge and skills and the capacity for future learning. Studies comparing students graduating from the traditional system with those trained through problem-based learning in their MBBS show quite clearly that doctors produced through problem-based learning are more knowledgeable and competent in handling clinical situations in the wards than those who underwent the traditional method of teaching (1,2).

### **Problem-based learning undergraduate program objectives**

The undergraduate program objectives served as the basis for curriculum development, as a framework for students to develop goals, as a basis for the assessment of students and as a yardstick for program evaluation. It was recognized at the University of Newcastle that the undergraduate program objectives had common themes and these themes have been clustered in what the School of Medicine and Health Sciences of UPNG refers to as domains (1,2). The current curriculum has 5 domains, namely:

- 1 Professional skills
- 2 Critical reasoning
- 3 Identification, prevention and management of illnesses
- 4 Population medicine
- 5 Self-directive learning.

The PBL Curriculum Review Committee decided that the learning and assessment of the problem-based learning should be conducted

by domains. Therefore, the curriculum is not taught by conventional subjects such as anatomy, biochemistry, physiology or pharmacology. Other disciplines are represented and the learning process is in the 5 domains (1,2).

### **Advantages of problem-based learning**

This approach to learning makes learning more enjoyable for students and tutors and promotes student-tutor interaction. It encourages student self-directed learning and promotes collaboration within the school, with team building capacity and interdisciplinary cooperation. It fosters clinical reasoning and problem solving as well as promoting retention of knowledge and motivation to learn (3).

### **Disadvantages of problem-based learning**

Problem-based learning may appear threatening when first introduced and therefore there is a need for staff training. The initial investment for resources, staff and space is expensive but subsequently the recurrent cost is the same as the traditional method. It is time consuming in the problem-writing phase and may be stressful if not directed well from all levels, especially when the tutors are not well trained in the method.

### **Graduates of problem-based learning**

Graduates from PBL schools are more up to date with knowledge. They are more primary care oriented and therefore good for PNG rural health needs. The graduates are more clinically knowledgeable in relevant basic medical science, have good communication skills and make fewer diagnostic errors.

### **Disadvantages of traditional medical education**

Meaningful patient contact is delayed to the later years of training. The artificial division of basic and clinical sciences creates learning blocks and forgetting. Under this system there is an accumulation of a vast amount of irrelevant factual information of doubtful significance and little opportunity to apply this knowledge. Learning is not student-centred and therefore becomes boring.

## Potential of problem-based learning in other programs

Experience from overseas has shown that PBL is useful in training programs for architects, engineers, lawyers, police and natural scientists. The plan at the school is to fully develop the MBBS problem-based learning and later extend this to health sciences programs and the nursing program. This should be possible within the next 5 years.

### Conclusion

Medical education in PNG has come a long way over the past 40 years. Many of us were taught by the traditional method to make us competent clinicians. However, in the changing world that we all live in, the process of medical education has passed another milestone in its history. We do not want to be left behind in this process and therefore it is vital that medical educators in PNG change with the changing needs of the population that we serve. Today there is a demand for better and more efficient medical services and this, among other things, has created the possibility of medical litigation, for which we must be prepared. Most importantly, we must train doctors who are clinically competent and have critical reasoning, sound professional skills and a self-directed learning culture to provide better clinical services for the improvement of the health of Papua New Guineans.

### ACKNOWLEDGEMENTS

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