

Innovative Techniques in The Training of Health Professionals: The Case of Moi University, Faculty of Health Sciences, Kenya

*Simon Kangethe
Fredrick Muya Nafukho
Moi University, Kenya*

*Alfred M. Mutema
Egerton University, Kenya*

This article argues that innovative teaching /learning methods are quickly replacing the traditional methods which were characterised by straight lectures, large group demonstrations and apprenticeships. The current knowledge revolution requires innovative educational methods in the training of professionals. The current emphasis is to place the learner at the centre of the learning process. This emphasis shifts the responsibility of teaching/learning from the teacher to the learner. The paper specifically discusses the training of health professionals at Moi University and the innovative training strategies employed in the training.

Traditional teaching methods characterised by lectures and large groups demonstrations are quickly being replaced by modern innovative teaching/learning methods. The growing need for new and effective approaches was recognised by education in the field of basic and secondary school education in Kenya more than two decades ago when the calls were made to change curricula to make them more practical and relevant to the needs of the Kenyan people which led to the current 8-4-4 system of education. In this system, we have 8 years of Primary education, 4 years of secondary education and a minimum of 4 years of university education (Ministry of Education, 1984).

The interesting development is the recent recognition by some educators of the need for innovative education in institutions of higher learning particularly in the training of health professionals at Moi university.

The main emphasis of the innovative teaching method is to place the student at the centre of the teaching/learning process and to place the burden and responsibility for learning on the learner. The other major emphasis is to avoid rote-learning and to develop problem-solving and life-long learning skills for the learner; in short -teaching the student how to learn.

Hard core traditional educators who thrived in preparing lesson plans and then lecturing for hours to passive students find it difficult to change. They ask, “why do we need new teaching and learning strategies now, whereas we seem to have been doing well with lectures, practical demonstrations and apprenticeships for centuries?”

Some traditional educators who are responsible for training health professionals complain louder than all other educators. They ask, “why do health workers have to contend with the burden of how to learn besides the heavy burden of the immense subject matter of the various courses they have to take ?” These questions and others sum up the problem and need for innovative education especially for health professionals who are involved in the field of training and development.

Problem Statement

Trainers of all professionals particularly health professionals have experienced a great need to adopt new teaching/learning methods which will ensure effective learning for their trainees. This need has arisen from the knowledge-explosion, and the rapid technological changes which characterise our modern world. The traditional lecture methods where experts talked for hours to passive students, coupled with demonstrations done by the experts to large audiences have fallen out of favour. As trainers flee from the traditional methods, they have found themselves in the middle of a new problem – the problem of identifying and applying the innovative teaching/learning methods thus replacing the out-dated traditional methods.

The primary purpose of this paper was to conduct a thorough review of literature to identify the innovative teaching/learning methods. The paper also discusses the application of the innovative teaching learning strategies at the college of Health Sciences, Moi University, Kenya.

Research Questions

1. What innovative teaching/learning methods are appropriate for training health professionals at Moi University, Kenya, given the new environment which is characterised by rapid increase of knowledge and rapid technological changes?
2. What do innovative teaching methods or techniques entail?

Rationale for Innovative Teaching and Learning Strategies Increasing complexities of modern life call for adaptation to many changes that take place in many aspects of our daily lives, especially in this knowledge explosion era (Nafukho, 1998). Education ought to prepare professionals to adapt to the many changes, hence the need for innovative learning and teaching methods several powerful reasons have been offered as explanations for the rapid development of innovative educational methods. These have been articulated as follows :

1. Teaching methodologies that enable students to develop competencies required for successful, professional life, promote life-long learning, develop self-directed learning skills and problem solving skills have become more valuable than traditional methodologies.
2. Harden et al. (1986) noted that “ through years at an authoritarian medical school, idealistic young doctors are moulded into rigid doctors who have lost much of their original ability.” Medical and allied health professionals have also identified the deficiencies of traditional methods of training which have been characterised mainly by lectures, and large group demonstrations. They have developed new approaches and methodologies to address the deficiencies of the traditional methods.
3. Information explosion and rapid increase of knowledge-bases around the world has overtaken traditional teaching methods therefore teaching “How to learn” and “How to find out “ have become more valuable than teaching digested facts, or spoon feeding “facts” to students.
4. Rapid technological changes have further complicated learning. The technology which is taught, crammed and practised today is obsolete before the students graduate, therefore, teaching methodologies that promote life-long learning skills have become more valuable because they enable graduates to keep-on-learning and keep up to date even after leaving school (Nafukho and Holmes, 1998)
5. Professional life in modern times calls for adaptability, participation in change and interaction with different specialists in problem-solving teams. Teaching methodologies that enable students to develop competencies required for successful professional life have become increasingly preferable to the straight-lectures and the rote-learning traditional methods, commonly employed by Kenyan University Lecturers and trainers.
6. Fast changing society, an expanding body of knowledge (information explosion), and rapid technological changes demand Continuing Education Therefore, learning skills developed during innovative education, enable doctors and other health professionals to do Continuing Education in a self-directed manner. Study and practice in the areas of medicine and health sciences is a life-long task.

Innovative education unlike the traditional education is a process which helps the student to develop skills such as:-

-

All of these skills help to convert students into: independent learners

During the teaching/learning process traditional teachers/lecturers are converted from preachers (information conveyor belts) to people who simply:

- facilitate
- advice
- guide (control)
- inform
- participate
- withdraw

Historical Development Of Innovative Medical Education

In the mid 1970's, many countries around the world had developed centres in faculties of health and medical schools with the growing recognition that a body of education/science needed to be understood by teachers of medical and allied health professions.

It was increasingly noted that by training teachers of medical and allied health professionals in educational methodology, the overall results were satisfying and rewarding. Specifically it was noted that modern medical education calls for teaching and testing beyond rote memorisation of facts and that training should be to done for:

- understanding of knowledge
- application of knowledge
- individual performance in realistic situations

As far back as 1951 a World Health Organisation (WHO) committee had made mention of the need for medical education. The first medical education program to meet the need for trainers familiar with appropriate educational methodologies was launched in University of Illinois WHO centre in 1959. In 1970 WHO began comprehensive co-ordinated long term programs for trainers of health professionals. In the same year an agreement was signed and WHO set up training centres for teachers of medical and allied health professionals. After establishing the Illinois Center, there was a proliferation of centres of educational Development for health professionals especially during the period 1971-73. The following centers were established during this period:

- For English speaking countries - WHO Regional Teacher Training Centre (WHO - RTTS) at Makerere University, Uganda.
- For French speaking countries - WHO Regional Teacher Training Centre at University Centre Younde, Cameroon.
- For Americas - WHO - RTTC in Mexico, and in Rio De Janeiro, Brazil.
- For Eastern Mediterranean at Pahlari University, Shira, Iran.
- For Western Pacific - University of New South Wales in Sydney, Australia.

Innovative medical education has been developed in response to dissatisfaction of public and health professionals with results of traditional medical education. Innovative strategies were used the Greeks – in what were called the dialogue and questioning method (Plato) (Boud and Feletti 1991). Chamberlain (1889) advocated “Multiple-making hypotheses.” John Dewey (1916) recommended the use of Real-Life situations”, and problems to be presented as part of the learning process. John Dewey (1929) and Piaget (1969) had actually demonstrated the ineffectiveness of providing ready made solutions to learners. Frazer (1931) and Brunner (1961) demonstrated how problems may be used in education. Recently (1980) Cyert pointed out that “All professionals are problem solvers and should be taught in problem-solving processes.

Brunner is the main proponent of discovery learning which is an important aspect of Problem-Based Learning (PBL). Frazer founded the case study method in which a case contained the facts, opinions and expectations needed to trigger off and feed a process of learning.

In 1961 the application of the problem-solving approach to the whole medical curriculum was started by Ham and associates at Case Western university, Cleveland Ohio, USA, in a Haematology course. The results of a comparison between students taught in the didactic method and those taught in innovative way - PBL -SDL showed the latter to be superior in exam scores

In 1969, Howard Barrows in McMaster University in Ontario, Canada established the first problem solving curriculum. The approach they developed was the PBL approach. This method resembled both discovery learning

and the case study method. In 1974, the university of Maastricht became the first European medical school to start an innovative medical education program, Problem-Based Learning (PBL).

The other well known universities to launch innovative medical education programs include:

- New Castle Medical School, Australia -(1979)
- Suez Canal University, Faculty of Medicine, Egypt -1982.

WHO has contributed generally to the establishment of innovative medical education programmes. It supported the establishment of a net work of community -oriented educational Institutions for health sciences in 1979. By early 1990's, it is notable that more than 50 institutions, had become members of the network. By mid 1990's, more than 70 countries had signed up as collaborating members in Problem -Based Learning. In the case of kenya, It is noteworthy that the college of health sciences of Moi University became a WHO Problem-Based Learning collaboration centre in 1994.

Theoretical Framework

The framework of this paper centers on the work done by World Health Organisation (WHO) in the area of effective education for health workers and the efforts of the college of Health Sciences of Moi University, Kenya to respond to the need for identification and application of innovative teaching/learning methods. As shown in the historical background of this paper, even before 1951 a committee of WHO had mentioned the need for measures which would ensure effective teaching of health workers. Since the health professionals make a major contribution to national development, it is crucial that their training should emphasize the application of the knowledge acquired during training.

Research Methodology

This is mainly a concept paper that has reviewed the pertinent literature in the work done by WHO in the area of medical education and the literature pertaining to innovative teaching/learning methods. This is then applied to the actual teaching practices employed by the College of Health Sciences, Moi University, Kenya.

Innovative Teaching at Moi University College of Health Sciences

The mission of Moi University is to produce graduates with practical and intellectual skills appropriate to the needs of present and future Kenyan society. The College of Health Sciences of Moi University strives to ensure that the students acquire such skills using modalities that encourage active learning in the context in which they will later function as health professionals.

The philosophy of the college, also embodied in the curriculum, entails training a doctor in the context of the community, in which he/she will later practise. It encourages the student to acquire the important skills of self directed learning, problem solving, and effective communication. Moreover the college emphasises not only curative, hospital based medicine, but also , through its community oriented approaches, prevention of diseases and promotion of good health.

Research orientation and an inquiring mind are integral parts of the training of a medical student, as well as other health professionals. The college, therefore also lays emphasis on acquisition of knowledge and skills in research, so that the graduates from all her programs will be able to carry out research, in the health and health related issues in modern day Kenya.

As a result of the overall mission and philosophy of Moi University, the orientation of educational programs at the College of Health Sciences are population and community based. The teaching and learning strategies have been deliberately chosen to encourage acquisition of an integrated and holistic body of knowledge and skills through self - directed active learning methods. This supports the mission of Moi University of producing graduates who are practical in outlook and suited to meet the needs of the present and future Kenyan society.

Innovative Teaching Methods

The following are the common methods used in innovative medical education :

- Self-directed learning (SDL)
- Small Group tutorials/Discussions
- Competence-Based learning
- Community Based education & service
- S P I C E S
- Case study
- Project
- Demonstrations
- Illustrated/Overview Lectures
- Role-play
- Computer-Assisted Instruction (CAI)

Self Directed – Learning Self-Directed Learning involves clear establishment of objectives by the learners. This may be done by individuals or groups of students. They may do it entirely on their own, or with some guidance from tutors. Information gathering commences and may lead students to either the library, learning resources centres, outpatient and in-patient hospital locations. It may lead student to consult either among themselves, their tutors, subject experts or guest consultants

The major aspect of self-directed learning is that students determine what they need to learn and to what depth. However, some guidance has to be put in place, and the availability of resources persons included whenever needed.

A special point worth noting in self-directed learning, is that tutor/guides, student guides, course booklets and curricula have to be available to students. This is in recognition of the fact that although some students may be fully capable of self directed learning, a small percentage require occasional guidance while a greater majority may require much more guidance from tutors. Student guides and other booklets may reduce the need for students to depend on tutors for their learning. SDL at Moi University is used in conjunction with Problem - Based – Learning (PBL). At times it is used entirely on it's own as a method of teaching depending on the circumstances.

Small Group Tutorial/Discussions Small Group Tutorial discussions, involves small number of students working together in the teaching/learning process. The number of students in a group ranges between 5 -10. Small group tutorials facilitate the development of many skills which are emphasised in innovative medical education and these include :

- Problem-solving skills
- Communication skills
- Reasoning skills
- Interpersonal skills
- Teamwork
- Attitude - shaping

Ideally small group tutorials should function under the supervision of a tutor whose role should be facilitatory as opposed to authoritarian. However, group dynamics need to be taught to students in order to prepare them for the interaction and the effects of this on student learning. Particularly, students need to know of the stages of group encounters and interaction such as :

- Forming
- Storming
- Norming
- Performing
- Teamwork
- End of group work

Competence Based Learning Competence Based Learning emphasises performance of the learners in terms of knowledge, skills and attitudes, and is therefore an appropriate method for professional training.

Competency Based Curricula The competency -based curricula have been used in designing and developing educational programs in health professions for many years. This model has been found to be quite appropriate in Problem-Based Learning, students-centred, community-oriented and integrated programs (Mutema, Kang'ethe and

Kivanguli, 990), Harden, (1986) described ten major steps that are critical in developing a competency -based curriculum. Table1 presents the process of developing a competency - based curriculum in health professions.

Table 1
Process of Developing Competency-Based Curricula in Health Professions

Step	Activity
Step 1	Identification of health problems
Step 2	Identification of professional roles and functions.
Step 3	Performing Task Analysis on Professional roles and functions.
Step 4	Development of educational Aims, Goals, and Objectives/ Task Analysis.
Step 5	Identification and selection of Subject matter/ Content to be learnt.
Step 6	Identification of teaching/ Learning Methods.
Step 7	Identification/ Selection of Learning resources.
Step 8	Identification of Assessment Tools to determine learner performance.
Step 9	Curriculum Implementation
Step 10	Curriculum Review and Change.

Community Based Education and Service (COBES) Community Based Education and Service is basically aimed at providing students with opportunities for learning within the communities. During such periods, students learn the sources, the nature and magnitude of health problems and related problems. In exchange for learning in this real life environments, students provide needed health-related services to different communities, each according to need.

SPICES The S P I C E S method is an approach that is commonly used at the Faculty of Health Sciences of Moi University. It is more than a teaching/learning method it is also a curriculum development approach. The Spices model is another educational approach that has been found extremely useful in developing curricula in health professions and especially those educational programs that put emphasis on problem -based learning, students centered, integrated community-oriented, electives and systematic as the acronym “SPICES” shows. The spices model has been found appropriate in planning, review and tackling problems related to the curriculum and in providing guidance relating to teaching methods and assessment of student performance.

In recent years there has been increased interest in curriculum planning in health professions due to many factors which have been raised earlier. In planning the curriculum and especially in new faculties of health sciences, innovative approaches such as (SPICES) have been considered. These are shown in Table 2 and are compared with traditional approaches in medical education.

Table 2:
Curriculum Approaches -- “SPICES” VS TRADITIONAL

	“SPICES”	Traditional
S	Student- Centred	Teacher-Centred
P	Problem Based	Information Gathering
I	Integrated	Discipline Based
C	Community- Oriented	Hospital -Based
E	Electives	Standard Program
S	Systematic	Apprentice-Based Or Opportunistic

In the planning and developing of the Moi University Health Sciences curriculum the use of the “SPICES” had to be considered in order to assist the teachers to understand the particular educational strategies they needed to use in implementing their programs. Also, by examining each of these issues it gives teachers and policy makers a better understanding and insight into the whole curriculum. The competency-Based Model and the spices model of curriculum development are useful educational strategies that have been used at Moi University to develop relevant curricula which are responsive to the health needs of the community. The application of these models has also assisted in making rational decisions during the initial planning stages and also during the actual process of designing, developing, integrating, implementing and evaluating the curricula.

Case Study This is a method in which medical and allied health professionals select cases and use them as the focus of study. Students take each case, read about it, analyse it, and make suggestions and recommendations regarding the case on the basis of the evidence they have gathered. Problem-solving skills including information searching skills are developed among other skills.

Project Method This is a method of teaching/learning in which learners are assigned a task or group of tasks to carry out over a given period of time. At the end of the same period, the learners make a presentation or submit project -reports for assessment. At Moi university students choose their own projects with guidance from their tutors.

Demonstrations This is a most appropriate method, especially for teaching skills. In the innovative medical education, several points are emphasised with a view of facilitating maximum benefit from this process. The cardinal point of emphasis is that provision be made for students to practise and actively participate in the learning process. Therefore, such aspects as demonstration being clearly visible to learners, audible and correct in procedure are deemed as vital..

Illustrated/ Overview Lectures In traditional medical education, lectures are typically cathedral type, boring and for the majority of students facilitate little learning. In innovative medical education lectures are to be over - view and spanning the major areas of study. As little time as possible is spent on direct lecture, with opportunities sought to interact with the learners whenever possible. - Use of handouts, posters, charts and other audiovisuals are encouraged in order to provide illustrations for the topics being addressed.

Role Play This is an old method of teaching but increasing in popularity hence its inclusion among innovative medical education methods. Depending on the objectives of a session, a tutor or students, assign each other different roles. By acting out these roles, students learn various correct functions and responsibilities intended for the session. Active participation and team work are among the major benefits of this method. Clear statements of the goals and objectives of the session are however necessary.

Computer Assisted Instruction Computers are being used increasingly in all spheres of education. Particularly, they are being used for teaching as well as assessment. Cox and Ewan (1988:244)indicate that three broad categories of computer programs are available for medical education which include:

- ◆ computer assisted instructions -CAI
- ◆ computer assisted assessment -CAA
- ◆ computer managed instruction-CMI

At the College of Health Sciences, Moi University, Introduction to computer applications is one of the courses that all student are required to take during the first year of study. In subsequent years, students are encouraged to use computers which are conveniently placed in resource rooms and laboratories. Although computers may not encourage itle amvid may not

innovative teaching methods employed in the training of health professionals in the College of Health Sciences, Moi University, Kenya.

References

- Abbatt, F.R., (1980) Teaching for Better Learning.
Geneva: World Health Organisation,
- Abercrombie M.L.J. and Terry, P.M.(1978). "Talking To Learn: Improving teaching and learning In small Groups. University of Surrey, Guildford, London.
- COX K.R.& Ewan C.E. THE MEDICAL TEACHER 2nd Ed Richmond, D. "Preparing students for continuing Education." (p.135) Churchill Livingstone. New York 1988
- Hamad, B. (1991) Community-Oriented Medical Education-What is it?
Medical Education 25, NO. 1,16-22
- Harden R.M (1986) Approaches to Curriculum Planning. Medical Education 20, NO. 5458-466.
- Harden, R.M (1986) Approaches to Research in Medical Education. Medical Education 20, NO. 6,522-531.
- Harden R.M Approaches to curriculum planning . Medical Education Booklet. 21. The Association for the study of Medical Education. Dundee. London, 1986.
- Nafukho, F. M. (1999) The Place of Lifelong Learning in Kenya: Need to build bridges between Private agencies, Public agencies and Universities. Conference Proceedings of the Sixteenth Annual Meeting, Association of Third World Studies, Inc. North Carolina Central University, Durham, North Carolina, October 8-10, 1998.
- Nafukho, F. M. (1999) The Role of Universities in africa in the Knowledge Explosion Era. Conference Proceedings of the 15th Annual Meeting, Association of Third World Studies, Inc. Central Connecticut University, Hartford Connecticut, October 9 – 11, 1997.
- Newble,D.I., and Clarke, R.M. (1986) The approaches of learning of students in a traditional and in an Innovative PBL Medical School. Medical Education 20, No. 4,267-273.
- Newble, D.I., and Entwistle, N.J. (1986) Learning styles and approaches : Implication for Medical Education. Medical Education 20, No. 3,162-175.
- Newble , D.I., Cannon, R., and Kapelis, z. (1983) A Handbook for Clinical Teachers. MTP Press Ltd., London.
- Nnodin J.O. (1988) Learning Anatomy: Students preferences of methods in a Nigerian Medical School. Medical Education 27,5,412-417.
- Nordoy, A. (Editor) (1972) Integration in Medical Education. Tromso Seminar in Medicine, University of Tromso, Norway.
- Norman, G.R. (1988) Problem -Solving skills, Solving Problems and problem-Based Learning. Medical Education, 22, No. 4,279-286.
- Parry, K.M. (1970) Forms of intellectual and Ethical Development in College Years: A Scheme. Holt, Rinehart & Winston , New York.