

Review Article

Teaching and Research Experience in Anatomy and Oral biology in the School of Health Sciences, University of Nairobi

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The paper narrates experience of teaching oral biology and anatomy to undergraduate and postgraduate students over forty year in the School of Health Sciences at University of Nairobi. Oral biology was an additional basic science subject taught to students of Bachelor and Master of Dental Surgery and the course was challenging and prepared the students with a sound foundation for clinical dental sciences and diverse dental postgraduate degrees. Anatomy teaching was multidisciplinary; gross, microscopic, developmental with clinical relevance, to medical, dental, pharmacy and nursing students in the first level of under and post graduate study. The teaching materials and methods changed over time often together with course content and curriculum reviews. The perspective on student attitudes, motivations career choices are considered with change in the education scenario in Kenya over the years. Research has been in the field for dental data collection and laboratory based in oral and anatomical science. Several papers on oral biology, anatomy and neuroscience have been published in local and international journals in addition to conference presentations.. Some of these have been in collaboration with colleagues within UoN and others with research institutes. Brain Awareness activities (Ubongo campaign) targeting school students and community child health education for nomadic communities to deter tooth bud removal has been a major area of interest over the years.

Keywords: Teaching; Research; Oral biology; Anatomy University of Nairobi**Abbreviations**

UoN: University of Nairobi; BDS: Bachelor of Dental Surgery; MDS: Master of Dental Surgery; DDS: Doctor of Dental Surgery; NMK: National Museums of Kenya; IPR: Institute of Primate Research; KEMRI: Kenya Medical Research Institute; AMREF: African Medical Research Foundation; SONA: Society of Neuroscientist of Africa; BSc: Bachelor of Science; MSc Master of Science; PhD: Doctor of Philosophy

Introduction

The experience spans for 40 years from April 1975 when I joined the University of Nairobi (UoN) with a Degree in Bachelor of Dental Surgery (BDS 1970) from Edinburgh University to teach the first intake of BDS students up to June 2014. I taught oral biology and anatomy under the mentorship of the late Prof. Joseph Mungai (Figure 1), who was then the Chairman of Department of Human Anatomy, to teach dental and medical students and to do research. I then obtained Doctor Dental Surgery (DDS) from Edinburgh University in 1990, with an external thesis on neural connections of the teeth to the brain in the baboon, under the supervision of the late Prof. Joseph Mungai and Prof. V. Fasana. Over the years, I continued to teach oral biology to BDS and later Master of Dental Surgery (MDS) students and Human Anatomy to health science students; dental, medical, pharmacy and nursing undergraduates and postgraduates. In addition I supervised postgraduate theses and

research for anatomy and dental sciences (Figure 1).

I have travelled to many parts of world for experience and to attend conferences which enabled net working. I have an interest in nature, conservation and heritage which added on to academics. This led me to participate in setting up Asian African Heritage exhibition in 2004 to trace the migration of South Asians to Kenya and building of the railway. In 2011, we set up a photographic exhibition and seminar on migrations of our ancestors from India who settled in Lamu, in Kenya, in late 1880s.

In June 2014, I left the University of Nairobi to join the Pwani University, in Kilifi, Kenya, as a Full Professor in Dental Surgery and Anatomy, initially in Department of Biomedical Sciences.

Teaching and Examinations

Oral Biology is a subject that is taught in-depth and examined separately in the first level for degrees of Bachelor and Master of Dental surgery at UON. It forms the basic science foundation for clinical dental sciences. The course content is integrated horizontally and vertically with human anatomy, medical physiology and biochemistry as well as clinical dental sciences. This has been of great advantage to the dental students in clinical years and postgraduate degrees.

Anatomy

Gross, developmental and microscopic, is taught to all



Figure 1: Prof Joseph Mungai.

undergraduate and post graduate medical, dental, pharmacy and nursing students in the first level of the course, where all academic staff in Department of Human Anatomy participate.

During my tenure, I had the experience to interact with external examiners in Anatomy and Oral Biology, namely, late Professor Adrian Owen of Queens University, Belfast and others from regional and local universities who came to examine undergraduate and postgraduate students.

Since 1980s, I have been associated with the Dental and Medical Schools at the Muhimbili Medical College, University of Dar es salaam as an external examiner while Professor David Ngassapa, has been a counterpart examining at Nairobi University. We have collaborated in writing books, and forming the East African division of International Association of Dental Research.

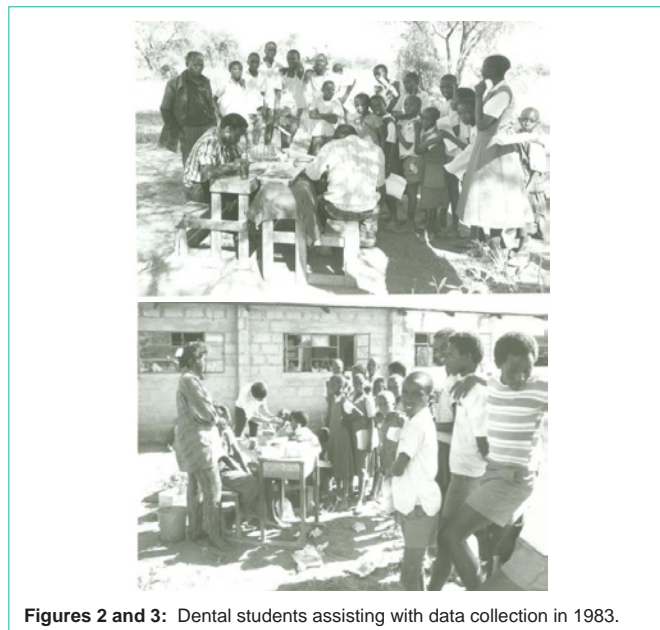
Teaching method and material

The teaching methods have changed dramatically from chalk and board to overhead/slide projection and on to power point presentation. This is in addition to internet learning material and e-learning programmes and diverse available teaching aids. In the later years, introduction of molecular biology in MDS course has opened up research and dental clinical sciences to understanding concepts such as malformations and gene therapy.

All the teaching material that I used was mainly prepared in the department, while some was obtained from external sources. These included skeletal material, dental casts, radiographs, projection slides, as well as dental and anatomy microscopic slides. The print and audiovisual material was sourced from books. In 1995, during my T.C. White visiting fellowship to Glasgow Dental School, oral biology department with Dr. Marie Watt, I participated in preparing computer assisted learning programmes on development of orofacial region and dental tissues. Dr. Watt later came as an external examiner for BDS, MDS and other exams in Human Anatomy Department for 4 years.

I participated in curriculum reviews to tie in with changes in health care needs of the country and career opportunities. The duration and course contents for undergraduate training for all cadres of health sciences have been revised over time.

The intercalated BSc. MSc. and PhD as well as MDS programmes



Figures 2 and 3: Dental students assisting with data collection in 1983.

has given me wide experience in postgraduate supervision of a broad spectrum of anatomy and oral biology and dental sciences topics. These have generated several publications in medical, surgical and dental disciplines. In addition, these graduates have provided a pool of teachers in anatomy and oral biology [1]. I have endeavored to teach students to meet their needs, mentor and guide them as my primary obligation.

Students

My perspective on students joining the University to pursue health sciences courses is based on personal observations, survey on knowledge and attitudes and changing scenario of political and institutional changes in admission; numbers, grades and parallel intake. Students come from all parts of Kenya, from national, provincial and private schools and from low, middle and high income society. The intake has been on merit and initially only students with Kenyan secondary school exams were admitted. Later (2005), parallel intake (Module 2) was introduced to admit students with other equivalent examination results meeting admission criteria (as well as Kenyan exams) who were able to pay fees of about Kshs 500,000/-.

The dental students, with whom I interacted a lot in the first ten years of intake were highly motivated, committed and focused in their career choice. Most of them did postgraduate degrees and taught at the Dental Faculty and School as well as hold positions in Health Ministry and are renowned private practitioners in Kenya and abroad.

In later years, students came with a background of high school problems, changes in teachers union and political situation. They needed much mentoring and guidance to settle in their chosen career. The parallel intake students had to pay the fees in time or else faced problems. The increase in student numbers also caused problems of adequate supervision with respect to staff numbers and laboratory/clinical facilities. In the earlier years, dissection supervision was adequate, but presently it is superseded by e-learning materials and audio-visual aids, although dissection is mandatory.

Career guidance is essential for students before joining and survey of knowledge and attitude of students in 1st year of study in MBCHB, BDS, B. Pharm has shown that they are not aware of course content and need for dissection of human bodies [2,3].

Research

Research was carried out using available material from within and outside the institution, most often requiring minimum funding. Reports were prepared for publications and conferences. Diversity of research topics allowed a sustained interest and a wide collaboration with other individuals, departments within UoN and other institutions such as Institute of Primate Research (IPR), National Museums of Kenya (NMK) and Kenya Medical Research Institute (KEMRI).

Much of the research in anatomy was on gross anatomy (bones), connective tissue, neuroscience on developmental and morphometric aspects of primate brains [4-12].

Oral biology research was on tooth eruption times among Kenyans in the early 1980s in collaboration with Professor John Odhiambo [13-15]. Field research was on collection of dental casts of Maasai, Kikuyu and Kalenjin school children aged 3-18 years in 1985, data collection assisted by students at Faculty of Dental Sciences (Figures 2, 3).

Aspects of dentition of the three diverse ethnic groups with different diet and life style were studied and dental casts analyzed together with late Dr. Phillip Amwayi and later with Prof G. Pokharyial [16-19].

Important information on socio-cultural practice of deciduous canine tooth bud enucleation to cure febrile childhood illnesses in infants in Nomadic communities was obtained during field work in remote Maasai schools and villages. Facilitation for visits to these areas was provided by AMREF (Nomadic Health Unit) and publications were prepared jointly with Drs. Phillip Amwayi and Anne Muriithi [20,21]. Community health education on hazards of the practice and childhood disease was initiated amongst the Maasai and other Nomadic communities since 1990s to date in collaboration with Dr. Peter Wanzala and Dr Peris Kibet, with several publications in journals [22-25].

Since 2005, through International Brain Research Organization (IBRO) mandate, brain awareness activities were conducted by a group of medical students from level 1-4, with interest in neuroscience. Together with Professor Nilesh Patel, medical physiologist and secretary of Society of Neuroscientist of Africa (SONA), students were guided to conduct sessions on neuro-anatomy, physiology, pathology and effects of drugs on brain. The target groups were students in primary, secondary and tertiary levels of learning in urban and rural areas of Kenya

The brain campaign was named the UBONGO CAMPAIGN and the team of students recruited new members to keep continuity to date. Many of these students developed interest in neuroscience as a career leading to PhD.

My greatest satisfaction has been teaching students who have acknowledgement of my contribution in their career. I thank my colleagues in Human Anatomy and in Dental School who have given me their continued support the University for providing me with a

forum for teaching and research.

Presently, at Pwani University I am Chairman of Department of Anatomy and Physiology in the School of Health and Human Sciences which was launched in August 2015. It incorporates departments of nursing, public health and food science as well to prepare for School of Medicine and Pharmacy in due course.

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