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DESIGNING EFFECTIVE E LEARNING MATERIAL

E-learning has become 'fashionable' and the internet hosts an increasing number of modules and courses from simple lessons to MOOC$_S$. But how best to design these? We now understand better than ever before how people actually learn and we should design our materials to enhance that learning. We learn by taking information from the environment through our sensory inputs into our working memory. Our working memory is very limited and we must not overload it. We need to process the information there, rehearse it and link it to the knowledge we already have in long-term memory. There are four fundamental steps that facilitate learning: First, the learner must focus on key graphics and words – both are necessary to enhance learning. Second, the learner must rehearse this information in working memory to organize it and integrate it with existing knowledge in long-term memory. Third, in order to do this integration, the limited working memory that we all have, must not be overloaded. Fourth, new knowledge stored in long-term memory must be able to be retrieved when needed in the future and so must be learnt in context. With this template in mind, I shall take, as an example, a simple lesson and analyse how the material in this is best presented to maximise student learning.

Biography

A D C (Tony) Macknight graduated MBChB from the University of Otago Medical School in 1963. After a year as a House Surgeon working for the Auckland Hospital Board, he returned to the University of Otago Department of Physiology where he completed a PhD in 1968 and an MD in 1969 studying aspects of cell volume regulation under the supervision of Professor James Robinson. He then spent two years doing postdoctoral research at the Massachusetts General Hospital, Harvard Medical School in the laboratory of Professor Alexander Leaf working on epithelial transport. He returned to a position as Lecturer in Physiology at the University of Otago in 1971. In 1981 he was elected a Fellow of the Royal Society of New Zealand and in 1984 he was appointed as the Wolf Harris Professor of Physiology at the University of Otago, a position he held until his retirement from full-time academic work at the beginning of 2002. He continued his research until 2007, his research group in Otago collaborating with the group headed by Professor Mortimer Civan at the University of Pennsylvania in a study of the transport pathways involved in the production of the aqueous humour. In addition to his research interests, he played a major role in the introduction in 1987 of problem-based,case-oriented learning in physiology for medical students at the University of Otago. During the 1990s he was a key member of the Curriculum Development group that designed and implemented a new, systems-based, case-related two year preclinical medical course. He also initiated the development of the computer-based data acquisition system for use in biomedical teaching and research that is now marketed internationally by ADInstruments as the PowerLab system and is used in universities, research institutes and industry throughout the world. Professor Macknight was the chairman of the Organising Committee for the 34th International Congress of the International Union of Physiological Sciences (IUPS) that was held in Christchurch, NZ in 2001 as well as the Chairman of the International Scientific Program Committee for that Congress. He was a member of the Council of the IUPS from 2001 to 2009. Presently he acts Director of Education for ADInstruments, is a member of the IUPS Education Committee, and continues to serve on Grant Reviewing Committees of the Health Research Council of NZ.

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