Chapter 9
Research-Inspired Teaching and Teaching-Inspired Research

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EXECUTIVE SUMMARY

A shift from pure neuroscience research to research into innovative approaches to teaching and learning has afforded an opportunity to consider ways to develop and integrate technology to improve student learning. Using the authors' teaching of histology at University College London (UCL), they describe how student learning and engagement in the subject has been advanced through the integration of a Web-based platform for students to view microscope slides. The opportunity to explore these innovations has been facilitated by a recent increase in recognition of teaching at UCL and the consequent expansion of the teaching grant program to explore new technological solutions for learning. In addition, there is now increased incentive to consider new approaches to teaching as a provision has been made for staff promotions to be given primarily on teaching prowess, as opposed to the historical research focus only.

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INTRODUCTION

After many years at University College London (UCL) carrying out laboratory neuroscience research with only a minor teaching role, I began to develop a greater interest in teaching. In 2006 I gave up bench research, briefly became part-time and moved to a teaching role. I now teach histology (microscopic anatomy) and neuroanatomy (structure of the nervous system) to science and medical students and am involved in many different aspects of the curriculum.

I was fortunate to have had a supportive research supervisor who allowed, and in fact encouraged, me to become involved with teaching. Initially, this was as a demonstrator for neuroanatomy practical classes for science and medical students and then as a tutor. I later received more encouragement and opportunity to teach from my Head of Department and this led to my demonstrating histology practicals for medical students. Later, and after the departure of one of the course organizers, I was offered the chance to take over his lecturing and presentation of histology practicals. I began to enjoy teaching in this way and tested this idea further by taking on some part-time teaching outside UCL. Here I taught neuroscience in the UK to students from the USA who were due to sit their medical degree (USMLE) exams. The reception I received from these students and their keenness to learn convinced me to dedicate my time to teaching at the tertiary level.

During my teaching over the years I found that undergraduates benefited from my research background and interests in two ways: they got a taste of the scientific endeavour necessary in creating new knowledge, and they benefited from the innovations I have made in the teaching arena that have been discovered as a result of my knowledge of the scientific research process. One such innovation involved a highly interactive web-based collection of digital microscope slides for the teaching of biological tissues. I introduced this to the teaching of histology at UCL for all medical and science students because I felt that the students were beginning to find this subject rather stale. Because of a tripling of student numbers (due to the merger of three large London medical schools) the histology practical classes that used traditional microscopes and glass slides became a thing of the past. This traditional method of teaching was useful for teaching students how to use a microscope but was of limited value when attempting to teach them about the subject of histology. The microscopes were often of poor or variable quality as were the glass microscope slides. This meant some students had an advantage when they had a good microscope and good quality slides compared with those that had a poor quality microscope and/or slides. This problem of variable quality of images viewed by each student plus the large increase in student numbers led us to adopt a digital solution that became an interim computer program for the teaching of histology. This provided students with large and clear images of tissue sections on computer monitors. However, this