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Medicine, Dentistry & Biomedical Sciences**

1. CONTEXT FOR THE APPLICATION (300 words maximum)

Please provide a context for your application. This should consist of an introductory statement about your contribution to learning and teaching/learning support to date. Examples of the information you might include are; the subject you teach or the area of learning support you work in, the type of learning and teaching/learning support activities you are involved in, how many learners are involved, your particular learning and teaching/learning support interests and an outline of your overall teaching/learning support philosophy?

My career until 1997 was as a Research Officer, working with Prof DB Archer to establish Vision Science as a significant research discipline within the Medical School. At that time I translated to lecturer with a strong international research profile but little teaching experience. However, with great encouragement from Professor Madeleine Ennis I developed a Special Study Module for the undergraduate Medical programme and became semester coordinator for level-3 SSMs. As a cell biologist in the area of experimental pathology I was soon recruited to the teaching of Biomedical Science and by 2004 became coordinator of the module that I developed into the current module entitled Tissue Biology & Pathology (BMS3024) and co-founded an MSc course in Molecular Medicine.

In September 2007 Prof Bert Rima invited me to become the Director of Education in the School of Biomedical Sciences with the remit of reforming the Biomedical Science degree programme for professional accreditation. This required the creation of 6 new modules and reform of several others, but our goal was realised with Institute of Biomedical Science accreditation in May 2008 with subsequent increases in student applications and entry standards. The new programme was immediately oversubscribed and has remained so with A-level entry advancing from BBC in 2008 to ABB in 2011. In 2008 I was appointed as Director of the Centre for Biomedical Sciences Education, assuming staff and financial management of the centre alongside the duties of Director of Education. In spite of managerial responsibilities I am dedicated to spending quality time with my students and in 2009-'10 coordinated 5 modules and engaged in >100hours of contact teaching in lectures, tutorials and practical classes. I have diverse interests and teach molecular cell biology, tissue biology and pathology, neuroscience, developmental studies and scientific methods to classes of between 40 and 80 students.

2. DISCUSSION

You should illustrate your discussion throughout with reference to specific learning and teaching/learning support activities. You should also provide examples of the influence of learner feedback on your learning and teaching/learning support practice.

(a) Promoting and enhancing the learners' experience (1000 words maximum)

I propose to illustrate this section with 2 case studies:

Case-1: The prescriptive nature of the IBMS accredited degree in Biomedical Science imposed large student numbers (>60 students) on modules developed for 15-30 individuals posing significant problems for maintenance of a quality student learning experience as the temptation was to default to a traditional lecture-based approach. I had developed the level-3 module Tissue Biology and Pathology for 20-24 students in which the peer-teaching element had received commendation from external examiners for the imaginative nature of the material and depth of student learning. In this module the students study the molecular biology of cells in community within the context of specialised tissues and the impact of 4 major disease entities on such relationships: neurodegenerative disease, cancer and genetic and autoimmune diseases with common molecular targets in epithelium and muscle. The students are provided

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with learning packs of cutting edge reviews through Queen's Online and work in study groups of 3 or 4 members, each addressing a lead question with literature searches of new studies and preparation of power-point talks for teaching their component of the topic to the class. Reluctant to lose this format I created large discussion groups (initially 4) comprised of 4 study groups each. Each discussion group meets in a separate room with an academic convenor who marks the presentations and fosters discussion. In the discussions, 5% of the marks are awarded for knowledgeable answers but up to 10% for insightful questions from the listening groups. This not only stimulates discussion but ensures that the students, in addition to researching their own topic lead, read across the material provided to prepare quality questions for the other study groups at discussion. Over a period of 4 weeks the convenors rotate around the discussion groups to ensure a balance in the generosity of marking. On weeks of peer-teaching the first 2 hours of a morning, including a short coffee break, are devoted to student presentations. Then after a half-hour break there is a plenary session when the whole class convenes for a staff member's summation of the material covered in the student presentations, clarifying any areas of confusion or conflict uncovered in the discussion groups. The format and timing of the peer-teaching sessions within the module have been adjusted yearly using information gleaned from student feedback. The plenary summations by staff were also introduced in response to suggestions from students who felt that they needed reassurance that the material they were presenting to each other was of sufficient quality for exam prep. The module also contains conventional lectures and virtual microscopy practicals in which the tissue pathology of material related to the peer-teaching topics is studied in combination with specific immuno-staining of proteins of interest.

Case-2: In response to poor student achievement over 2 years and several concerns of the external examiner, in 2010 I assumed coordination of our level-2 module in Molecular Cell Biology (BMS2015). This was a new module that had been developed by researchers with an inappropriately narrow focus and I was in agreement with the external that the level of the material presented was too narrow, inappropriate in the level of detail required for level-2 and that the module needed the introduction of meaningful coursework, a practical component and better QA. I was sympathetic with the difficulty of my colleagues who had insufficient time and experience to cope with the delivery of challenging material to undergraduates when they had only prior experience in teaching at M-level. As molecular cell biology presents teaching challenges related to the rapid increase in current knowledge and the abstract nature of the mechanisms described I took the opportunity to use my research experience in the use of fluorescent cell probes and antibodies to illustrate molecular cell components and processes microscopically. I hoped that the use of fluorescence microscopy would make the material I addressed in lectures more real to the students and so increase their appreciation and engagement. Topics such as mitochondrial changes in programmed cell death, cytoskeleton dynamics in cell migration and DNA replication and repair were made to shine from the dark background of the microscope field to one word descriptions of cool! I was also mindful of a study by the Royal Society of Chemistry which indicated that science students were bored by the unimaginative nature of undergraduate practicals and the fact that they never got their hands on advanced instrumentation. I addressed the latter issue through the use of a confocal scanning laser microscope that was until very recently used in our research lab in Vision Science. The students made specific reference to these sessions in their favourable feedback of the module and in particular to the thrill of using the "big laser microscope". These practicals require a significant time commitment from several members of technical and academic staff, all of whom were required to learn new practical skills and background knowledge. However, the benefit was evident in the quality of the academic follow-up and practical-based essays prepared by the students. In addition to the practical sessions I wanted to introduce the students to an element of peer-teaching as they would experience in the level-3 module described above. I therefore organised revision sessions with an identical discussion-study group format but in which the students presented summaries of lectures from the module using a selection of 5-8 slides from the lectures with or without their own modifications; these sessions received excellent student feedback at the module review. The module results were extremely heartening with the majority of our students achieving 1st class or 2.1 Hons level grades.

Comments from the external examiner (Prof Kim Piper, Barts & London Hospital) on the changes to the module: A huge improvement: Excellent study guide with clear learning objectives, lecture timetable and assessment guide. I was delighted to see the introduction of a practical element and

introduction of course work to include group seminar, practical essay and dissertation. Model answers are clear and mark allocation transparent.

(b) Supporting colleagues and influencing support for student learning (350 words maximum)

Meeting institutional objectives:

I take seriously the challenge that we face in Queen's to be a truly research-led university and to ensure that our research informs all aspects of our teaching practice. I utilise my own research as source material in all aspects of my own teaching and freely share these resources with my colleagues.

I was also motivated by a recent university initiative that challenged us to look upon our undergraduates as partners in our research. Coming from a background where I saw the bulk of research prosecuted by postgraduates and postdoctoral fellows I was sceptical of the value of inexperienced undergraduates in our research enterprise; this was in spite of the fact that our undergraduates who take a year-out in US laboratories regularly come back with 1st author publications in top-flight journals. Since that time and based on experience with our school's Summer Studentship programme I am convinced that our undergraduate students can deliver high quality research data in the context of innovative teaching and with empowerment for the world of work.

I support the university's initiative to increase the employability of our students through the Student Plus programmes and I feel that the work I did in achieving professional accreditation for our Biomedical Science degree has had multiple benefits for our students, even for those who do not choose to pursue a career in the NHS.

Collegial support:

Over the past 5 years I have created several new courses and as management responsibilities increased, freely handed them to younger colleagues with full rights to all my lectures and teaching material; indeed I recently configured a new Master of Research in Molecular Medicine programme for intercalated Medical and Dental students. For this I created 2 completely new modules that next year will be passed to colleagues in a "debugged" format.

I have also initiated a scholarly activity in our centre that provides a forum for our teaching fellows to discuss innovations in their practice or receive updates on research advances in our area.

(c) Ongoing professional development (350 words maximum)

Until I took the position of centre director in our school I was a regular attendee at the various courses and workshops organised by our Centre for Educational Development. Some of the speakers I heard at these sessions, particularly Prof Phil Race, had a profound influence on my perspectives and teaching practice. Looking back I realise that my basic attitudes to education were still heavily influenced by my own experience as a student and although I went through the tick boxes of good quality control I didn't really engage in true outcome-based teaching and reflective practice; rather I regarded time spent on such activity as a diversion from my research or "real teaching", which for me was lectures, all of which were too long and too complicated. Unfortunately I see the lecturer I was in my young colleagues from our research centres, who in spite of having taken the PGCHET obviously do not engage in modern practice. Therefore to ensure real control of teaching quality in our degrees I am initiating a renewed programme of peer-review, coupled with teacher-mentoring in which research centre staff will be reviewed and mentored in their teaching by the experienced teaching fellows in our centre. In this programme there will be regular meetings and attendance at each other's lectures.

My work in school management, ongoing collaborative research and teaching leaves me little time for outside courses that would foster my own professional development so currently I tend to learn through interaction with the talented teaching fellows I have the privilege to work with on a daily basis.

