QUB TEACHING AWARDS

APPLICATION FOR EXCELLENCE IN TEACHING AND/OR LEARNING SUPPPORT BY A TEAM AWARD 2018

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1.   PREVIOUS TEACHING AWARDS (200 words maximum)

NA

2.   CONTEXT FOR THE APPLICATION (500 words maximum)

The introduction of the new academic year structure to stage 1 modules in 16/17 in the School of Biological Sciences resulted in the development of two large 40 CAT modules, BIO1301 World of Microorganisms and BIO1304 Molecular Basis if Life. The content of these modules is delivered to approximately 300 students from ten degree pathways [Centre for Biomedical Sciences (Biomedical Sciences, Human Biology); School of Biological Sciences (Biological Sciences, Biochemistry, Marine Biology, Microbiology, Zoology, Food Quality Safety and Nutrition; Food Science and Food Security); School of Chemistry and Chemical Engineering (Medicinal Chemistry) across two Faculty (Medicine Health and Life Sciences; Engineering and Physical Sciences) groupings. The development of these large modules provided the opportunity to revise module content and structure but was also anticipated to present challenges in terms of teaching, student learning and engagement, and logistics including laboratory capacity, module data management, management of student attendance, and student communication. The module coordinators of these two large modules, Dr Linda Stewart and Dr Angela Mousley, decided to work together to develop a holistic approach to management and delivery of stage 1 teaching and learning within the School. We started by constructing a common module format with each module comprising three components: (i) <u>core knowledge</u> which is subject specific, sub-themed and QAA benchmarked; (ii) <u>toolbox sessions</u> which identify the tools, technologies, methodologies and analyses relevant to the subject area and; (iii) <u>research- and employment-led case studies</u> which address important biological issues and/or questions and allow students to link their academic learning to employment opportunities. The content of both modules is delivered via (i) lectures, three per module per week; (ii) practical sessions, ten per module delivered in biweekly sessions, and (iii) workshops throughout the semester.

With digital learning solutions now part of the new QUB Education Strategy we wanted to develop modules that would be subject-relevant, and which capitalised on modern digital technologies to underpin teaching and learning in the large class cohorts. In order to achieve this we recognised that we needed to identify and enlist the help of a specialised network of people with the specific IT and administrative skills, in addition to the academic team already in place. The result is the successful development and running of the largest modules in the School of Biological Sciences. The modules have a common module format and have been modernised with integrated digital learning solutions to compliment and facilitate current digital trends and enhance the student experience in terms of teaching and learning. This team network consists of the module coordinators (Dr Linda Stewart and Dr Angela Mousley, Lecturer of Education Dr Michael Stewart, Maureen McKee and Peter Reavy from Information Services and Eve Wilson SOBS administrative staff.

3.   DISCUSSION SECTION (1700 words maximum)

As stage 1 students transition from secondary to tertiary level education they may feel overwhelmed by both the large class sizes, volume of information, and a greater expectation for independent learning. In order to minimise the transition experience and maximise the learning environment for stage 1 students we, as module coordinators of the two biggest stage 1 modules in the SOBS, decided to take a <u>collaborative</u> approach to the development of the new modules. We took this opportunity to restructure and update each module and integrate digital technologies to enhance student experience, learning and engagement, and to streamline content, delivery and assessment. A common module structure was developed and the content of each module benchmarked to QAA and relevant Professional Bodies (e.g. Royal Society for Biology, Institute of Biomedical Science). We worked together to construct comprehensive module handbooks and practical manuals with similar structures for each module making it easier for students to navigate and find pertinent information. Liaising with the IT department was essential to utilise and integrate available digital technologies, and administrative help was engaged for large module management.

A. Integrating Digital Technologies to enhance traditional approaches to student learning
(i)   Interactive Textbook

In order to capitalise on digital technology and move beyond the textbook- directed approach to independent learning, BIO1301 (World of Microorganisms), introduced the use of the Connect platform and SmartBook that was available for the recommended text. The SmartBook is an interactive adaptive etextbook and is a unique way to engage students in their learning. Students are assigned reading from the ebook that is interactive in format and allows for changes in the direction of reading material that are individualised in response to the student's answers to pop up quizzes. When students get questions wrong the textbook can direct them to a text, graphical, or video explanation that attempts to better explain the specific concept. This personalised learning experience is designed to give students, who may be struggling, time to understand subjects, while faster learners can surge ahead without getting bored. This is important in large class cohorts with a range of abilities and interests. The interactive feature encourages reading and provides flexible access. This system also provides learning resources and a visual analytics dashboard that delivers at-a-glance information regarding student performance, study behaviour and effort. It helps identify student strengths, weaknesses and learning styles, providing opportunity for student support by addressing identified difficulties during lectures. Student support sessions on accessing, using and getting the most from this technology were scheduled and, although not compulsory in 16/17, most of the students bought the licence, accessed the ebook and utilised the interactive adaptive features. A student feedback survey on this novel technology determined that 74% of students would recommend the Smartbook to future students taking the course. This smartbook and Connect platform experience was presented by Dr Linda Stewart at the annual QUB Teaching conference in 2017.

(ii)   Technologies to aid interactive teaching environments
Lectures and practicals constitute the main methods of delivering module content to the students. In large student cohorts it is widely recognised that students feel more isolated and disengaged during lectures. One of our aims was to encourage class participation, interaction and student engagement. Q&A sessions were introduced at the start and end of the lectures through the use of the TurningPoint technology platform (managed within the school by Dr Michael Stewart) which facilitated punctuation of lectures with MCQs. Michael arranged training for all academic staff (Turning Point Lunch and Learn series) on setting up and using the system and provided help and support for staff who wish to use the system.

B. Introduction of Novel Technologies to Aid Student Engagement, Assessment and Feedback
The limitations of laboratory capacity dictated that the practical sessions were divided into four groups (4x per week). Practical attendance is compulsory and linked to the learning outcomes of the modules. In order to engage students with the practical content in advance a prelab quiz was introduced. This is set up on Questionmark and is compulsory for students to complete. Maureen McKee's skill and expertise in the use of Questionmark were required at this stage. The quiz ensures students read, engage with, and understand the practical content in advance. There is no mark associated with it and it is set up to provide instant feedback. The practical sessions groups are determined by degree pathway and also reflect timetabling issues. Setting individual groups up on Questionmark required Peter Reavy's IT skills. Having access to the individual practical groups on QM enabled opening of prelab quizzes a week in advance of each practical session and closing of them on the evening before the practical, and facilitated easier management and monitoring of this activity.

During practical sessions students complete a proforma which is submitted and returned with feedback. However, the marks for the practical sessions are generated by completion of a post lab quiz set up on Turning Point by Dr Michael Stewart. This quiz reflects the content and understanding from the completed practical. Instant feedback and explanation is given during the quiz giving students a sense of how they're doing in the course. The digital results are downloaded and collated onto a master spreadsheet by Eve Wilson providing the module coordinator with the opportunity to regularly assess student-learning. Student attendance at practical sessions is compulsory and is recorded manually on a daily basis by the demonstrators. The attendance sheets are given to Eve who monitors student and demonstrator attendance, emailing absentees immediately. Eve then updates attendance spreadsheets.

This enables early identification of students who are absent from compulsory elements and who may therefore be at risk of failing the module.

Restructuring of the modules facilitated reformation and alignment of the assessment profile of the modules. Both modules are assessed by exam (60%) and continuous assessment (40%). The continuous assessment contributes 40% of the final module mark and consists of 'off site' class tests on lecture material set up on QM and the practical portfolio. The feed-back/-forward is delivered to the students by various means. For each module the biweekly pre lab quiz delivers instant automated QM delivered feedback. The biweekly postlab turning point quiz also provides instant feedback and discussion from the academic practical lead. Several selected practical tasks are peer marked before uploading onto QOL. The practical demonstrator 'mentoring' scheme (see below) enabled student contact with mentors both on and off site. Each module has module surgery sessions post class tests with the relevant module coordinator, and finally students are sent report cards four times per academic year (twice per semester). This is made possible by the development of a specific computer program by Peter Reavy which can convert the master spread sheet containing all student results, produced by Eve Wilson, into individual report cards for each student which can then be sent out via QOL providing students with an official record of progress that they can monitor over time.

B. Linking Subject Specific Content to Research and Career Disciplines
Restructuring the modules to align with the new academic year structure enabled revision of the subject-specific module content. The module coordinators agreed to encourage input from others schools within the Faculty in order to harness the diversity in expertise. These modules benefit from the contribution to teaching from staff in the CEM and CCRCB, as well as external experts from the BCH, RVH and FSNI. In addition, in response to increased employer demands for science graduates with superior technical skills, a 'Practical Skills Portfolio' was introduced by Dr Michael Stewart. This is a progressive record of all the core technical skills experienced by students as undergraduates. This enhances the student skill set, demonstrates subject specific practical competencies and can be used by students for preparation of their CV and to enhance their employability.

C. Inclusion of Student Support Systems
Restructuring of the modules enabled the introduction and embedding of other student support services into the module timetables. These included sessions by the subject librarian (Hazel Neale), the careers employability and skills teams for Biological Science and Biomedical Science (Mark Gallagher; Eimear Gallagher) and the learning development team (Jeanie Parris). In addition,'Module Surgeries' were scheduled three times during the academic year to enable students to discuss their progress with the module coordinators, and identify any areas for improvement. Small groups of students were also assigned a PhD student (demonstrator)'mentor' who stayed with this group (in practical 'teams') for the duration of the module. This, 'team' approach, which involved exchange of contact details, enabled the students to build a relationship with their demonstrator that enhanced the learning environment.

Has our approach worked?

Year 16/17 was the first year of the new large modules and they were categorised by the staff and students who participated and the external examiner reports as being very successful. The evidence from the module evaluations for year 16/17 shows enhanced scores relative to other years (module evaluations available from Eve Wilson). The exam marks are generally lower than previous years most probably because of the significant increase in volume of content for students to learn. However, these lower exam marks have been offset by higher CA performance. The overall average module marks are comparable to previous years with the result that student progression was not impacted. The FYE 2017 for Biological Sciences showed an upward trend.

FYE 2017		Teaching	Learning Opportunities	Assessment and Feedback	Academic Support	Organisation & Management	Learning Resources	Learning Community	Student Voice	Students' Union		Overall I am satisfied with the quality of my course.	
Biological Sciences	**% Agree**	75.9	66.4	57.9	72.1	80.2	87.6	69.2	63.4	34.7		87.2	
School Result	% Agree: previous year	71.5	77.6	38.9	71.9	73.0	89.4	75.1	48.5	n/a		79.2	

The feedback from the external examiners for the modules was excellent:

'Year 1 BIO 1301 – The World of Microorganisms. Professor Neil A R Gow (External Examiner)
I wish to comment on the course BIO1301. The World of Microorganisms. 2016-2017. Coordinated by Linda Stewart. This course is running for the first time and enrolled 295 students. Of these 95% passed and only 1.4% failed. The average CA mark 78% -and only 11% of the class failed to get a 1st class mark in continuous assessment and the overall average exam mark for BBC1301 was 58%. The very large recruitment to the class may be the result of staff initiatives to speak to local schools about microbiology paying dividends. The use of the Interactive adaptive textbook by Prescott is highly innovative and enables bespoke learning individualised for students and customised learning and revision and examination. By-in from the students is obviously very high with all 300 £25 licences being taken up. I would suggest this would make an excellent presentation for the Education Division of the Microbiology Society. Along with threaded modules on biochemistry and genetics this will give QUB students a very strong foundation of understanding in the molecular sciences. This really is an innovative and extremely well run course – and the method of delivery could be considered for other courses. excellent.'

The development of these large modules is a work in progress. We are investigating the possibility of converting the 'off site' class tests on site, however, the infrastructure to achieve this is currently not in place. Maureen is keeping us updated on the new QM platform to be introduced in the coming months. We are also considering rolling out 'writing skills' and 'statistical analysis' workshops as these are areas consistently identified as weak within the student cohorts. Presentations and demonstrations were delivered by Dr Linda Stewart and Dr Michael Stewart at the annual QUB Teaching conference 2017 on the SmartBook technology and Turning Technologies, and we are currently investigating the identification of a Smartbook/ interactive adaptive platform for BIO1304.

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