

QUB TEACHING AWARDS

APPLICATION FOR A RISING STARS TEACHING AWARD 2017

(Open to individual academic and learning support colleagues who have been teaching/supporting learning within higher education for less than 5 years)

Contact details
Name (including title) Dr Paul Mensink (Lecturer Education)
School/Department: School of Biological Sciences
Number of years teaching in higher education: 3

1. PREVIOUS TEACHING AWARDS (200 words maximum)

If you have ever previously won a Queen's Teaching Award, please note the year and category (eg Rising Star, Team etc) below. You should also provide a short explanation of how the work outlined in this application differs from the work for which you were previously recognised.

Not applicable

2. CONTEXT FOR THE APPLICATION (300 words maximum)

Please provide a brief summary of your application and a context for your work.

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?

I am a Lecturer (Education) in the School of Biological Sciences, where I am the module co-ordinator for the first-year course Biodiversity (BIO1305, 106 students) and the second-year course, Marine Ecology (BBC 2026, 26 students, level 1). I am responsible for lecture content, practical design, field course organisation and module structure. In addition to module co-ordination, I have lectured for modules across every level of the school from large introductory courses (Environmental Biology, ~76 students) to more intimate upper-level and tutorial-style classes (Marine Zoology, ~ 13 students). My teaching role also includes the research supervision of undergraduate honours dissertations (3 students year⁻¹).

In all my teaching, I am committed to creating an exciting and interactive atmosphere, where my students are actively engaged in their own education in an open and supportive environment. I strive to spark the curiosity of my students through an enthusiastic, energetic and engaging lecturing style. I strongly believe that when students are motivated to learn by their own excitement and curiosity, their learning experience can extend far beyond the short period they spend in the classroom with me.

Student responses to my unique lecturing style have been overwhelmingly positive (teaching evaluations - overall mean - 4.78 ± 0.16, mean ± SD, 5 courses). However, I consider myself to be a reflective practitioner and I am constantly seeking new ways to deliver course content. I have a particularly keen interest in using technology to design creative and bespoke learning assessments that sharpen highly transferable skills such as logical thinking, critical analysis, and unbiased interpretation. I also enjoy using technology to enhance the feedback I make available to my students. During my time at Queen's, I believe I have implemented several successful strategies which have had a very positive effect on the quality of the student experience.

"Never has a lecturer been more encouraging and motivated me to do my best than Paul. His enthusiasm is infectious and makes lectures a joy."

Student feedback, Marine Zoology
BBC 3041

"Incredibly approachable and helpful, his enthusiasm sparks my own"

Student feedback, Marine Ecology field course, BBC 2026

2. DISCUSSION

You should illustrate your discussion throughout with reference to specific learning and teaching activities/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)

In this section, I detail a specific strategy I have employed to enhance teaching and learning support in my classroom. This online and community-based learning approach is closely aligned with the major themes in the Education Strategy 2016-2021 including (i) the development a dynamic and relevant curriculum, (ii) the innovative and flexible delivery of that curriculum and (iii) the thoughtful accommodation of the diverse range of learning capabilities found amongst our students.

Background and rationale

Quantitative skills such as data visualisation, statistical analysis and results reporting are becoming highly sought-after by employers across a range of fields. Statistical analysis has become a powerful and versatile skill our graduates need to succeed. Unfortunately, university educators consistently struggle with providing students the relevant level of expertise required for gainful employment. This is mainly because the field of statistics is advancing at a rapid pace, and the ability to perform statistical analysis has become irreversibly coupled with the student's capability to operate the (typically complex) statistical software responsible for executing that analysis. As educators, we now face the daunting task of teaching elementary statistical concepts, which students already find difficult in isolation (e.g., distributions, hypothesis testing, regression), while simultaneously teaching moderately advanced statistical computing (data manipulation and statistical programming). In combination with the range of computer literacy skills exhibited by our students (e.g., many students struggle with basic data entry), the dual set of learning outcomes, statistics and statistical programming, creates a situation where educators are unable to meet our obligations to deliver to a diverse range of capabilities within the classroom (a concern prioritised in Education Strategy 2016-2021).

"The enthusiasm and energy in every lecture. Also the personalised feedback to every piece of work."

Student feedback, Marine Ecology
BBC 2026

In the School of Biological Sciences, we have previously taught statistics and statistical programming (using the popular and open-source programme, R) together in three 2-hour practical sessions (6 hours total) in first-year Environmental Biology (EVB1004, now Biodiversity). On module evaluations for Environmental Biology in 2015/2016, 56% of the responses to "What did you enjoy least about the module?" explicitly mentioned statistics or statistical programming. When students were asked to identify potential improvements to the module, they suggested that 'Stats sessions should be less focused on using R and more info given on application and purposes of stats tests', 'Separate lectures/practicals on R and stats, not at the same time.' and 'Less focus on R in terms of statistics'. Clearly, having to learn both statistics and statistical programming is hindering the progress of our students. We need to determine how we can best leverage our limited time to teach students the quantitative skills they need while making sure they are competent with the statistical software required to apply these skills.

What have I done to remedy this?

To address the challenge of teaching basic quantitative skills and statistical computing together, I transitioned my teaching from strictly face-to-face tutorials to a more integrated and blended learning approach that includes (i) traditional tutorials, (ii) online walk-through videos and (iii) a dynamic stand-alone support website.

The first step of my blended learning approach was to create over 40 easily-digestible videos that students can navigate at a pace attuned to their own computer literacy. Videos can be embedded into QOL where the

students can easily stream them. After completing the videos and associated formative feedback quizzes independently, students can attend voluntary tutorial sessions. These tutorial sessions offer the in-depth assistance to students who are particularly struggling; however, it cannot offer the real-time support that most of the students need to efficiently progress through the material.

To deliver real-time support, I have developed a standalone website, Qubstats.com, that provides a vibrant online community for statistical programming and data analysis and serves as a resource hub for students during their quantitative training. Students sign-up using their QUB email address and create an anonymous user name (via a login page where users are approved by staff). The most important innovation the site offers is a dynamic question and answer portal (Fig 1). This Q & A portal goes far beyond the basic capabilities and limitations of a QOL discussion board and is designed to foster a community atmosphere of peer mentoring and support. On QUBstats.com, students can instantly ask a question (e.g., a coding error message) as anonymous users and have them answered by teaching staff (who are alerted via email), but most importantly, questions can also be answered by their peers who have encountered a similar issue. Questions can be supported using images, hyperlinks or rich text and be categorised using tags or themes. Posted answers can be voted upon by users in terms of their usefulness with popular questions or trending problems automatically featured on the site homepage (Fig 2). Importantly, questions are archived, creating a growing resource for both present and future students. Previous answers are easily searchable for students, allowing them to progress through the learning material faster and more efficiently (Fig 2).

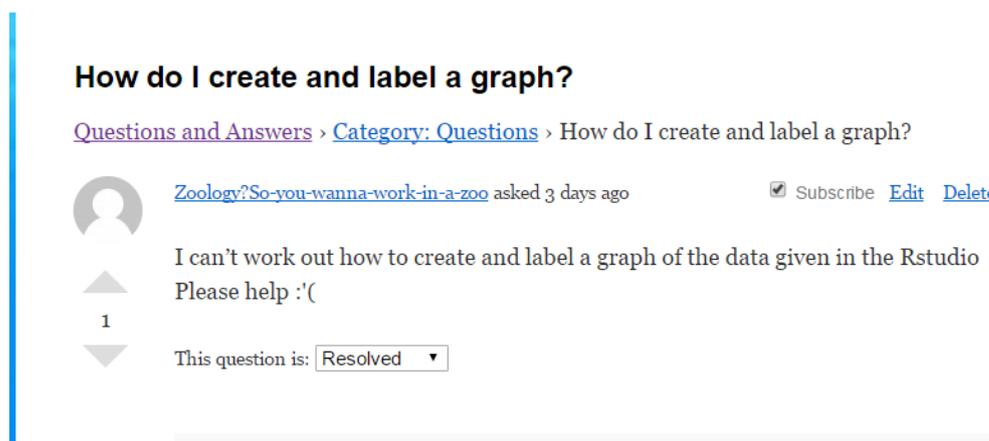


Figure 1. Example of a student question on the qubstats website.

I help students tackle statistics and statistical programming at their own pace in a safe online environment (free from exposure to potential internet harassment on general help sites) by having the site administered, monitored and moderated by QUB staff. This method encourages the students' active engagement in the learning material without embarrassment and provides them a lasting resource that they can access not only throughout their module, but throughout their entire degree and beyond. The site can also act as a feedback mechanism for staff by identifying areas where students are struggling.

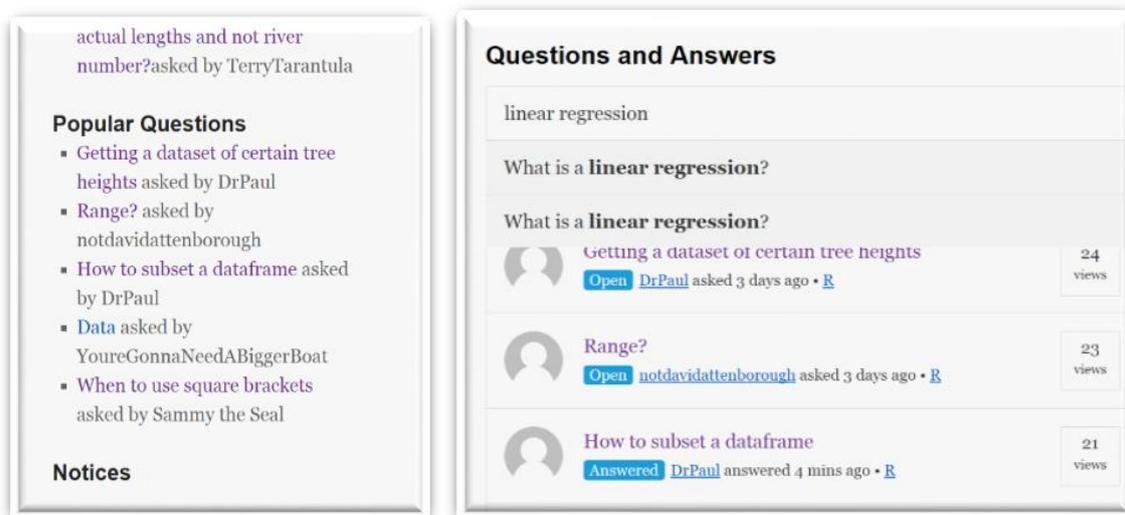


Figure 2. A list of popular questions located on the site homepage where students can easily access them (left) and an example of the site search engine automatically suggesting relevant questions that have been asked previously (e.g., “linear regression”, right).

The site has 100 subscribers (95% of all students in the class) and current questions on the site have received 164 views. While the website was initially developed for first-year biology students (BIO1305, 105 students) there has been considerable interest in the site at Faculty level (Dr Karen King, Education Committee meeting – 01.03.2017). The ubiquitous need for greater quantitative skills has been recognised across the university, which suggests this website could offer a valuable and enriched learning experience for students across multiple faculties. By using a blended learning approach with the aid of the qubstats.com website, we can help students deal with a difficult two headed monster (statistics and statistical programming) and foster a robust peer-to-peer community where students learn faster by gaining access to vital resources, seeking help from their peers and taking on the role of the teacher when helping others.

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

In the NSS, students consistently request more frequent and detailed feedback on their progress. Appropriate feedback is of even greater concern for our first-year students because of the removal of January examinations (ES 2016-2021) and the greater emphasis on continuous assessment (i.e. students will receive no mid-year exam marks to gauge their progress as university students). The size of first-year classes makes detailed mid-year reporting of student progress logistically difficult and consequently, students may only receive minimal details about their current standing within the module (e.g., overall average mark).

To help my first-year students gain a better understanding of their module progress, I wrote a small computer programme that generates personalised mid-year report cards (10 minutes for ~ 100 reports). The programme automatically produces a personalised statistical analysis for each student based on their individual performance in each continuous assessment component delivered during the first semester (using only a standard summary mark sheet). However, students may have more difficulty gauging their module progress because in comparison to exams, CA marks are typically more variable, higher and lack conceptual equivalent scales that enable students to interpret their mark. Therefore, within my reports I plotted each student’s mark against the overall average mark for the class (including standard deviation) and used a traffic light system to ease interpretation of their overall standing (Fig. 3). The programme also performs a range of

other calculations including relative performance on class tests vs. practicals (i.e. are they just poor test takers?) and relative progress over time.

Students found the traffic light system helpful (92% strongly agree or agree), believed the overall report card was useful (96% strong agree or agree) and have shown interest in having these report cards made available for their other modules (96% strong agree or agree, PRS survey, n=50). Dr Karen King (DE) has asked that we explore expanding the report cards to other first year modules (SBS Education board – 01.03.2017) and other module coordinators have responded positively to this suggestion (personal communication). In addition, I am also developing this software package as an openly available programme to aid colleagues at other national and international institutions.

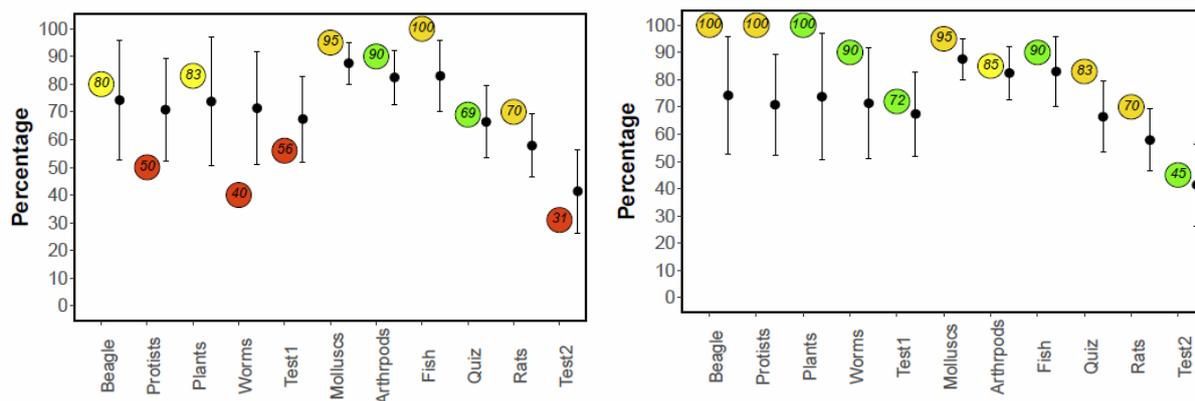


Figure 3. An excerpt from two mid-year report cards showing the relative comparison between the class mark and the student's mark using a colour coded system to indicate the relative rank within the class (gold- top 25%, green- top 50%, yellow – bottom 50%, red – bottom 25%).

(c) Ongoing professional development (maximum 350 words)

I appreciate that improving my teaching is a life-long commitment. While at Queen's I have taken several QUB courses including *Preparing and Giving Lectures*, *Teaching Larger Classes*, *Using Computer Assisted Assessment*, *Using the Personal Response System in Your Classes* and I am currently enrolled on the PGCHET. I have also participated in faculty-level education events such as the *Innovative Learning and Assessment Workshop* (run by Dr Kate Exley) and the *QUB Teaching and Learning Conference* (oral presentation abstract submitted for 2017).

I have always been very interested in leveraging the full potential of online technologies to deliver both formative and summative assessment for my students. After receiving my training in QuestionMark, I immediately implemented it in my Marine Ecology course (BBC 2026) for in-class tests. Immediately after the test, I spent the next hour going through each question with the students and discussing the correct answers. For example, in 2015 the question on biodiversity was in the top 5 most difficult questions (out of 22) on the in-class test and therefore, we thoroughly discussed it during the feedback session. On the final exam, the biodiversity question was selected second-most out of any question (7 essays available) and had the second-highest mean mark amongst all essay scores. I continue to use this technology and in 2016, I used QuestionMark to efficiently administer post-laboratory practical assessments for my first-year students. Due to my successful use of QuestionMark, I was asked by Dr Karen King to run a tutorial on QuestionMark software for academic staff at the 'Technology Session for Medicine Health and Life Sciences'.

**Teaching Awards 2016
Guidance**

The following are suggestions of the type of information you might wish to include in your analytical application - it is not an exhaustive list. You may also wish to draw upon educational literature within your application.

Promoting and enhancing the learners' experience	<u>Evidence of</u> <ul style="list-style-type: none">• how you stimulate and inspire learners• how you develop, organise and present resources• how you assess learners appropriately
Supporting colleagues and influencing support for learning	<u>Evidence of</u> <ul style="list-style-type: none">• ways in which you contribute to the development of colleagues within your area• how you contribute to institutional initiatives• your contribution to regional/national/international initiatives
Ongoing professional development	<u>Evidence of</u> <ul style="list-style-type: none">• professional development activities undertaken• how you have used these activities to review and enhance your practice• how this has led to improvements for your learners.