The Triumphs and Trials of Embedding Employability into the First Year BSc Biomedical Science Curriculum

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Introduction

Students enter a biomedical science undergraduate programme for a variety of reasons, from being good a science in school to having a specific career destination in mind, such as GEC entry Medicine. With the current move to students as "customers" driven by higher tuition fees, "Employability" has become a key performance indicator that Universities and courses are judged by. However improving students' employability right across this diverse range of motivations and careers awareness can be a challenge, and clearly requires a variety of approaches and activities. Therefore when the BSc Biomedical Sciences course at University of Birmingham recently underwent a major Curriculum Review, a philosophy aimed at improving employability was adopted, involving:

- Integrating the careers team into the programme, supporting students to identify skills acquired during the programme and how to evidence this in their CV.
- Increased opportunities to inspire students by meeting and hear from active researchers within the College right from the outset of their programme.

We sell our Universities to potential students on the basis of our research excellence- but how often do our students really get exposed to it?

Lopatto (1) has previously shown that exposing undergraduates to high quality research and giving them opportunities to participate in research activities such as placements, not only increases their research skills but also has a wider positive impact on their attitudes, confidence and proficiency. Skills developed include reading primary literature, data collection and experimental design. Many of these gains are portable, such as increased independence, which would help in any career pathway.

Intervention

We designed a new first year undergraduate module – "Introduction to Research and Experimental Skills". The module was designed to support students' transition to higher education and train them in the core skills required to complete the programme, such as literature searching, numeracy, presentation skills and statistics. Integrated into the module were seminars and research tasters designed to expose students from the outset to cutting-edge research in the College, to inspire and underpin the value of research in undergraduate degrees.

- Inspirational researchers gave seminars on current topics, delivered as 30 minute "bite sized" talks. These sessions were not didactic material to be learnt- but rather to give students a flavour of the research of the College, and how this integrates in with their curriculum. Five researchers spoke to the students about medical topics as cancer, changes in Immune responses with age, and cardiovascular disease; and therapy research such as into antibiotic resistance and immunotherapy, over 3 sessions.
- Research Taster tours (2h each) in a variety of laboratories from across the College (4 different laboratories) introduced students to research laboratories and were linked to skills training such as literature searching, oral presentation and experimental design. These sessions provided a practical theme to the activity and were embedded into their curriculum. The researchers were told via email that the aim of this session was to inspire these first year Medical Sciences students by giving them an overview of their research filed, to give them a tour of their lab and an insight into "life-in-the-lab", and what was required for the follow up activity.
- The in-course assessment was an experimental design project linked to their final Research Taster session. A mini "Research Conference" provided the opportunity for the students to present their experimental design to peers and academics as a poster. The poster presentations received immediate feedback and were graded on experimental design, quality of the communication, presentation and the students' explanation and defence of their design.

Outcomes

Longitudinal follow up will be used to evaluate the impact of the new curriculum design. However three interesting observations came out of our experience in the first iteration of this new module (122 students).

1) The Research seminars were appreciated by the students. The Research Tours and follow up work received a mixed reception, with 41% of students stating this was the best aspect of the module. A few commented their tours were not relevant or they did not like the additional work required; reflecting the diverse aspirations of these students.
2) The experimental design project and poster production for the Research conference caused concern for the students (see observation 3) probably as this is their first time to complete such an activity. Given extra support, via "sorting out difficulties" sessions on how to approach the assessment, they were all able to produce excellent posters, the standard of which exceeded our expectations. The students enjoyed the research conference, stated they were proud of the posters and 51% reported this was their single most significant learning event within the module.
3) The challenge was for colleagues to adjust their approach to year 1 undergraduate students:
   a) Some colleagues were confused about the background of the students, their level of prior knowledge and how to adjust their language to suit first year students
   b) Some questioned the value of the sessions
   c) The research questions provided to the students for the poster assignments were often too complex or vague

Conclusions

- *We need to adjust our assumptions of peoples' understanding of the course.*
- *Need clearer communication of the "bigger picture"*
- *Review and amend research questions prior to giving to students.*
- *Provide small group teaching sessions to discuss research questions and approach as a group and continue "sorting our difficulties" sessions to support groups with their posters.*

Discussion

Whilst there is evidence that exposure to research experiences during their undergraduate course can positively impact on students' skills and career choices (1), other research has shown that the quality of the research engagement is critical (2). Our experience of trying to increase the research exposure of these first year students corroborates these finding and illustrates some of the difficulties in trying to control the quality of the research experience of our students. Developing better ways of communicating motivation and requirements with research colleagues is required.

References

Lopatto, D (2010) "Undergraduate research as a high-impact student experience" Peer Review –Association of American Colleges and Universities: Spring 2010 p27-30
Hounsell, D (2002) "Does research benefit teaching- and how can we know?" *Exchange* **3** p 6-7.