Managing the Careers Expectations of STEMM PhD Students Roundtable

14:00-16:00 4th June, University of Edinburgh, St Leonard's Hall, St Trinnean's Room

Introduction

The Royal Society brought together a group of PhD supervisors representing a range of universities from across the UK to discuss the issue of managing the careers expectations of STEMM PhD students. The meeting encompassed wide-ranging discussions addressing the different roles of stakeholders, and the different mechanisms currently in place and what could or should change in order to more effectively manage the careers expectations of STEMM PhD students.

There are more STEMM PhD students now in the UK than ever before and they go onto a diverse range of careers in and outside of academia and science. There is the perception that leaving academia is a failure but as only a minority can continue onto post-doctorate positions, students need to understand that they have achieved a good qualification and that they have the skills to go onto do a range of careers. Many HEIs already provide many aspects of the recommended responsibilities but that is not uniform across the sector.

The format of the meeting was two plenary discussions. Each of the sessions saw broad and fascinating discussions. The key points from which have been set out below thematically.

Experience

This section's discussion is divided between students, supervisors and HEIs.

- **Students**

It was widely acknowledged that there were huge variation in the understanding and aims of students across STEMM disciplines as well as in the opportunities to continue a career in academia. However, it was felt that in general students did not necessarily have realistic career expectations upon starting their PhD, and those few who did did not stay in academia. Those particularly prone to leave academia are students in applied or technology subjects or studying for an EngDoc or ProfDoc.

The group discussed the issue of clarity around scientific career paths for students looking outside of the university at career options, and, partly because of this, an academic career was seen as the default and leaving academia as 'opting out'.

This was thought to be partly the product of hiring PhD students on the premise they may potentially want to stay in academia, and for this reason some students did not want their supervisors to be aware that the student was seeking careers advice.

- **Supervisors**

Supervisors admitted that they were not necessarily the best source of knowledge or experience of a wide range of scientific careers outside of academia, and for this reason it was thought that supervisors should play a signposting role for students to careers and university services.

The majority of supervisors themselves did not feel adequately acquainted with the careers services that their university could provide students and would welcome some training or induction sessions.

- **HEIs**

Universities and Higher Education Institutions do not all currently articulate what they view a PhD qualification as, and set out what skills (both transferable and discipline specific) they expected students to gain throughout the course of a PhD at their institution. This transparency would help manage the students' and employers expectations and clearly set out what skillset students should acquire.

Induction courses for PhD students should include a mandatory careers talk to crystallise their understanding of the wide range of career paths. This should be supplemented by discussions with PhD supervisors during their annual review in order to spur thinking about careers options.

It was thought that there were issues around the recruitment of PhD students in non-applied fields, as companies did not always understand what the students' qualification could provide, and therefore how they might fit into a company. This was reflected by some companies not differentiating between hiring undergraduate and doctorate students in starting positions. However, some industries such as pharmaceutical companies were the exception and entering the industry with a PhD qualification provided a step up the career ladder which set them ahead of undergraduate entrants.

Additionally, universities may not find collaborating with some industries as appealing as SME's who may be interested in sponsoring a PhD student for a research project may create a funding gap between how much the industry would want to put into a research project and the point at which they would try and control the academic side of it.

Key points

1. At the beginning of a PhD many students do not think about careers.
2. The majority of PhD students do not become academics and, in most cases, supervisors are the minority that do continue their careers in academia.
3. There are subject differences of expectations, experiences and levels of contact with industry.
4. PhDs students are not necessarily able to articulate what skills they are acquiring.
5. There was a general uncertainty around information about scientific careers or post-PhD careers.
6. Supervisors are not necessarily the best people to give careers advice to students.
7. The connection between supervisors and careers services is weak in many institutions, and could be strengthened to improve the confidence with which supervisor's signpost services to students.
8. There was a misconception that careers services were not for academic careers.
9. The student selection process was biased towards hiring for future academics.

Best practice

This section's discussion is divided between students, supervisors and HEIs.

- **Students**

Students have a wide range of experiences and understanding of career options and need to recognise they have responsibility for making their own career decisions. However, it was understood that students respect the authority of professors who can propel them into looking at career options.

If introduced earlier in the process of a PhD students may be able to do more long-term planning, and it was thought that this could help with the apparent drop off by female students after their PhD partly due to issues of moving and spousal settlement.

There need to be opportunities for students to investigate and spur them on to look into work experience or internships.

- **Supervisors**

Ideally supervisors should get training for signposting careers information and universities have a responsibility to provide training to help supervisors do the best job possible. The attendance by professors at careers inductions for students is important to show how important the topic is.

Many of the supervisors said that they would encourage their students to do internships, for example in Stirling they often have 6-9month internships - both breaks and integrated into a PhD are welcomed. Edinburgh University is looking at the possibility of integrating a break for all students but there are issues around funding and visa flexibility. However, it was understood that many of them had strong links with industry or worked in disciplines which were applied, and that in many other STEMM disciplines the prospect of students taking time out to do internships may not be viewed as favourably.

Supervisors should try where possible to keep track of their PhD alumni and engage them on speaking to current students as examples of future career paths. It was thought that role models or examples are ideally needed to show the different routes doctoral graduates could take.

- **HEIs**

Universities should provide clear information on the skills (transferable and subject specific) which students should expect to gain from a PhD. This may also include training for students in order to recognise what they have learnt and how to represent that to employers.

Annual subject days or PhD days in departments/universities (eg like the Scottish Alliance of Computer Scientists annual day) are an excellent vehicle to bring in examples from different industries and provide information about careers and careers services. It is also an ideal platform for industry to step up in PhD recruitment and internships.

Universities should look to provide a Mentor for students who can comment on pastoral aspects of student, including providing an impartial signpost to careers advice. It was proposed that one way of highlighting to students what impact or real world applications their research might have, could be served by an impact statement of the PhD work as part of the annual review process.

The issue of the structure of PhDs was discussed as having a bearing on the readiness for different career paths. The traditional format of a PhD involves organising a big project over the course of the PhD and providing outputs from the coherent thesis. However, there was an emergence of some who want to move to system of research with regular output of papers, which could then be collated into a thesis.

Key points

1. Supervisors would welcome training in order to effectively signpost services and manage students' expectations.
2. It was recommended that senior academics could mentor junior academics
3. Universities and supervisors support students contact with careers outside academia, and support internships and work experience broadly.
4. That there should be a change to annual review forms to include careers discussion between supervisor and student.
5. A discipline specific PhD one-day event linked to industry should be compulsory for departments.
6. It was recommended that the tracking of alumni, and subsequent careers days with Alumni from a range of careers was a good way to introduce examples of career paths to students.

Managing the Careers Expectations of STEMM PhD Students roundtable

To be held at the University of Edinburgh, on 4th June 2014 at 14:00-16:00 in St Leonard's Hall, St Trinnean's Room. This meeting will be co-Chaired by Dr Alex Brand and Dr Andy Leonard both members of the Royal Society's Higher Education Steering Group.
This meeting will bring together supervisors representing universities from a range of locations, and from different sizes and types of university.

Agenda

Time	Agenda Item	Aim
14:00-14:10	Introduction to the topic	To introduce: • the background to the Royal Society work • that the aims of the meeting are to garner views from PhD students on how best to help manage their careers expectations, and • how the outputs of the meetings will be used to inform Royal Society work in this area.
14:10-14:20	Introductions of participants	The participants will be asked to introduce themselves: giving and their name, title, and research area if appropriate.
14:20-15:05	Plenary discussion	To get all participants discussing the issues and contributing on: • Do you think STEMM PhD students have realistic careers expectations? • What challenges do supervisors face in assisting PhD students understanding their options at the end of a PhD?
14:55-15:05	Refreshment break	
15:05-15:50	Plenary discussion	To discuss the points raised to see if there is consensus and to answer: • How does your university help? What should best practise in this area look like? • What role should HEIs and supervisors play in managing the careers expectations of STEMM PhD students?
15:50-16:00	Concluding remarks	These will be given by the Chair(s) of the meeting summing up: • the issues that came out of the meeting • providing information to reiterate how the meeting will inform the RS' work, and • thank the participants for their valuable contributions.

Managing the Careers Expectations of STEMM PhD Students roundtable

4th June 2014, at the University of Edinburgh, St Leonard's Hall, St Trinnean's room

Chairs

University	Name	Department
University of Aberdeen	Dr Alex Brand	Biology
Oil and Gas UK	Dr Andy Leonard	

Participants

University	Name	Department
Dundee University	Dr Leon Chernin	Physics
University of Durham	Dr Buddhapriya Chakrabarti	Mathematics
University of Edinburgh	Dr. James A. Bednar	Computer Science
University of Edinburgh	Prof. Robert B. Fisher	Computer Science
Glasgow Caledonian University	Prof Bimal Kumar	School of Engineering and Built Environment
University of Edinburgh	Dr Jia Li	Lecturer in Carbon Capture and Storage
University of Edinburgh	Dr Prashant Valluri	School of Engineering
Edinburgh Napier University	Dr David Binnie	Engineering
Stirling University	Prof Amir Hussain	Computer Science
Stirling University	Dr Bruce Graham	Mathematics and Computing

Staff

Organisation	Name	Department
The Royal Society	Caroline Dynes	Science Policy Centre