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The PhD effect

Earlier this year, the Biochemical Society was approached by the Royal Society of Chemistry to undertake a survey of molecular-bioscience PhD students in the UK. This research, funded by the UK Resource Centre for Women in Science, Engineering and Technology, seeks to contribute to the expanding body of work which addresses the gender balance within the SET (science, engineering and technology) community. A similar survey has already been undertaken for PhD students involved in chemistry.

Over 2300 questionnaires were sent to 30 departments where molecular bioscience research was known to be undertaken. These included departments of biochemistry, molecular biology, biology and many others. This is in contrast with the survey of chemistry PhD students, where subject identification is much clearer. This is not necessarily a detriment to the molecular bioscientists, but more a result of the increasingly blurred subject divisions within traditional academic departments in our sector.

The under-representation of women within SET is undeniable, with only 14% making up the field of science, engineering and information and communication technology (Office for National Statistics 2007). While the reasons for this inequality are much discussed, our knowledge of the manner in which this attrition occurs, especially in the biosciences, where women are in the majority among undergraduates, is sketchy.

This collaborative research project provided an opportunity to examine the PhD experience as a crucial phase of in the careers of molecular bioscientists. Is the PhD experience less positive for women than men? How does this affect their career intentions?

The results of the survey of chemistry PhD students were indicative of a culture which is unattractive to female scientists. While 72% of first-year chemistry PhD students indicated an intention to stay in research after their PhD, this was true of only 37% of those in their third year. This trend was not seen amongst male chemistry PhD students. The proportion of male PhD students in chemistry intending to pursue a career in research after completing their PhD fell by only 2%, from 61% among first-year students to 59% among third-year students.

While it might be logical to expect similar results from the molecular-bioscience cohort, this was not the case. Although female respondents were less likely than males to be planning to pursue a research career after completing their PhDs, the difference between male and female students was much smaller than that in chemistry: 58% of female in comparison with 69% of male respondents. Furthermore, open-ended questions suggested that it had always been the intention of a smaller proportion of women to enter a research career after gaining a PhD. Hence, although fewer women bioscientists were deterred from pursuing a research career by the PhD experience than were men, fewer of them had held this ambition from the outset.

The open-ended questions allowed respondents to put forward a more personal viewpoint on their PhD experience, both good and bad. The majority of respondents were enjoying the PhD experience, with one remarking: "I am really enjoying this. I'm learning a lot while already making a difference".

Those who considered the downsides to PhD study frequently cited

long and irregular work hours: "I didn't realize how much I would have to sacrifice in terms of free time and feeling constantly under pressure".

The survey also uncovered different levels of satisfaction between men and women on the subject of supervision; 94% of men reported that the relationship they had with their supervisor was 'good' or 'excellent', in contrast with 81% of women, who were also more likely to consider the experience only good, rather than excellent. Although levels of over 80% satisfaction are to be praised, the 20% who were less than happy are cause for concern. In describing her supervision experience, one respondent said: "Generally I enjoy my work but the whole experience has been over-shadowed by the very poor supervision I have received and the reluctance for any of the other academic staff to intervene..."

Many respondents suggested ways that supervision could be improved, including an enhanced mentoring programme where more advice could be sought.

Although many PhD students in molecular biosciences wanted to pursue a research career, one-third of respondents rated their awareness of their job options outside academia as poor or very poor. The Biochemical Society has been aware for some time of the demand for careers advice and information amongst young scientists: this is an issue that the sector must tackle as a whole.

The results of both surveys highlight an important point: the student experience is quite variable between subject groups. Chemistry and molecular-bioscience students have significantly different experiences during their PhD courses, and any incentives designed to improve the student experience, and therefore improve retention, should be subject specific.

The complete report, which will be published in the autumn of 2008, makes compelling reading for anyone interested in the PhD experience. There is much to celebrate in what is clearly a generally successful subject area for PhD training. However, it would be foolish not to analyse the less positive messages and seek to make appropriate changes to our procedures.

Questions about the results discussed in this article should be initially directed to Rebecca Smith (Parliamentary and Policy Officer)