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Involving students in researching learning and teaching approaches: An additional focus for undergraduate student publications?

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'I am neither especially clever nor especially gifted. I am only very very curious.'

Albert Einstein

I am delighted to have the opportunity to contribute to *The Plymouth Student Scientist*. When Karen Gresty and Mick Uttley first proposed this initiative some years ago I was working at the University of Plymouth and was delighted to support the idea. I was also aware that this had been tried in other Universities where, after an initial burst of enthusiasm, the journals did not always thrive. It is very clear that this is a thriving journal and the contents of the first three issues are a testimony to the hard work and commitment of the staff and students involved. I am pleased and delighted to be able to contribute to the fourth edition.

(Re) turning to Einstein, the idea that curiosity is a characteristic of undergraduate students who should be integrally involved in the research enterprise of Universities has a long history. However, in the past staff often thought that undergraduate students were not clever or gifted enough to get involved in serious research and the result was we were often involved rather superficially in the research process. For example, when I was doing my Geography degree in the 1970s the experience I had of working alongside a researcher was very restricted. For example, I was required to spend several practical workshops accurately measuring the shapes of very intricate coastlines of atolls in the Indian Ocean - ostensibly this was a practical for 110 undergraduates so they could learn the finer art of calculating areas using equipment which is now obsolete. In fact what we seemed to have been doing was providing data (questionable in its accuracy) for a paper written by a senior lecturer – I don't think we were even acknowledged. We certainly did not know the context of the work we were doing and we never saw the final outcome. I personally had no curiosity at all about the practical I have described.

In 2009 the idea of 'students as researchers' has become embedded and highly valued in higher education practice (Healey & Jenkins, 2009) with students often seen as co-producers of research in the broadest sense. Today's Science students at Plymouth have a very much more explicit understanding of the research that their lecturers do and this journal encapsulates this very different approach – one which allows the 'blooming' of student curiosity. Although the papers in this journal have used advanced techniques (which will also probably become obsolete at some stage), students are not expected to simply repeat learnt techniques as I was - there is more to the process they are engaging in. What is happening here is more akin to a research apprenticeship – students are learning to select from a range of research skills/ processes and publish the results. Even for those who will not be choosing to continue careers in Academia, the approaches used – the questioning approach, the selection of the methods employed and the

communication skills - are going to be of use in careers of all kinds. They are transferable as well as discipline specific skills.

However, I do wonder sometimes whether students are introduced explicitly enough to the 'learning and teaching' concepts which underpin the things they are asked to do. Do they understand the careful 'building up' of research inquiry skills throughout the programme? Do they have an overview of the journey they are setting out on when they start a degree? Certainly, students cannot write articles like those that are published in this edition of the Journal in their first year – and staff will have carefully helped them develop the skills and knowledge – and curiosity – to get the stage they have reached. How can we make the learning and teaching process more explicit?

At the University of Adelaide, a model has been developed to help staff and students develop explicitly the research experiences of students through a process of curriculum design (see [Willison & O'Regan, 2006](#)). Here the emphasis is on showing how teaching and research can be inextricably linked to each other in an incremental progression (Brew, 2006). Students need to be helped to ask research questions of 'increasing sophistication, specificity, depth and breadth that sets them on the journey towards making the unknown known' (Willison & O'Regan, 2007 p5). If you are interested in how this approach can be applied to Science disciplines, take the time to review the case studies published for Human Biology (pp.8 -28) and Psychology (p77-79) by Australian academics who have worked with this research skills framework (Willison & O'Regan, 2006a).

As the Adelaide project shows, research and communication skills need to be fostered over several years and students will benefit most from this if the research skills development framework is clearly defined through their assignments and they are made aware of the progression they will encounter from the first stages of the degree through to graduation. The authors and editors of *The Plymouth Student Scientist*, and other groups involved in these activities at a range of institutions, might like to get together to consider how to involve students more explicitly at each level. You might ask whether the Adelaide framework would be useful for UK students generally. And is the route that our students follow similar to the one described in Australia? Making this process explicit might help to inspire the curiosity of authors of the next generation of articles for journals like this.

Another focus for student e-journals seems to be emerging from this Editorial – perhaps a new way forward. We would not have the Adelaide research skills development framework if it had not been for a group of lecturers and educational developers getting together to review and research their own teaching – a process referred to as pedagogic research. Plymouth, in particular, has huge expertise in this area through the work of the five Centres for Excellence in Teaching and Learning, the Educational Development unit and committed staff in the Faculties – in fact this journal is an outcome of this kind of academic curiosity about what can make learning work better.

The challenge I'd like to set students is to think about getting involved in their own pedagogic research – possibly as final year projects - which could be published. At the University of Exeter we have been experimenting with student- generated pedagogic research. Students have been working (as volunteer researchers) on identifying and addressing pedagogic research questions and looking for learning and teaching 'solutions'. These are presented to staff and students at an annual conference. '*The Plymouth Student Scientist*' could valuably broaden its remit to address these sorts of questions in the Sciences – to capture the undeniable curiosity *some* students have about broader educational questions to genuinely improve the educational experience of *all* students.

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