Student creativity and the research-teaching link agenda

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There has been considerable debate about the reality of the benefits of learning in a research environment: do undergraduates gain anything measurable from being taught by active researchers, and is learning significantly enhanced in a research intensive university compared to one that is not? A common response is that the final year projects students undertake are likely to benefit from occurring in an active research environment. Fair enough, but what about undergraduates at earlier levels?

One resource that is currently underused in my view is the postgraduate research student population. These students often help demonstrate in laboratory or field classes, but they rarely engage with undergraduates on the topic of their own research.

There are several possible benefits from arranging an interaction between postgraduate researchers and junior undergraduates, built around the topics of research students' work:

- The postgraduates benefit by having to explain their work to students who may lack detailed background in the topic i.e. this is a challenging science communication task for the postgraduates.
- The undergraduates gain insight into the research work progressing at their own institution. This can help them understand that science is an active process, not simply the mastering of a huge body of knowledge.
- Interaction with researchers not much different in stage of development from themselves can help develop the understanding that science is something they themselves can aspire to do, rather than being done by much older people.
- Undergraduates may also gain insight into what the life of a researcher is like.

The scheme we have established at Glasgow possesses the listed benefits, but also encourages student creativity. The scheme is part of a Science Communication course which can be taken by science students of any discipline, normally at Scottish University Levels 1 and 2.

1. Undergraduates in small groups (4 or 5) are linked (on the basis of preferred interests) with a mentor who is a post-doctoral researcher or an advanced (year 2 or 3) postgraduate researcher.
2. The Undergraduates' task is to find out what their mentor's work is about, by consulting the mentor's website and my meeting the mentor.
3. The Undergraduates are expected to create three outputs from the interaction:
   - Each undergraduate writes a profile piece in broadsheet newspaper style on their mentor, outlining the research being done, but focussing more on what it's like to be a researcher, and how the mentor got into research.
   - Each undergraduate group prepares a poster on the mentor's work, with all the posters presented at a poster conference. The undergraduates are asked to design a poster that can be understood by a lay audience: at the poster conference, they are expected to be able to handle questions about the poster and the underlying research.
   - Each undergraduate group makes a short television programme on the mentor's work. They are encouraged to think creatively about the format of their programme.

   Note that the mentors are not expected to take part in making either the poster, or the television piece: their role is simply to provide information and advice.
4. Each of these outputs is assessed. For the group assignments, we use anonymous peer review to moderate the grades awarded to individual students.

Comments

We have not found it hard to recruit mentors (though we do pay them) and overseas researchers have been particularly keen to participate: they see this task as a help in developing their own science communication skills.

The task faced by the undergraduates is challenging: postgraduate/postdoctoral research can be quite technical and apparently obscure, so the undergraduates have a steep learning curve to climb. The advantage is that they are learning what real research can be about, and that they can aspire to do it.

The work also encourages undergraduate student creativity. None of the communications they need to prepare are like standard essays or laboratory reports: they have to think creatively about how to present difficult research to a general audience in three different media: print journalism, poster and television.

There are, no doubt, other ways in which undergraduate-postgraduate interaction can enhance learning and unlock creativity, but we have found this scheme is effective and eye-opening to students.