Story of a Paper

Case Study for Society of Biology HE Bioscience Teacher of the Year Award 2013
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Background - what is it?

Story of a Paper is a teaching approach designed by the author to make explicit aspects of research and knowledge construction that are often hazy to students. A researcher (presenter) chooses a paper from their career and, with the help of a one-sheet framework of guidance and ten prompts, informally tells the story of how this came into being. The session fits within a 1h (50 min) lecture slot, with 35-40 minutes storytelling and 10-15 minutes for questions and discussion. Presenters can be at any stage in their research career and need not have teaching experience; the only requirement is that they have authored or co-authored a paper and are willing to engage with students.

The focus is not the data itself (although this is touched on), but rather key aspects of bioscience practice and identity that are revealed by answering prompts such as: who are you/what is your present role; what was your role/where were you then; why is this paper important to you; who are the authors (role, contribution, significance of position); how was it funded; what was the scientific context; what were the key findings; why this journal (reviewers comments, resubmission, peer review, editorial decisions), and what were the consequences (reputation, career, leverage for grants, citations, opened up research avenues).

The approach was introduced at Imperial College London during 2012 for MBBS/BSc (4th year), BSc Biomedical Science (3rd year) and BSc Biochemistry/Biotechnology (2nd year) students with two presenters: a Head of Division and a Teaching Fellow. It was evaluated by questionnaire (returned by 50% of student attendees, both presenters) and interviews (10 students, 1 presenter). In the author's module, Story of a Paper complements a previously-introduced mini-research project which gives students an opportunity to design and execute their own research in groups (within a guiding framework) and write it up as a research paper (Saffell 2009).

Reasons for introducing this teaching approach

It is important that undergraduate bioscience curricula give students opportunities to acquire the "ways of thinking and practicing" in the discipline (Hounsell et al, 2005), to move beyond knowledge itself to an understanding of how it is generated and contested - and by whom. This is as relevant for students who move out of the discipline as for those who go on to postgraduate bioscience futures. Employers expect bioscience graduates to have bioscientist thinking skills and some idea of practice in the bioscience community, but undergraduate understanding of how science works is often limited, particularly its social aspects (Ryder et al, 1999).

One way of remedying this is to give undergraduates access to our community of practice which, as expounded by Lave and Wenger (1991), affords learners opportunities to acquire identity, conceive of possible trajectories and gain insight into how things are done. Participation in bioscience research environments helps (McCune, 2009; Saffell, 2009), but is not always possible or available and usually comes towards the end of a degree, too late for some students (Saffell, 2012). Moreover, transformative though such experiences can be, there is more to bioscience practice and identity than research at the bench, and other modes of authentic engagement with practitioners that are effective (Stein et al, 2004). In agreement with Wenger that, "if learning is a matter of identity, then identity itself is an educational resource" (Wenger, 1999), the author designed Story of a Paper to provide a medium for researchers at any stage in their career to reveal key aspects of bioscience identity, practice and knowledge-generation to students with whom they may not otherwise interact.

Lecturers' perspective

Story of a Paper sessions were an enjoyable and rewarding experience for presenters as they very well received by students, who were engaged and asked several questions. Presenters found the framework helpful and said they had included aspects they would not have thought about without the prompts. The storytelling component was highlighted as being the most useful "as it immediately made me think of talking about events that led up to the paper, events during the paper and events that happened as a consequence of the paper." The presenters felt strongly that curricula should include sessions that give students a sense of how research and knowledge construction works, and were happy to repeat the exercise. Aspects emerging from their stories included lab politics/dramas/personalities, how science is done, how teams work, different career trajectories, careers information, multi-disciplinary research, science-as-process, need for continual revision of concepts, checks and balances, as well as the information elicited directly by prompts. Discussion was guided by student questions and encompassed what life is like as a PhD student and post-doc, how research is funded, research in industry vs academia, career issues, choosing a journal, total cost of the paper, and working with collaborators.

Students' perspective

Evaluation questionnaires (27 students) and interviews (10 students) showed that Story of a Paper was highly valued. From a selection of descriptors, 93% indicated they had found the session valuable, interesting, useful and worthwhile, none found it boring or a waste of time, and five said they could take it or leave it (though three also found it interesting). Nearly all thought the session should be included next year, with most citing the value of insight into the research process, "it goes beyond the science that is taught in the modules, and puts the significance of both science and medicine into context of the outside world. I find that this was one of the most worthwhile lectures to attend because it teaches/shows something that you can never really learn elsewhere." Others mentioned an opening-up of possibilities, "it has made me start to think seriously about taking a year out to do a Masters or to break off to do my PhD."

Asked what they had taken away from the session, half mentioned the process of doing and publishing bioscience research, "good insight of how 'real world' research worked, and how things progress from an idea or theory into a full-blown research project." Nearly half cited changes to their own outlook and plans, "conveyed an idea of a dynamic and exciting lab world, something that certainly makes research more appealing to me as a potential future choice," while a third mentioned the collaborative and team aspects of research, and a few specifically mentioned being surprised by the funding and time required.

The author's module leadership, lecturing and teaching innovations are consistently rated very highly by students, resulting in two Imperial College awards for Excellence in Teaching (in 2007 & 2011) and the Rector's Medal for Outstanding Innovation in Teaching in 2011.

Benefits

Story of a Paper is a source of motivation for students. It gives them insight into the bioscience community and lets them see possible futures, as indicated by the richness of their questionnaire comments and questions in the sessions. By inviting students into their research worlds, presenters reveal bioscience research practice that is obscured to students. Encounters such as these give them a sense of belonging to the bioscience research community. The format and opportunity to engage with a researcher is a nice change from lectures (mentioned in half the questionnaires). The framework is simple to use and easy to explain to presenters, who readily see the value in the approach and find the sessions enjoyable. The approach is as suitable for early-career or senior researchers who have had little or no teaching experience as it is for more experienced lecturers.

Issues

Confidentiality: presenters need to be circumspect about disclosing sensitive issues. Timing: presenters should spend an average of just under 4 minutes per prompt to leave enough time for discussion; breaking for questions halfway through (or throughout the session) ensures time for interaction. Paper topic: course conveners should consider whether relevance of a paper is important; the value in the approach lies beyond content, but relevant content might add another useful dimension. Integration: the author favours sessions being integral components of modules, but they could equally be added extras that are optional. Distributing paper: the framework suggests that students are supplied with a copy of the paper beforehand, to read and bring to the session. This is not a necessity, especially if the paper content is not relevant to the course. Powerpoint: presenters are encouraged to talk directly to students, avoiding slides as far as possible to facilitate informal interaction.

Reflections

The advantage to students of studying in a research-intensive university is their proximity to cutting-edge research groups, but they need *access* to these environments and people to acquire bioscience "ways of thinking and practicing". Story of a Paper serves to facilitate this interaction. Its use is being extended from undergraduates to taught postgraduates, PhD students and clinicians, as well as to other disciplines at Imperial and contacts overseas. It is versatile enough to be a one-off session or form a series, using presenters with contrasting seniority and/or research area. Students indicated in their feedback that they are particularly interested in hearing from early-career researchers as well as experienced ones. The author is now working on a framework for "Story of a Patent," given the emphasis at Imperial on translation.

References

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