

The Impact of a Teaching Specialist in a Research Led University

Jennifer Ann Jean Burnham
*Department of Chemistry
University of Sheffield, UK
j.burnham@sheffield.ac.uk*

Abstract

My intention was never to make an impact. After my appointment, I set out to learn how to teach well and my activities in this area have led to improvements in the quality of teaching provision in my department in addition to my own practice. I set up a faculty network of people interested in teaching to relieve the isolation accompanying my role as a teaching-specialist in a research-focussed department. More people than I had anticipated use the network and it has helped raise the profile of teaching within the faculty. This article explores the impact I have had on my teaching practice, my career, my department, and my institution through a series of stories and concludes with a summary of the success that helps me gauge that impact.

Keywords: Scholarship, mentorship, teaching excellence,

Introduction

I am a teaching specialist at a Russell Group university. The institution has invested heavily in its teaching support and infrastructure during the eleven years I have worked here and it has rethought its attitude to its teaching staff. We are no longer referred to by the pejorative 'teaching only' title, we are now known as 'teaching specialists'. Our career pathway has been defined and, in recent years, both academic and teaching-specialist staff have been promoted to professor for their work in learning and teaching.

I was appointed as one of two fixed term teaching assistants to give teaching relief to staff in advance of the RAE submission (RAE2008, n.d.). At that time, I was an experienced research chemist with minimal teaching experience. Since then, I have learned about teaching, I have been promoted twice and am now a Senior University

Teacher with equivalent status to a senior lecturer. My teaching performance is personality-driven and I aim to fill it with enough enthusiasm to carry even the reluctant along. I value thought and independence among students and I tailor my teaching to instil these qualities. I like to solve problems and the work I will describe here has been inspired by a desire to improve things. Whilst I do not claim to be driving the evolution of higher education, I have made an impression in my sphere. This article draws on stories from four different areas of my influence in order to describe my impact.

My Stories

What my MEd did for me

When I was appointed, my teaching experience was limited to laboratory demonstrating and workshop support. I felt very inexperienced. I asked to do a postgraduate certificate in learning and teaching and enjoyed it so much that I completed an MEd in teaching and learning in higher education. I was told the MEd would be life-changing and it has been. I entered as a cynical physical scientist and emerged as a neo-social scientist with eyes opened to the advantages of qualitative research. In addition to studying teaching and learning theory, I was exposed to teaching practice from across the university following the model outlined by Rowland (1999). I had my prejudices and preconceptions challenged in vigorous debate and I have reflected deeply on my teaching and my teaching philosophy.

My Masters dissertation drew on action research into an intervention in my laboratory teaching. I made use of some curriculum theory (Barnett, Parry & Coate, 2001; Barnett, 2009) to repackage my laboratory course to ensure that it covered a satisfactory balance of technical skills, content knowledge, and personal attributes. The dissertation attempted to evaluate the success of this redesign by making use of some project work I was also running in the lab. My project drew on the creativity of the students and the number of experiments they could do in one lab session to investigate a problem that had arisen with one of the laboratory exercises. I enjoyed the project. I found it invigorating and it was fruitful in terms of my understanding of the problem. The students were engaged and enthusiastic throughout. They had great ideas, they

worked hard, and they gave very positive feedback about the opportunity and the experience in the end of module evaluation. I presented the idea of using students as a resource at a conference (Burnham, 2012) and wrote the research up for my first teaching paper (Burnham, 2013).

The project work was worthwhile for what I learned about the problem with the chemistry and it disproved a common belief in my department that less experienced undergraduates are not capable of good quality research. I benefited from the experience of researching and writing the dissertation but using the project work did not do a good job of evaluating the changes to my laboratory curriculum. I have since identified some questions that needed answering in order to design a better investigation into the success of the changes. I put these into a presentation (Burnham, 2015) and some of my counterparts have thanked me for having had the courage to ask publicly the questions they themselves are tackling.

The new attempt to evaluate my laboratory course embraces qualitative research methods and I have an enthusiastic final year project student to help me out. She is collecting evidence to generate a description of the student experience in the laboratory using a hermeneutic spiral methodology (Bodner, 2004). The aim of the work is to compare the student experience with the aims of the redesigned lab and it has the potential for publication. This educational research is a departure from the normal chemistry projects we offer and my student is delighted to have the option of doing it.

My MEd started me on a path that has included presenting my work and writing it up. Publishing my work and receiving supportive feedback from my peers has made me feel like I have done things that have value. It is important to me that my educational research work is recognised. One of my colleagues recently celebrated his 500th paper. Having achieved one of my own has really boosted my self-confidence.

Something I read in JChemEd

My scholarship activities have highlighted some deficiencies in the traditional chemistry curriculum and have provided examples of good practice to adapt. Within chemistry education, the Journal of Chemical Education (JChemEd) is a treasure trove of brilliant

gems of ideas. In researching peer assessment, I came across a paper outlining a “*learner-centered*” writing assignment that made use of peer review mid-way through to strengthen the final essay (Shibley Jr., Milakofsky, & Nicotera, 2001). The key point of the model is that through peer assessment, students can gather opinions on their work at the same time as learning to critically evaluate which then feeds back into improvements in their own work. Sometime later when departmental discussion turned to the creation of a literature project for the final year students, I made a case for including peer review. The case was persuasive and took me from initial informal conversations to serious and earnest discussions at committee level and the module got the design I thought would work best. A draft of a 3000 word review of the primary literature is peer assessed by two students and commented on by a staff member. The three sets of comments and the experience gained as a peer-reviewer help the student improve their final submission. Whilst it is not ‘my’ module (it was given to a colleague to run) I continue to be proud of the praise it receives:

The literature review with peer review stage by other students is I think a unique example of excellent practice that I want to highlight as very innovative and an example of the very best practice. (Frey, 2015)

Meetings and conferences as well as JChemEd are a great source of ideas and examples of unusual, entertaining, or innovative teaching. When the need for additional project work for our final year undergraduates was highlighted, I saw the potential for a fun and student-centric employability skills project. This time, I got creative (if not total) control and Skills for Success was born.

In Skills for Success, students apply for a project that suits their particular career ambitions. The design draws on two philosophies I learned whilst on conference. First that it is not necessary to assess every tiny piece of work a student does (Storying Sheffield, 2015), and second that students are productive in their own right (FreeLaw Legal Clinic, 2015). Ideas for projects have come from many places including the literature (White, Brown & Johnston, 2005; Jones, 2011), activities within the department (Chemistry Green Impact, 2015), and conference presentations (Taylor, 2012). The projects all have some chemistry content and activities range from experimentation and light research, *via* journalism, enterprise, publicity, and work

experience, to debates and entertainment shows. To consolidate their learning, students write a reflective essay after the project work is complete. This final element reinforces the learning gained in the project and ties Skills for Success in closely with the attributes we aim to instil in our graduates (University of Sheffield, 2015).

Designing the project work enabled me to work with a senior member of staff from another teaching section. She was impressed by my work and nominated me, successfully, for a prestigious institutional award for excellence in learning and teaching. The case drew heavily on the design of Skills for Success and this was highlighted in the citation that accompanied the award. This has been great for me but I think a bigger accolade for Skills for Success is the thanks I received from students for whom the project experience helped them choose a direction for their career.

I do my scholarship in learning and teaching because I am interested. The ideas it generates are an added bonus to something I would do anyway and the ideas have spilled out into wider benefits for my department and my students. Reading a paper in JChemEd has resulted in project work highlighted as the very best practice in teaching. My scholarship more widely has generated project work capable of influencing graduating students' career choices. These are satisfying pieces of evidence to reflect upon and they are also a useful justification of the time I spend on scholarship.

The student dimension

A teacher's biggest impact is on the students they teach and measures and metrics do not capture this well. I can see the results of my actions in the achievements of individual students and I know I make a difference.

One former tutee applied to spend a year studying at an Australian university shortly after a well-respected chemist in my field had moved there. I suggested to him that he might enjoy doing a research project with this chemist, and he did. He liked it so much that, following his graduation, he returned to Australia for doctoral studies with the same professor. The partnership has generated five research papers and the tutee recently thanked me for the original recommendation.

Whilst my first tutee probably would have succeeded whatever he did, another had got stuck. He graduated early from his degree with a BSc and was turned down for an MSc in another faculty. He felt lost and spent a year sitting in front of the television. In the spring, he came to see me for advice. Knowing his ambitions were chemistry-focussed, I persuaded him to apply for an MSc within our department. He did so, got a place, and his MSc project led on to PhD and then post-doctoral studies with the same supervisor. His work has generated seven papers (including one in Nature Materials and a Nature Communication) and approximately £400,000 in additional research funding.

A significant portion of my institution's income comes directly from teaching students, but it is not headline-grabbing in the way million-pound research grants and multi-million pound infrastructure deals are. My impact is not headline-grabbing either, but I am proud of my students' achievements and I can measure my impact in the metrics their work has produced.

Two is company, more is better

Ten years ago at a university learning and teaching conference I pointed out (to a panel including the PVC for Learning and Teaching) that being 'teaching only' felt like being a woman before emancipation (indispensable but not thought capable of doing a 'man's' work). Having done this, I found other teaching only staff who felt as second-class in their own setting as I did in mine. I came up with an idea of a university network where teaching only staff could share experiences and support each other. Advice to be inclusive (and not teaching only elitist), and to keep things simple led me to set up a faculty network for all staff involved in teaching. To get it going, I had help and support from within the institution. The faculty PVC gave his endorsement; the faculty Director of Learning and Teaching was vastly enthusiastic and got committee approval for the venture at university level; and the faculty Learning and Teaching Development Manager was a fount of advice, insider-knowledge, and ideas. We battled antipathy and incomprehension from the Faculty Executive Board, but eventually the Science Teaching Network was born.

The Science Teaching Network meets four or five times per year. Meetings are informal and open to all. They involve refreshments and lots of chat before the 'business' of the

meeting which can involve structured discussion, presentations, or exploration of learning and teaching technology. To date, seventy out of a possible three hundred staff have engaged with the network from across the spectrum from very junior teaching assistants to extremely experienced professors. There is a positive feeling about teaching within the faculty and a growing acceptance of its importance is reflected in the growing number of teaching specialists which is now more than thirty.

I am making use of the network to change perceptions surrounding teaching activities and academic promotion. I was horrified when a senior colleague commented that it was not possible to get promoted for teaching (unless you were a teaching specialist). He was wrong. The university promotions criteria describe the teaching component of an academic role, however, the evidence needed to prove this is not made obvious in those criteria. Following on from a network brainstorm on promotions, I compiled examples of evidence for the teaching-related promotions criteria for Grades 7 – 10 (Professor). These were endorsed by the Faculty Executive Board and have been used by academics and teaching-specialists alike to help write their cases for promotion. We also made use of the compilation of evidence when the network hosted a faculty-led workshop on career progression and promotion. An unanticipated outcome of this is that, because I am very familiar with the promotions criteria, I have been able to help four colleagues improve the teaching component of their CV to achieve success in subsequent promotions rounds.

My original idea for a network was limited to teaching only staff. What I have created is better than that with academic colleagues bringing their experience, perspective, and wisdom to our meetings. It is a discussion forum for exchanging ideas and good practice and it is also a support network. The network is cited as one indicator of how the faculty is achieving its aims within its learning teaching and assessment strategy and another faculty has modelled its own 'Teaching Circles' on the basis of our success. For me, the most important point of all is that the network has been effective in enabling staff to meet and talk to colleagues from other departments outside of the formal committee structure. Very junior university teaching associates can now exchange ideas with experienced professors and the teaching environment in the faculty is healthier as a result.

Conclusions

My intention was never to make an impact. I work within a supportive environment that has enabled me to follow my interests and my stories show why this has been a good investment of time. In pursuing and extending my Masters studies, I have met people who value teaching as much as I do and whose interest in my interests has helped them grow. My contributions to departmental teaching developments were done to fill gaps in teaching provision and are now being held up as excellent practice. I have provided opportunities for students to do something different to the standard undergraduate fare and I have seen my influence extend beyond their undergraduate studies into their careers. I have presented my work at conferences and written some up for publication. I have received recognition for the quality of my teaching and having a scholarly output has improved my self-worth. I have helped colleagues to write successful cases for promotion and have received several requests to be a mentor. By creating and curating networks and attending meetings and conferences, I am contributing to the growing fellowship of teaching specialists nationwide. All of this has been useful with regards to my career although that was not the original motivator, and it reflects well on the department that supports me.

With the advent of a Teaching Excellence Framework (Department for Business, Innovation & Skills, 2015) there is likely to be a top-down drive to enhance teaching quality. I think teaching specialists have an important role to play in enhancing learning and teaching from the bottom-up. We are making the transition from teaching assistant or laboratory demonstrator to a teaching-focussed career but with few role models to follow. My stories describe some of the impact I have had on my teaching practice, on the teaching in the department, on my career, and within the institution (and beyond), and how it is reflected in the achievements of my students. The activities that started this were not huge but they were timely. My story suggests that it is simple to make a small difference and that lots of small differences can make a large impact.

References

- Barnett, R., Parry, G. & Coate, K. (2001). Conceptualising curriculum change. *Teaching in Higher Education*, 6(4), 435-449.
- Barnett, R. (2009). Knowing and becoming in the higher education curriculum. *Studies in Higher Education*, 34(4), 429-440.
- Bodner, G. (2004). Twenty years of learning how to do research in chemical education. 2003 George C. Pimentel Award. *J. Chem. Educ.*, 81(5), 628-625.
- Burnham, J. A. J. (2012). *Turning laboratory problems into educational opportunities*. Presentation given at Variety in Chemistry Education and Physics Higher Education Conference, Edinburgh, Scotland, 30-31 August 2012.
- Burnham, J. A. J. (2013). Opportunistic use of students for solving laboratory problems: Twelve heads are better than one. *NDIR*, 9(1), 42-48. Retrieved 15 June 2016_ from <https://www.heacademy.ac.uk/sites/default/files/ndir.9.1c.pdf> (accessed 15 June 2016)
- Burnham, J. A. J. (2015). *How can I measure the success of my lab teaching?* Flipped session given at Variety in Chemistry Education and Physics Higher Education Conference, Nottingham, U. K., 20-21 August 2015.
- Chemistry Green Impact (2015). *Recycling in the Chemistry Department*. Retrieved 15 June 2016_from http://www.sheffield.ac.uk/chemistry/about/green_impact
- Department for Business, Innovation & Skills (2015). *Fulfilling our potential. Teaching excellence, social mobility and student choice. November 2015*. Retrieved 15 June 2016_from <https://www.gov.uk/government/consultations/higher-education-teaching-excellence-social-mobility-and-student-choice>.
- Frey, J. G. (2015). *Examiners Report for a Taught Programme of Study: Session 2014-2015*. Prepared for the University of Sheffield.
- FreeLaw Legal Clinic (2015). Retrieved 15 June 2016_from <http://www.sheffield.ac.uk/law/freelaw>
- Jones, C. D. (2011). The kitchen is your laboratory: A research-based term-paper assignment in a science writing course, *J. Chem. Educ.*, 88(8), 1062-1068.
- RAE2008 (n.d.). Retrieved 15 June 2016_from www.rae.ac.uk.

- Rowland, S. (1999). The role of theory in a pedagogical model for lecturers in higher education. *Studies in Higher Education*, 24(3), 303-314.
- Shibley Jr., I. A., Milakofsky, L. M., & Nicotera, C. M. (2001). Incorporating a substantial writing assignment into organic chemistry: Library research, peer review, and assessment. *J. Chem. Educ.*, 78(1), 50-54.
- Storying Sheffield (2015). Storying Sheffield, telling untold tales. Retrieved 15 June 2016_ from <http://www.storyingsheffield.com/>
- Taylor, P. (2012). *Students making videos about lab classes*. Oral Byte presented at Variety in Chemistry Education and Physics Higher Education Conference, Edinburgh, Scotland, 30-31 August 2012.
- The University of Sheffield (2015). *The Attributes of the Sheffield Graduate*. Retrieved 15 June 2016_ from <http://www.sheffield.ac.uk/sheffieldgraduate/studentattributes>
- White, H. B., Brown, S. D., & Johnston, M. V. (2005). Contemporary moral problems in chemistry: Effect of peer presentations on students' awareness of science and society issues, *J. Chem. Educ.*, 82(10), 1570-1576.