

# From Bioscience to Pedagogy: a transition in progress

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### Abstract

The professional lives of UK STEM HE academics are complex and multi-faceted and may vary depending on the local context. What is common to all however is the pressure to improve the student learning experience not least to improve institutional outcomes in the National Student Survey and university league tables. Increasingly academics have responded to such influences by attempting to re-orientate their careers away from a purely STEM and bioscience disciplinary focus to one that also encompasses expertise in the learning and teaching aspects of their academic practice. How does one begin to make such a transition though? This paper uses the methodological approaches of autobiography and self-study to investigate some ways in which such a transition might be attempted. Articulation of personal dilemmas and issues in this way can become a useful research tool by providing evidence and analysis of problems to illuminate the experience of and for others. The specific instance here will concentrate on how formal initiatives within universities and wider across the sector have sought to elevate the role of learning and teaching in HE and discuss whether this has been successfully achieved or not. Finally, it will be concluded that the changing HE landscape, while demanding ever more engagement on multiple levels by academic practitioners, will probably result in a certain level of insecurity and anxiety amongst those practitioners.

### Keywords

pedagogy, transition, Teaching Fellowships

## 1. Introduction

I would like to describe here my experiences of moving from a specialism in research in the biosciences to one involving scholarship in the pedagogical aspects of that discipline in the higher education (HE) sector in the United Kingdom (UK). The method used will be autobiographical self-study because in describing my situation I am aware that a number of colleagues who have PhDs in the Science, Technology, Engineering and Mathematics (STEM)

disciplines are seeking, or are in the process of, making this same transition. In analysing my personal experience I will use the work of Bullough and Pinnegar (2001): *Guidelines for Quality in Autobiographical Forms of Self-Study Research*. These authors state that “in educational research, questions of context, process and relationship have moved toward the center of the inquiry”. Again, “self-study’s appeal is grounded in ....identity formation”. The emphasis here on identity formation is one I am keen to understand in the context of a rapidly evolving HE scene in the UK.

## **1.1 General Context**

In the UK the state has allowed a large increase in the number of students with no corresponding increase in funding to manage this expansion. Furthermore, the burden of funding an undergraduate degree programme has increasingly been shifted onto the individual student who as a result may place many more demands on the academic practitioners delivering their programme of study (Singleton-Jackson *et al*, 2010). These changes have had the effect of drawing attention to the pedagogical responses needed to cope with the new stresses imposed within the HE system (Lawson, 2014). So how should one try to make the transition from expertise in bioscience research to the pedagogical aspects of one’s practice to try to meet the many, often conflicting, demands made of us?

There are many potential barriers for the STEM practitioner to overcome to enable this transition to occur. Primary amongst these is the nature of the research itself within two disparate disciplines. In the STEM areas colleagues are used to obtaining data of a quantitative nature usually derived from laboratory experiments and/or direct observations. Pedagogical research often uses social science qualitative research methods and as such presents a wholly different philosophical field of enquiry to the STEM practitioner. Methods employed here might involve questionnaires, focus groups, interviews and thematic analysis of text. This is far removed from the research experience normally encountered in the STEM disciplines and may constitute a significant barrier to be overcome.

## **2. Developing pedagogical practice through an autobiographical lens**

### ***2.1 Self-studies should ring true and enable connection***

Historically emphasis on teaching in modern universities in the UK (from the 1970’s) was left to individuals who, depending upon their interest and enthusiasm, sporadically experimented with different teaching methods. Initially I too dabbled in this “amateur” approach to pedagogical research, seeking, in my first academic positions, no incentive and receiving no official encouragement for this activity. The introduction by HEFCE of the Teaching Quality Enhancement Fund (TQEF) in 1999 gave rise to the National Teaching Fellow Scheme (NTFS) which favoured a more “directed” strategy. This might be thought of as a form of pragmatic action research, driven by the dictates of government policy into more applied areas such as work-based learning and key skills. With this increased emphasis on the importance of teaching in HE, has come my own conviction that it will be

necessary to progress my career as a biological sciences-specific pedagogical researcher. Primarily for this reason I applied for a teaching fellowship in my own university in order that I may increase my access to resources which would enable me to better tackle pedagogical problems and broaden my knowledge base in this facet of my job. Ultimately of course, I would wish to further my career and extend my influence amongst my colleagues (especially managers) by pursuing this path for the benefit of my students.

## **2.2 Self-studies should promote insight and interpretation**

UK universities however may pay lip service to the concept of pedagogical excellence as a criterion for promotion (Cashmore *et al*, 2013). The problem of assessing the quality of teaching is apparent. The reluctance of UK universities to promote academics through their teaching ability alone may reside in the fact that objective criteria to compare the “excellence” of different academics’ teaching is largely absent.

Despite these realities my decision to concentrate on the teaching aspects of my position rather than the research-based focus of my specific discipline arose from a “nodal moment” in my career. Being involved at the planning stage for the development of a new Pharmacy degree programme and then actually having to provide the biological teaching within that programme meant that very little time was left for me to do biological research. This I think is a theme common to many STEM academics in the UK. The massification of the HE system invariably means that time available for research is severely constrained (Beerkens-Soo and Vossensteyn, 2009). The NTFS and individual university teaching fellowships were, I believe, set up to directly address this point, ie. to institute a career path outside of subject-specific research to HE professionals and to reward teaching expertise and commitment.

## **2.3 Self-study research must engage history forthrightly**

Many academics in the contemporary UK STEM HE context would probably prefer to remain committed to a research emphasis in their careers but simply do not have access to the financial or other resources to be able to do this. In my case, it is true that, although I am deeply committed to the equitable education of my students I would still wish to have more time to devote to laboratory-based biological research. Engaging with my history then here, leads to my realisation that the practical expertise I have developed over the years as a STEM scientist need not go to waste even if I am not as fully immersed as I once was in active biological research. The practical skills and theoretical knowledge I have gained could be put to use for the benefit of my students. Knowing how to do this effectively though is one of the problems facing the STEM practitioner. Thus I have tried to gain as much exposure as possible to strategies to enhance my pedagogic practice. This has included engaging with HEA discipline specific groupings to equip myself with the necessary skills. I have done this in order to find possible routes to improve my practice as well as progress my career.

#### **2.4 Self-studies are about the problems and issues that make someone an educator**

The formulation of the institutional teaching fellowship required one to undertake a pedagogical research project which presumably would reduce the time one is available for teaching students. This is a problem I had to wrestle with because my active engagement in a pedagogic research project directly affected my ability to do a good job for my students and this is the very problem I sought to escape from by concentrating on pedagogy rather than research in the first place!

Apart from having many more students to teach, STEM academics are also faced with a much larger administrative burden imposed upon them by universities seeking to “quality control” their systems for “processing” students through programmes of study. The contemporary academic is then torn in many directions with the competing professional demands of teaching, research, administration etc. (Baldwin *et al*, 2005) drastically impinging upon their private lives and that of their (long-suffering?) families.

#### **2.5 Authentic voice is a necessary but not sufficient condition for the scholarly standing of a biographical self-study**

“Part of the appeal and value of autobiography comes when a life is recognised as a form of resolution, for either good or evil, of life’s dilemmas” (Bullough and Pinnegar, 2001). In this view, analysis of one’s past experiences is a form of personal development providing meaning and shape to the inchoate nature of lived events in an attempt to take a rational path in the future. This search for meaning amongst complexity certainly has affected the choices I have deliberately made to manage the stresses of my day to day life. While this experience is certainly authentic it is likely not to be unique amongst colleagues working in the biological sciences. Nevertheless it may be sufficiently different from other professional lives to be of some general interest. Additionally, if the UK government focuses research monies on a few elite institutions, as is suspected by many entering into the current Research Excellence Framework (REF) process, many STEM HE academics will be confronted with the same dilemmas as outlined here (Martin, 2011). This account may then serve as one possible resolution to a potentially developing problem.

#### **2.6 The self-study researcher has an ineluctable obligation to seek to improve the learning situation not only for the self but for the other**

Is there any evidence that raising the profile of teaching in our sector improves student learning (which should after all be one of the main goals for any activity within a university)? There is however, *no* evidence for an *improvement in teaching* as a result of the various schemes seeking to do this. As UK universities do not directly assess teaching quality, any award that purports to reward excellence in teaching (and consequently learning?) must be called into question. In my own institution, for example, there is no formal mechanism for

assessing the effectiveness of the individual teacher. Here university fellowships and “Teacher of the Year” awards available to staff have no element of peer observation or evaluation of the efficacy of one’s teaching built into them.

### ***2.7 Self-studies portray character development and include dramatic action:***

#### ***Something genuine is at stake in the story***

I entered into the HE setting in my area of the biological sciences with the expectation that much of my professional life would be concerned with research-orientated endeavours. However, due to circumstances unique to my professional setting the opportunity to progress my research interests did not readily arise and this allied to my heavy teaching duties necessitated me seeking other avenues for progression and opportunities for scholarship. However upon making this cognitive and dispositional shift I was disturbed to find that even within my own setting of a post-1992 “teaching-orientated” university in the UK system, research appeared to be more valued than teaching.

The realisation that a heavy teaching load would not necessarily progress my career impressed upon me the need to find a way to reconcile the competing demands of my professional role. Pedagogical research seemed a good way to draw at least some of the disparate narrative threads of my professional life together. However, these steps into another world, far removed from my original expertise came with a tangible sense of risk. Moving outside of my own biological teaching experience into other areas of the university with the stated intention of improving practice is also fraught with tension and political danger. As a university teaching fellow I was supposed to raise the profile of learning and teaching possibly by being an exemplar or role model. This is a rather vulnerable position for the putative pedagogical researcher to be in given the combined subject-specific knowledge, teaching skills and practice experience of university staff.

### ***2.8 Quality self-studies attend carefully to persons in context or setting***

I am painfully aware of my lack of expertise within my own tentative efforts to reconfigure my career towards a pedagogical focus. It has been noted that examples of teaching excellence would be rather rare in an untrained population and some form of training would be needed for academics to aspire to pedagogic excellence (Elton and Partington, 1993). However, it is still not obvious to me, even today, that one would be rewarded for investing time and energy in pedagogical training, especially being, as we are, in the run-up to the REF with all the attendant focus on research that that entails. This personal view, that teaching is still secondary to discipline-specific research is in accord with many other researchers in this area (eg. Boshier, 2009).

### **2.9 Interpretations made of self-study data should not only reveal but also interrogate the relationships, contradictions and limits of the views presented**

There is a wave of academics who may be viewed as discipline-specific pedagogic experts (Nixon *et al*, 2001). A possible negative outcome of choosing this path is that one might be taken less seriously as a biological researcher. Additionally, devoting time to pedagogic research rather than discipline-specific research and emphasizing teaching more generally in universities may result in a divergence between university “teaching academics” and university “research academics”. This may be an undesirable outcome for many. It should also be noted that Professors of discipline-specific education are rather rare so the approach outlined in this paper may be of limited utility in terms of career advancement.

## **3. Conclusion**

The above discussions represent my progress so far in a new field of scholarship. My initial intention to forge a path between the binary divide of teaching and research in the biological sciences via the medium of biology-specific pedagogical research is, it transpires, contingent upon many competing factors. First amongst these was my university’s ability to give me enough time and resources to properly undertake the fellowship they awarded me in the context of a heavy teaching and administrative load. Indeed it has been posited that the heavy workloads characteristic of today’s HE sector may be in fact actually detrimental to student learning given the negative impacts it has upon staff (Hoecht, 2006).

It is nevertheless important that we engage with the pedagogical elements of our roles to ensure that even in these uncertain times student learning is placed at the forefront of our academic practice. This is despite the obvious fact that descending into “the swampy lowlands” inhabited by our learners might confront us with “problems [that] are messy and confusing and incapable of technical solution” (Schoen, 1995). This may leave us feeling vulnerable, isolated and ill-equipped to deal with the many problems we might face. This continuing uncertainty around the possible success of the strategy I have embarked upon is probably to be expected. Bullough and Pinnegar (2001) seem to concur when they conclude:

“In self-studies, conclusions are hard won, elusive, are more generally tentative than not. The aim of self-study is to provoke, challenge and illuminate rather than confirm and settle”.

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