

Doctoral Students in Science and Engineering: developing academic identities and career trajectories (0274)

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Abstract

This paper is concerned with the experiences of doctoral students in Science and Engineering in the latter part of their PhD studies as they prepare for transition to the workplace in academia or elsewhere. There is relatively little research on doctoral students in Science and Engineering compared to the Social Sciences and Humanities (Mangematin, 2000; Delamont & Atkinson, 2001; Cumming, 2009). This paper will report on the initial phases of a (potentially) longitudinal project, which will involve doctoral students from Engineering and Life Sciences in their final year of study. The data to be collected from each student will be consistent with the previous research conducted by McAlpine et al (in press) and include demographics data, logs of weekly experience followed by an in-depth interview. The main focus of this study is on the construction of identity(-ies) of these students and how this relates to their intended career trajectories.

Context and Focus

It is commonly noted in the literature that there is relatively little research on doctoral students in Science and Engineering compared to the Social Sciences and Humanities (Mangematin, 2000; Cumming, 2009). The “academic and scientific enculturation” of scientists is relatively absent from the “sociology of science, sociology of the professions and the sociology of education” (Delamont & Atkinson, 2001: 88). From the literature available, there is substantial evidence of the differences in experiences of doctoral students in Science and Engineering throughout their PhD study as well as the variation in potential career paths and trajectories. A study of biochemistry doctoral students through ethnographic interviews, reveals the importance of the research group and the supervisor in helping to normalize and support the doctoral student through experiences of ‘failure’ that provide a form of extended socialization mechanisms to enable to the development of tacit skills (Delamont & Atkinson, 2001). However, Cumming (2009) has argued that the normal assumptions or set of characteristics accorded to the typical experience of doctoral students in the Sciences (such as, participating as a group member, work on a problem common to the research group etc...) are not always so clearly in evidence and that there is abundant variation to the assumed norms of experience. In-depth qualitative research through individual case studies, he argues can shed new light on “the inter-relationships that exist with regard to education, training, research, work and career development” (Cummings, 2009; 887). The importance of researching the experiences of doctoral students in Science and Engineering is significant also for gaining a more nuanced understanding of the career intentions and potential trajectories of these students. These students may be as likely to enter research (or other) careers in the private sector as they are to pursue careers in

academia. The intended career of students may relate closely to the skills development required during their period of PhD study and where their focus lies in terms of collaborative work and emphasis on publications and other academic pursuits (Mangematin, 2000).

It would seem clear that there is scope for further research into doctoral student experiences in the Sciences and Engineering in order to better understand how they are enabled and supported through doctoral work and as previous studies have shown, in-depth qualitative work can give a rich insight into these processes. The main focus of this paper is on the construction of identity(-ies) of these students and how this relates to their intended career trajectories. Building on previous collaborative work (McAlpine & Lucas, under revision), this study intends to utilize the idea of academic identity-trajectory (McAlpine et al, in press) where individual case studies are presented to explore *past* experiences and influence on *present* intentions and engagement in academic work as well as *future* imagined possibilities. The dynamics of agency and structure will be explored (Archer, 2000) and also potentially the extent to which *future* imagined career possibilities influence the *present* intentions and engagement in academic work. In particular, where an academic career is intended, the extent to which doctoral students are mindful of the performance driven culture and the rules of the academic 'research game' (Lucas, 2006) will be explored.

Initial Exploratory Pilot Study

This paper will report on the initial phases of a (potentially) longitudinal project, which will involve doctoral students from Engineering and Life Sciences in their final year of study and nearing completion. The students will be drawn from one research-intensive university in the UK. The data to be collected from each student will be consistent with the previous research conducted by McAlpine et al (in press) and include demographics data, logs of weekly experience followed by an in-depth interview. The logs use a combination of closed and open ended questions to capture experiences and interactions related to: feeling like an academic, physical and human resources drawn upon, reflections on contextual elements influencing perceived progress and/or obstacles, and important people contributing to progress during the particular week as well as career intentions and trajectories. The logs are then utilised to structure the probes and specific contexts used in questions during the interviews. The initial pilot study will include individual case studies of approx. 5-10 doctoral students in Engineering and/or Life Sciences. The intention is to use the pilot work to inform a larger longitudinal study with doctoral students and early career researchers in the Sciences and Engineering across 2-3 research intensive universities. This data will provide a comparison to the research already conducted on doctoral students and early career researchers in the Social Sciences (McAlpine et al, in press; McAlpine & Lucas, under revision).

It is anticipated that this collection of a rich array of empirical data will give fruitful insight into doctoral student experiences in the Life Sciences and Engineering and their developing identities as researchers and of their future career hopes and plans.

References

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