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Passing the baton: a collaborative approach to development and implementation of context-specific modules for graduate teaching assistants in cognate disciplines

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A systematic approach to the training of graduate teaching assistants (GTAs) is required to meet the challenges posed by growing numbers of undergraduate and graduate students. At University College Dublin, educational developers and academic staff across six schools collaborated on the design and phased implementation of context-specific GTA modules. By year three of the project, academics were successfully implementing credit-bearing GTA modules in their schools, describing them as tailored and relevant to their needs, and valuing the dynamic partnership involved in their development. GTAs stated that the modules helped them to understand relevant policies and procedures, motivated them to fulfil their role, and had given them ideas on how to change their teaching. This approach had supported the successful 'passing of the baton' from educational developers to academic staff.

Keywords: graduate teaching assistants; training; module design; context-specific; collaboration; STEM

Introduction

Graduate teaching assistants (GTAs) have a vital role in engaging students in their learning and are often the first point of contact when students experience learning-related difficulties. University College Dublin (UCD), in common with many international universities, has a long tradition of engaging GTAs, often called 'demonstrators', to support the delivery of undergraduate programmes in the sciences, including the medical sciences. A recent report by the UK Council for Graduate Education (Lee, Pettigrove, & Fuller, 2010) describe this group as comprising 'early career academics'.

In the STEM (science, technology, engineering and mathematics) and health science disciplines, GTAs are often PhD students who support undergraduate students by demonstrating laboratory experiments, facilitating questions, grading assignments, promoting student reasoning and student interaction in addition to a range of other teaching duties (Bond-Robinson & Rodriques, 2006; Herrington & Nakhleh, 2003; Lee et al., 2010). Although a vital group, GTAs' expertise can be very mixed (Scott & Maw, 2009) and there is now a requirement in the UK, and internationally for improved education and training to support them in their role. In the last decade, the

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introduction of the Higher Education Academy (HEA) Professional Standards Framework has led to a more systematic approach to GTA training in the UK, as the framework has informed institutional policy and helped to shape and share training for this group (HEA, 2013). Chadha (2013, p. 26) recently noted that 'appropriate and rigorous training that equips the GTAs with the necessary skills set has become essential'.

In UCD and elsewhere, GTA training has often taken the form of generic one-day workshops (Lee et al., 2010; Scott & Maw, 2009), delivered by 'professional staff' (Park, 2004) in central educational development units, supported by sessions provided by staff from particular disciplines. However, our experience, and that of others (e.g. Sharpe, 2000), is that feedback from GTAs on this type of provision has been very mixed. In particular, GTAs have criticised a lack of relevance to their disciplinary context. The introduction by UCD of a structured PhD programme in 2009 provided doctoral students with the opportunity to undertake up to a maximum of 30 ECTS (60 UK) credits of taught modules related to their research and/or transferrable generic skills, including, for example, a teaching and learning module. The inclusion of such a module in doctoral training is supported by the UK Council for Graduate Education as it provides early support to students for the teaching component of their academic careers (Lee et al., 2010). Therefore, we planned to develop a 5 ECTS (10 UK) credit module at masters level (UK Level 7) that could contribute to a structured PhD or masters programme.

To address the perceived lack of contextual relevance, a team of educational developers collaborated with interested academic staff to develop a number of credit-bearing, school-based modules to support doctoral students in their GTA role. The schools involved in this study were primarily STEM or cognate disciplines, i.e. Physics; Public Health, Physiotherapy and Population Science; Biomolecular and Biomedical Science; Chemistry and Chemical Biology; Medicine and Medical Science; and Biology and Environmental Science. The purpose of the collaboration was to 'pass the baton' from staff of the educational development unit to academic staff by supporting them to design and deliver a more authentic and contextualised experience for GTAs in their discipline. To gauge the success of the collaboration, this study focuses particularly on staff experiences of the process of module development while also taking account of GTAs' experience of the resulting modules.

This paper explores:

(1) The experiences of staff, both academics and educational developers, of a collaborative approach to module development;
(2) The module learning outcomes that were most valued by GTAs and how they were achieved in the schools' implementation of the modules.

Educational development model

The collaboration required a new educational development approach that eschewed generic workshops delivered by educational developers with only marginal contributions from academics in particular disciplines (Lee et al., 2010; Park, 2004; Scott & Maw, 2009) in favour of greater involvement of academics from the outset (Gibbs, 2013).

Gibbs (2013) discusses the trajectory of educational development units within higher education institutions. This trajectory involves a dual shift in focus:

- From individual teachers to course teams, schools and local leaderships;
- From imparting discrete, isolated techniques and tactics to a more strategic approach, integrating and aligning techniques in more complex arrays to improve teaching and learning quality in key areas.

Grace, Smith, Bradford, and Elvidge (2004) claim that the lack of credibility of generic ways of enhancing teaching and learning practices accounts for the contemporary emphasis on teaching for the discipline in educational development practices. They discussed a variety of educational development models for accredited programmes that incorporated generic and subject-specific elements to different degrees in an attempt to harness the synergies between them. For this study, the model of collaboration involved creating a 'generic' module template, designed initially by the educational development staff, with subsequent adaptation to tailor it to the needs of the individual schools to develop six 'school-specific' modules. In using this model, there was also an intention of developing a 'community of practice' (Lave & Wenger, 1991; Sharpe, 2000) of staff involved in supporting our institution's GTA training. The value of creating this group was to give them an opportunity to create, share and sustain their expertise in GTA education practices.

GTA module design: outcomes, learning and assessment approaches

Generic module template

Modules to prepare GTAs for their teaching roles share features of faculty development programmes for the same purpose, although participants are at a different point in their careers. A blend of practical, reflective and self-evaluation skills is central to many general faculty development programmes (HEA, 2013; Thandi & Sethi, 2009). Bamber (2008) recommends that staff development programmes be student-focused, develop staff as reflective practitioners, facilitate the early acquisition of practical skills and enhance motivation to learn. Focusing on GTAs' training, Herrington and Nakhleh (2003) explored the views of 538 undergraduate and 14 GTAs on what effective instruction in chemistry comprised. Three key themes emerged: knowledge, including of chemistry, teaching and learning, and procedural laboratory skills; communication skills, use of layman's and scientific language; and the affective domain, including concern for students, willingness to help and approachability. Scott and Maw (2009) found that bioscience GTAs required skills in demonstrating, marking first-year reports and data-handling exercises. DeChenne (2010) found that GTAs in the STEM disciplines needed to develop their teaching self-efficacy.

In a review of the North American GTA training, Park (2004) highlights the importance of both generic and subject-specific skills, noting that GTAs 'effectiveness can be improved through self-reflection and reflective practices, because they increase self-awareness and help in recognition of things worth changing' (Park, 2004, p. 6). Reflection is encouraged in many GTA programmes (Lee et al., 2010).

Cho, Kim, Svinicki, and Lowry Decker (2011) note that, while GTAs need early survival skills, such as teaching techniques, class planning and classroom management, concerns about their effectiveness and impact on student learning come later as competence grows. Similarly, Young and Bippus (2008) observe that, whereas an emphasis on school and institutional policies, professional socialisation and interpersonal interactions is important, GTAs need to be taught the skills for planning the first day of class; their observation is supported by the novice to expert literature.

Consequently, the learning outcomes of the 'generic' GTA module were developed to emphasise practical survival skills initially (O'Neill, 2014). Initial assessment of the 'generic' module comprised, first, a planning and reflection exercise on teaching sessions including session plans and rationales based on the literature; second, a 'what would you design differently and why?' task to produce a revised experiment, session or manual, with a rationale for change based on experience and the literature; and, finally, a reflection on performance exercise, based on feedback from peers, self, staff or students including evidence-based recommendations for change. Other features of the module included:

- Using a social constructive approach that encouraged peer dialogue (Dotger, 2011; Meele, 2003);
- Pass/fail grading to encourage self-development and sharing of resources.

O'Neill (2014) provides further details.

School-specific module design and implementation process

Six schools, as noted earlier, expressed an interest in developing their own modules. A module coordinator from each school was allocated an educational developer to collaborate on the design of a module tailored to their specific needs. The six module coordinators and their educational developers came together as a developing community of practice to share progress on design and implementation in a series of workshops over the first three years (Lave & Wenger, 1991). During this process, detailed guidelines and resources were developed and made available for others to use (O'Neill, 2014).

Module design differed as follows:

- *Intensity and sequencing of teaching*. Based on the availability of their GTAs, one school had to front-load sessions rather than have continuous contact;
- *Context-specific teaching and assessment requirements*. For example, small group teaching knowledge and skills were incorporated into one of the health professional school's modules, and many of the modules included additional sessions on the theory and practice of grading assessments;
- *Source of feedback on their performance.* Reflective writing assignments were based on either GTAs' reflections on their undergraduate students' evaluations or GTAs' peer-to-peer observations;
- *Inclusion of subject competency assessments*. In one of the laboratory-based disciplines, where GTAs' levels of subject knowledge varied, an alternative for one assessment was to provide model answers for an undergraduate laboratory report.

The baton was passed on gradually as follows:

- Year 1 (2010) modules were co-taught primarily by the educational developers with support from the schools' academic staff;
- Year 2 (2011) modules were again co-taught but this time primarily by academic staff with educational developers assuming a more supportive role;

- Year 3 (2012) and subsequent years modules were independently delivered by academic staff in the schools.

Teaching and learning resources were shared across the six modules; for example, models of reflection, laboratory 'real-life' scenarios, peer-observation models and forms, and science-specific teaching articles. A screencast of 'learning principles and theories for demonstrators' was developed as a reusable resource where academic staff needed more support with embedding educational principles (O'Neill, 2014).

In summary, the collaborative approach adopted is consistent with recommendations for more school-specific teaching support (Gibbs, 2013; Neumann, 2001) and represents a shift of emphasis in educational developers' roles from the direct teaching of GTAs, which has had limited success, to supporting and engaging academic staff in a community of practice to develop and deliver their own modules (Lave & Wenger, 1991).

Research methodology and analysis

A mixed methods approach was used, i.e. an online survey and in-depth interviews.

To gain an understanding of their experiences of the collaborative approach, in-depth interviews using open-ended questions were conducted with all six module coordinators and the three educational development staff (each allocated to two schools). The module coordinators ranged in academic grade from professor to lecturer; three had university teaching qualifications and three regularly attended teaching and learning workshops.

Analysis involved data reduction, exploration and synthesis, stages common to all qualitative research designs, regardless of their specific methodological commitments. Data were initially broken down into manageable segments that were tentatively labelled. New labels were generated as new data became available. Broader underlying themes in the labelled segments were then identified and, by further coding and re-categorisation of the text segments, fewer, recurring and salient themes were identified. This form of analysis involves moving through increasing levels of abstraction to transform the initial mass of raw data into as concise a conceptual description and interpretive explanation (Sandelowski & Barroso, 2003) of the phenomenon of interest as possible.

In the existing and incoming data, relationships between themes were identified, enabling exploration of underlying patterns in the data. At this stage, the literature was revisited and a tentative coding framework was devised to help filter and organise the data. The emergent coding framework, which resulted from an iterative interplay between concepts pervading the theoretical and empirical literature, the research question and themes and patterns gleaned from the data, provided a conceptual lens through which to interpret the data. As data exploration deepened, the coding framework was modified, cross-checked by the second researcher, and used to refine the themes until the maximum amount of data was accounted for as concisely and parsimoniously as possible and with a minimal degree of overlap and redundancy.

An online survey was developed to explore GTAs' views of the module outcomes that they most valued. In order to explore how the learning outcomes were achieved through the schools' implementation of the modules, the survey compared perceptions of learning outcomes between Time 1 (2010), when the modules were

Table 1. Overall GTAs' outcomes ($n = 72$) and differences between Time 1 ($n = 56$) and Time 2 ($n = 16$).

GTAs' outcomes	Overall for both cohorts ($n = 72$)		Differences between cohort Time 1 ($n = 56$) and Time 2 ($n = 16$)			
In descending order of means	Mean	SD	t	df	Sig	Higher in
Understand how policies and procedures impact on my role	2.99	1.04	2.43	35.51	NS	–
Motivated to fulfil my role as a GTA	2.78	1.12	−4.91	25.97	.00*	Time 2
Learned how to change my practice	2.75	1.04	−5.28	28.20	.00*	Time 2
Learned how to seek feedback	2.67	1.05	−3.88	19.77	.00*	Time 2
Identified weaknesses as a teacher	2.57	1.07	13.38	60.43	.00*	Time 1
Better prepared to plan teaching and learning	2.53	1.13	−9.68	29.42	.00*	Time 2
Better understanding of difficulties students may have	2.51	1.10	−3.91	18.75	.00*	Time 1
Better prepared to provide students feedback	2.51	1.06	−4.62	19.32	.00*	Time 2
Know how to go about improving	2.51	1.17	−7.82	27.86	.00*	Time 2
Identified strengths as a teacher	2.30	.92	.80	24.67	NS	–
More confident as a teacher	2.29	.89	2.43	35.51	NS	–
Obtained techniques for teaching role	2.23	1.00	1.51	23.81	NS	–
Obtained knowledge for teaching role	2.04	.79	1.28	26.43	NS	–

*Significant at .01; NS = Not significant.

initially co-taught, and Time 2 when they were taught independently by the schools (2012). Drawing on the module learning outcomes (O'Neill, 2014), 13 statements were developed (see Table 1). In order to assist in the comparison, these statements were used in both Time 1 and Time 2 for all modules. GTAs were asked to rate each individual statement on a Likert scale of 1–5 to indicate the extent to which they felt that they had achieved the relevant outcome, with 5 being 'strongly agree'. Respondents were also asked to rate their overall level of satisfaction with the module, scored out of 10. Seventy-two GTAs completed the survey; 56 in Time 1 (2010) and 16 in Time 2 (2012). This accounted for a 60% ($n = 120$) response rate in Time 1 and a low 14% response rate ($n = 108$) in Time 2. The sample size, in Time 1 or Time 2, did not allow for an analysis by individual schools.

Ethical approval had been sought and obtained from the university to carry out the study.

Findings and discussion

Staff experience of the collaborative approach to module development

Analysis of data from the nine academic and educational development staff interviews generated two key themes: *a relevant and tailored module* and a *dynamic and emergent partnership*.

Relevant and tailored module

The modules resulting from the collaborative process were described by staff as practice-focused, yet 'theoretically informed' with teaching and learning principles

'abstracted', 'clarified' and 'applied in context'. The modules were informed by the 'perspectives of the discipline' and the centrality of the disciplinary context resulted in modules that were perceived as being responsive and relevant to the needs of both academics and GTAs. One academic described the module as providing students with 'principles-informed practical techniques'. Teaching and learning terminology was explained and applied in context, improving the perceived relevance of the module. Another academic described how

> once you put it in a context … it's like 'oh well this is how that idea applies to trying to teach Boyle's law or whatever it is. Some kind of concrete sort of [discipline] thing.

Related to the concept of relevance, academics and educational developers emphasised how the collaborative process of module co-production resulted in 'tailored', 'bespoke' modules appropriate to the 'subject, discipline and local needs'. For example, one academic whose GTAs were dealing with large laboratory classes adapted the module to contain a session on how to facilitate undergraduates who were progressing at different paces.

A degree of GTAs' preparation had been provided prior to the design of the tailored, credit-bearing module and schools' academic staff noted that the new module enabled the integration of existing practices and resources from within their schools, resulting in a more coherent product. The flexibility to incorporate existing practices was widely welcomed and considered important to the responsiveness and success of the module. A module for a laboratory-based discipline incorporated an existing health and safety session into their module. The generic module template appeared to have provided a scaffold or framework upon which some of the schools' existing materials and activities 'could be grafted'. The ability to tailor assessments was also regarded as key, particularly in transferring ownership of overall module design to the schools. Three of the module coordinators reduced the assessments from three to two tasks.

Lee et al. (2010) highlight the continued debate between those who value 'contextual and discipline specific programmes, versus those who value generic and interdisciplinary programmes'. The academics and educational development staff in our study were convinced of the importance of context specificity. Their conviction reflects growing recognition over the last decade of the importance of maintaining strong, yet permeable, disciplinary boundaries in higher education (Becher & Trowler, 2001; Grace et al., 2004; Neumann, 2001). Jenkins, Healey, and Zetter (2007) note that there are important disciplinary variations in teaching–research relationships that need to be acknowledged and valued. Of course, disciplinary boundaries shifts are continuously negotiated and the disciplines of today may not be those of tomorrow; as a result, 'early career academics' (Lee et al., 2010) may find themselves working within and between new disciplinary configurations as their careers progress. For now, grouping cognate disciplines for the purpose of enhancing teaching and learning practices within them may provide a pragmatic compromise (Grace et al., 2004). Similarly, Trowler (2013, p. 6) suggests that the 'family resemblances concept allows us to adopt a view of disciplines which is not restrictive'.

A dynamic and emergent partnership

The 'dynamic and emergent partnership' model of design and development was highly valued by the academic staff, and allowed complementary expertise and skills

to be harnessed. An important factor was 'early involvement of the subject specialist from the outset', resulting in 'buy-in' and a sense of engagement in both process and outcome with the eventual module being viewed as a co-creation of educational developers and academic staff. Educational developers were perceived as having a mediating function and as being 'orchestrators' of the collaborative process. In addition, they facilitated a process of cross-fertilisation by enabling partnerships to form between academics from different schools. This approach produced an emergent community of practice that allowed 'cross-disciplinary' peer networks to develop, and ideas and resources to be pooled and shared. This offers the potential to ensure the longer term sustainability of the modules by providing additional support outside of the educational developers group; this facilitated the process of 'weaning' from reliance on the support of educational development staff.

Initial co-teaching in years one and two, with a move to going it alone in the third year, was particularly valued by the educational developers. One educational developer noted: 'I think co-teaching gives [school] staff confidence and particularly by trying to, rather than having them just sit in while I do the lecture'.

The partnership also had an impact on the academic staff in their own 'emerging identity as a teacher'. It provided a 'valorised role' within what was, for some, a new teaching and learning discourse that emphasised the importance of 'reflection and self appraisal of their own teaching'. It created an awareness of the evidence supporting teaching and stimulated an interest in the science of teaching. It opened up 'new ways of doing things' in their own teaching in addition to developing their GTAs' teaching.

The partnership approach adopted aligns with some of the orientations to educational development described by Land (2001). It was context-specific and educational developers acted as 'modeller-brokers', working with academic staff to demonstrate good practice and a 'professional competence' orientation and helping to bring them to a basic level of competence in teaching and learning. The model of structured and ongoing support, through series of workshops and peer support, is not dissimilar to the intensive course design model design described by Dempster, Benfield, and Francis (2012). Their approach, which was used for curriculum change with a focus on e-learning, also achieved positive outcomes such as 'sharing ideas' and 'building networks'. In their discussion on this approach, Dempster et al. cite Salmon's (2005) work that highlights the importance of ownership by the academic department of both the content and the pedagogy for significant curriculum change to occur.

In summary, the staff highlighted that the collaborative approach had been successful in the design and implementation of the modules. We turn now to the views of GTAs enrolled on the modules.

Achievement and value of the module outcomes: GTAs' views

When examining the means of GTAs' ratings of the outcome statements in the online survey (Table 1), the highest rated statement was: *understand how policies and procedures impact on my role* (mean 2.99). Young and Bippus (2008) also found that knowing policies and procedures is an important outcome of GTAs' training. Another particularly valued outcome in this study was that GTAs were *motivated to fulfil my role as a GTAs* (mean = 2.78); a key attribute in teacher training, according to Bamber (2008). This outcome along with *learned how to change my practice*

(mean = 2.75) indicates that the module was relevant to the GTAs and triangulates the findings from the staff interviews of the relevance of the modules to the GTAs' context.

Although *knowledge for a teaching role* was the lowest rated outcome (mean = 2.04), the module appears to have developed GTAs' capacity to reflect on, critique and enhance their practice.

We explored whether there was any difference in GTAs' ratings when a cohort was co-taught (Time 1) compared to a different cohort who were taught solely by the schools' academic staff (Time 2); i.e. after the baton was passed. GTAs were asked to give an overall rating of their module out of 10 and no significant difference was found ($t = .155$, df = 30.7, $p = .87$) between Time 1 (mean = 7, SD 2.3) and Time 2 (mean = 6.92, SD 1.38).

We found significant differences between Time 1 and Time 2 in respect of the means of eight of the thirteen outcome statements. Two were higher at Time 1 (*identified weaknesses as a teacher* and *better understanding of difficulties students may have*) and six were higher at Time 2, in particular, *better prepared to plan teaching and learning* and *better prepared to provide students feedback*. School-specific delivery appears to have been particularly successful in developing GTAs' skills in planning for teaching and learning, possibly as the 'session plan' assessment task was more authentic with the school staff. Young and Bippus (2008) believe that planning is as an important skill for GTAs, often neglected in their training. The findings indicate that an area that requires further attention is addressing GTAs' level of confidence in their teaching. Cho et al. (2011, p. 277) agree, concluding that more needs to be done 'to develop instructional support strategies that enhance GTAs' confidence'.

Although there was no significant difference between Time 1 and Time 2 in overall ratings of the modules, analysis of the ratings of the individual outcome statements suggests more success and student satisfaction at Time 2 when school academics delivered the module.

This may be due to greater perceived relevance and context specificity but could also be explained by a more general improvement in the module as it developed. From the GTAs' point of view, the collaborative educational development approach adopted appears to have been reasonably successful. However, care is needed interpreting this data as the response rate was very low in Time 2.

Conclusions

The collaborative design of a context-specific module for GTAs supported the successful 'passing of the baton' from educational developers to academic staff. Areas for future enquiry include the further development of GTAs' teaching and learning capacities; for example, confidence in their teaching, and the form and content of continuing professional development. In this study, similar to Sharpe's (2000) findings, the development of a community of practice of academic staff within and among schools was valued as a way of providing support and critique of teaching and learning practices (Dempster et al., 2012; Grace et al., 2004; Land, 2001). In conclusion, it is suggested that a key role for educational developers is to collaborate in the establishment of such communities of practice, situated in cognate disciplines, so as 'to intertwine subject-specific and generic approaches to academic development that are beneficial to staff, to institutions, as learning organisations, and to the wider academic community' (Grace et al., 2004, p. 110).

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Notes on contributors

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