International Journal for Academic Development

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/rija20

A neglected area: supervision development opportunities for doctoral researchers involved in undergraduate and masters project mentoring

Marita Grimwood & Richy Hetherington

To cite this article: Marita Grimwood & Richy Hetherington (2021): A neglected area: supervision development opportunities for doctoral researchers involved in undergraduate and masters project mentoring, International Journal for Academic Development, DOI: 10.1080/1360144X.2021.1959336

To link to this article: https://doi.org/10.1080/1360144X.2021.1959336

Published online: 17 Sep 2021.

INTERNATIONAL JOURNAL FOR ACADEMIC DEVELOPMENT
https://doi.org/10.1080/1360144X.2021.1959336

A neglected area: supervision development opportunities for doctoral researchers involved in undergraduate and masters project mentoring

Marita Grimwood [a] and Richy Hetherington [b]

[a]Department of Learning and Teaching Enhancement, Edinburgh Napier University, Edinburgh, UK; [b]Graduate School, Faculty of Medical Sciences, Newcastle University, Newcastle, UK

ABSTRACT

This paper calls for consideration of appropriate support and development for doctoral research students involved in supervision of undergraduate and Master's degree projects. This subgroup's professional development tends to be neglected in academic development and the related literature. The paper describes a development workshop offered regularly to this group over four years. Presenting evaluation and focus group data, the authors argue that although institutional structures can inhibit such development activities, there are benefits to PhD students, project students, and lead supervisors when doctoral research students' supervision is validated and supported. They call for further research and development provision in this area.

ARTICLE HISTORY
Received 26 October 2019
Accepted 14 March 2021

KEYWORDS
Supervision; projects; postgraduates; researchers; academic development

Introduction: doctoral research students as supervisors or 'project mentors'

Doctoral research students who teach are established contributors to undergraduate teaching. Often known in the literature as Graduate Teaching Assistants (GTAs), their contribution to undergraduate teaching varies depending on subject and institution, but can be as high as 91% of laboratory courses (Reeves et al., 2016). The majority of GTAs are provided with training prior to teaching. Although they may only receive payment for contact hours, remunera

tion for GTAs appears relatively ubiquitous in the UK (UK National Union of Students [UK NUS], 2013, p. 7). In STEM (Science Technology Engineering and Maths) subjects a GTA often has a defined role as a demonstrator in practical classes. This may involve teaching laboratory techniques or software packages. Across academic disciplines GTAs have paid teaching opportunities leading seminars and tutorials.

Doctoral research students are increasingly aware of the career value of gaining teaching experience during their postgraduate studies (UK NUS, 2013, p. 13; Bryan & Guccione, 2018). In a context of potentially mutual benefit, development opportunities for doctoral research students who teach are well established in universities in the UK and beyond. Tensions between the requirements of teaching and research are often a consideration for doctoral research students and academic supervisors. However,

CONTACT Marita Grimwood M.LeVaul-Grimwood@napier.ac.uk

there is a significant body of work identifying the importance of the interaction between teaching and research and how building resilience and practical intelligence support problem solving (Lee, 2012, p. 4). Shortlidge and Eddy (2018) show there are more mutual benefits than negatives to be gained from research students being involved in teaching.

The report of the 2015 PRES results (Turner, 2015, p. 5) indicates that teaching experience 'seems to be an important factor affecting the professional development of research students. It especially improves communication skills'. PRES results for the university discussed below are typical of the sector, in that many research students feel they are not given teaching opportunities. Sector-wide PRES data indicates that around 50% of research students have teaching opportunities (Turner, 2015, p. 23; Neves, 2018, p. 15), while 'those who had teaching experience tend to agree more with all skills development-related items in the PRES questionnaire' (Turner, 2015, p. 24).

Despite this, one substantial area of doctoral research students' teaching is almost totally absent from the literature: their informal supervision of undergraduate and masters level projects. While it is not usual for doctoral research students to be named supervisors, those who work in many STEM-based research teams often fulfil an informal supervisory role. Throughout this article we refer to this role as project mentoring, and the doctoral research students who undertake it as project mentors. The role arises from the close relationship between the doctoral research student's research and that of the project student. There are mutual benefits as a project student may generate data that can be cited with acknowledgement in a thesis, or that forms the basis for, or a contribution to, a publication. This intrinsic nature of their role in a research team means the teaching role that project mentors perform can be difficult to represent to university leaders and academic developers. Remuneration for it as teaching is not a given, so project mentors may not appear on university systems used to identify teaching staff. In the authors' own contexts, this is one reason they have fallen 'under the radar' in university models for academic development.

In exceptions to a more general absence in the literature, Dolan and Johnson (2010) note that 'At research universities, postgraduates (i.e. graduate students and postdoctoral researchers) regularly assume a primary role in mentoring undergraduates in research' (p. 543). Wood (2003) also recognises that doctoral research students take on a significant amount of day-to-day supervision of undergraduate project students in Biological Sciences (p. 113). Yet the literature on Graduate Teaching Assistants (GTAs) more generally does not recognise such project mentoring as a component of teaching. Over an extended period, there has been little recognition of the project mentoring role. Neither Sharpe's (2000) framework for GTA development nor the UK Centre for Bioscience Survey on the role of GTAs in Bioscience teaching (Scott & Maw, 2009) makes any mention of project mentoring or supervision. A national survey of research students who teach found that the majority of GTAs are provided with training but appears to exclude project mentoring in its remit (UK NUS, 2013). However, more broadly supervision is being increasingly recognised as a form of teaching and project mentoring could be seen as a formative stage of this process. The role of training to supervise and recognition of expertise in this area has been promoted through the UK Higher Education Academy's Professional Standards Framework UKPSF (Taylor, 2016).

It is therefore unsurprising that there is very little literature on training and development to support doctoral students in their mentoring of project students, even though this type of interaction is a very common activity in many STEM research groups. We argue that there is a powerful case for proactively articulating doctoral researchers' contribution in this area, and supporting their development. In this context, we present a case study discussion of a short development session to address this need that we have run over a four-year period. We present and discuss data from our participant focus group and draw conclusions to identify specific needs for further development work and research in this area.

Literature review: the case for training and recognition

Recognising project mentoring as teaching, and supporting its development, potentially benefits doctoral research students, project students, research teams, and universities more widely. The Postgraduate Taught Experience Survey (PTES) shows that 'learning and project support' is one of the three areas that correlates most strongly with overall student satisfaction in Masters students' comments (Neves & Leman, 2019). Duke and Denicolo (2017) highlight that doctoral research students are dissatisfied with 'their inclusion into the research culture' and 'employability skills development' (p. 2). They also note that 'even those who subsequently embark on academic careers feel inadequately prepared for its full scope' (p. 3). Drennan and Clarke (2009) highlight that, nationally in the UK, doctoral research students are dissatisfied with the amount of teaching experience available to them. As Fairbrother (2012) notes, both the literature and the 'teaching assistant' title often accorded to doctoral research students, construe their role as assisting with teaching, rather than doing it themselves (p. 355). This may inhibit them from recognising and articulating the teaching skills they develop – particularly in the case of project mentoring. In the authors' experiences, it is not uncommon for doctoral research students and postdoctoral researchers to say they have no teaching experience, only for further questioning to clarify that they are involved in assessment, project mentoring, and/or small group teaching. For them, 'teaching' is often synonymous with 'lecturing', and seen as the preserve of comparatively high-status, permanent academic staff. Thus, providing training and development opportunities in relation to such roles can help to make this contribution explicit and may help professionalise aspects of teamwork and leadership which – though important to future career prospects – may otherwise remain tacit. In addition, while there is little in the literature on the development of doctoral research students' leadership skills, Browning et al. (2017) argue it is essential to support them to nurture such skills, of which a growing supervisory role is one dimension. Duke and Denicolo (2017) recommendations include 'seek[ing] out, and weav[ing] into the research process opportunities for skills training, [and] teaching [...] to facilitate development as a researcher and to enhance future career prospects' (p. 5). They draw on work by Porter and Phelps (2014), which proposes that an 'integrative approach' to skills development is 'equally applicable for those interested in academic teaching as [...] for those oriented towards non-academic careers' (p. 63). Engagement in project mentoring is a key example of such integration.

Career development benefits for doctoral students

Aside from the doctoral research student's career development, support which encourages reflection is likely to improve the quality of the learning experience for the students, and lead in the end to better quality project work (Gibney, 2013). Yet Chadha (2013) notes that while studies indicate that development activities for GTAs have a positive impact on their teaching, there are not many and details of development content are not explored (p. 207). In their survey of undergraduate researchers, Shellito et al. (2001) found that 64% of students who reported being unsatisfied with their research experiences indicated that 'someone other than a faculty member, such as a graduate student or postdoctoral researcher, was the most helpful to them' (p. 461). However, their study also found that undergraduate researchers' 'satisfaction with their research and their ability to learn from it strongly correlated to the time spent with their lead supervisor' rather than with project mentors (p. 462). This suggests a need for development opportunities for doctoral research students, to create increased mentoring capacity within the research group, or a need to manage project students' expectations and perceptions. Anderson et al. (2006) note that the research into undergraduate dissertations, is more focused on the project work itself and how it is assessed, rather than its supervision.

Benefits to doctoral students' research

Involvement in project support and guidance may also benefit doctoral students' research. French and Russell (2002) study, found that after a term of teaching inquiry-based rather than 'verification-style' laboratories, a large majority of them saw benefits to their own research practice. Project mentoring is a form of inquiry-based teaching. Drawing on her own experiences, Fairbrother (2012) argues that reframing 'teaching assistants' as trainees with greater autonomy could benefit both their students and their future careers. Gilmore et al. (2014) found, in keeping with previous studies, that doctoral research students working as teaching assistants develop more when their faculty mentors have active engagement with their teaching – an engagement that is effectively built in to a setting where a doctoral researcher and members of their own supervisory team share responsibility for a student project. A development offer is a powerful way to validate doctoral research students' teaching skills. Finally, Gonzalez (2001) closes the gap between doctoral research students and project students, arguing that 'The distinct mission of the research university [. . .] is to introduce students to research, to inspire in them a passion for discovery. This applies both to graduate and to undergraduate students' (p. 1624).

Benefits to project students and their supervisors

Particularly since the Boyer Commission report (Boyer, 1998) the role of research experience for undergraduates has been increasingly recognised, in terms of supporting deeper-learning opportunities and development of higher-level skills like critical thinking (Dooley et al., 2004; Wood, 2003). Bearing this in mind, Dolan and Johnson (2010) highlight a number of benefits to doctoral research students' involvement in teaching

and supervising undergraduates. Notably, doctoral research students provide a significant resource not only in the time they are able to offer project students. In addition, project students often feel doctoral research students are more approachable than their main supervisor (p. 545). Drennan and Clarke (2009) point out that the research experience of taught Masters' students is an under-explored area in the literature. Feldon et al. (2019) make a compelling case for the role that early career research staff and senior doctoral research students make in the development of junior doctoral research students. This empirical recognition of the importance of peers in the development of student researchers could be logically extended to the relationship between research students and undergraduate and project masters students. Recognising not only that the support exists but that training interventions are useful in guiding development as a mentor is key to both investigations. Moreover, senior staff stand to benefit from doctoral research students who are better able to support and assist project students in their day-to-day work, thereby freeing them up to deal with more overarching questions and issues. In the example they studied, Dolan and Johnson (2010) found that as well as this, the project mentor was a useful source of feedback to the supervisor (p. 550).

Development for project mentors – a case study

This case study focuses on a UK university, which is one of the country's 24 leading research-intensive universities known as the Russell Group. The University hosts around 29,000 students each year around 7000 of whom are postgraduate students. The Faculty of Medical Sciences – where this case study is located – typically has around 800 research students. The majority (around 500) are PhD students with a significant cohort of Research Masters and a few MD and MPhil students. Doctoral researchers are provided with training and development opportunities through faculty-based Graduate Schools. Postgraduates who teach (GTAs) are required to undergo training before they can perform paid teaching duties. For the majority, this involves a programme which aligns to the UK Professional Standards Framework (UKPSF). Some Schools have in-house subject-specific training as the requirement and ideally this will complement the university training. Most of the faculty's doctoral research students work in bioscience research projects to produce empirical data.

Supervisor training is now an essential element for all new formal PhD supervisors in the Faculty. However, doctoral research students are not officially considered teaching 'staff' unless they are employed as GTAs, and development for teaching is managed centrally rather than through the faculty-based researcher development programmes. Therefore, justifying funding for this 'grey area' was not straightforward. Yet seen more holistically, offering such opportunities stood to benefit everyone.

Once funding issues were resolved, a two-hour lunchtime workshop was developed, and scheduled to align with the start of Undergraduate and Masters projects. The brief length of the workshop reflected the heavily research-focused culture of the Faculty which means it can be difficult to get engagement with new development sessions and workshops that are more than a couple of hours in length. Materials used were edited and adapted from those used within the university with formal roles in supervising projects.[1] Over 300 researchers booked for this optional training over the following four years. This

is especially notable at a research-intensive university, where the process of establishing and engaging people with provision can be challenging (Chadha, 2013, p. 215).

The session was co-facilitated by a research team leader with faculty-level responsibility for doctoral research students; and an academic developer with a particular background in supporting doctoral research students who teach. Both facilitators are also experienced project supervisors. The session takes an evidence-based approach and features a series of discussion exercises, including a case study, to encourage reflection on professional decision-making processes in project supervision.

Attendance at the workshops was entirely voluntary, and was advertised by email to both postgraduate and their supervisors. Advertising to supervisors precipitated a higher uptake of the development session (in one case with a difference of 300% between a session run in December and another in the following month) suggesting a perceived value on the part of supervisors, who encouraged others to attend. Over a four-year period, there was a total attendance of 260, with 155 of those being doctoral researchers. The 105 staff attendees were mainly research staff. Their roles included both project mentoring and formal supervision. A small number of permanent academic staff also attended indicating they would like further guidance. In the light of our observations above about faculty culture, this was very encouraging. However, doctoral research students occasionally commented in their evaluations that they found the presence of experienced supervisors off-putting. While there is alternative provision for those with more experience, it is difficult to manage this aspect of attendance completely.

Initial evaluation data

Over the eight sessions provided over a four-year period (2014–2019) 338 researchers booked places of which 260 attended, 155 of which were research students, 105 were staff. Following their attendance, 135 participants completed an electronic feedback evaluation. It requested categorical input on the overall standard of the workshop using a Likert scale (Likert, 1932). It also prompted the participants to provide a categorical assessment their development based around the Vitae (2010) Researcher Development Framework. Free text comments were sought on the best and worst aspects of the workshop along with any general comments.

Ethical approval for an evaluation of the workshop incorporating the anonymised feedback evaluation data, was provided by the university. Additional ethical approval was then granted for a follow-up focus group, with ethical approval granted to contact the 338 research students and staff who had previously booked a place on the workshop.

Evaluation of the sessions proved very positive with 85% saying the sessions were good or very good and only one participant claiming the session was poor. A large proportion of the free-text comments suggested that researchers appreciated the guidance around expectations of either the researcher's own role or that of the project student:

> '[It was] reassuring to be reminded of what is expected of me as a support supervisor.'

The other aspect that elicited a relatively large proportion of the comments was an appreciation of the opportunity to discuss the challenges of the project mentor role with peers. One highlighted that they had most liked 'the chance to have a discussion with peers about problems you could face and possible solutions'; another that 'many

different points of view were expressed'. Other perceived positive factors were that they would give greater consideration to planning and efficiency when dealing with project students. Others highlighted it assisted consideration of their priorities, workload and responsibilities: 'helped me plan for the next project student'. There were also several calls for follow-up activities that would help researchers to develop their skills in supervision and teaching:

> 'I would like to attend the next level of this session whenever feasible';
>
> 'A follow up session to consider the situations that arose.'

When asked for free-text comments about what further professional development they would like, the most common theme was the desire for some formal recognition of having had this training and a connection to Higher Education Academy accreditation.

Digging deeper: invitation to a focus group

In July 2020, after running this workshop for four years, all previous participants were contacted via their university email addresses with an invitation to be part of a focus group. This included a few preliminary questions, aimed to encourage reflection on the workshop, as a filter for focus group participation and as a cue to develop pertinent discussion. The responses proved useful in capturing the longer-term reflections of a broader group. The call was sent to all 338 who had booked to attend. With the majority of this intrinsically transient group having moved on, the email reached 117 of whom 19 responded.

The most commonly cited benefit of these workshops in the responses to the email was clarity on the expectations and boundaries of the role of a PhD student involved in mentoring project students. A question regarding how much responsibility project mentors should take, and how much autonomy their student should be afforded elicited the response that the sessions were valuable despite having 'good' support from their own supervisor. This highlights that expectations of project mentors may be insufficiently clarified by their supervisors, and their roles not well defined.

A second benefit was improved confidence. One respondent framed this as about knowing when to give advice and when to step back. Another said it removed the stress of feeling they needed to know all the answers. For yet another, confidence related to a third theme: learning from others, with one respondent saying he had learned that it was 'OK' to create a situation where a student will make mistakes in order to learn.

One area recognised as new learning for the project mentors was around communication and supervision styles. At higher levels of education, the bidirectional flow of information becomes more important. This is perhaps particularly the case in STEM subjects, where a discursive approach to learning at undergraduate level can be less common than in other disciplines. Recognising the importance of listening but also of how one is likely to act as a supervisor is helpful. The session invites participants to reflect on their own preferred teaching style and the style of their own supervisors. It encourages them to think about their strengths and weaknesses, and addresses the need to be flexible about this to support diverse students.

Broader benefits to the workshop were cited too. Some respondents were grateful for the opportunity to attend the workshop in order to feel 'qualified' for their project mentor role. Others reported a new perspective on their own doctoral projects. One wrote: 'prior to attending the workshop, I was expecting my supervisors to do more than what they were already doing in terms of teaching and mentoring'. Another noted that project mentoring had given them greater confidence in their own PhD, as they realised how much they had learned, and teaching others also highlighted knowledge gaps.

A few perceived the clarity over role boundaries as beneficial to the project students as well as to themselves. One saw this manifest in their confidence to give students greater autonomy, and another mentioned the student not getting 'as many conflicting opinions' and perceived this freed up the supervisor's time. Another wrote: 'Students who started in the lab after the workshop showed increased self-confidence and gave us higher scores in feedback'. Three issues were raised concerning the workshop. One respondent mentioned that timing could be an issue: if a project mentoring opportunity did not arise soon after participating, learning would be lost. Another said the case study used was irrelevant to them, implying that the facilitators could do more to draw out the applicability of the issues across broader research methods and areas.

The final issue was a need for further support. Participants responded positively to the idea of buddying or peer mentoring, drop-in sessions, supervisor shadowing 'outside the research group' and 'problem-sharing sessions'. One highlighted that problem-sharing with peers could help with complex issues like disengaged students. There was again an implied lack of access to developmental support from their own supervisor. There were calls by some for directions to relevant literature, a handbook and frequently asked questions (FAQ) guides.

There were points of consistency in feedback across the original workshop evaluation and the responses to the focus group call. Overall, feedback suggested that supervisors were not always able to offer support in the ways that project mentors might have wished. The value of clear role boundaries and expectations, and the confidence and sense of legitimacy that training conferred, came over strongly.

Focus group

As the discussion above shows, while there were aspects of the workshop content that respondents remembered and consciously applied, there were others that appeared forgotten. The focus group sought deeper insights into the perceived benefits of the workshop, and further development needs. Of the 19 survey respondents nine agreed to participate. Seven were then selected on the basis of their status as early career researchers. Of these, five were able to attend: three recently completed PhD students, one current PhD student and one member of research staff who had experience of project mentoring as a doctoral research student.

Full Covid-19 lockdown was in place in the UK by this point in time. This meant the focus group took place online. A key issue with this is that participants' interview environments are not within the researchers' control. Participants had little or no flexibility as to the interview location, and all were interviewed from home. However, given that our questions,

were not especially sensitive or confidential, and participants had already voluntarily engaged with the subject matter in their responses to the call, we did not see this as a barrier (Ravitch, 2020). Technical difficulties were a risk, however. Two participants accessed the online meeting slightly late, and missed the introduction, in which we reiterated the research purpose and ethics, and their right to withdraw at any time. Those participants stayed on at the end, for us to recap this with them and answer questions they had.

The workshop was a long time ago for some of the focus group participants. One mentioned that it was hard to pinpoint which of her ideas about project mentoring she had taken from it. Reflecting comments in the emails, few if any of them remembered the handout provided or the fact that we discussed supervision styles, drawing on work by Lee (2008). Although very consistent with the email responses, the focus group additionally established in further detail the characteristics, needs and concerns of a small group of project mentors. Key themes emerged from this, which we explore below.

The challenge and enjoyment of project mentoring

Managing interruptions to their own research, as well as time to feed back to the student, were identified as particular challenges of project mentoring. However, there was a consensus among all participants that project mentoring was enjoyable, exciting or rewarding. One participant said 'I don't groan – I get excited at the prospect of a new student; another that it was enjoyable even though boundary-setting was necessary.

Possibly reflecting their willingness to participate in the group, this was an enthusiastic group of early-career supervisors – not a group of junior researchers acting purely out of obligation.

Emerging professionalism and reflective practice

This enthusiasm extended to an emerging professionalism as supervisors and HE teachers. One described 'putting the student first' for the brief time they were with her. They talked about avoiding going to their own supervisors for support, instead seeking advice from peers to solve problems or persevering alone even when time was pressing. Two gave specific examples of learning from reflection: one saying they got a better balance between friendliness and professionalism second time around; another remembering what it was like to be in the student's position. Another identified her research group as a source of peer learning, and another talked about needing to be 'malleable', to adapt to individual students' needs.

Project mentoring: research or teaching?

Participants mainly saw project mentoring as teaching, something increasingly acknowledged in recent years (Taylor, 2017). One had a supervisor who had emphasised this, which increased her confidence to say she had teaching experience. Another had gained HEA recognition based solely on supervision. Another had applied to teacher training, and highlighted it in the application. One said it was 'definitely teaching' though it 'might not always feel like it'. Another saw it more as research but added that working with their student 'feels like a student-teacher interaction'. They were thus generally aware of the skills they were developing.

Further support and development needs

In terms of support we might offer, the suggestions were rich and varied. Many picked up on the examples we had mentioned in the call, reinforcing the theme of peers as a key source. Other suggestions included:

- a 'refresher' workshop now they had more experience
- an online guide or 'cheat sheet' for problem-solving, so they could 'dip in again'.
- In particular, they highlighted more information on supervision styles
- peer mentoring, buddying or shadowing: 'a kind of casual conversation with people in similar situations'. One commented that mentoring would 'take away the worry' and 'give you more confidence'.

These suggestions reinforce the theme of peers and personal reflection as key means of support. They also reflect the sense of professionalism noted earlier and imply – not unsurprisingly – a greater understanding of their own needs once they were engaged in project supervision.

Benefits to own research and career

Several participants articulated how project mentoring had benefitted their own research and careers. Three participants talked about 'learning from' their students and the process of teaching. One described becoming more systematic in their own research as a result. Another identified improved skills in writing and explaining her own work, which she noted were transferable beyond academia. Yet another participant said she was conscious of the need to be what she called 'a whole researcher', developing the full range of skills for an academic career.

Conclusions and implications

Our case study suggests that project mentors, their students and their supervisors would all benefit from project mentoring being better recognised and supported by universities. Offering this kind of support targets support at supervisors right at the beginning of their teaching careers rather than (potentially) years later. It supports both the quality of supervision, and doctoral researcher satisfaction. Supervision is increasingly recognised as a form of teaching, and project mentoring is, for many, their first engagement with it.

This work suggests a number of next steps. Firstly, there is potential for more development initiatives for project mentors. Our investigation highlighted the potential benefits to them of easily accessed online support materials, peer mentoring or buddying, and more explicit institutional signposting to HEA recognition for supervision and project mentoring. Our participants' responses suggested that this could not be left to supervisors, and that though they themselves were highly resourceful in many instances, they still appreciated support on offer. Better development opportunities would also help staff groups, such as postdoctoral researchers and technicians, who are similarly involved in project mentoring. Many attended our workshops. This should be considered when advertising and facilitating development opportunities. This support for the development of project mentors is a way to reach groups who are not traditionally defined as teachers, but who have a significant impact on student learning.

It also highlights the need for university decision-makers to think beyond those dividing lines of staff/student, and research/teaching that are sometimes more clearly enacted in policy than they ever are in staff and in students' academic practice. Communication between teams supporting research and teaching is particularly important if project mentoring is to be adequately supported. The numbers attending our sessions shows an appetite for development, and the responses of the focus group in particular highlight their need for a more holistic approach where peer support for effective supervision practices is normalised. The literature and our own enquiry suggest that this can enhance both teaching quality and career development.

Finally, this is a neglected and under-researched area of provision. More work is needed to identify, analyse and respond to project mentors' development needs; to evaluate their effectiveness in the role; and to evaluate any development initiatives. Enhancing research and practice in this area stands to benefit not only project mentors and their students, but the broader culture of supervision and supervisor development in universities. Our workshop and this case study are intended as a step on a path towards this cultural shift.

Note

1. The authors would like to acknowledge Dr. Kate Exley as the author of the materials on which this session was originally based.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Notes on contributors

Marita Grimwood is an Associate Professor in Curriculum Design at Edinburgh Napier University. She has extensive experience in educational development, both in employment and as a consultant.

Richy Hetherington is a teaching lecturer in Newcastle University's Faculty of Medical Sciences, with a principal focus on the professional development of research students. He acquired a doctorate in evolutionary genetics at Imperial College London before working in healthcare research and biotechnology R&D.

ORCID

Marita Grimwood http://orcid.org/0000-0002-5296-5459
Richy Hetherington http://orcid.org/0000-0002-6013-5738

References

Anderson, C., Day, K., & McLaughlin, P. (2006). Mastering the dissertation: Lecturers' representations of the purposes and processes of Master's level dissertation supervision. *Studies in Higher Education*, *31*(2), 149–168. https://doi.org/10.1080/03075070600572017

Boyer, E. L. (1998). *The boyer commission on educating undergraduates in the research university, reinventing undergraduate education: A blueprint for America's Research Universities*. State University of New York at Stony Brook. https://files.eric.ed.gov/fulltext/ED424840.pdf

Browning, L., Thompson, K., & Dawson, D. (2017). From early career researcher to research leader: Survival of the fittest? *Journal of Higher Education Policy and Management*, *39*(4), 361–377. https://doi.org/10.1080/1360080X.2017.1330814

Bryan, B., & Guccione, K. (2018). Was it worth it? A qualitative exploration into graduate perceptions of doctoral value. *Higher Education Research & Development*, *37*(6), 1124–1140. https://doi.org/10.1080/07294360.2018.1479378

Chadha, D. (2013). Reconceptualising and reframing graduate teaching assistant (GTA) provision for a research-intensive institution. *Teaching in Higher Education*, *18*(2), 205–217. https://doi.org/10.1080/13562517.2012.696537

Dolan, E. L., & Johnson, D. (2010). The undergraduate-postgraduate-faculty triad: Unique functions and tensions associated with undergraduate research experiences at research universities. *Cell Biology Education – Life Sciences Education*, *9*(4), 543–553. https://doi.org/10.1187/cbe.10-03-0052

Dooley, D. A., Mahon, R. M., & Oshiro, E. A. (2004). An undergraduate research opportunity: Collaboration between undergraduate and graduate students. *Journal of Food Science Education*, *3*(1), 8–13. https://doi.org/10.1111/j.1541-4329.2004.tb00034.x

Drennan, J., & Clarke, M. (2009). Coursework master's programmes: The student's experience of research and research supervision. *Studies in Higher Education*, *34*(5), 483–500. https://doi.org/10.1080/03075070802597150

Duke, D. C., & Denicolo, P. M. (2017). What supervisors and universities can do to enhance doctoral researcher experience (and how they can help themselves). *FEMS Microbiology Letters*, *364*(9), fnx090. https://doi.org/10.1093/femsle/fnx090

Fairbrother, H. (2012). Creating space: Maximising the potential of the graduate teaching assistant role. *Teaching in Higher Education*, *17*(3), 353–358. https://doi.org/10.1080/13562517.2012.678601

Feldon, D. F., Litson, K., Jeong, S., Blaney, J. M., Kang, J., Miller, C., Griffin, K., & Roksa, J. (2019). Postdocs' lab engagement predicts trajectories of PhD students' skill development. *Proceedings of the National Academy of Sciences*, *116*(42), 20910–20916. https://doi.org/10.1073/pnas.1912488116

French, D., & Russell, C. (2002). Do graduate teaching assistants benefit from teaching inquiry-based laboratories? *BioScience*, *52*(11), 1036–1041. https://doi.org/10.1641/0006-3568(2002)052[1036:DGTABF]2.0.CO;2

Gibney, E. (2013, September 19). *Training schemes help improve PhD outcomes. Times Higher Education Supplement*. The World Universities Insights Limited. https://www.timeshighereducation.com/news/training-schemes-help-improve-phd-outcomes/2007447.article

Gilmore, J., Maher, M. A., Feldon, D. F., & Timmerman, B. (2014). Exploration of factors related to the development of science, technology, engineering, and mathematics graduate teaching assistants' teaching orientations. *Studies in Higher Education*, *39*(10), 1910–1928. https://doi.org/10.1080/03075079.2013.806459

Gonzalez, C. (2001). Undergraduate research, graduate mentoring, and the University's mission. *Science*, *293*(5535), 1624–1626. https://doi.org/10.1126/science.1062714

Lee, A. (2008). How are doctoral students supervised? Concepts of doctoral research supervision. *Studies in Higher Education*, *33*(3), 267–281. https://doi.org/10.1080/03075070802049202

Lee, A. (2012). *Successful research supervision*. Routledge.

Likert, R. (1932). A technique for the measurement of attitudes. *Archives of Psychology*, *140*, 1–55. Retrieved July 29, 2021, from http://www.voteview.com/pdf/Likert_1932.pdf

Neves, J. (2018). *Postgraduate research experience survey*. AdvanceHE Press.

Neves, J., & Leman, J. (2019). *Postgraduate taught experience survey*. AdvanceHE Press.

Porter, S. D., & Phelps, J. M. (2014). Beyond skills: An integrative approach to doctoral student preparation for diverse careers. *The Canadian Journal of Higher Education*, *44*(3), 54–67. https://doi.org/10.47678/cjhe.v44i3.186038

Ravitch, S. M. (2020). *The best laid plans . . . qualitative research design during COVID-19*. Social Science Space. https://www.socialsciencespace.com/2020/03/the-best-laid-plans-qualitative-research-design-during-covid-19/

Reeves, T. D., Marbach-Ad, G., Miller, K. R., Ridgway, J., Gardner, G. E., Schussler, E. E., & Wischusen, E. W. (2016). A conceptual framework for graduate teaching assistant professional development evaluation and research. *CBE - Life Sciences Education*, *15*(2), 1–9. https://doi.org/10.1187/cbe.15-08-0183

Scott, J., & Maw, S. J. (2009). The role of the postgraduate student in delivering bioscience teaching. *Bioscience Education*, *14*(3), 1–10. https://doi.org/10.3108/beej.14.3

Sharpe, R. (2000). A framework for training graduate teaching assistants. *Teacher Development*, *4*(1), 131–143. https://doi.org/10.1080/13664530000200106

Shellito, C., Shea, K., Weissmann, G., Mueller-Solger, A., & Davis, W. (2001). Successful mentoring of undergraduate researchers: Tips for creating positive student research experiences. *Journal of College Science Teaching*, *30*(7), 460–464. https://www.proquest.com/docview/200332320

Shortlidge, E. E., & Eddy, S. L. (2018). The trade-off between graduate student research and teaching: A myth? *PLoS ONE*, *13*(6), e0199576. https://doi.org/10.1371/journal.pone.0199576

Taylor, S. (2016). *UK Professional Standards Framework (UKPSF). Dimensions of the framework for doctoral supervisors*. Higher Education Academy.

Taylor, S. (2017). *Enhancing Practice in Research Supervision*. UK Council for Graduate Education. http://www.ukcge.ac.uk/media/Download.aspx?MediaId=2002

Turner, G. (2015). *Postgraduate Research Experience Survey (PRES) 2015: The research student journey*. Higher Education Academy. https://www.advance-he.ac.uk/knowledge-hub/postgraduate-research-experience-survey-2015

UK National Union of Students. (2013). *Postgraduates who teach*. http://www.nus.org.uk/PageFiles/12238/1654NUS_PostgradTeachingSurvey_v3.pdf

Vitae. (2010). *Researcher development framework: Summary of the analysis of consultation responses*. www.vitae.ac.uk/CMS/files/upload/Vitae-RDF-consultation-analysis-may-2010.pdf

Wood, W. B. (2003). Inquiry-based undergraduate teaching in the life sciences at large research universities: A perspective on the boyer commission report. *Cell Biology Education*, *2*(2), 112–116. https://doi.org/10.1187/cbe.03-02-0004