A Guide for
Research Supervisors in Organisations Outside Higher Education

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UK Council for
Graduate Education

Content

Introduction

Since the late-20th century the purpose of the doctorate has been broadened from developing future academics to training key research workers for the knowledge economy who can also be employed as researchers in the public, private, and 'third' (not for profit) sectors (Thune, 2010; Pedersen, 2014). That broadening has been associated with four major developments in doctoral education (see Herman, 2013).

Firstly, there has been a change in emphasis in doctoral outputs from adding to knowledge and understanding in a discipline to using disciplinary or interdisciplinary expertise for the benefit of the economy and society. Secondly, rather than funding being solely through the state, other stakeholders have increasingly been partially or wholly funding doctoral studentships as a way of improving their outputs. Thirdly, while doctoral candidates used to spend all of their time within the academy, many are now undertaking their studies partially or mainly within partner organizations and off-campus. Finally, there have been associated changes in supervisory arrangements from these being located within academia to being shared with partner organisations.

In the UK, a significant number of universities are involved in doctoral collaborations with external partners outside higher education and hence many candidates are spending a proportion of their studies in partner organisations. As, ultimately, it is universities which are responsible for the standards of awards and the quality of the candidate learning experience, it would be expected that they would make every effort to ensure that appropriate support is offered to the supervisor in the external institution.

In order to see how far this is the case, the web sites of the 150 institutions in the UK which provide research degrees were reviewed in the expectation that their research degrees code of practice or regulations or both would indicate the institution's policies and procedures relating to support for doctoral supervisors in external partner organisations. In most cases, this was publicly available but in a few it was not and contact was made through e-mail. Data was obtained for all of the institutions, of which 23 (15%) made no mention of support for external doctoral supervisors, 36 (24%) allowed for the appointment of an advisor but outside

the supervisory team, and 91 (61%) allowed for the appointment of an external supervisor within the partner organisation.

A further search was made to see how far those institutions supported external supervisors to engage in professional development in their roles. Among the 91 institutions allowing external supervisors, 7 (8%) required that external supervisors should undertake mandatory training, 4 (3%) 'expected' that they would undertake training, 12 (13%) offered, invited or encouraged external supervisors to undertake training, and 68 (76%) made no mention at all of training.

The implication is then that institutions seem to be offering relatively little in the way of support to external supervisors and the aim or purpose of the present guide is to provide such support. The objectives are to consider the questions:

- What is a doctorate?
- What is involved in studying for a doctorate?
- What are collaborative doctorates?
- What are the benefits of collaborative doctorates?
- What are the potential challenges?
- How can supervisors help to overcome the challenges?

What is a Doctorate?

The doctorate is the highest qualification awarded by universities, and it is awarded to candidates who meet certain standards. In many European countries, these are specified by the state, but not in the UK. However, the Quality Assurance Agency (QAA) which regulates higher education, has produced a generic set of criteria.

The QAA (2015:30) criteria are that:

Doctoral degrees are awarded to candidates who have demonstrated:

- The creation and interpretation of new knowledge, through original research or other advanced scholarship, of a quality to satisfy peer review, extend the forefront of the discipline, and merit publication

- A systematic acquisition and understanding of a substantial body of knowledge which is at the forefront of an academic discipline or area of professional practice

- The general ability to conceptualise, design and implement a project for the generation of new knowledge, applications or understanding at the forefront of the discipline, and to adjust the project design in the light of unforeseen problems

- A detailed understanding of applicable techniques for research and advanced academic enquiry.

So, to gain a doctorate, candidates have to show a mastery of the literature in their subject or area of professional practice, to acquire and understand techniques for research and scholarship in their field, to be able to design and implement a research project, and crucially

to be able to create and interpret new knowledge to the satisfaction of peers and which is worthy of academic publication.

What is Involved in Studying for a Doctorate?

These objectives can be demonstrated in different ways, giving rise to different types of doctorates and patterns of study.

The 'Individual' Doctorate

This is the research doctorate as originally developed in Germany in the early 19th century, and essentially involves the candidate in undertaking a supervised research project over a period of three or four years, producing a thesis usually of 80-100,000 words.

The 'Structured' Doctorate

The structured PhD involves candidates in undertaking initial taught coursework in their subject for up to a year, and then spending a further three years or so undertaking a research project. Candidates are expected to work in cohorts and support each other during their doctoral journeys. Normally these programmes last for four years and then as with the individual PhD, produce a thesis.

Doctorates by Publication

While the processes underlying the 'individual' and the 'structured' doctorates are very different, the end product remains the same in terms of the production by the candidate of a written thesis. However, in the case of doctorates by publication, the end product is presented in a different way, namely as a compilation of publications with a linking commentary. Usually, because the focus is on publication in academic journals, these doctorates are usually supervised by academics alone.

The Professional Doctorate

The UK Council for Graduate Education (2002: 62) has defined a professional doctorate as:

> A programme of advanced study and research which, whilst satisfying university criteria for the award of a doctorate, is designed to meet the specific needs of a professional group external to the university, and which develops the capability of individuals to work in a professional context.

These doctorates normally involve an assessed taught component followed by a research project based in the workplace which may be written up as a thesis (shorter than that for a PhD) or as a portfolio (see Kot and Hendel, 2011: Mellors-Bourne et al 2016). Candidates usually have three supervisors, two in the university and one in the workplace. As with the structured PhD, candidates are normally expected to form cohorts and move collectively through the programme. Professional doctorates may be named, e.g. Doctor of Business Administration, Doctor of Education, Doctor of Nursing, Doctor of Social Work, or be generic as in Doctor of Professional Studies (DProf.).

The Practice-led Doctorate

A relative newcomer to the portfolio of doctorates is 'practice-led' doctorates. These involve the production of creative works, e.g. dance, music, sculpture, paintings, creative writing, as research outputs but are mostly mediated through an accompanying text or exegesis (see Grennan 2015).

All Doctorates

While these pathways to the doctorate are different, they do share the common feature of review by a team of examiners of which at least one is external to the institution and include an oral examination of the candidate. In the UK, a supervisor cannot be part of the examining panel.

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What is a Collaborative Doctorate?

Collaborative doctorates have been defined by Hill and Meek (2019: 3) as

[doctorates] where the topic supports the work of a non-university organisation, with whom the project is seen as a collaboration. This usually means joint supervision of the candidate from the university and the partner organisation…'

In the UK, collaborative doctorates take seven main forms.

CASE Studentships

In 1993, the then-government published a White Paper on Science and Technology Policy 'Realising Our Potential' (HMSO 1993: 4), which noted that the UK was lagging behind in mobilising its research base to support economic growth and stated that:

…steps should be taken, which, on the basis of other countries' experience, will help harness strength in science and engineering by bringing… [the publicly-funded university science base] into closer and more systemic contact with those responsible for industrial and commercial decisions.

It was in response to this that in 1994, a number of the UK research councils in the science and technology fields introduced Collaborative Awards in Science and Engineering (CASE) studentships (see Mills and James 2019). These involve industrial or commercial organisations in identifying projects suitable for a doctorate which would benefit their businesses and, in partnership with universities, recruiting candidates to carry them out. Candidates had three supervisors, a principal supervisor and co-supervisor usually from the university and a third, subsidiary or additional co-supervisor from the partner institution. Subsequently, CASE studentships were adopted by research councils in the social sciences and arts and humanities, and for that reason the original description as 'Collaborative Awards in Science and Engineering' has been dropped and they are now known as 'CASE' or 'industrial CASE' studentships. These are usually 'individual' PhDs.

Centres for Doctoral Training (CDT)

In 2008, the Engineering and Physical Sciences Research Council (EPSRC) created 45 CDT. These were based on universities or consortia of universities and covered a specific research theme to address a specific skills gap in the current market. The CDT offered a four-year training programme relating to that theme to candidates, including a taught component. Candidates were expected to move collectively through the research phases of their degrees, i.e. to form a cohort. Funding was through the research council but with the expectation that, where appropriate, there would also be further sponsorship from external organizations which would provide opportunities for candidates to undertake research and contribute towards the costs of their studentships.

In its day, this model of structured PhD training was revolutionary, and it was subject to a major review in 2011 (see Creasey 2012). This proved highly favourable, and in the wake of it the EPSRC expanded the number of CDT to 115. In addition, the other research councils followed suit and established CDT or Doctoral Training Centres (DTC) of their own, and by 2020 there were in all 108 CDT.

Collaborative Doctoral Partnerships/Collaborative Training Programme

Collaborative Doctoral Partnerships (CDP were initiated by the Arts and Humanities Research Council (AHRC) in 2012 as a means of engaging in doctoral education with public, private, and third-sector organisations. Their unique feature was that, instead of funding universities and expecting them to find external partners, the funding was given to the latter on condition that they involved the former. This model proved successful, and in 2016 another research council, the Biology and Biological Research Council (BBSRC) followed suit with its Collaborative Training Programme which provides block awards for doctoral studentships to external organisations, again to be managed in collaboration with a higher education institution. These are usually 'individual' doctorates.

Doctoral Training Partnerships (DTP)

In 2011, the ESRC introduced a variant on the CDT in the form of Doctoral Training Centres (DTC). While the CDT covered specific research themes and addressed specific skills gaps, the DTC were multidisciplinary and covered a variety of research areas. Institutions or consortia of institutions were given a block grant to fund research studentships with the expectation that, where appropriate, external partners would be involved in designing, implementing, and supervising research projects which would be of benefit to them. In the following year, this model was adopted by the Arts and Humanities Research Training Council (AHRC), but they were called DTP. In 2016, the ESRC followed suit and named their centres DTP. The DTP model proved highly successful and has now been adopted by all of the research councils. These may be 'individual' doctorates or, where a number of studentships are available within a similar area, 'structured' usually as a '1+3' model with a year of research training followed by 3 years of research.

European Industrial Doctorates

In 2012, the European Commission established the European Industrial Doctorates scheme which funded PhD studentships between university and industrial partners in at least two European countries, and in which a number of UK universities and firms participated (European Commission, 2017). Subsequently, that has been incorporated into the Marie Sklodowska-Curie Actions (MSCA) which is now the main EU programme for doctoral training in Europe, and again there is participation by UK institutions. These are all 'structured' doctoral programmes.

Industrial Doctorate Centres (IDC)

In 1990, the-then Science and Engineering Research Council commissioned the Parnaby report on how engineering employers regarded the PhD, which concluded that:

…companies which research, develop, design and manufacture plant and equipment as well as IT-based forms [viewed] the PhD [as] too narrow and academic for industry… (quoted Godfrey 2012: 2)

So a decision was taken to introduce a new doctorate, the Doctor of Engineering (EngD) which would enable candidates, described as 'research engineers' to be sponsored by industry and complete a work-based research project which they then wrote up as a thesis for the degree. This degree was introduced in five universities in 1992 and subsequently expanded. In 2008 the now re-named Engineering and Physical Sciences Research Council created 45 Centres for EngD training (Kitigawa 2011). Subsequently, these have been superseded by IDC which offer EngD degrees in specified areas of science and technology. The IDC scheme funds single institutions or consortia of institutions to work with external partners to identify suitable 'real-world' projects to be tackled by EngD research engineers. The latter are expected to spend 25% of their time in the university and 75% in industry. Currently, there are five Industrial Doctorate Centres in the UK, all offering structured doctorates.

Public Private or Third Sector Funded Consortia

Collaborative doctorates may be funded by consortia of external bodies; examples include the TWI (2020), National Structural Integrity Research Centre (2020) which is funded by TWI, Lloyd's Register, and BP and is involved with doctoral provision in 26 UK universities and the Marine Alliance for Science and Technology for Scotland (2020) which involves industrial partners and 11 universities in providing doctorates.

Individual Research Sponsors

Collaborations may be funded by individual organisations out of their own resources; these are usually either individual PhDs or professional doctorates funded by employers to provide advanced professional development, for example in education, health, and social work.

What are the Benefits of Collaborative Doctorates?

On the basis of the literature (see Slaughter, 2002; Harman, 2004; Mendoza, 2007: Thune, 2009; Borrell-Damian et al 2010: Reid and McCormack, 2010: Morris et al, 2011; Centre for Economic and Business Research, 2011: Labiad, 2013; Hogg and Hardill, 2014; Granata and Duchy, 2016; Gustavsson et al, 2016; Hills and Meek, 2019; Barnacle et al, 2020; Tavares et al, 2020) the key benefits can include:

Candidates

- Privileged access to data and research analysis.

- Better personal support from industrial partners than universities.

- Better provision of resources to support research.

- More chance to make an immediate impact through implementation of the research.

- Acquisition of transferable knowledge and skills, including management, financial,, multi-agency/disciplinary teamworking, and presenting to multiple audiences.

- Access to industrial as well as academic networks.

- Gaining valuable work experience in a non-university and a university environment.

- Enhanced employability, higher salaries, and better promotion prospects.

Partner Organisations

- Increase in research capacity at relatively modest cost.

- Chance to enhance the research culture.

- Professional development of staff in relating to research and universities.

- Chance to address strategic research challenges.

- Knowledge exchange from academia to solve problems.

- Enhanced performance (Centre for Economic and Business Research, 201x).

- Future opportunities to collaborate with academics on relevant projects.

Universities

- Attracting a more diverse range of doctoral candidates who aspire to do research which has an immediate impact.

- Gaining access to data which might otherwise not be available.

- Professional development of academic staff in working with external organisations.

- Chance to share in intellectual property rights through patents.

- Opportunity to demonstrate 'real world' impact of research, which has become increasingly important to university's government research funding.

- Establishing relationships with key practice and policy audiences.

- Future opportunities to collaborate with practitioners on relevant projects.

What are the Potential Challenges in Collaborative Doctorates?

Different Expectations About the Outcomes of the Project

Academic and external supervisors may have very different expectations about the outcome of the project.

Example

Saliminen-Karlsson and Walgren (2008) interviewed samples of academic and external supervisors. The perspective of the academic supervisor was summarised by one who said:

> The role of the industrial supervisor is to make the work related to the industry, so that it is relevant for that company. [Not] all industrial supervisors have PhDs themselves…those who have not…are generally much more difficult to work with. They do not understand what a doctoral project entails, they do not understand the process. (Loc. cit.: 86)

That of the external supervisor was summarised by another respondent who said:

> When we sit there, I can see that the professor knows what he wants…but how can he communicate it when we think so differently...we must always think that we have to get some profit out of the project… we have to get things done. But it's not that way at the university, instead they try to get deep into it. (Loc. cit. : 89)

So, while the academic supervisor understood that the doctorate involved the production of a doctoral thesis, the industrial supervisor was really only interested in the results.

Different Expectations About the Time Scale for the Project

As Malfoy (2011: 577) has put it, industry relies on 'fast and furious' methods, 'want the answers to issues yesterday', and expect a return on their investment in months; by contrast academic supervisors insist upon thoroughness, rigour, checking, and accuracy and are accustomed to working to time scales of three or four years or more. So external supervisors can become frustrated at the slow pace of the research projects, and academic supervisors frustrated by the urgent demands for results (see also Kihlinder et al (2011)).

Different Expectations About Supervisory Roles and Responsibilities

Academic supervisors who have only supervised conventional doctorates may be accustomed to a 'master-apprentice' model of supervision in which they have a dyadic relationship with their candidate and are in sole charge of directing their studies. Similarly, senior figures in external organisations are accustomed to acting as line managers and to subordinates doing as they are told. This, as Granata and Duchy (206) have noted, creates a potential for conflict between supervisors themselves and, as Fillery Travis et al (2017) have argued, for conflicting advice to be given to candidates.

External Organisations and Supervisors Not Fulfilling Their Responsibilities

External organisations may have a limited understanding of their responsibilities to the candidate. In particular, they may see the candidate as an extra pair of hands in undertaking the research and fail to understand that that they are studying for a doctorate as well and need relevant support and supervision (see Mills and James 2019).

A further difficulty can be where partner organisations promise access to data, and then fail to deliver:

> ## Example
>
> Mills and James (2019) in their study of collaborative research projects in the social sciences quote the case of 'Michael' a candidate who conducted a research project in conjunction with the chief executive officer of a national organisation. He had a written agreement with the CEO for access to data, but this was not accepted by other staff in the organisation. He tried to offer assurances about confidentiality, but was rebuffed, and eventually had no alternative but to reformulate his research questions, theoretical perspective, and methodology.

Academic Organisations and Supervisors Not Fulfilling Their Responsibilities

Similarly, academic organisations may neglect their responsibilities as well. This can reflect the view that collaborative doctorates are considered by some as inferior to traditional ones.

> ## Example
>
> In their study of collaborative doctorates in the arts and humanities, candidates interviewed by Hill and Meek (2019) said:
>
> 'I still get the feeling that senior faculty members would rather see a couple of high-quality journal articles, rather than a set of experiences relating to collaboration, engagement and impact' (quoted loc. cit. :24)
>
> 'Some fellow candidates and members of staff do not see me as a proper PhD student' (quoted loc. cit.: 26).

Additionally, academic supervisors may, on occasion, fail to back up candidates who have issued with the partner organisation. Milla and James (2019) give the example of one candidate who was promised and then denied access to data, but whose academic supervisor refused to intervene to protect his own relationship with the external organisation.

Supervisors Moving Jobs

A PhD usually takes at least 3, and often 4, years to complete, certainly when possible additional work is identified at the examination stage. Academic supervisors can and do obtain jobs at a different institution during the PhD process, and it is not uncommon for the academic to continue to supervise the candidate from their new institution. It is possible for the candidate to move institutions with their academic supervisor, although this will depend on a number of factors which all stakeholders would have to agree.

It is much more common for the practise-based supervisor to move jobs, as the job market in non-university sector is much more fluid than within higher education. Unless the practise supervisor changes roles within the same organisation, and is very committed to the doctoral project and candidate, it is very unlikely that the supervisory role would be maintained. In one social science collaborative doctorate known to the authors, the practice supervisors within a local authority changed seven times, and in another an alternative supervisor could not be found within the small, arts-based body. Both of these situations created unanticipated problems for the doctoral candidate and for the continuity of the research.

Intellectual Property Rights (IPR)

The final challenge concerns potential conflict over the ownership of outputs or IPR between the sponsor, the university and the candidate. As Damian-Borrell et al (2010: 503) noted in their case studies of doctoral training involving industrial partners across Europe:

> In general, the collaborative doctoral cases showed that there is an inherent tension between the candidate and the university's need to publish and the company's (and in many cases the university's) need to secure possible future exploitation of results…

Most cases managed to resolve confidentiality and IPR issues successfully, but some reported long delays (up to 2-3 years).

Such delays can penalise candidates, particularly if they are trying to pursue an academic career.

Example

Taylor et al (2018:109) cite the case of a pharmaceutical company which sponsored a doctoral research project to develop a new drug for the market, one condition of which was that it retained the intellectual property rights, which the researcher agreed to in writing at the start of the project. He was successful in developing and testing the drug and gained his PhD. But, for reasons of commercial sensitivity, the company refused to allow his thesis to be deposited online and open to inspection or for parts of it to be published in journals for five years. While the company cannot be blamed for protecting its investment, this created severe problems for the researcher in applying for an academic post as he was unable to provide any evidence of the quality of his work, and he ended up with a job outside academia. He was bitter about this and felt he should have been warned before agreeing to sign away his IPR that he would not be able to disseminate the findings which would close off an academic career.

How Can Supervisors Help to Overcome the Challenges?

Collaborative supervision by academic and external supervisors is necessary to achieve the benefits of collaborative doctorates described above, but it is by no means a sufficient one, as indicated by the list of things that can go wrong. These can have serious consequences in delaying the completion of research projects or even leading to their abandonment. Co-supervision therefore needs to be actively managed with co-supervisors approaching it in the right frame of mind, identifying their formal roles and responsibilities, discussing how these are going to work together, and reviewing co-supervision as the project proceeds.

Approaching Collaborative Supervision

As Guerin and Green (2015) and Maguire et al (2018) have suggested, it is important that academic and external supervisors approach collaboration with a mind-set that includes:

- An explicit acknowledgement that that there is a potential for divergence in the interests of academic and external partner institutions as opposed to sweeping it under the carpet and hoping to 'muddle through'.

- A pluralist approach which accepts that alternative perspectives from inside or outside academia may be as valid as that of their own.

- A willingness to learn about alternative approaches from academic or external partners.

- A willingness to enter into a discourse to develop a common understanding of how to proceed.

- A recognition that, at the end of the day, it will be the doctoral candidate who suffers if things go wrong.

Designing and Planning the Research Project

While academic doctorates only have to meet university requirements, collaborative doctorates have to also meet the requirements of the partner organisation. As Tsatsaronis (quoted Gracy, 2019: 2) has put the matter:

> The PhD supervisor has the responsibility to ensure that a PhD project is designed correctly. They need to ensure that a candidate does research in the area that hasn't already been explored. It needs to be substantial enough for a PhD project, but it also needs borders. The industrial supervisor has the responsibility of coming up with the best possible application of the outcome of the candidate's research. It is a big responsibility. If the application…isn't appropriate, it might show no impact... Normally a person who takes a role of an industrial supervisor [needs to be] experienced enough to pick which application of the research project will have demonstrable impact.

In this context, it is particularly important that the external supervisor is fully involved in planning and designing the work project. As the ESRC (undated: 2) has stated in its guidance for working with external partners:

> …a non-academic supervisor should be fully involved in setting objectives, the research focus, methodologies for the project, the management process and in monitoring and reviewing the progress of candidates. Such active involvement and interest by the non-academic organization is beneficial and should be encouraged. The non-academic supervisor is the partner's representative in the project and has responsibility to ensure that their organization is kept informed of the project.

The ESRC suggests that the supervisors should agree a research plan, including key activities and dates, milestones, the reporting and meeting schedule and timetable and, crucially, the deliverables. Again, at the planning stage, it is important that the supervisors agree who is responsible for the provision of resources to support the research project (for example technical equipment) and the candidate (training and appropriate office facilities).

Determining Intellectual Property Rights, Publication, and Thesis Defences

Once the deliverables are determined, supervisors need to recognise that their agendas may differ and agree matters relating to intellectual property, publication and thesis defences. A basis for discussion might include the protocols in the example below:

Example

The Innovation Fund Denmark (undated) has a model agreement for all aspects of industrial doctorates, including IPR, publication and thesis defences. It defines as Foreground Knowledge 'All knowledge generated during collaboration about the Project regardless of whether this knowledge was created by the Institution or the Company'.

The protocols for the IPR are:

- Each Party shall own the Foreground Knowledge created by the Party in question during the collaboration on the Project. The Company shall take over any rights associated with an Invention made by the Industrial PhD Candidate as part of the work to attain the PhD degree…

- Inventions made entirely by the Institution's supervisor in connection with the Project and based entirely on the ideas of the Institution's supervisor shall be taken over by the Institution…

- Foreground Knowledge created jointly by the staff of the Parties shall be jointly owned by the Parties pro rata to their intellectual contribution to the developed Foreground Knowledge. If the respective contributions of the Parties cannot be documented, the Foreground Knowledge shall be owned by the Parties in equal shares…

In terms of publication, the protocols are:

- Each Party shall be entitled to publish own Foreground Knowledge. Foreground Knowledge jointly owned by the Parties can be published by one of the Parties if the other Party does not wish to take part in the publication and provided it does not hamper the completion of the Project and the Industrial PhD Candidate's education and attainment of the PhD degree…

- If the Institution wishes to publish its Foreground Knowledge, the Institution shall notify the Company at least 30 days prior to the intended date of publication and forward the text and any additional material the Institution wishes to publish. Until 30 days after receipt of the notice, the Company can request that the publication be postponed by up to four months from the date of receipt.

With regard to the defence of the thesis, the protocols are:

- … the Industrial PhD Candidate is obliged to defend the PhD thesis in public. The Institution alone shall be entitled to determine when and where the publication and defence of the PhD thesis take place; however, the defence shall take place no later than three months after submission of the thesis.

- The Institution can decide that the defence be postponed if necessary for the protection of intellectual property rights. Such a postponement of the Industrial PhD Candidate's defence beyond 3 months from the submission of the PhD thesis shall, however, require the consent of the Industrial PhD Candidate.

Identifying Formal Roles and Responsibilities

Academic and industrial supervisors need to identify their formal roles and responsibilities. These may be defined by research centres or institutions for the various categories of supervisors.

> ### Example
>
> The EPSRC Centre for Digital Entertainment based at the universities of Bath and Bournemouth provides guidance for the roles of supervisors for research engineers (RE) studying for the EngD as below:
>
> The Industrial Supervisor:
>
> - Guides the RE's research agenda.
>
> - Advises on strategic importance and industrial relevance of work.
>
> - Ensures the RE has had relevant company induction.
>
> - Ensures the RE is aware of the company's expectations regarding conduct and what material is suitable for disclosure to the public sphere.
>
> - Ensures company colleagues fully understand the nature of the RE's role as a doctoral candidate embedded in a company who is not an employee.
>
> - Clears the RE's presentations to external audiences.
>
> - Guides the RE on choice of taught units and professional development to fill skills gaps.
>
> - Regularly meets with the RE and academic supervisor to monitor and record progress.
>
> - Allows the RE time to attend conferences and do coursework. Time spent on these are an integral part of the programme and do not count as leave.

- Approves leave in consultation with the academic supervisor.

The Academic Supervisor:

- Guides the RE's research agenda.

- Advises on the doctoral worth of research agenda (regarding novelty and literature).

- Advises on depth of understanding and analysis.

- Ensures the RE has had relevant university inductions.

- Guides the RE on choice of taught units and relevant professional training.

- Approves spend on the RE's Training Support Fund.

- Regularly meets with RE and industrial supervisor to monitor and record progress.

- Guides the RE on the production of the thesis/portfolio including suitability of evidence.

Available online at: https://www.digital-entertainment.org/media/filer_public/5e/6a/5e6a3767-b37a-49fd-97d4-689970ec7c49/cde2_guidance_for_engd_supervisors_v2.pdf

These guidelines clearly distinguish between the roles of the two supervisors, with the industrial one essentially responsible for the project and the academic one for doctorate, and also their joint responsibilities in terms of meeting with the RE and monitoring their progress.

Discussing How They Are to Work Together

Within the framework of their designated roles and responsibilities, as Spooner-Lane et al (2008) have suggested, supervisors then need to discuss with each other how this will work out in practice.

Example

Grossman and Crowther (2015: 4) have developed guidelines for collaborative discuss and agree in advance; extracts from these include:

Meetings

- Will there be an agreed format for keeping records of meetings?

- Will both co-supervisors, together, meet with the candidate or have independent meetings with the candidate?

- Who will organise meetings? How often? Where?

- Will meetings be minuted and if so by whom, to what level of detail and will the notes be copied to both co-supervisors and the postgraduate?

- How often will co-supervisors meet on their own to discuss the postgraduate's progress?.

Communication

- Will all emails be copied to co-supervisors and the postgraduate?

- Will the postgraduate send emails to both co-supervisors, or just to one co- supervisor? If so, which one?

- How will the long absence of a co-supervisor be managed?

- What vacation leave or study leave will be granted to the postgraduate?

- What notice of leave should be given and how far in advance and should it be given to all concerned?

- What will be the best way to access one another, especially if off-campus?

- What will be the procedure for all when crises emerge?

Feedback

- Will the same draft be read consecutively by each co-supervisor so they can see the others' corrections or will each supervisor receive a copy of the same draft to comment on?

- What are the arrangements for the final draft regarding reading, correcting, standards to be met and overall quality of the final thesis prior to all co-supervisors signing the document off for examination?

The process for discussing concerns and conflicts:

- About the candidate?

- With and between co-supervisors?

- If the postgraduate goes to one co-supervisor with a problem about another supervisor, how will this be handled?

Both Borrell-Damian et al (2010) and Fillery-Travis et al (2017) have suggested that the outcomes of these discussions should be embodied in a formal contract which would then serve as a basis for future reference and for regular review.

Succession Planning

Issues arising from potential changes in jobs by supervisors should be anticipated from the outset. This is particularly important for the possibility of the partner supervisor moving jobs, for two reasons. First, the arrangements for academic supervisors changing employment within the higher education sector are well rehearsed, and are an integral part of any discussions when a senior academic is appointed, who will most likely supervise several doctoral candidates in their previous institution. Secondly, changing jobs within the long course of a PhD is much more likely with the partner supervisor, who might well work in an environment with a higher rate of job mobility.

In Denmark, which pioneered industrial doctorates, it is a requirement that candidates have two company supervisors, a main one and a co-supervisor who 'ensures anchoring and implementation of the project, e.g. if the company supervisor changes jobs' (Innovation Fund Denmark, 2020: 3). But, where it is not compulsory, embedding the PhD within the partner organisation, perhaps by research presentations and including the candidate in meetings and discussions, and raising the issue of potential supervision with key colleagues at the start of a collaborative doctoral project, would help mitigate the difficulties encountered by the doctoral candidates when a practice supervisor moves jobs during the course of a collaborative doctorate.

Meeting Regularly and Frequently with the Candidate

As noted early, in 2012 the European Commission introduced the European Industrial Doctorate programme, which was one of the largest of modern times and involved in all 101 projects and 281 academic and external partners. Subsequently, it produced a final report (European Commission, 2017) which includes nine case studies of university-external organisation collaborations. By far the most striking finding was that the key to effective collaboration lay in regular – in most cases weekly – contacts between candidates and their academic and external supervisors. These did not necessarily have to be face-to-face meetings – they could be telephone calls or teleconferences – but regular and frequent contacts were seen to be the key in keeping supervisors and candidates in step and leading to successful outcomes.

Regular Reviews of Supervision Itself

As well as reviewing the progress of research projects towards their objectives, there is a need for regular reviews of the relationships of collaborative supervisors with each other and with the candidate. Such reviews, perhaps once or twice per year, might be undertaken with the candidate present and, following Taylor et al (2018) include:

- Whether both supervisors feel that project expectations are being met.

- Whether they feel that the division of roles and responsibilities is still appropriate and effective.

- Whether the candidate feels that he or she is being offered a clear steer by co-supervisors or experiencing difficulties in meeting multiple and diverse demands.

- Whether the candidate remains clear about where roles and responsibilities lie for their supervision.

- Whether the candidate feels that co-supervisors are accessible.

- Whether the candidate feels that they have an appropriate balance between direction and support.

- Whether the candidate feels that there is an appropriate balance between commitments to the university and to the collaborative organisation.

Such discussions can identify problems stemming from co-supervision at a relatively early stage and before they delay, fatally or otherwise, the progress of the research.

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