A PRACTICE PERSPECTIVE ON DOCTORAL EDUCATION – EMPLOYER, POLICY, AND INDUSTRY VIEWS

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Abstract

As we enter the Transformative Age of digital and green transitions, the European Commission and other global policy-makers herald universities as key players in innovation and transformation. PhD students ostensibly represent the pinnacle of higher education and suitable candidates for policymakers' visions. Academic research has shown that traditional PhD programmes may fail to equip their graduates with the necessary skills and knowledge required. Practitioners' voices have, however, been less well heard. We review thirteen policy and industry reports relating to doctoral education including EU policy documents, wider policy contributions across the EU, and industry-led reports. We also conduct thirteen semi-structured interviews with PhD employers or experts in PhD recruitment/placement. Findings highlight the lack of transferable skills in doctoral graduates, but also shed new light on attributes and experience as key hiring factors. We examine interdisciplinarity and intersectorality as potential solutions to employer and policymaker demands.

Keywords: Doctoral education, practice perspective, programme design, skill acquisition, PhD programmes.

1. Introduction

We have entered the Transformative Age and "can expect fundamental shifts in how we live, work and play… how we learn – and, along with it, the nature and role of the university" (Halloran and Friday, 2018, p. 2). The European Commission's vision of "a fairer, healthier, greener and more digital society" (2020, p.1) requires new skill acquisition for students at all levels. The highest level of academic achievement is the doctorate and as such, doctoral should be key to meeting the challenges that our society faces. However, doctoral education faces its own challenges, with common critiques surrounding the overspecialization and lack of real-world applicability of their work (Cui and Harshman, 2020). Change is needed to meet the goals of national and international strategies and to enable doctoral graduates to improve their own employability in the process, given how few remain in academia (Alfano, Gaeta, & Pinto, 2021). While the topic has understandably become popular with academics, there is still a considerable lack of other voices in the discussion. Thus, we offer a practice-based perspective on the current state of doctoral education through analysis of employer, policy, and industry views. This paper begins with a discussion of our methods, our findings across two main themes, and concludes with a discussion section.

2. Methods

Our multimethod study includes a) a systematic review of thirteen policy and industry reports relating to doctoral education; and b) thirteen in-depth semi-structured interviews with PhD employers or experts in PhD recruitment/placement. The systematic review process included three sources of non-academic reports and policy documents:
1. Directorate General for Education, Youth, Sport and Culture strategy and plans.
2. EU level policy reports citing doctoral education.
3. Big 4 (KPMG. PwC, EY, Deloitte) consulting reports citing doctoral education.

The first search was conducted within the Directorate General for Education, Youth, Sport and Culture website while the second and third searches were conducted using Google's advanced search function. Filters applied were as follows: pdf format documents, English language, and that the website had been updated in the last year. These filters ensured a level of formality, the author's ability to analyse

the information, and the currency of the documentation respectively. Each were then reviewed using the qualitative data analysis software NVivo.

Interviewees for the semi-structured interviews were identified in the first instance through an international doctoral education consortium, spanning multiple countries including Ireland, Spain, Greece, and Finland. Further interviewees were then added through a snowball sampling approach. Having first obtained informed consent, interviews were conducted virtually using Microsoft Teams. They lasted an average of 34 minutes and ranged between 18 to 52 minutes. Interviews took a semi-structured approach and as themes began to emerge, questions evolved through an iterative process. All interviews were recorded, transcribed verbatim and analysed inductively using NVivo.

Table 1. Overview of interviews.

Interview No.	Country	Occupation	Duration
Interviewee 1	Spain	Co-founder, medical informatics company	40 mins
Interviewee 2	Spain	Medical Director, pharmaceutical company	52 mins
Interviewee 3	Finland	Market Research Analyst, health research clinic	27 mins
Interviewee 4	Ireland	Head of Innovation, technology MNC	30 mins
Interviewee 5	Portugal	HR Director, private clinic and hospital group	43 mins
Interviewee 6	Ireland	Co-founder, sports wearables company	32 mins
Interviewee 7	Ireland	Supervisor, hospital-based research institute	39 mins
Interviewee 8	Ireland	Founder, social media marketing company	34 mins
Interviewee 9	Ireland	Principal Investigator, national software research center	45 mins
Interviewee 10	Ireland	Director, national data analytics research center	30 mins
Interviewee 11	Spain	Head of Innovation, healthcare NGO	20 mins
Interviewee 12	Ireland	Careers Guidance Counsellor, university	34 mins
Interviewee 13	Ireland	Data Analyst, national health organisation	18 mins

3. Findings

Findings highlight two main points for discussion: firstly, the changing role of universities in society, and secondly, the emerging role of interdisciplinarity and intersectorality as means of addressing challenges through adaptability and transferable skills in doctoral graduates.

3.1. Role of universities in changing contexts

There are "growing expectations that universities will not only undertake their core pedagogical function and carry out research, but also engage in other activities, such as contributing to the development of culture, cooperating outside academia, citizen engagement in research and science carried out by universities through societal outreach, and the use of research to tackle societal challenges" (Whittle and Rampton, 2020, p.15). This is particularly important now, as we enter changing times, only accelerated by the COVID-19 global pandemic. "Changes in climate, digital technologies and geopolitics were already profoundly affecting our society and driving our agenda. However, the pandemic has sharpened the need for Europe to lead the twin green and digital transitions and make its societies and economies more resilient. This creates an unparalleled opportunity to move out of the fragility of the crisis by creating a new vitality for our Union" (European Commission, 2020, p. 1-2).

Green and digital transitions are a priority for policymakers and industry, especially within the European Union as the EU strives to be a global leader in innovation and societal change. This is critical for universities to be aware of when preparing graduates, especially those at the doctorate level, for the changing nature of work. Deloitte explain that this change to the nature of work is due to "technology innovation, a growing demand for new competencies, changing employee expectations, shifting labour demographics and inclusion/diversity strategies, new workforce models, and the evolving business environment with all its regulatory changes" (Lutin, 2020, p.1).

In terms of the digital transition in particular, it is important that we are "ensuring strong collaboration and smart specialization between universities, research centers and firms, and adequate availability of skills" (Directorate General for Education, Youth, Sport, and Culture [DG EAC], 2020, p. 9). To do so, DG EAC (2020) suggest four key criteria for successful digital transition:

1. New environments that are conducive to collaboration and innovation;
2. Stronger innovation capabilities across both academia and the research sector;
3. A new generation of entrepreneurial people; and
4. The creation and the development of innovative ventures.

Innovation and collaboration are also key to employers, as interviewees noted that teamwork was important for the organization's success in being one step ahead of their competitors. However, the traditional isolation of doctoral programmes led some of the employers to believe that doctoral graduates – despite their expert knowledge – were not valuable assets to the organization as they lacked adaptability to the fast-paced industry environment. Expert knowledge only played part of the role in the hiring process, as experience in a professional setting was highlighted as a key benefit. Both would make it easier for the candidate to fit into the organization on both a technical level and personal level, the latter of which was highlighted by one of the employers as taking priority in some cases.

3.2. Skills, interdisciplinarity and intersectorality

Two ways of introducing opportunities to build adaptability and provide professional experience to doctoral students are through interdisciplinarity and intersectorality. Interdisciplinarity - the act of working with and transferring knowledge from different disciplines to one's own – has become increasingly visible in doctoral education (Kemp and Nurius, 2015). Interdisciplinarity provides students with new perspectives and methods of working, which one of our interviewed employers mentioned as one particular way of bringing much needed diversity to their organization (Interviewee 9). Industry leaders also highlight the importance of interdisciplinarity, with statements that futureproofing will require "building mechanisms so that understanding of the world outside Universities is drawn in systematically and across the full range of academic disciplines" (Andrew and Bagshaw, 2019, p. 12) This will allow universities to "shape the work of businesses through their research and teaching innovations which capitalise on new technologies, processes and approaches" (Andrew and Bagshaw, 2019, p. 12).

Intersectorality, whereby universities will work in collaboration with industry, is also on the radar for industry and policymakers. The European Universities Association (EUA) stresses that universities are well able to equip researchers with the necessary basic and advanced skills to meet current technological and societal challenges. At the same time, universities also engage in and co-implement numerous collaborations with partners outside of academia. Through collaborative doctoral education schemes, universities foster the involvement of public and private sector actors in doctoral training" (European Universities Association [EUA], 2020, p. 13).

Chircop, Karakas, Kiss, and Szczepanski (2020, p. 14) paint a picture of an ideal industry-academia interaction where "both the expectations of industry and those of academia are satisfied to a similar extent and an equal partnership develops". Such productive collaborations are "strategic and long-term. They are built around a shared research vision and may continue for a decade or beyond, establishing deep professional ties, trust and shared benefits, which can bridge the important cultural difference between academia and industry. Ideally, they are led by individuals who understand both the academic and business world" (Chircop et al., 2020, p.14).

Both interdisciplinarity and intersectorality are deemed not just desirable, but essential. They increase doctoral student employability by augmenting their potential for innovation due to the variety of skills, knowledge and perspectives they experience. It appears that the main issue, however, is that these students are not aware of their unique capabilities and thus can have lower confidence than their peers despite being much more qualified for a multitude of roles (Interviewee #7 and #9). It is also why when interviewed, employers stated that they tend not to see any particular benefits to choosing a job candidate with a PhD over one without, unless a highly specific technical role was waiting to be filled "towards the back" (Interviewee #2) of the organization and less so in a role dealing with people (Interviewee #8).

Whittle and Rampton (2020) identify a need to increase the inter-sectoral mobility of academics and researchers: "Whilst there remains a need for many academics to work in-depth within their own disciplines, two trends are increasing the need for inter-sectoral and inter-disciplinary mobility amongst researchers: first, the trend towards short-term funding for research positions at R2 and R3 levels in general; this is requiring researchers to change roles within academia or even into and out of other sectors; second, many of the key challenges facing society require solutions that draw on and combine expertise from different academic disciplines and with expertise from non-academic sectors. There is therefore a need to develop a mix of specialist and transversal competences, which typically requires a degree of inter-sectoral and inter-disciplinary mobility, although such mobility will take very different forms and vary across different disciplines" (p. 88-89).

Another priority for practitioners is ensuring that the correct skills are developed within university programmes. The European Council of Doctoral Candidates and Junior Researchers, calls for quality standards that encourage transferable skills training in doctoral programmes (European Council of Doctoral Candidates and Junior Researchers [Eurodoc], 2020). The Council Conclusions also note the need to broaden researchers' skills and competences and propose an enhanced European Competence Framework for Research Careers (Eurodoc, 2020).

The topic of transferable skills is not new, particularly in doctoral education. It is another reason why interdisciplinary and intersectoral doctoral programmes are becoming more common, as they develop through practical work where they can be applied across a variety of contexts and careers. Some of the most commonly sought transferable skills include communication, teamwork, time management, organization and project management (Interviewee #1, #2, #4, #6 and #12).

It is worth noting however, that employers revealed that attributes such as confidence, determination, positivity, and resilience would also be considered desirable skills (Interviewee #5, 7 and 9). Resilience specifically was also described as a skill by the DG EAC (2020) though this was linked to the pressure placed by the COVID-19 pandemic.

4. Discussion and conclusions

As society progresses, policymakers highlight the importance of universities in preparing a highly skilled workforce equipped to deal with the modern challenges of a more technologically advanced and sustainable future. Universities are now considered a major player in this societal development (Whittle and Rampton, 2020). However, a distinct lack of transferable skills and practical experience lead many employers to dismiss the potential of universities' most educated prospective workforce: doctoral graduates. The introduction of interdisciplinary and intersectoral doctoral programmes aim to tackle the past criticisms of overspecialization and isolation by placing doctoral graduates in new environments where they must learn to adapt and work in complex teams and organisations thus better preparing them for the future. Such diverse knowledge and practical work are deemed as highly desirable from employers, industry and policymakers alike (Interviewee #8).

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