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The changing landscape of doctoral education: A framework for analysis and introduction to the special issue

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ABSTRACT

Traditionally, doctoral education was a matter of the talented few being apprenticed to learn how to research from masters in their discipline; it was conducted in private in spaces far removed from normal teaching or industry or commerce; the only requirement to supervise or to examine candidates was to be research active; many candidates dropped out in the course of their studies; for those who persisted their research took as long as it took; and the majority of graduates went on to become academics. But, over the past three decades or so, there have been a number of changes which have transformed doctoral education almost beyond recognition. The purpose of the present article is to provide a general analysis of these factors in order to provide an overall framework for the discussion at the international level of the changes in doctoral education in a sample of case studies drawn from across the globe.

KEYWORDS

The Humboldtian doctorate; developments in doctoral education; the modern doctorate

The Humboldtian doctorate

Doctorates have their origins in the mediaeval universities, when they were used primarily as a means of accrediting teachers in medicine, law and theology. This paradigm remained dominant until, in the early nineteenth century, a number of eminent Enlightenment thinkers in Prussia began to advocate a new kind of university, one in which the core mission should be the creation of original knowledge and understanding and where research would be pre-eminent. These advocates included Friedrich Schliermacher, Johann Fichte and Wilhelm Von Humboldt (see Watson, 2010).

It was von Humboldt who was able to implement this new model when, in 1809, he became head of the newly created Department of Religious and Educational Affairs in the Ministry of the Interior and responsible for higher education. In that capacity, he took the lead in founding the University of Berlin which in 1810 became the world's first explicitly research-led university. Part of its mission was to make provision for the training of future researchers, for which purpose it instituted a new type of doctorate, one which was to be awarded for making an original contribution to the knowledge and understanding in the arts and the sciences or as they were then labelled 'philosophy'. Hence, the new degree was titled 'Doctor of Philosophy' or PhD (Nybom, 2003).

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The PhD was intended for a tiny handful of the brightest and the best; it was based on a 'master-apprentice' model of delivery; supervision was seen as a private relationship between consenting adults; candidates had to complete a research project, write it up in the form of a thesis and defend it at an oral examination; and, because it involved the creation of new knowledge, completion took as long as it took.

Except in what became Germany, what was subsequently called the Humboldtian model (see Ash, 2006) made little headway during the rest of the nineteenth century in Europe, where universities remained primarily concerned with undergraduate teaching. But if the universities of the Old World remained unimpressed by the new doctorate, it was more rapidly embraced by those of the New World, by the United States. There, the first PhD was awarded by Yale in 1861, and the precedent was quickly followed by Harvard, Michigan and Pennsylvania.

By the start of the twentieth century, Germany and the US had a virtual monopoly in the market for doctoral education. But, when the First World War demonstrated the strength of German science, the government of the day in the UK pressed universities to introduce the degree.

The first (in fact a DPhil.) was awarded by Oxford in 1920, and over the following decade, all of the UK universities adopted the degree. After the Second World War, the PhD was exported to other countries with higher education systems modelled that of on the UK, including Australia, New Zealand and South Africa.

By the late 1940s, the PhD had spread throughout the Anglo-American world, but it was still resisted across much of Western Europe which clung on to its historical doctorates. However, the 1950s and 1960s saw research rise to the top of the political agenda both as a key to both economic growth and defence capability, and this was reflected in a rapid growth of PhD programmes in Western European countries, with the final adopters being Italy (1988) and Denmark (1989).

By the late 1980s, the PhD had conquered Western Europe, but not Eastern Europe. In most of the so-called 'Soviet bloc', there were different arrangements based on the USSR model of a two-step doctorate which could be taken inside or outside the universities, for example in the Academies of Sciences, and in either case was subject to state approval (see, for example, Connelly, 2000). However, following the so-called the 'velvet revolutions' at the end of the 1980s and start of the 1990s, many, if not all, of the now post-Soviet countries re-organised systems for graduate education including the establishment or re-establishment of the PhD in the universities (see Smolentseva et al., 2018).

By the 1990s, then, the PhD had become a qualification delivered over a large proportion of the globe. In its essentials, it was recognisable as the degree which had been introduced at the University of Berlin just under two centuries earlier.

Developments in the doctorate in the late twentieth and twenty-first centuries

However, over the last three decades or so, as Hammond et al. (2010) have suggested, the doctorate has been transformed by four general developments, namely formalisation, growth and diversification of the candidate population,

diversification of modes of study and diversification of purposes. Each of these general developments includes a number of specific ones, which have been identified by S. Taylor (2012, 2014).

Formalisation

In the past, the education of doctoral candidates was generally left to supervisors and candidates to manage, with little in the way of external intervention. However, through the processes of commodification, McDonaldisation, regulation, collectivisation and structuration it has been increasingly formalised

Commodification

Historically, the master and apprentice model of supervision model whereby the learner learned from the 'master' was the norm.

However, as with undergraduate and postgraduate coursework education, 'doctoral education has now been shaped by neo-liberal government policies into a "provider-consumer" framework' (S. Taylor et al., 2018, p. 9). As a result, candidates are now more likely to expect their supervisors to provide a service by providing support with their projects (see, for example, Dann, 2008; Denicolo et al., 2020; Grant, 2005). When there are problems, they are much more likely to look towards their supervisor for assistance and then if need be seek help from others including complaining to the supervisory team, demanding a change of supervisor, using institutional complaints procedures, accessing external complaints procedures, or ultimately recourse to the law.

McDonaldisation

Historically, sponsors of research students have a fairly relaxed attitude to completion times and submission rates. Indeed, prior to the 1980s, in many countries there were no statistics on how many students completed and how long it took them (see Simpson, 2009).

Subsequently, studies were undertaken in Western Europe (Blaume & Amsterdamsaka, 1987, De Weert, 2004; Kehm, 2004; Maher et al., 2004), the US (Golde, 2005), Canada (Elgar & Klein, 2004) and Australia (Bourke et al., 2004), all of which suggested that around one-half of doctoral students failed to gain their degrees. To make matters worse, the same studies found that, of those students who did gain a degree, relatively few completed within the allotted time. So, for example, an investigation of completion rates among social scientists in the UK (Winfield, 1987) revealed that less than one-fifth of sponsored students completed within even 4 years. A similar study by Bowen and Rudenstein (1992) of the US revealed that successful students were taking, on average, 8 years to do the degree, twice the time allotted. Even more damningly, their longitudinal evidence indicated that, over the previous 30 years, average completion times had increased by around 20%.

In response, over the past three decades or so, public research sponsors across much of the globe have then acted to improve completion times.

Regulation

Historically, neither research sponsors nor institutions paid little, if any, attention to doctoral education. As Park (2007, p. 29) has written, doctoral education took place in a 'secret garden' in which candidate and supervisor worked closely together without a great deal of external scrutiny or accountability.

However, three factors have led institutions to take a much more active interest. Firstly, research funders and stakeholders have increasingly insisted that research meets relevant ethical standards and have required institutions to police their implementation (see Trafford & Lesham, 2008). Secondly, commodification (see above) has meant that institutions have had to take responsibility for the quality of supervision and develop mechanisms for assuring and enhancing the student learning experience. Thirdly, McDonaldisation (see above) has meant that institutions have had to institute policies and procedures to ensure that students complete on time or as near as possible. So the secret garden has been opened to external gaze and doctoral education has become heavily regulated (see Bitusikova, 2010b; Bohrer, 2010; Jakopovic & Borosic, 2010; Negyesi, 2010; Pietzonka, 2010; Byrne et al., 2013; Andres et al., 2015; Kivisto et al., 2017; Nerad, 2020)

Collectivisation

At least outside the US, the historical model of doctoral education has been one of the research students having a single supervisor. This can have the advantage that there is one line of responsibility and source of advice and guidance to support students' research projects. However, if that one person is negligent or the relationship does not work or if something happens to the supervisor, then there is a risk that serious problems can occur. So the argument has been made that, with more than one supervisor, there is a safety net for the student and for the research project (see, for example, Watts, 2010). For this reason, there have been moves to augment supervision arrangements by the addition of further supervisors, i.e. for supervision to be broadened to include a supervisory team or, particularly in the sciences, formal and informal supervision by a research group (see Hakkarainen et al., 2016).

But, while the collectivisation of doctoral education may overcome some problems, it can also cause others in so far the relationship between supervisors and students becomes more complex and potentially subject to conflict over competing intellectual perspectives, interpretations of projects, supervisory roles and supervisory styles (see, for example, Guerin & Green, 2013; Guerin et al., 2011; C. Manathunga, 2012; S. Taylor et al., 2018).

Structuration

Originally, as S. Taylor et al. (2018, p. 12) have put it, 'doctoral education took the form of individual study; the supervisor provided guidance, the candidate worked independently or his or her own'. While that is still the situation in some countries, in others, there are various forms of training for research candidates. Such training is aimed at improving submission and completion times, as well as enhancing employability. Such developments have resulted in a more structured programmes of study in some cases including coursework which is often integrated into the overall programme, monitoring procedures

and skill development relating to employability (see Elliot et al., 2020; Kiley, 2014; Gonzalez-Ocampo & Badia, 2019).

As a result, many institutions have implemented structures to support doctoral studies including graduate schools, doctoral colleges, doctoral research schools, and doctoral training centres and industry partnerships (see Hasgall et al., 2019; Kovacevic et al., 2022).

As S. Taylor et al. (2018, p. 12) suggest, 'In these ways, doctoral education has increasingly become structured at both the programme and the institutional levels (see Andres et al., 2015; Bitusikova, 2010a; Kiley, 2011; McGloin & Wynne, 2015)'.

In these ways, doctoral education has increasingly become structured at both the programme and the institutional levels (see Andres et al., 2015; Bitusikova, 2010a; Kiley, 2011; McGloin & Wynne, 2015).

Growth and diversification of the candidate population

Massification

Up to a few years ago, as Joyner (2003, p. 123) has written ' . . . very few people, mostly of high attainment and motivation, undertook research degrees'.

But, and across the globe, over the past two decades, the number registering for doctoral programmes in most countries has grown rapidly (Andres et al., 2015; Archbald, 2011, Halse & Mowbray, 2011; Cyranoski et al., 2011; Huang, 2017; Kearney, 2010; OECD, 2019; Pederson, 2014; Powell & Green, 2007; Sarrico, 2022; Shin et al., 2018; Ulhoi, 2005; UNESCO, 2019).

McCulloch and Thomas (2012) suggest that this reflects three main factors. The first is the shift in many countries from an elite to a mass system of higher education at the undergraduate and taught postgraduate levels. On the one hand, the fact that there were many more people with undergraduate or master's degrees increased the numbers who were eligible to undertake doctoral programmes; on the other, the fact that these lower degrees had become relatively common increased the cachet associated with the doctorate and gave it an edge in terms of status and possibly qualifications in the labour market. The second is the demand of the knowledge economies for researchers and the third the financial incentives for institutions to recruit international students (see below).

International diversification

The other trend has been the internationalisation of doctoral studies, that is, candidates undertaking their research degree in a country other than that of their origin. Although this is not new, as S. Taylor et al. (2018, p. 13) have noted . . . for example in the 19th century both US and UK chemists did their doctoral studies in Germany (Simpson, 1983) – what has changed very rapidly in recent years is the sheer scale of movement to study abroad for doctorates, particularly of course in the US, UK, Oceania, and Western Europe

The reasons for this are many and varied, but they include the very rapid growth of undergraduate education in developing countries coupled with a lack of capacity for postgraduate education, which has led both governments and the emerging middle classes to send graduates abroad to do research degrees (see, for example, Banks &

Bhandari, 2012; Mogueron, 2005; Zhao, 2003). In other cases, research students are staying at home, but studying for degrees with foreign universities. As a consequence, significant proportions of doctoral students are now from other countries. For example, in 2019, 42% of research students in the UK were from outside the country, as were 41% in the Netherlands, 38% in Sweden and 18% in Germany (OECD, 2019, p. 11).

Domestic diversification

Moreover, this expansion in numbers has been associated with an increase in the diversity of the domestic graduate population (see, for example, Petersen, 2012). Offerman (2011, p. 25) has profiled the traditional doctoral student as:

> . . .a twenty-something, unmarried white male studying full-time and serving in some sort of assistant role to his faculty mentor or member of his doctoral committee. He was singularly devoted to his area of study and research.

While his contemporary counterpart (loc. cit.25–26) is:

> . . .as likely to be a woman as a man. . .as likely as not to be studying part-time. . .as likely as not to work outside the traditional graduate, research assistant, or teaching role. Characteristics of a non-traditional student include being older, more engaged in family and work life, financially independent, and studying part-time (25–26)

These changes mean that those involved in doctoral education now need to be alert to, as Yeatman (cited Johnson et al., 2000, p. 137) has put it:

> . . . the needs of many PhD aspirants who, by historic cultural positioning, have not been invited to imagine themselves as subjects of genius. These include all those who have been marginalised by the academic scholarly culture; women, and men and women from the non-dominant class, ethnic or race positions.

Obligation

Historically, it has been assumed that, as doctoral candidates are adults, they should take responsibility for their own well-being and mental health. Institutions, then, have often not been expected to have roles in relation to supporting candidates to enjoy high levels of well-being and/or positive mental health

In recent years, however, a significant volume of evidence (see, for example, Cumerma, 2018; Guthrie et al., 2017; Levecque et al., 2017, Marais et al., 2017; Metcalfe et al., 2018) has emerged suggesting that doctoral candidates suffer disproportionately from low levels of well-being and, in a number of cases, from mental distress (depression and anxiety) and mental health issues (clinically proven depression and anxiety as well as more severe illnesses including bipolar and psychosis).

The causes of this development are complex; as Levecque et al. (2017) and Marais et al. (2017) point out, they may include the possibility that, with the massification of the undergraduate population, more postgraduates have been coming forward with low levels of self-esteem and/or mental distress or health issues. Alternatively, it has been suggested (see Barry et al., 2018; Benjamin et al., 2017; Levecque et al., 2017, Marais et al., 2017; Thornley, 2017) that the experience of doctoral study in itself can undermine

candidates' sense of esteem and well-being and lead to mental distress and/or mental health issues. As Metcalfe et al. (2018) have argued, problems may include the pressures of doctoral work, lack of understanding of the standards required for doctoral research, loneliness, boredom, relationships with supervisors, financial difficulties, harassment and career uncertainties. Of course, the two sets of causes, pre-existing and doctoral-study related, may interact to affect well-being and mental health.

As this evidence of issues relating to the well-being and mental health of the doctoral candidate population has emerged, there has been a shift in expectations of institutions, i.e. the latter have had to accept a degree of responsibility.

Diversification of modes of study

Casualisation

As S. Taylor et al. (2018, p. 13) have suggested:

> Historically, the model has been for doctoral students to be full-time. While this largely remains the case in the natural sciences, the picture can be very different in the arts, humanities, and social sciences. In these disciplines, a combination of debts incurred by the shifting of costs from the state to students and a relative paucity of funded studentships has deterred many students from moving straight from taught programmes to research ones and into deferring doctoral studies until later in life. By then, students have jobs and family responsibilities, and have to study part-time.

Dislocation

Again, historically, the model has been that students have studied full time on campus. But advances in information and communication technology, including the Internet, the World Wide Web and virtual learning environments, have meant that, as Archbald (2011, pp. 13–14) has written,

> Students can enter doctoral study without residency requirements, without facing hundreds of hours of annual commuting, and without quitting their jobs or relocating. The barriers, costs and risks associated with the decision to pursue doctoral study have been substantially diminished. Thus doctoral study can now be realistically contemplated by vast new swathes of the adult population – the mid-career adult wanting to advance in his or her present field, enter a new field, or embark on a journey of intellectual growth and enrichment.

Thus, even before Covid, there was a trend towards online supervision (Maor et al., 2015). But of course the onset of the pandemic was followed by a virtually universal shift to online supervision which, as Kumar et al. (2019) have shown, has brought major challenges to those involved in doctoral education in terms of connecting with candidates, communicating with them, building a professional relationship, calibrating expectations of roles and responsibilities, undertaking the research project, encouraging writing and giving feedback.

Diversification of purposes

Cross-fertilisation

Traditionally, doctorates have been undertaken within a single discipline. However, tackling many of the major problems and issues in contemporary research requires cross-fertilisation across and between disciplines, and hence many funded research projects are inter-disciplinary. Where supervisors themselves have a mono-disciplinary pedigree, operating across two or more can, as C. L. Manathunga et al. (2006, p. 370) put it, be '. . . cognitively, emotionally and socially threatening work' because they can outside their disciplinary comfort zone and operating in unknown territory (see Blackmore & Nesbitt, 2008; Boden et al., 2011; Gardner et al., 2012, 2014; Halliday & Kiley, 2016; Kiley, 2009).

Proliferation

While traditionally the PhD has been the main research degree over the past two decades, other forms of the doctorate have developed including doctorates by publication, practice-based doctorates, professional doctorates and project-based, or sometimes referred to as Industry doctorates.

As S. Taylor et al. (2018, p. 14) suggest:

> In most countries the doctorate has necessitated the production of a thesis or dissertation, i.e. a monograph, while in a few - particularly the Scandinavian countries – there has been the option of a collection of papers which have been published or accepted for publication plus a linking synthesis (see Lee, 2022; Siggaard Jensen, 2007).

Recently, there has been a steady increase in the doctorate by published papers, particularly in some disciplines. Such an approach provides a peer review of the ongoing work and the earlier dissemination of research results. This can be of particular value in certain research areas (see Dowling et al., 2012; Jackson, 2013; Niven & Grant, 2012).

Professional doctorates are not new in themselves – the first was established in 1894 (see Allen et al., 2002) – but for most of the twentieth century were few in number and mainly confined to education. However, in the late 1980s, they were re-conceptualised as an alternative to the PhD for the professions. Whereas the PhD was intended to produce professional researchers, professional doctorates were seen as a way of producing 'researching professionals' at the leading edge of practice in their professions, which included business, librarianship, nursing, pharmacy and social work and many others. In consequence, professional doctorates began to enjoy a new popularity and have subsequently proliferated in the US, Australia and the UK (see Archbald, 2011; Kot & Hendel, 2011; Zusman, 2013) although they have enjoyed less support in Europe (see J. Taylor, 2008).

A further doctoral form is the practice-led doctorate. This programme, which usually involves the creation of an artefact or artefacts such as artistic, musical and literary works, is accompanied by a thesis. In this form of a doctorate as Paltridge et al. (2011) and Grennan (2015) have suggested, candidate may need additional support in compiling and writing their theses in addition to any work related to the artefact.

An additional variant has been the industrial doctorate. Universities are being strongly encouraged to develop collaborations with industry to solve 'real world' problems. One way of doing this is for doctorates to take the form of industrial projects with students located for research purposes with partner firms (Kolmos et al., 2008; Mendoza, 2007; Sense, 2016; Thule, 2009).

Utilisation

Traditionally, the primary purpose of research was seen to be the advancement of knowledge for its own sake, i.e. its use was primarily academic. But one of the major changes in recent years has been the re-purposing of research in terms of not just its academic value but its wider value as well, and this has affected the doctorate. So, whereas previously, supervisors and candidates often had carte blanche in determining the scope and direction of doctoral studies, in many countries funding has become increasingly linked to projects which are seen to also have a clear potential to generate wider economic, environmental, political and social benefits.

Capitalisation

Historically again, the primary purpose of the doctorate has been to reproduce the academic workforce, i.e. to train new generations of researchers for the universities. However, a combination of a static or declining supply of permanent academic posts and increasing comparative advantage in non-academic employment (see Baker, 2019; Byrne et al., 2013; Shakni et al., 2021) has curtailed this justification of devoting resources to doctoral education

Instead, the purpose of the latter has been re-expressed in terms of supplying human capital for the knowledge economies. As Pederson (2014, pp. 633–4) has put it:

> In developed countries, intensification of PhD production during the past decade has occurred to foster long-term economic growth to overcome challenges of globalisation as the functioning of the world's economies have changed and international competition from new players is eroding the lead of established economies. Developed countries are thus investing in human resources as it is necessary to push the technological frontier to ensure growth. On the other hand, emerging economies are able to generate growth solely by employing existing technology while investments in human resources allow these economies to grow at a faster pace.

In response to such objectives, there is now a presumption that the doctoral experience will include a training to become a researcher both within and outside academia, and provision for the development of relevant skills has been made in most of the key doctoral-awarding nations (see Bienkowska & Klofsten, 2012; Bitusikova, 2010a, Neumann & Tan, 2011; Campbell et al., 2005; Cuthbert & Molla, 2014; Dahan, 2007; Group of Eight, 2013; Kearney, 2010; C. Manathunga et al., 2009).

From the humboldtian to the modern doctorate

These changes have evolved the Humboldtian model into a different form, which is summarised below (Figure 1):

Attribute	Humboldtian	Process	Modern
Formalisation			
Student-Supervisor relationships	Master-Apprentice	Commodification	Producer-Consumer
Duration of studies	As long as it takes	McDonaldisation	Four years
Institutional engagement	'Secret garden'	Regulation	Regulated
Supervision arrangements	Single Supervisor	Collectivisation	Supervisory team
Institutional context	Unstructured	Structuration	Structured
Diversification of candidate population			
Numbers	Few	Massification	Many
National composition	Home	Internationalisation	Multi-national
Academic and social composition	Elite	Diversification	Mixed
Responsibility for wellbeing	Candidate	Obligation	Institution
Diversification of modes of study			
Time spent on study	Full-time	Casualisation	Full and part-time
Place of study	Campus	Dislocation	Home/distance
Diversification of purposes of study			
Scope	Single discipline	Cross-fertilisation	Multi-disciplinary
Awards	PhD by research	Proliferation	Multiple types
Knowledge	Knowledge for its own sake	Utilisation	'Useful knowledge
Career	Academic reproduction	Capitalisation	Human capital production

Figure 1. Summary: From the Humboldtian to the modern doctorate.

Case studies

These changes have impacted doctoral education across the globe, but the impacts have varied depending upon national systems of doctoral education. In order to try and evaluate this, the editors undertook to investigate these differing impacts in a sample

of doctorate awarding countries. The sample was designed to represent the seven main world regions as below:

Asia	China, India, South Korea
North Africa and the Middle East	Iran, Turkey
North America	United States
Oceania	Australia
Russia and E Europe	Russia
South America	Chile
Sub-Saharan Africa	South Africa
Western Europe	France, Germany, Spain, United Kingdom

In all, in 2017, these 14 countries accounted for 62% of known world doctoral enrolments and 70% of doctoral graduates (see S. Taylor, 2021).

For each country, the editors invited a distinguished academic or team of academics to contribute a case study of what they saw as the most important changes and their impacts upon doctoral education.

Each of these articles provides a stand-alone account of the transformation of doctoral education in a country. Collectively, they provide a unique dataset for comparative analysis, which is undertaken by the editors in the final article in the special issue.

Disclosure statement

No potential conflict of interest was reported by the author.

Notes on contributor

Stan Taylor was formerly Director of the Centre for Academic and Researcher Development at Durham University in the UK where he is currently an Honorary Professor in the School of Education. He has many years of experience working with doctoral supervisors to enhance their practice. He is co-author of *A Handbook for Doctoral Supervisors* (Routledge 2018) and co-editor of *The Making of Doctoral Supervisors* (Routledge 2021) and *Doctoral Examination: Exploring Practice Across the Globe* (Routledge 2023). He is an Honorary Life Member of the UK Council for Graduate Education and author of its *Framework for Good Supervisory Practice*

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