

## **Doctoral research and policy change: factors influencing impact potential**

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## **Doctoral research and policy change: factors influencing impact potential**

### **Abstract**

The study reviewed the literature for a key theme for achieving change in management practice through doctoral research – the influence of that research upon policy. The study investigated the longer-term impact of doctoral research in influencing public policy, broadly defined to include the policies of regulatory and professional bodies. The analysis of the literature included a focus on four specific policy areas:

- Children, Young People & Families
- Climate Emergency & Just Transitions
- Wellbeing
- Inequalities

The extant literature covers a diverse range of topics, but little was found which addresses the factors which lead to doctoral research subsequently having an impact on policy. Therefore, the latter part of the paper develops a theoretical framework to address this gap, covering the background of the researcher, the topic chosen, the method used, the participants in the research and institutional support. This framework can be used to analyse specific examples of doctoral research which include policy change in their objectives or where policy change might be a longer- term aspiration. The factors which determine the extent to which doctoral studies are successful in achieving these objectives could influence the content of doctoral training programmes to enhance the impact of engaged management scholarship.

### **Introduction**

Doctorates are one of the instruments through which universities can influence policies of external bodies. This can happen in a number of ways. It might be that the doctorate is being

sponsored by an organisation which is interested in policy change, either to its own policies or those of other organisations. Alternatively, the policy impact might originate from the professional background and research interests of the individual undertaking the doctorate, whose motivation includes aspirations to change policy as a result of their studies. The attempted influence on policy might be part of the research design or it might be that the evidence from the completed research is used afterwards to influence policy. It may be that the relevance to policy is anticipated at the outset, or it might arise from unexpected findings.

Recent research undertaken on the contributions to management practice arising from five completed DBA theses (Breese et al., 2021) identified a number of contributions linked to organisational policies, broadly defined. Although the work background of DBA researchers meant that the changes were often found in private sector businesses, sometimes there were implications for public policy or the policies of professional organisations. Other professional doctorates, such as those in education, are more often linked directly to public policy than DBAs. There are also some doctoral degrees which are specifically concerned with public policy, such as doctorates in public administration, although these reduced in number between 2000 and 2015 (Slagle and Williams, 2019). On the other hand, Slagle and Williams (2019) found that, overall, public policy is a growing area for doctoral research, with an increasing proportion of doctoral graduates in the US working outside academia.

The review of the literature on the impact of professional doctorates in Breese et al. (2021) suggests that the role of completed doctoral research in influencing policy in the field in which the doctorate has been undertaken is a neglected topic. Initial impressions are that this gap in analysing the relationship between doctorates and policy change applies to PhDs as well. For example, there is no specific mention of doctoral research in the UK's Universities Policy Engagement Network (UPEN) report, 'Engaging with UK Government Areas of Research Interest' (UPEN, n. d.).

To address this gap, a literature review was undertaken, based on articles which combine a focus on doctoral research with impact/influence on policy. The literature sources identified were further divided into themes, covering

- Children, Young People & Families (Ch)
- Climate Emergency & Just Transitions (CI)
- Wellbeing (W)
- Inequalities (I)

Having reviewed existing evidence on the role of doctoral research in influencing policy change, the next step was to develop a theoretical framework, which might be used to analyse the factors which lead to doctoral research subsequently having an impact on policy. This could be applied to doctoral research which includes policy change in the objectives as well as instances where policy change might be a longer-term aspiration. The factors which determine the extent to which doctoral studies are successful in achieving such objectives could influence the content of doctoral training programmes to enhance the impact of engaged management scholarship.

The next section of the paper summarises the literature review method. This is followed by the findings of the literature review, including specific discussions for each of the four themes. After this the theoretical model for linking the characteristics of the doctoral research to future policy impact is introduced. The final section outlines some of the potential directions for further studies, through additional literature searches and primary research using the theoretical framework.

## **Method**

A literature of academic sources on policy impact arising from doctoral research was undertaken using Web of Science (Social Sciences Citation Index) and Google Scholar in

2022. The search process was repeated in May, 2023 to check on the latest publications added. Appendix 1 summarises the search terms used in Web of Science, the numbers of publications generated by each search and the sources which were relevant after reviewing the results. Similar searches were undertaken in Google Scholar, which returned a broader range of sources, including reports and book chapters. Only sources in the English language were included. The method for the literature review aimed to generate inter-disciplinary insights, through a tailored approach to the thematic aspects (Breslin et al., 2020).

Many sources were concerned with policies for doctorates, rather than the implications of the findings of doctoral research for organisational policies, so a large proportion of the sources identified from the databases were not relevant. Sources which did cover the subject matter of the study were divided into those concerned with the broader impact of doctoral research and those specifically about policy change arising from doctorates, or post-doctoral stages (see Table 1). For the latter, those publications which fell within the remit of the four themes which were the focus of the study were categorised in order to identify variations between the themes. A high proportion of the sources did fall into one of the themes, even though none of the themes were included in the search terms.

It is not claimed that the literature search has resulted in complete coverage of all sources which might have addressed the role of doctoral research in achieving policy change. In particular, the focus has been on the social sciences, rather than doctoral research in the natural sciences where the policy implications might be more direct, such as the efficacy of medications for addressing a specific health condition. Even within the social sciences, some research may not be captured using search terms directly linked to the topic of interest. For example, there were no sources which referred to the policy influence opportunities for alumni from doctorates in public administration, so further specific searches would need to be undertaken to check what has been written on this.

**Table 1 Literature review on doctoral research and policy change: sources identified**

| Literature Theme   | Main Sources  |                                    |  |           |              |
|--|---|------------------------------------|--|-----------|--------------|
| Doctoral research – broad impact                                   | Aguinis et al., (2021), Boud et al., (2021), Confait, (2018), Delaney (2001), Diamond et al., (2014), Doraisami and Millmow (2016), Guccione and Bryan, (2022), Kovacevic et al. (2022) |                                    |  |           |              |
| Policy change as part of impact during the doctorate               | Barkhuizen (2021), Creps (2019), Spiegel et al. (2011)  |                                    |  |           |              |
|  | Main sources  | Theme                              |  |           |              |
| Contributions to change from doctorates – empirical studies        |   | Children Young People and Families | Climate Emergency and Just Transitions | Wellbeing | Inequalities |
|  | Colville and Gorton (2013)  | x                                  |  |           |              |
|  | Kowalczyk-Waledziak et al. (2017)   | x                                  |  |           |              |
|  | Lingard (2010)  | x                                  |  |           |              |
|  | Carr (2017)   |                                    | x                                      |           |              |
|  | Newell et al. (2017)  |                                    | x                                      |           |              |
|  | Boardley et al. et al. (1999)   |                                    |  | x         |              |
|  | Reed et al. (2011)  |                                    |  | x         |              |
|  | Sayers et al. (2015)  |                                    |  | x         |              |
|  | Wilkes et al. (2015)  |                                    |  | x         |              |
|  | Belcher et al., (2022)  |                                    |  |           | x            |
| Training programmes for doctoral students for post-doctoral impact | Nagro et al. (2020)   | x                                  |  |           |              |
|  | Nurius and Kemp (2014)  | x                                  |  |           |              |
|  | Bornstein et al. (2018)   |                                    |  | x         |              |

|                                    |                       |  |  |   |  |
|------------------------------------|-----------------------|--|--|---|--|
| Post-doctoral research fellowships | Hyder et al. (2003)   |  |  | x |  |
|                                    | Lembani et al. (2016) |  |  | x |  |

### **Literature review findings**

The broad themes covered in the literature are summarised in the first column of Table 1, with the key sources under each theme being listed. This section of the report is structured using the categories in Table 1.

#### *Doctoral research – broad impact*

From the perspective of universities, scholarly impact covers a variety of different types of impact, some of them with an academic focus and others looking outside the HE sector.

Aguinis et al. (2021) provide a conceptual model of scholarly impact, which includes policy makers as the key stakeholder group for impacts on society. Developing a strong doctoral programme is seen as one of the key success factors for maximising scholarly impact.

Aguinis et al. (2021) identified that the roles of doctoral graduate alumni as leaders in both HE and other fields has longer-term benefits for the institutions which supported their doctoral studies.

The longer-term impact of doctoral research is of growing interest (Kovacevic et al., 2022), but the literature on impact focuses mainly on the broader benefits for the doctoral researcher themselves and the organisations they go on to work for (Delaney, 2001; Diamond et al., 2014; Confait, 2018; Boud et al., 2021; Guccione and Bryan, 2022). Diamond et al. (2014) undertook a large scale study of the career pathways of doctoral students in the UK seven to nine years after their graduation in the mid-2000s. Amongst the innovative activities which doctoral graduates were likely to contribute to, whether working in HE or another sector, were ‘Developing a new or significantly improved process, way of working, policy or

strategy' (Diamond et al., 2014: 83). Boud et al. (2021) identified 'Influence on policy making, strategizing and decision-making and impact on performance indicators' arising from around half of eight professional doctorates they investigated for impact of different types. This included attempting to change or shape the profession of the researcher in some way.

Delaney (2001) identified having a doctorate as one of the factors enabling researchers to influence policies in their own organisation, in a study of 304 researchers in the North East of England. However, the relevance of the doctorate to policy issues may vary. Doraisami and Millmow (2016) were concerned about the lack of impact on Australian public policies of university economics departments which were highly ranked in academic terms. They suggested that this may be because a high proportion of researchers in these departments had obtained their doctorates from overseas universities, rather than Australian ones.

There have been attempts to break down the longer-term impact of doctorates into different categories. One such typology, the Buxton and Hannay Payback Framework was developed by the Health Economics Research Group from Brunel University (Reed, 2011). This typology was used by Reed (2011) to assess the impact of 16 primary health care research projects in Australia. Impact was categorised into five domains: research transfer; research targeting, capacity building and absorption; informing policy and product development; health and health sector benefits; and broader economic benefits. Ten of the projects included doctorate awards in their research.



### *Policy change as part of impact during the doctorate*

Some of the sources identified were concerned with the relationship between impact activity and the other aspects of undertaking a doctorate. Barkhuizen (2020) explores experiences during doctoral study for a teacher with prior action research experience, as part of the development process of moving into a full-time academic position. Tensions arose between meeting institutional standards and achieving impact for the local teacher community she was part of, which led to identity dilemmas for her. In a similar vein, Creps (2019) describes how doctoral research on educational policy led to unexpected questioning of the beneficence of educational research.

Spiegel et al. (2011) refers to doctoral programmes being developed through collaboration by different universities as part of action research for environmental health improvements in Ecuador. First, Masters' courses were established for participatory action research, then doctoral programmes followed. This kind of initiative where action research is part of the design of the doctorate lies outside the remit of this report. Other search exercises specifically on action research would identify many other examples. In this report, the focus is the longer-term potential of doctoral research to influence policy, as an extension of the work on the thesis.

### *Policy change as part of the longer-term impact of doctoral research*

There are a number of studies which have undertaken primary research in different fields on the longer-term impact of doctorates, which often include policy change. Many of these studies are concerned with professional doctorates or professionals in employment undertaking part-time PhDs. These studies have been divided into different themes, where this is evident (Table 1). Where studies contribute to more than one theme, they have been categorised into the main one they fall under.

### *Children, young people and families*

There is a stream of research concerned with the policy impact of educational research. The broadest scope amongst the publications identified was by Lingard (2010), who undertook a review of the impact of doctoral research on policy making in education. He drew a distinction between research *of* policy, which is more academically orientated, and research *for* policy, which seeks a more direct policy and practice impact, often through a professional doctorate in education. Lingard (2010) emphasises the importance of critical research *of* education policy as a part of democratic society and suggests high quality research of this kind may eventually have an impact on changing educational policy as well. The scope of Lingard's (2010) analysis is inter-disciplinary and incorporates theory on the research-policy duality to unravel the complexity of the relationship. In particular, the 'political' aspects of attempting to influence education policy through research are seen as requiring specific skills on the part of the doctoral graduate. Lingard (2010) is of the view that pressures to make education research, including doctorates, closely aligned with policy can narrow research approaches and methodologies and undermine the critical role of the academic. Lingard's article was about all levels of education, and not just about children and young people in schools.

Through a survey of 16 Polish and Portuguese teachers, Kowalczyk-Waledziak et al. (2017) evaluated the influence of doctoral degree research on teachers' professional growth by examining their reasons for pursuing doctoral studies and perceptions of the potential effects of doctoral studies on the field. Most of the positive outcomes were personal ones; improvement in teaching practices and opportunities for career development. In addition, there was evidence that doctoral studies have a significant impact on the wider teaching profession and school management.

Colville and Gorton (2013) reviewed the impact of their own doctoral research projects on local authority policy and practice in educational psychology. Colville's research was concerned with processes for special educational provision, while Gorton studied school readiness in young children. Work on the two doctoral projects initiated a process of change in policy and practice in related areas of the authors' local authority and became embedded in relevant plans. Beyond this, the doctoral research helped raise the profile of the educational psychology service and increase the influence on wider local authority policy and practice.

The role of special education doctoral students in bridging the research-policy gap in the US is the subject of a research article by Nagro et al. (2020). They evaluated a doctoral researcher professional development training opportunity on the policy-making process, the 'Short Course'. Survey data gathered over 3 years from participants and their sponsors suggests that it helped to increase policy engagement and future advocacy. The method used by Nagro et al. (2020) included three cohorts of students and was designed to identify whether a significant change in policy awareness and advocacy had been achieved through the 'Short Course'. Therefore, they did not look in detail at individual doctoral researchers and how they might or might not achieve an impact on policy. Their research was also mainly focused on experience during the doctoral programmes, rather than longer-term interventions after graduating. Nurius and Kemp (2014) reviewed doctoral training for another professional group who work with children and young people - social work students. They emphasised the need for transdisciplinary approaches to build capacity for high impact research.

These contrasting contributions to research falling within the 'children, young people and families' theme indicate the potential for policy impact, the training requirements needed and also some of the dangers of aligning research and policy too closely.

*Just transitions*

The volume of research on climate change and associated issues has grown rapidly in recent years. For example, Li et al. (2022) identified a total of 36,584 Chinese master's and doctoral theses with evidence of the impact of climate change from the China National Knowledge Infrastructure database, between 2000 and 2022. However, the processes by which doctoral research might have an impact on policies for the transition to a low carbon economy seems to have seldom been the specific focus of academic studies. Just two examples were identified from the literature search.

Carr et al. (2017) explored the outcomes from a doctoral programme on water resource systems. They found that where doctorates took a cross-disciplinary approach this helped to achieve societal relevance, as well as help the researchers to carry over the cross-disciplinary perspective into their future careers.

In-depth analysis is provided by Newell (2017) of how doctoral research at the University of South Pacific (USP) may affect future low-carbon marine transport policy in Pacific Island nations. The research emphasises the special qualities of partnerships and collaboration with a network of stakeholders and researchers to influence policy and donor strategy for the usage of fossil fuels. The paper shows how the USP research helped identify future alternatives in addition to targeted analysis for policy interconnections and barriers to low-carbon transition. Newell (2017) also shows evidence of regional collaboration between the USP and research centres, a network of stakeholders, and knowledge partners to give high-quality economic and technical analysis and support at a scale that can significantly alter policies over time. Thus, the USP doctoral degree programme made a significant contribution to the development of the Pacific area through ground-breaking research, garnering attention from and collaborating with governing institutions.

### *Wellbeing*

The impact of professional doctorates in health fields has been the subject of a number of studies. Wilkes et al. (2015) conducted an online survey with 27 nursing doctoral graduates who had graduated between 2001 and 2012 from the United Kingdom and Australia. Results from the survey showed that outcomes from doctoral studies in nursing were evident in improvements in practice and clinical policy development. Sayers et al. (2015) also studied the impacts achieved by nursing doctoral graduates, in their case in the mental health nursing specialism. This study was undertaken in the US, where the Practice Doctorate Movement has been set up, in recognition of the leadership role of doctoral graduates in the transformation of health care services. Sayers et al. (2015) described the role and attributes of nurse educators with a focus on their role as leaders in mental health nursing. They also made recommendations for developing the leadership role of nurse educators and suggested that further research examines the impact of clinical leaders on client, staff, and organizational outcomes.

The role of doctorates as part of wider research impact case studies has also been the subject of research, for example, by Reed et al. (2011). In their study of 16 completed projects, three-quarters of Chief Investigators expected their research to inform 'policy development, organisational decision making and education'. Providing information for policy making had a high impact score (77%) but actual influence over policy making was considerably lower (31%).

Doctoral graduates are seen as an important contributor to Health Services and Policy Research (HSPR). Bornstein et al. (2018) report on a project in Canada which sought to identify the sectors and roles where doctoral graduates can contribute to improvement of health systems and the competencies which doctoral training needs to include to maximize subsequent impact. Hyder et al. (2018) undertook a study on the capacity development needs

of health professionals in Pakistan, who had been sponsored to undertake doctorates outside the country. The study found that in the roles to which these doctoral graduates returned there was a lack of academic incentives to sustain their research efforts, and more autonomy in work and provision of facilities to stimulate further contributions was needed. Lembani et al. (2016) reported on the effectiveness of one initiative to build capacity in HSPR in Africa, through post-doctoral research fellowships. They found that the research fellowships were a useful approach but needed to be embedded in a community of practice to be effective.

Boardley et al. (1999) assessed the nature and degree of public policy involvement of public health dietitians and nutritionists, through the Public Health Division of the Society for Nutrition Education. When asked to rate current level of involvement in public policy change, 44.3% reported no involvement, 47% were somewhat involved, and 7.3% reported that they were very involved. Having a doctoral degree was one of the factors leading to greater involvement, alongside being registered dietitians and having government jobs.

To summarise, in the Wellbeing theme there is research from a number of different countries on the impacts achieved by doctoral graduates, but this seems to be predominantly from health professions. The importance of evidence-based practice is reflected in the umbrella term 'HSPR'. The literature includes studies with recommendations for doctoral training and post-doctoral initiatives to maximise impact in health fields. Beyond the health professions, no studies were identified which had been concerned with the policy impact from a broader well-being perspective.

### *Inequalities*

Belcher et al. (2022) assessed the contributions of three completed doctorates towards social innovation to address inequalities of different types, using the Theory of Change (ToC) evaluation method. The three doctoral projects were from different African countries – truth-

telling in Uganda, philanthropy in Tanzania and sanitation in the Niger Delta in Nigeria. As part of their societal impact, two of the projects, the ones in Uganda and Nigeria, aimed to influence government policy. Government policy and practice was one of five ‘intended influence pathways’ identified using ToC. The evaluation found that the projects had varying levels of success in achieving their intended influence outcomes, which Belcher et al (2022) linked to the degree of transdisciplinarity in the research design. For example, the truth-telling project was judged to be more successful than the sanitation project in engaging government representatives, which helped it achieve more in changing government policies. Belcher et al. (2022) is relevant both in terms of identifying factors helping to achieve policy influence and the method they used to evaluate impact.

#### *Literature Review Summary*

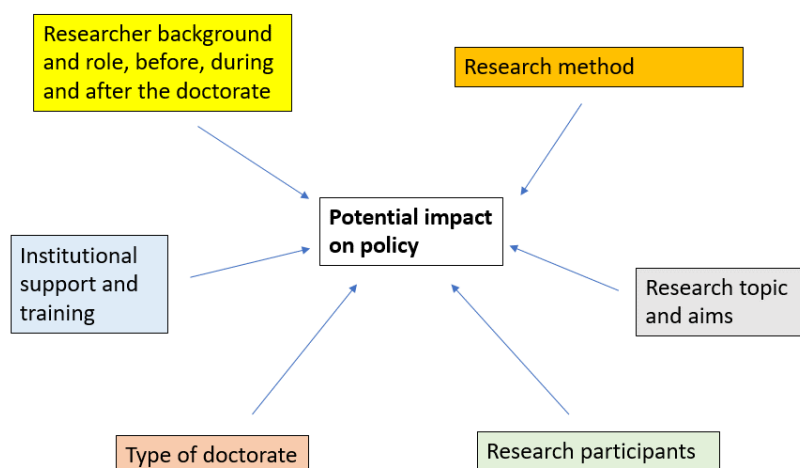
There are a significant number of publications concerned with the policy implications of doctoral research. Amongst the four themes, this is particularly the case for *Children, young people and families* and for *Wellbeing*, perhaps because of the strong associations of doctoral research with the professions in these areas. The literature covers a diverse range of topics, but there is little which addresses the factors which lead to doctoral research subsequently having an impact on policy. The one theme which stands out as enabling doctoral graduates to have a subsequent influence on public policy was that of working across disciplinary boundaries (Belcher et al, 2022; Carr et al., 2017; Nurius and Kemp, 2014), which is particularly associated with practice-based doctorates (Costley and Pizzato, 2018). While this is a useful finding for doctoral programme design, there are other factors more closely related to the characteristics of doctoral research, which appear not to have been explored in any depth in the literature. These include the background of the researcher, the topic chosen, the method used, the participants in the research and institutional support. This suggests that

there is a gap in the extant literature in exploring these characteristics systematically, in terms of how they affect the potential to have a future impact on policy.

### **Characteristics of doctoral research and potential policy impact**

The different aspects of doctoral research which might affect the potential for policy impact in the longer term are shown diagrammatically in Figure 1. These six factors will now be discussed in turn.

#### **Model of factors influencing the potential impact of a doctorate on policy**



**Figure 1 Model of factors influencing the potential impact of a doctorate on policy**

#### *Researcher background, before, during and after the research*

Background of the doctoral graduate as a factor in achieving policy change has not been addressed in any depth in the literature, except in relation to professional background in a broad fashion, such as public health dietitians and nutritionists (Boardley et al., 1999), special education (Nagro et al., 2020), social work (Nurius and Kemp, 2014) and health professionals (Hyder et al., 2018). In these instances, it is assumed that the professional concerned will



continue in the same field after their doctorate and make a contribution to policy in that profession. This is likely to be associated with career progression to increase their influence over policy. More in-depth case studies of individual doctoral researchers and their working careers before, during and after the doctorate would provide micro-level research evidence to complement the broad profession-related research so far.

The background of the researcher also links with other factors below, such as the need for institutional support to achieve impact from their doctorate. This was a particular interest of Nagro et al. (2020) and Nurius and Kemp (2014), in evaluating initiatives which had been built into doctoral training programmes.

#### *Doctoral qualification*

The nature of the doctoral qualification has a major bearing on policy impact, in terms of the degree to which contribution to management practice is central to the doctoral qualification. Despite this, many sources do not highlight type of doctorate as a factor (for example, Boardley et al., 1999; Reed et al., 2011) or are specifically concerned with professional doctorates (for example, Boud et al., 2021; Wilkes et al., 2015). Lingard (2010) is one of the few sources which contrasts PhDs and professional doctorates, making the point that research aims are often different (see sub-section below).

#### *Research topic and aims*

Lingard (2010) makes a distinction between research *of* policy, which is more academically orientated and is likely to be associated with a PhD, and research *for* policy, which seeks a more direct policy and practice impact, often from a professional doctorate.

Some of the sources in the literature refer to doctoral programmes with a thematic and/or geographical focus (for example, Carr et al., 2017; Newall, 2017). This often incorporates

cross-disciplinarity in assisting with policy impact, as has been advocated in the literature (Belcher et al, 2022; Carr et al., 2017; Nurius and Kemp, 2014).

More fine-grained analysis of research objectives and outcomes in terms of the stage at which the doctoral research ends and follow-up actions after the doctorate begin appears not to have been analysed systematically. For example, many doctorates include the development of a conceptual framework as part of their objectives. In a professional doctorate, in particular, it might be expected that the final stage in the primary research would include practical application of the conceptual framework. This might then lead on to attempts to influence policy depending on the success of the conceptual framework in use. This is one example of novel research angles which might lead to evidence on successful approaches to longer-term policy change.

#### *Research method*

The choice of quantitative/qualitative/mixed methods as a basis for future policy impact was a not major theme in the literature sources reviewed. This is another potential area for future research, which itself could be explored using quantitative, qualitative or mixed methods!

#### *Research participants*

Where participants include policymakers, the potential for subsequent policy change is increased. However, access to policymakers cannot always be gained. There may be trade-offs between academic requirements and future policy impact in the choice of the type of participants to target. The difficulties in recruiting 'elite' participants, such as senior government officials, is a factor against including them, especially if the issues raised may be sensitive ones (Belcher, 2022). Choice of participants may also be influenced by pressures to achieve timely completion of the doctoral research.

### *Institutional support and training*

Institutional support is a major theme in the literature, including evaluation of attempts to enhance policy impacts through the design of doctoral programmes (Nagro et al., 2020; Nurius and Kemp, 2014). However, as with researcher background, there is a need for more studies, including at the micro-scale, given the importance of basing institutional support and training programmes on a firm evidence base.

### **Conclusions, limitations and further research**

This study has identified a relative dearth of literature on the policy impact of doctorates, in addressing in depth the factors which are likely to assist doctoral research projects to lead to changes in public policy. It has identified five key factors: the background of the researcher, the topic chosen, the method used, the participants in the research and institutional support.

This identification of factors which might affect the ability of doctoral researchers to influence policy in the future needs to be the subject of further research, to see how the combination of different factors has led to specific outcomes for doctoral graduates as individuals.

The literature review identified that where there is a strong professional alignment with a research theme there may be more examples of policy impact, as reflected in the use of the acronym 'HSPR' in the health field (Lembani et al., 2016). The opportunity for doctoral research to influence the policies of health professionals may therefore be one of the fruitful areas for further studies.

There are many limitations in the study, as a small, exploratory research project. Further targeted literature searches would develop the coverage of existing research evidence, for example, on the policy impacts from doctorates in public administration. The literature review was restricted in the main to the academic sources, and further work is needed to

incorporate the materials available from bodies responsible for the management of doctoral research and its impact. For example, in the UK, this would include UK Research and Innovation and its seven Research Councils, the Universities Policy Engagement Network and the UK Council for Graduate Education.

The implications of this research for doctoral training at universities is not explored in depth. However, there is potential to use the results to enable current and future doctoral researchers to understand the factors which will help their research to have longer-term policy impacts. There is also the opportunity to facilitate this through institutional training programmes, with specific initiatives linked to longer term policy engagement, such as the example reviewed in Nagro et al. (2020). However, the extent to which policy impact is built into the aims of doctoral programmes study requires careful consideration, in balancing academic and practice-orientated objectives and taking account of the shorter- and longer-term benefits which the researcher and other stakeholders hope to gain through the doctorate. This highlights the importance of developing the evidence base through further research.

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**Appendix 1 Literature searches undertaken in Web of Science, Social Sciences Citation Index (May, 2023)**

| <b>Search No.</b> | <b>Reason for the search</b>                                      | <b>Search terms</b>   | <b>No. of results</b> | <b>Selected articles</b>  |
|-------------------|---|---|-----------------------|---|
| 1.                | Articles combining a focus on doctoral research and policy change | <b>doctora*</b> (Title) and <b>research</b> (Title) and <b>policy</b> (Title)                                       | 8                     | Nagro et al., Lembani et al.,   |
| 2.                | Articles combining a focus on doctoral research and policy change | <b>doctora*</b> (Title) and <b>research</b> (Title) and <b>influence</b> (Title)                                    | 4                     | None selected   |
| 3                 | Articles combining a focus on doctoral research and policy change | <b>doctora*</b> (Title) and <b>research</b> (Title) and <b>impact</b> (Title)                                       | 19                    | Nurius and Kemp,  |
| 4                 | Articles combining a focus on doctoral research and policy impact | <b>doctora*</b> (Abstract) and <b>research</b> (Abstract) and <b>impact</b> (Abstract) and <b>policy</b> (Abstract) | 165                   | Reed et al., Doraisami and Millmow, Delaney, Creps, Carr et al., Aguinis et al., Boardly et al., Wilkes et al., Barkhuizen, Kowalczyk-Waledziak et al., Belcher et al., Costley and Pizzolato, Bornstein et al., Lembani et al., Hyder et al., Newell et al., Sayers et al., Spiegel et al. |