

## What Research Administrators Need to Know about Researcher Development: Towards a New Conceptual Model

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### Author's Note

The conceptual model presented in this submission was presented at an invited seminar at the University of Oxford in March 2010. The material in the submission is not derived from other materials, nor has it been supported by a grant, contract, or similar instrument.

### Abstract

Located within the recently emerged field of researcher development, this article represents an attempt to make a key theoretical contribution to its knowledge base through a conceptual analysis. It presents as propositional knowledge an original theoretical model of the componential structure of researcher development, as interpreted and defined stipulatively by the author. Three key components are identified: behavioural development, attitudinal development, and intellectual development. Each of these is further deconstructed to reveal its sub-components, of which eleven in total are identified, including: processual change; perceptual change; analytical change; and comprehensive change. Drawing upon examples of qualitative data found in the literature, as well as her own experience, the author demonstrates the model's potential as an analytical framework for enhancing our understanding of what researcher development is and how it occurs. This knowledge is invaluable to university research administrators. In particular, it is important that research administrators recognise the width of researcher development: much more than changing observable behaviour and increasing productivity and output, it also involves changing viewpoints, mindsets and perceptions, and increasing intellectual capacity.

*Keywords:* researcher development, research leadership, professional development, research culture, researchers, researcher training.

## Introduction

To promote it effectively and contribute meaningfully to its success in their institutions, research administrators need to understand what makes for effective researcher development. They are, however, severely disadvantaged in this respect, for the scholarship of researcher development is relatively underdeveloped and its knowledge base scant. This is unsurprising, since it is an emerging field of study: not quite embryonic, but certainly in its infancy, with an identity that is still evolving.

Yet there are signs that it is beginning to be recognized as a field of study – or certainly a sub-field – in its own right. Indeed, Tight (2008) identifies higher education research as “a developing field of study,” which “could be conceived of as a partially explored territory through which a variety of tribes traverse. (p. 596)” We may think of the narrower, more recently emerged and hence more “developing,” researcher development as one such tribe – or, to be more precise, the *focus* of the “tribe” of researchers for whom it represents a shared interest: its territory.

Specific critical incidents, as well as economic and social trends and shifting policy contexts, have kick-started and accelerated its emergence. In the UK, the publication in 2002 of the Roberts Report served as one such catalyst (Roberts, 2002). A literature-based study of the work-related training, development and employability of post-graduate researchers in science, engineering and technology, the report highlighted researchers’ inadequate preparation for the world of work, prompting the UK government to invest £20 million, over five years, in higher education-based researcher training and development.

Criticism directed at the quality of research in specific subjects—such as that directed at educational research in the UK and the USA (e.g., Hargreaves, 1996; Hillage, Pearson, Anderson, & Tamkin 1998; Kirst, 2000; Lagemann & Schulman, 1999; Levin & O’Donnell, 1999; Tooley & Darby, 1998)— was another contributor towards identifying a need for examining more closely researcher development, whilst the rise in the uptake of doctoral programmes worldwide has sharpened higher education institutions’ (HEIs) foci on researcher development, partly as a customer service measure and partly as a mechanism for coping with a diverse student clientele. Added to this, in countries where they are applicable (most notably the UK and Australia), nationally imposed institutional research performance accountability and funding allocation measures have pushed researcher development high up on the list of strategic institutional priorities.

Such is the context within which this new field of study has been, and continues to be, defined. Researcher development now consists of enough commonly linked issues, questions and foci of investigation -- its “bits and pieces”-- to warrant its own drawer in the big chest of sub-fields of study that make up educational research, and the launch of its own journal, the *International Journal of Researcher Development*, in 2008, represents a significant marker of this stage in its development.

Having begun to shape an identity of its own, the scholarship of researcher development is ready to move up a notch. Indeed, it must do so if the field is to gather momentum and be taken seriously as a focus of academic study in its own right, for as Chapman (2005) observes, “the academy judges by the theory and scholarship emerging from a particular field and discipline. Can’t be helped, that’s the nature of academic discourse and its self-construction. We stand or fall by the weight others attribute to our scholarship. (p. 310)” Branching out from examination of issues -- such as: who needs to be developed, how, by whom, and for what purpose, and what are the implications of the answers to each of these questions? -- it is time to widen the field’s investigatory foci to include a more introspectively directed dimension. (or rather, a closer scrutiny of the field, since the purpose is to delve deeper into its essence.) It is time to turn the spotlight on researcher development itself and examine more closely its constituent “bits and pieces,” for doing so will shed more light on the issues identified above and on the process whereby researcher development occurs. This, in turn, will serve to augment the knowledge base upon which research administrators, as well as research leaders at all institutional levels, may draw. Indeed, research administrators’ professionalism and, by extension, their professional credibility, will be determined, at least in part, by their familiarity with and contribution to the developing knowledge base, as well as their application of it to their practice.

As noted below, enhancement of researcher development scholarship involves breaking new ground. It requires not only greater analytical depth than has typically been applied to the field, but also a focus on hitherto neglected and unexamined issues. Such unexplored territory lies within the conceptual landscape, for researcher development as a concept is un(der)-examined. Yet conceptualisation is fundamental; it holds the key to enhancement of knowledge about process(es), policy and practice. Only when we understand how researcher development occurs can we develop effective policy for the improvement of practice. Yet this understanding is dependent upon clarifying, first, what researcher development means, and then, within the conceptual framework that this creates, what researcher development is. This article intends to make inroads into this landscape.

The article constitutes a conceptual and quidditative examination that addresses the question: what is researcher development? (Quiddity, a little-used term, refers to the ‘whatness’ of something: what it is.) It is not intended as a processual model and therefore does not explicitly address how researcher development occurs. Gaps and omissions are highlighted in relation to how researcher development is defined, and a range of interpretations is outlined, before a stipulative definition is presented. An original conceptualisation is explained and a theoretical model of the componential structure of researcher development formulated from conceptual analysis is illustrated. The potential of this propositional knowledge as an analytical framework is demonstrated through qualitative data found in the literature.

The following outline begins to describe where the field currently stands, in relation to conceptualising and defining researcher development.

### **What is Researcher Development? Conceptual Clarity and Definitional Precision**

What is researcher development? Does it refer to developing researchers (as or into professionals), or to developing people (professionals, practitioners or students) as or into researchers? There is clearly a difference between each in relation to the development involved, between the point of departure and the intended destination, as well as in the experientially acquired and epistemologically influenced mindsets of each of the potential constituencies of “travellers” (Bulterman-Bos, 2008; Labaree, 2003). Each interpretation has different developmental processual implications, and herein lies a key rationale for conceptual clarity, for, as implied above, the value to the knowledge base afforded by much of what is said or written about researcher development—whether it takes the form of reasoned observation or theoretical perspective—will be dependent upon its credibility and potential for furthering understanding of how people develop. This understanding is—or ought to be—the bedrock of institutional research strategy, policy and practice.

Yet interpretational and definitional precision are important also because they are essential to construct validity (Evans, 2002). Since construct validity involves consensual acceptance and understanding of specific terms, it is (or ought to be) a key rigour-related concern in research design and execution. It is threatened not only when different understandings of key concepts, or of the terms used to refer to them, occur between researchers and research subjects (LeCompte & Goetz, 1982), but also when such conceptual and terminological incongruence occurs between researchers and those to whom they disseminate their findings and conclusions: fellow researchers, practitioners and policy makers (Evans, 1998). The issue is not that everyone should agree on how something is understood or conceived, but that each person’s understanding is conveyed accurately to other interested parties. Construct validity is about accuracy of communication, not unanimity of interpretation. Though its attainment can never be guaranteed, its pursuit involves conceptual clarity.

Since conceptual clarity and definitional precision greatly reduce the likelihood of misunderstanding and of different parties communicating with each other at cross purposes, they are essential elements of the development of any field of study. They are key to delineating the parameters that mark out the conceptual, ontological and quidditative territory of a field of study and of where that territory overlaps with that of other fields. They underpin the categorisation and classification that inform views about whether something should be located in this or that field, or whether it sits on the boundaries, or contributes towards blurring them. Yet, in relation to the field of researcher development, conceptual clarity and definitional precision are underdeveloped.

#### ***Definitions and Interpretations of Researcher Development: Gaps and Omissions***

The concept of researcher development, particularly using this precise terminology, is relatively unexplored. This is hardly surprising since, as with all

emergent fields, its literature base is limited. Yet the evident lack of conceptual clarity and definitional precision has implications for practice and scholarship. What university research administrators may mean by researcher development, for example, may be quite different from how it is interpreted by academics holding research leadership roles, or by academic learned societies and professional associations, or by individual academics and researchers. Moreover, inconsistency and disagreement may be found not only between, but within, each of these constituencies. For research administrators, researcher development may be equated to capacity building for the purpose of increased output in the form of publications and successful funding bids, with the ultimate aim of increasing income. Such an agenda may not necessarily incorporate consideration of the development of researchers' creative skills and methodological expertise beyond what is required to secure grants and have papers accepted by leading, peer-reviewed journals (Evans, 2009; Gordon, 2005). Research councils, on the other hand, may adopt a much more cognitive- and skills-based interpretation of researcher development for the broader purpose of raising academic standards and the advancement of science (used in a generic sense).

Without clearly expressed interpretations or definitions, conjecture and inference remain. Katerndahl's study (2000), for example, found that attendees at an annual medical research methods conference went on to significantly greater research productivity, defined as publications and presentations, in comparison with non-attendees. Yet would he categorise this as researcher development? (He does not explicitly label it as such.) Is it researcher development? If so, then it may be reasonable to argue that conference attendance appears to contribute to researcher development, but any agency that then promotes conference attendance as a likely vehicle for developing researchers would need to have satisfied itself that it shares an interpretation of researcher development as, *inter alia*, increased output. It thus becomes clear that a knowledge of how development is construed is critical both to the development process and knowing how to effect it.

The literature, both academic and grey, encompasses a wide range of (usually implicit) interpretations of and foci on researcher development, from a broad brush consideration of career paths, advancement and development of practising and aspiring researchers (Krais, 2002; Laudel & Gläser, 2008; Tien, 2008; Tynan & Garbett, 2007), through issues related to the development of employability-related and societal growth-relevant skills (Craswell, 2007; Manathunga, Lant, & Meekick, 2007; Roberts, 2002; Slaughter, Campbell, Hollernan, & Morgan, 2002), acculturation and socialisation within research cultures and environments (Bieber & Worley, 2006; Deem & Brehony, 2000; Gardiner, Tiggemann, Kearns, & Marshall, 2007; Louis, Holdsworth, & Campbell, 2007; Mendoza, 2007; Raddon, 2006; Tierney & Rhoads, 1993), capacity building issues, policy and practice (Coleridge, Smith-Barbaro, & Kinsley, 2004; Hemmings, Rushbrook, & Smith, 2007; McIntyre & McIntyre, 1999; Pollard, 2006; Rees, Baron, Boyask, & Taylor, 2007), to the development of individuals into "better" researchers (Åkerlind, 2007, 2008; Evans, 2002, 2009; Gardiner et al., 2007; Wood, 2006) by the acquisition and development of specific skills and knowledge (Adams, 2004; Coleridge et al., 2004) and the adoption of different outlooks, concerns, values and foci (Labaree, 2004).

Some analysts adopt a more holistic developmentalist perspective that avoids distinguishing academics' research development from the development of other aspects of their work, and in doing so they support the currently fashionable notion of a research-teaching synergy within academic practice (Brew, 2006; Macfarlane & Hughes, 2009; Reid & Petocz, 2003). Indeed, in relation to academics it is considerably more common to find references to terms such as *faculty members' professional growth* (O'Meara, Terosky & Neumann, 2008), *educational development* and *staff development* (Macfarlane & Hughes, 2009), than to more narrow references to research-focused development. Researcher development may be considered to encompass all of these, but such consideration would involve fixing onto a collection of issues or subjects a label that may not necessarily be consensually accepted as an accurate descriptor of them. It is therefore important that any agency or constituency whose declared or accepted remit is centred upon, or incorporates, researcher development clarifies what it means by the term.

### ***Beginning to Fill the Gaps: A Conceptual Analysis of Researcher Development***

Researcher development is defined both broadly and succinctly as the process whereby people's capacity and willingness to carry out the research components of their work or studies may be considered to be enhanced, with a degree of permanence that exceeds transitoriness. The words "may be considered to be" are intended to convey the interpretation of any form of development as subjectively determined, in accordance with different needs, interests and agendas.

Use of the word "people" rather than "researchers" is intended to convey inclusiveness: researcher development is not only about making researchers better at researching, it is also about transforming into researchers people representing other constituencies or who do not currently identify themselves principally as researchers. "Capacity" is chosen over alternatives such as skills, knowledge, attitudes, understanding, competence or procedures, not only because it encompasses all of these (and more, McIntyre & McIntyre, 1999), but also because it incorporates consideration of externally imposed or derived factors, such as resources or academic freedom or (professional) status, whose improvement or enhancement contributes to defining the contextual dimension of researcher development. Reference to people's "willingness" to undertake research is perhaps superfluous, given that "capacity" is intended to include this, but its inclusion is explicitly intended to factor in the importance of motivation and attitudinal preparedness.

But a conceptual analysis involves more than the presentation and explanation of a stipulative definition. It involves examining the very essence of the concept in question: what is conceived as its substance, or its quiddity.

### ***Essence, Substance and Quiddity***

In communicating the conceptualization of researcher development, it is impossible to choose between the terms "essence," "substance" and "quiddity;" all are

equally applicable. Indeed, without applying strict philosophical interpretation of their nomenclature (which is not necessary for the purpose of advancing or clarifying the argument in this paper), it is difficult to distinguish between them. They all connote (getting to) the core of what is the nature and form of this “thing”—this concept—that is researcher development. They are therefore used interchangeably here.

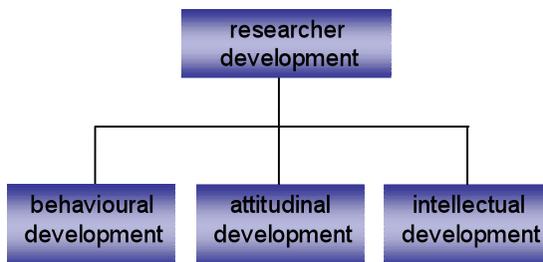
Researcher development is essentially development for researchers or aspiring or potential researchers. It is a bi-partite concept: relating, rather obviously, to “researcher” and “development.” With the broad interpretation of “researcher” clarified, an examination of “development” follows.

In some respects the development in question may be considered *professional* development. On the other hand, this adjective’s etymological link with professions and professionals may preclude its applicability to researcher development on the grounds that research(ing) is not necessarily and universally accepted as a profession (see, for example, Evans, 2008). Linked to this, researcher development may occur in or apply to people who are not necessarily or conventionally recognised as professionals, not least since they may not be in paid employment. Moreover, researcher development is now widely considered to incorporate both professional and personal development. The complex ecologies of people’s lives are becoming increasingly recognised as the fusion and, in some cases, inseparability, of work and personal life. Development that occurs in a professional or work context, and that enhances one’s capacity to undertake one’s work, must inevitably impinge upon or influence the attitudes, viewpoints, knowledge, understanding, and skills that may be applied to one’s life as a whole, and vice versa: a point that is implicitly incorporated into Eraut’s (2004) argument about workplace learning.

### ***Deconstructing Researcher Development: A Conceptual Model.***

The conceptualisation that is the focus of this article is illustrated in Figure 1 as a conceptual model interpreting the componential structure of researcher development.

Essentially, it represents a basic deconstruction of researcher development into three main components: behavioural development, attitudinal development and intellectual development. These are defined, respectively, as: the process whereby

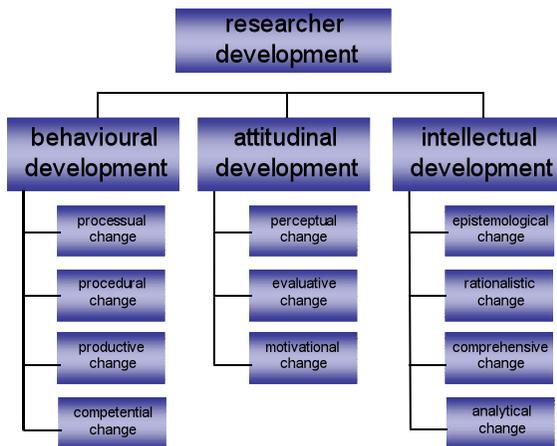


*Figure 1:* The componential structure of researcher development: 1st tier components.

people’s behaviour or performance are modified; the process whereby people’s attitudes are modified; and the process whereby people’s knowledge, understanding or reflective or comprehensive capacity or competence are modified. However, each is intended to be located under (or subsumed within) the overarching umbrella definition of researcher development, presented above, and therefore must comply with the conditions implied by it. This means that the term ‘modified’ should be understood as ameliorative modification—change for the better, which constitutes what may be considered the enhancement of researcher capacity. It also means that the specific modificatory activity referred to in the three subsidiary definitions must be specifically research-capacity-enhancement-focused.

The behaviour- or performance-modification that constitutes the behavioural component of researcher development refers to the full range of physical activity that forms part of what may be categorised as research activity or performance. This component is about “doing” research, in all its forms and at all of its stages. It includes both independent and interpersonal activity. Attitudinal development and intellectual development, in contrast, involve mental activity.

To better explain each of these three components, 11 further sub-components are identified. These may be thought of as foci of change, or change dimensions. How these foci of change—these sub-components, or second tier dimensions—relate to the three ‘first level’ or ‘first tier’ components is illustrated in Figure 2. Labels for the second tier components are intended to be generic rather than narrowly stipulative.



*Figure 2:* The componential structure of researcher development: 1st and 2nd tier components.

*Processual change* (see Figure 2) is about change in relation to the processes that constitute people's research practice—how they conduct the various elements of research-related activity.

*Procedural change* similarly relates to changes to people's capacity to manage procedures within research-related practice. Often such procedures will be imposed at the institutional level or within the wider discipline—such as research bids' applications procedures. Sometimes they may be self-imposed strategic procedures, or what is colloquially referred to as “playing the game” (Lucas, 2006).

*Competential change* involves the increase or enhancement of research-related skills and competences, such as the development or refinement of writing, analytical or presentation skills.

*Productive change* refers to change to people's research output: to its quantity and/or nature. This would be represented by an increase in publications or a shift towards a more research-focused work output.

*Perceptual change* refers to change in relation to people's perceptions, viewpoints, beliefs and mindsets—views about whether, for example, research should have relevance and usefulness and impact upon policy and practice; whether it should be “applied” or “pure;” whether it may—and should—be done by inexperienced and untrained amateurs/practitioners. Perceptual change relates, too, to perceptions of research as a component of one's work, or a constituent of one's professional identity; as such it incorporates self-perception.

*Evaluative change* means changes to people's research-related values, including the minutiae of what they consider important: that is, what matters to them about research and researching.

*Motivational change* refers to increases in people's motivation and levels of morale and (job) satisfaction in relation to their research activity.

*Epistemological change* means change to the bases of what people know or understand about research and researching, and to their research-related knowledge structures, as well as the theoretical and conceptual frameworks within which they locate and undertake their research activity.

*Rationalistic change* is about change to the extent and the nature of the reasoning that people apply to their research practice.

*Analytical change* refers to change to the degree or nature of the analyticism applied to research-related activity.

Finally, *comprehensive change* involves the enhancement or increase of people's research-related knowledge and understanding.

### Testing the Model: Functionality, Purpose and Limitations

The efficacy of the model as an analytical tool is, however, dependent upon the soundness of its componential structure and the classification that underpins this; these make it what it is. The soundness of the componential structure relates to the accuracy and effectiveness with which the model represents the quiddity or essence of professional development. The issue is whether any components have been omitted or erroneously included.

On one level, empirical evidence of any component justifies its incorporation within the model. So, too—since this is a theoretical model—does credible hypothetical evidence, or hypothetical (or imagined) cases that have authenticity or feasibility insofar as they are convincing or plausible representations of the empirical world.

#### *The Components in Evidence*

A lack of primary research data to use as evidence into researcher development is unproblematic since the evidence is functional only, serving the purpose of testing the componential structure within this model. Two sources of evidence are presented: secondary data selected from literature in the field, and the author's own experience as a researcher who has developed.

First is Armstrong's 2001 account of one particular episode in his own development as a researching academic:

In my naivete I was not prepared for research that was going to be presented to policymakers and funders who were going to make important decisions based on their own interpretations of my story. However objective I believed myself to be in all aspects of the research process, I did not anticipate that the readers of the research were not going to be as objective in their interpretation of my interpretation.

Ultimately the potential impact of my research seemed to hinge around one phrase – “relatively expensive.” As part of the research I looked at how the voluntary organisation provided its training for volunteers, and taking a range of factors into account, I concluded that the training they provided, per capita, was “relatively expensive” compared with other voluntary organisations and other ways of providing the training. I was asked by the management committee of the voluntary organisation if I would mind changing the phrase to read “relatively cheap” on the grounds that the local policymakers and funding bodies would only skim the report and would focus on words like “expensive.”

No textbook learning had ever prepared me for that life changing moment....

Experiences I have recounted have been important sources of learning about the process of *becoming* a researcher. None of them can be dealt with by reading

methodology textbooks (though some do warn of the dangers, even if they cannot tell you what to do). And so the only way to learn to be a researcher is through doing, and importantly being aware of how the doing has been constructed through praxis (pp.2-4).

Armstrong's case provides evidence of intellectual and attitudinal development by demonstrating a complex interplay of three second tier change dimensions: comprehensive, perceptual, and epistemological

Comprehensive change is evident in his increased understanding. Through this experience he grasped something that he had previously been unaware of—that others may interpret his research differently from how he interpreted it. His understanding of the politics of the “research game” (to use Lucas's (2006) term) also increased—he better understood the importance to different stakeholders of their own (political) agendas and how research might be intended to be utilized within these agendas.

Leading on from this comprehensive change, perceptual change manifested itself through Armstrong's changed perceptions of the functions that research may be assigned to by others - others who play their parts as stakeholders in the research process - and himself (self-perception). He refers, for example, to his own naivete, which he implies having previously failed to recognize. Moreover, as such self-perception underwent the slight shift that transformed it into self-awareness, it, too, then illustrated comprehensive change.

The epistemological change that Armstrong experienced is evidenced by his denouncement of methodology textbooks as sufficient bases for researcher knowledge and his acceptance of praxis as a more reliable knowledge base. Since this specific example of epistemological change resulted from increased or enhanced understanding it also fuses with comprehensive change.

Manifesting a different combination of change foci, an employee of Sikes' (2006) case study New University in the UK outlined his development as a researcher:

I was appointed to teach on the PCET course [Post Compulsory Education and Training] but since I came here in around '93, '94, research has come to be much more of a priority. Whereas before it was optional, it's definitely expected that you do it now. Over the past few years I've got involved in research and writing, I've started a doctorate and I'm starting to think that I might be able to call myself a researcher! (Ron) (p. 555).

Here is evidence of processual change and perceptual change: as the range of processes that make up Ron's work have expanded to include research as a new dimension, so, too has his self-perception. His decision to undertake a doctorate implies that this new-found identity as a researcher reflects evaluative change. In his later comments this becomes explicitly evident (The RAE to which he refers is the UK's

Research Assessment Excellence. The competitive mechanism whereby UK universities are awarded government funding, it involves universities' submitting profiles detailing their research environments and achievements. These submissions include individual academic staff profiles in the form of lists of what are considered their best four publications.)

In response to the RAE climate I'm conscious that I'm now spending more time than ever before in research-related activities. I'm still engaged in the usual pedagogical research, the kind of stuff that supports my day-to-day teaching activities and without which my teaching would suffer. However, I'm now spending much more time doing research for outcomes other than this. I've been writing a chapter for a book that I'm also an editor of, and writing papers for four conferences I've been accepted at, and so on. This is not divorced from my teaching practice, as I use a great deal of material from my research reading in my teaching, but I am conscious of this difference of purpose! And I welcome it. (Ron) (p. 561).

This last sentence demonstrates Ron's changed values (evaluative change): his research activity does not merely reflect compliance with institutional requirements or foci, it has become a component of his work that matters to him, and that he embraces readily. Moreover, since he is now clearly doing more research, with the result that his output has increased, he also demonstrates productive change. More broadly, his is a clear case of attitudinal change's intersection with behavioural change.

The development experienced by Raddon's (2006) early career researchers during their doctoral studies in UK universities evidently involved much competential change:

... the line manager or whatever at the time, said it would be good to write that up for a journal—which I had never considered writing. Writing? Goodness! This was like the professor, my friend's father, who wrote; it was important, clever people who wrote! But anyway I did write something and that was fine, it was just a small thing but I think that was probably quite a pivotal task. (Hannah) (p. 9).

Hannah's skills set widened to include writing for publication, and if this then marked a turning point (as implied by her reference to a pivotal task) in her practice as a researcher that led to the inclusion of writing for publication within the processes that she undertakes in her work (affording the change a degree of permanence that exceeds transitoriness—a phrase included in the overarching definition of researcher development), then processual change could also have been demonstrated.

In speaking of his PhD supervisor, another of Raddon's (2006) interviewees reports developmental experiences that evidently incorporated not only competential change resulting in the enhancement of his writing skills, but also the subtle interaction

of perceptual and comprehensive change that both altered his perception, and increased his understanding, of what effective PhD supervision involves. More specifically, he developed a keener understanding of how writing skills may be improved and fine-tuned:

He was of the old school of academia and by that I mean he saw PhD supervision as a kind of apprenticeship ... developing me and also arguing with me and being a pedantic bastard about my punctuation and my spelling, my grammar, my syntax in my writing. That was actually very, very useful, I learned how to write via him doing these things and correcting me all the time, even though I thought I was right and he was wrong, I eventually had to concede that he did know something about how to write (Haydn) (p. 10).

Moreover, Haydn's recognition of having initially misjudged his supervisor's effectiveness clearly demonstrates a re-evaluation that represents perceptual change: change in relation to his self-perception. His perception of himself as having been more knowledgeable than his supervisor was adjusted as a result of (or alongside) the comprehensive change that he experienced. Epistemological and evaluative change also feature here, evidenced by the growth of Haydn's recognition and valuing of mentoring (of the kind provided by his supervisor) as a basis of knowledge about what good academic writing is, and how it may be developed.

The author's experience as a developing researcher can evidence the remaining four dimensions of researcher development – procedural, rationalistic, analytical and motivational change.

The productive dimension is perhaps the easiest to evidence. For example, the author's research activity and output have increased. Compared with her practice of ten years ago, she now writes more articles, presents more conference and seminar papers, reviews more research proposals and journal articles, and participates more fully in research-related activities through the many professional associations to which she now belongs. But it is the reason why output and activity were increased in this manner that illustrates rationalistic change. The author reasoned that this increased output would represent proactive practice that would ensure wider dissemination of her work and raise her profile as a researcher in the field more effectively than if—as had been her previous practice—she waited passively to be noticed. This reasoning does not constitute researcher development as defined herein because, being an isolated example, it clearly lacks “a degree of permanence that exceeds transitoriness.” However, in this case it served as the catalyst for the author's development of a generally more rational approach to her work, which involves asking herself, in relation to each key choice facing her, what the long-term goal is, and by what course of action it may best be achieved. Replacing the intuitive and sometimes unconsidered responses to choices or situations that she might previously have rushed into making, she considers her capacity to carry out the research components of her work to have been enhanced by this habitually more rational approach.

Linked to this is the motivational change that it also demonstrates. The rationale for increasing output served to motivate the author towards increased activity to achieve that output. Moreover, not only did the extent to which she was motivated change, but also the nature of her motivation: she became motivated by the desire to disseminate.

Analytical change is evident in an example of the author's very early development as a researcher. As a master's student she wanted to research teacher morale, job satisfaction and motivation, and had formulated her research questions and designed her data collection methods, which she then proudly presented to her supervisor. "You need to explain first of all what you mean by 'morale'," he told her. So she began searching through all the literature that she could lay her hands on in a quest for an acceptable definition of "morale." Finding such a definition much more elusive than anticipated, she began analysing the concept in depth. This was her introduction to the form of analyticism that underpins conceptual clarity and definitional precision, which, as enduring features of her practice, have now become her trademarks.

Procedural change is perhaps one of the least frequently occurring dimensions, probably because procedures do not feature heavily in research activity, which is more dominated by processes. This infrequent occurrence does not invalidate its status as a dimension of researcher development, though the author has nevertheless given much consideration to whether it merits identification as a dimension in its own right, or whether it is subsumed within another dimension, namely, either the processual or the competential dimension. Though the author remains undecided (and, indeed, currently considers procedural change the most controversial and least secure of the eleven dimensions of researcher development), procedural change has so far been retained as a component within the model. It is exemplified by the author's experience with standard procedures within research practice, such as submissions to ethical review boards; submitting an article to only one journal at a time; publishing books that are drawn from published articles, but not vice versa; and following the specific procedures required of any funding body as part of the bidding process.

### ***Reliability and Limitations***

The contentious status of procedural change raises wider issues relating to the structural reliability of this model, for it is important to consider not simply whether all identified components may be evidenced, but whether their hierarchical alignment is sound. Whilst it may always be possible to identify components that should, but do not, appear in the model, a key consideration should be the classificatory level represented by such apparently omitted components. The issue is one of overlap: whether each identified component on any one hierarchical level or stratum (i.e. first or second tier components) is self-sufficient insofar as it is not considered to be subsumed within, or to be a sub-component of, any other component sharing the same hierarchical level. This is extremely difficult to ascertain, not least because, in the social sciences, specific relationality that underpins categorical schemes and classificatory strata is difficult—if

not impossible—to determine and hence is often subjectively, rather than consensually, determined. It is really a matter of opinion whether, for example, identity influences perceptions, including self-perception and self-conception, or vice versa. One might argue that the model presented herein omits reference to change dimensions related to people's (*inter alia*): *beliefs, ideologies, self-conception, self-efficacy or self-esteem*, yet it actually presents each of these as subsidiary elements of—and therefore representing a different classificatory level from—perceptual change. Perceptual change therefore encompasses these contributory change dimensions, so they are implicitly covered. A flaw in the model would be represented by the identification of an omitted dimension that cannot be considered to be subsumed within—or to be a sub-element of—a dimension that is already identified.

It is this challenge of ensuring the equivalence of the classificatory levels represented by this model's components that, as implied, the author is by no means confident of having met. For example, consider that processual change is subsumed within procedural change on the basis that any procedural change must—since, by definition, it involves procedures—also involve processes. On the other hand, procedural change may be interpreted as nothing more than competential or processual change because the procedures that researchers become increasingly familiar with as they develop serve as the vehicles for increasing their competence and enhancing their skills and the processes that they apply to their research. Yet independence is an issue; if a case may be made that a change dimension may potentially or feasibly occur in its own right, independently of another dimension within which it may initially be considered to be subsumed, then, arguably, its status as a dimension may be merited. Processual change may indeed occur independently of procedural change since not all processes constitute or represent procedures. On this basis, therefore, it merits identification as a dimension in its own right – whether the same may be argued for procedural change remains undecided.

The point remains that if two or more dimensions may potentially be conflated the classificatory terminology is undermined, since the dimensions in question may need re-naming to label more effectively their reconsidered and redefined constitution. It may be argued, therefore, that this model may be flawed, and so it is presented as propositional knowledge (as, indeed, all theory must be considered) and placed in the public domain in the hope and expectation that others will join in developing it further.

### **Applying the Model: a Framework for Analysing Researcher Development**

This model is proposed as an analytical framework that has the potential to further understanding of effective researcher development by revealing the specific dimensions of change that collectively make up individuals' development experiences. Its capacity for doing so is demonstrated, in outline, by the empirical examples presented in the preceding section. What these reveal is something of the complexity of researcher development. Like any form of effective human development it does not simply involve

behaviour modification. As herein defined, researcher development also incorporates a range of dimensions or components that represent attitudinal and intellectual change. Any behavioural change that it entails is most effective when underpinned by attitudinal and intellectual change. Such combined—or holistic—development represents genuine commitment on the part of the developpee, rather than half-hearted compliance reflecting a lack of conviction that the development being imposed, recommended, or requested does, in fact, constitute change for the better.

Herein lies a valuable lesson for those holding research leadership and development roles: quite simply, the importance of reaching and winning over hearts and minds should not be underestimated. Research administrators need to understand that the effectiveness of initiatives aimed at increasing research productivity and output, at raising the quality of output by enhancing people's research skills, and at building and strengthening research cultures by making research a more prevalent feature of people's work (all of which are behavioural components of researcher development) will be dependent upon the extent to which, correspondingly, values are modified, perceptions are shifted (or widened), knowledge bases and structures are re-aligned, understanding is deepened, analyticism is increased, rationality is enhanced, and the motivation to participate and co-operate is heightened (all of which are attitudinal and intellectual components of researcher development).

Used as an analytical framework this conceptual model homes in on individuals' reported development experiences and identifies the specific components and dimensions that evidently constituted the experience. More broadly, such analyses identify patterns, trends and atypicality, and to identify causal links. It will identify which specific components and dimensions of researcher development occur most frequently, under what circumstances, and with what results. It will identify which specific components and dimensions evidently occur in the most effective researcher development experiences or opportunities, and which are evidently missing from the least effective ones. Used in this way, it is potentially a very useful tool for research leadership and administration at all levels.

### **The Elucidatory Capacity of Examination of Researcher Development's Ontology or Quiddity**

This paper seeks to enhance understanding of what makes for effective researcher development, for the purpose of augmenting the research administration knowledge base by presenting a new conceptualisation, which will hopefully extend the parameters of what is understood by researcher development. Yet this contribution is limited because it constitutes the presentation of only a partial view, afforded from one perspective. There is much more to understanding what makes for effective researcher development than a conceptualisation of it. Whilst developing this conceptualisation of researcher development and the model that represents it, the author has worked concurrently on analysing and developing a theoretical model representing the researcher development process in individuals, for it is

this process— micro-level researcher development—that constitutes one specific mediating influence. This is the influence of “individual cognitive and psychological states in the learning process” to which Smylie (1995, p. 107) refers. Individuals’ micro-level researcher development is defined as *their acquisition, through a consciously or unconsciously applied mental internalization process, of research-related knowledge and/or understanding and/or attitudes and/or skills and/or competences that, on the grounds of what is consciously or unconsciously considered to be its/their superiority, displace(s) and replace(s) previously-held research-related knowledge and/or understanding and/or attitudes and/or skills and/or competences.* It incorporates what Vygotsky (1978) calls internalization, and which Ball (2009, p. 50), applying it to the context of teachers’ professional development, describes as “how the information presented ... in a professional development program can move from an interpsychological plane, where there is a social exchange in which more informed others encourage learners to consider conceptual innovations, to an intrapsychological plane.” Micro-level development is intended to relate to individual, singular “episodes” of researcher development that constitute, as far as they are discernible, the unitary components of bigger picture, or wider scale, development. In some cases it focuses on what may be considered the minutiae of research activity. Micro-level development is about discovering a better way of framing research questions, or of writing abstracts for journal articles, rather than the more expansive commitment to becoming a more prolific writer or a more successful grants applicant.

But understanding the micro level researcher development process as it occurs in individuals is about identifying and understanding what it is that prompts and sets in motion thought processes inside people’s heads that lead to changes to their research-related attitudes, understanding or behaviour. Whatever it is, it cannot be uncovered using the conceptual model alone, for this is a quidditative, not a processual, model: it shows what researcher development is, rather than how it occurs. The micro-level researcher development process in individuals also needs analysing and throwing into the equation, for it is this that holds the key to understanding why, despite being exposed to the same contexts and stimuli (such as through attendance at the same professional development event or the same research supervision meeting), such changes may on occasion occur in some researchers’ heads but not in others’.

When it is examined in isolation, researcher development’s componential structure has limited elucidatory capacity. The bigger picture presents a more expansive image, and this bigger picture portrays human agency as a mediating factor: the actions of individuals—researchers or potential researchers—whose research capacity may be considered to be enhanced. This part of the picture zeroes in on the micro-level process whereby individuals develop as or into researchers. This represents another single link in the chain that, in its entirety, or wholeness, constitutes effective researcher development. The researcher development process in individuals must be examined, both in isolation and in relation to other links in the chain of understanding – of which the ontology, or quiddity, of researcher development is one. The elucidatory capacity of each is augmented by this process.

### Implications for Research Administrators

What impact may this enhanced understanding of researcher development have on research administrators? How may it help them discharge effectively their responsibilities for developing and implementing or encouraging research policy and practice, for the wider purpose of institutional improvement?

Hopefully it will raise, and heighten, awareness of the scale of researcher development: what it is and what it involves. The key point that research administrators need to grasp is that effective researcher development is not just about guiding people towards better research activity as manifested by increased or enhanced output. Output—even in its widest sense—is only one element of research. To be effective in their roles, research administrators need to understand and recognize the tripartite nature of researcher development: that people's attitudes towards research, and their intellectual capacity for research and their application of this to their work, are as much a part of the full package as their output. The eleven second-tier elements, or change foci or dimensions proposed here, play more of a supporting role in enhancing understanding of researcher development. Their main value to the research administration knowledge base lies in their capacity for elucidating what is meant by behavioural, attitudinal and intellectual development.

The width—certainly the tripartism—of researcher development is typically, and has consistently been, overlooked at the macro (national) and meso (institutional) levels. Attempts to increase research capacity or to improve research quality *en masse*, through strategic development and policy initiatives, have focused predominantly on behavioural development and, more specifically, on productive change. The intention has evidently been to increase various categories of output, such as publications and funding bids. But the importance of attitudinal and intellectual development has been underplayed, and since behavioural development alone represents only partial development, any strategic or policy initiatives with so narrow a focus are destined for only partial success. Research administrators must take heed of this. If they hope and intend to influence faculty—and fellow administrators—to change, they need to understand what makes these colleagues tick.

### Conclusion

This paper has presented a conceptualisation of researcher development as a theoretical model that uses deconstruction to identify two hierarchically positioned layers of specific constituent components or elements. These collectively represent researcher development's quiddity, or essence. The model, presented as propositional knowledge (as, indeed, all theory must be considered), is placed in the public domain in the hope and expectation that others will join in refining it and taking it further. Indeed, it may be extended beyond the representation of two tiers, for each of the second tier dimensions, or foci of change, potentially has its own components, such as self-esteem, self-confidence, interests, identity, and self-conception. Positioning these—and others—hierarchically is

unlikely to be a simple and straightforward task since their relationality, including their dependence upon and capacity for informing other (sub-)components, is by no means consensually accepted. At such a level of deconstruction the picture becomes blurred since it is really a matter of opinion whether, for example, identity influences perceptions, including self-perception and self-conception, or vice versa.

Further, this model's componential structure may be considered flawed by those who feel the author should have conflated a certain dimension, or subsumed a particular one within another. Such contributions to enhancing the model are welcome; it was revised several times since the first draft and, as indicated, the author herself is by no means convinced of the accuracy of its componential relationality. Yet to some extent the model's accuracy (if, indeed, accuracy is achievable—which itself is doubtful) is not the point. The point—the purpose of this article—is to contribute a theoretical perspective that will enhance the researcher development knowledge base by signalling a new direction in which to extend the field: a direction that will lead to a deeper understanding of what researcher development is and how to use this knowledge to examine the process by which it occurs.

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