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A picture of the research field of doctoral education from the students'

perspectives: studies using questionnaires and scales

Maria Cerrato-Lara, Montserrat Castelló Badia and Kirsti Lonka

Abstract

Studies on how students experience their PhD have been promoted as an indicator to improve doctoral programmes (assessment-oriented) and/or in order to understand how this collective develops in their careers (research-oriented studies). This last group has increased in the last years since researcher development has become a field of research in the context of higher education. In this respect, a database of studies measuring the PhD experience can be useful for researchers. Thus, we conducted a review of 53 empirical studies, focusing only on research that use questionnaires and scales in their data collection, published from 1991 to 2018. Results along these 27 years not only shows the core elements that have been considered traditionally when measuring the *PhD experience*, but also identifies some gaps and contributes in the clarification of this generic term. Directions for future research are offered.

Introduction

Researcher development has become a key policy issue of concern among institutional leaders in recent years, and is now a field of research in the context of higher education. In this context, the PhD experience, broadly defined conceptually as a *journey* (e.g. McAlpine, 2012; Taylor, 2011), has attracted a lot of research interest. The metaphor of a *quest* (McCulloch, 2013) has also been used. An alternative metaphor presented in this book is that of *traversing*, but how are the views of stakeholders represented?

Studies based on the doctoral students' views have been conducted with two main aims: first, to understand doctoral students' career development (research-oriented studies); second to improve doctoral programmes (quality-assessment-oriented). The former are generally conducted on a small scale, whereas the latter are more commonly large-scale in nature, but not always.

This review focuses on large-scale studies. Therefore, we focus on those studies that use questionnaires and scales to screen the pre-doctoral population. This revision can be interesting both for administrators and for researchers in the field of doctoral education regardless of whether they are thinking of using readily available instruments for measuring the PhD experience or designing new ones.

Our revision can be qualified as relevant considering that we did not find any other review so far measuring doctoral experience, except the one from Evans & Stevenson (2010) reviewing 16 studies between 1990 and 2009 measuring international doctoral students' learning experiences, but without focusing on large-scale studies.

Methodology

We used the *PsycInfo* and *ERIC* databases in our comprehensive review, with no limitation on the year of publication. The search terms included "PhD", "doctor*" and "graduate" on the one hand, and "questionnaire", "survey" and "scale" on the other, resulting in a total of nine combinations for each database. The initial electronic search resulted in 208 potential articles. Articles that evaluated the PhD from a perspective other than that of the student were excluded. Other common exclusion criteria were a focus on the respondents' concerns about their post-PhD career prospects or employment level and, to a lesser extent, their experiences in the transition to teaching. The full article was reviewed in ambiguous cases. Having selected a total of 47 original empirical studies, we

used the “snow-ball” method in the form of a manual search of the references listed in the selected articles to find others. Google Web Search was used as well as some large-scale studies conducted by governments and universities were published as reports and not as journal articles. As a result, 53 studies were included in this review.

For presentation purposes we classified the selected studies by geographical area. For each area we classified them according to whether the data was collected among PhD students who were conducting their studies (understanding the experience as a current process) or when they had completed them and were doctoral graduates (in retrospect). In some cases we also found mixed-sample studies (e.g. PhD students combined with their supervisors or with recent graduates). Two main groups were also distinguished: studies examining the general PhD experience and those dealing with specific aspects of it.

Results

The reviewed studies are summarized according to the classification described using the questions words *Where* (geographical area), *When* (stage of the process) and *What* (general PhD experience or specific aspects). See Table 1:

Table 1
Studies using questionnaires & scales measuring PhD students' experiences

Where	How	When	What	Studies
USA and Canada	Large -scale	During PhD	General Experience	Golde & Dore (2001) Nettles & Millett (2006) Maton et al. (2016) Shapiro, Hudson, & Downey (2017)
			Specific Aspects	Zhao, Golde, & McCormick (2007) Zimak, Edwards, Johnson & Suhr (2011) Crede & Borrego (2014) Van Dusen, Barthelemy & Henderson (2014) Fang, Bednash, & Arietti (2016) Miller, Duron, Bosk, Finno-Velasquez, & Abner (2016) Feldon et al. (2017)
		After PhD	General Experience	Bowen & Rudenstine (1992) Morrison, Rudd, Zumeta, & Nerad (2011) NORC (2012)

		Mixed	General Experience	Barnes & Randall (2011) Kim, Park, Park, Khan, & Ketefian, (2014) Hardré, & Hackett (2015) Petr et al. (2015)
			Specific Aspects	Anderson (1996) Hughes et al. (2015) Dreifuerst, McNelis, Weaver, Broome, Draucker, & Fedko (2016) Rodriguez-Menendez, Dempsey, Albizu, Power, & Campbell Wilkerson (2017)
Europe	Large-scale	During PhD	General Experience	Jacobsson & Gillström (2006) Chiang (2011)
			Specific Aspects	van Hout (1991) Torrance, Thomas, & Robinson (1992) Torrance, Thomas, & Robinson (1994) Pyhältö, Stubb, & Lonka (2009) Martinsuo & Turkulainen (2011) Stubb, Pyhältö, & Lonka (2011) Pyhältö, Toom, Stubb, & Lonka (2012) Stubb, Pyhältö, & Lonka (2012) Lonka et al. (2014) Butter (2014) Pyhältö, Vekkaila, & Keskinen (2015) Gibbs et al. (2016) Alvarez, Elempuru, Castelló, Villardón-Gallego, & Yániz (2017) Cerrato Lara, Castelló, García-Velázquez, Lonka (2017) Lonka, Ketonen, Vekkaila, Cerrato Lara, & Pyhältö (2018) Van der Linden et al. (2018)
		Mixed	General Experience	McKenna, Keeney, Kim, & Park (2014)
Oceania	Large-scale	During PhD	General Experience	Pearson, Cumming, Evans, Macauley & Ryland (2011)
			Specific aspects	Cantwell, Scevak, Bourke, & Holbrook (2012)
Asia	Large-scale	During PhD	General Experience	Halai (2011) Miki, Gregg, Arimoto, Nagata, & Murashima (2012)
			Specific Aspects	Ge, & Ho (2018) Jung (2018)
		Mixed	General Experience	Juntasopeepu, Kunaviktikul, Chintanawat, & Srisuphan (2012) Kim et al. (2012) Nagata et al. (2012)
			Specific aspects	Shafaei, Nejati, & Razak (2018) Shafaei., & Razak (2018)

Focusing on the content of the PhD experience (the *What*), the studies in the *general experience* category measure the students' representations and evaluations of their PhD programme and institution, their interaction with supervisors and other colleagues, the working climate in which they develop their research, their personal involvement and their future expectations. Certain socio-demographic (especially gender, ethnicity and

economic funding) and academic (especially elapsed time since the commencement of PhD studies) information is commonly collected. With regard to the latter, several studies investigate the factors that influence the completion of doctoral studies.

Studies on one or more *specific aspects* of the PhD experience were more numerous, and many of them were smaller in scale. Table 2 groups them by generic or specific content. A few fall into more than one content category: Shafaei, & Razak (2018), for example, analysed the doctoral experience in terms of culture adaptations and well-being, and the study thus appears twice in our table – under both aspects. There were also studies in which some content was measured, as a recurrent variable rather than the main topic, as in the case of some indicators of well-being and socialization: these studies are marked with asterisks for the benefit of researchers interested in exploring them further.

Table 2
The content of studies focusing on specific aspects of the PhD experience

Content (generic)	Content (specific)	Studies
Personal variables	Gender	Feldon et al. (2017)*/**
	Culture adaptation	Jacobsson & Gillström (2006)*; Chiang (2011); Shafaei et al. (2018)*/**; Shafaei., & Razak (2018)*/**
	Personality aspects	Cantwell, Scevak, Bourke, & Holbrook (2012)*
Learning context	PhD Programme	Petr et al. (2015)*; Ge, & Ho (2018); Rodriguez-Menendez et al. (2017)*/**
	Supervision	Zhao et al. (2007); Pyhältö et al. (2015)**; Gibbs et al. (2016); Rodriguez-Menendez et al. (2017)*/**
	Others	Anderson (1996); Jung (2018)
Paths in the PhD process	Starting a PhD	Zimak et al. (2011); Van Dusen et al. (2014)*; Dreifuerst et al. (2016)
	Carrying on with a PhD	Martinsuo & Turkulainen (2011); Crede & Borrego (2014)*; Van der Linden et al. (2018)*/**
	Needs & preferences	Rodriguez-Menendez et al. (2017)*/**; Van der Linden et al. (2018)*/**
	Challenges	van Hout (1991); Pyhältö et al. (2012)*
	Future steps	Van Dusen et al. (2014)*; Fang et al. (2016)*
	Identity	Pearson et al. (2011)
Discipline(s)		Hughes et al. (2015)
Research/work		Stubb et al. (2012)*; Butter (2014)*/**; Alvarez et al. (2017)*/**

Academic writing	Torrance et al. (1992); Torrance et al. (1994); Lonka et al. (2014)*; Cerrato Lara et al. (2017); Lonka et al. (2018)*/**
Well-being	Stubb et al. (2011)*; Lonka et al. (2014)*; Shafaei et al. (2018)*/**; Shafaei., & Razak (2018)
Socialization	Pyhältö et al. (2009); Miller et al. (2016)

*One or more indicators of well-being are measured

** One or more indicators of socialization are measured

As it can be observed in Table 2, challenges and academic writing represent the older traditions. Studies analysing paths in the PhD process placed most emphasis on indicators of socialization and well-being.

Table 3 synthesizes information from Table 1 and Table 2 providing numbers and percentages:

Table 3
Descriptive analysis of the studies

Analysed traits		<i>n</i>	%
Geographical area	USA & Canada	23	43%
	Europe	19	36%
	Oceania	2	4%
	Asia	9	17%
Stage of the PhD process	During PhD	35	66%
	After PhD	3	6%
	Mixed	15	28%
Content of the PhD experience	General experience	20	38%
	Specific aspects ¹	33	62%
	Personal variables	6	14%
	Gender	1	2%
	Culture adaption	4	10%
	Personality aspects	1	2%
	Learning context	9	21%
	PhD programme	3	7%
	Supervision	4	9%
	Others	2	7%
	Paths in the PhD process	13	30%
	Starting a PhD	3	6.5%
	Carrying on with a PhD	3	6.5%
	Needs & preferences	2	5%
Challenges	2	5%	
Future steps	2	5%	
Identity	1	2%	
Discipline(s)	1	2%	
Research/work	3	7%	
Academic writing	5	12%	
Well-being	4	9%	
Socialization	2	5%	
¹ Note. One or more indicators of well-being are measured	24	56%	
One or more indicators of socialization are measured	13	30%	

As can be observed, 43% of the studies were conducted in the USA and Canada, 66% focused on participants engaged in their PhD studies, and 62% examined specific aspects of the PhD experience. On the other hand, none was conducted in Africa, and 38% examined the PhD experience in general.

In relation to the theme of research, although academic writing was the most commonly studied topic in this new research field (5 studies), in terms of generic categories the paths in the PhD process with its longer tradition attracted the most research (30%), followed by the learning context (21%). On the other hand, some aspects of the PhD experience have been explored scarcely as it is for example the case of gender, personality aspects, identity and discipline (two per cent each).

It is also relevant to highlight that many of the studies (86%) measured some variables of well-being and/or socialization, which seem to be meaningful indicators to explain the PhD experience as they can yield valuable information on student satisfaction from a more emotional perspective.

Discussion

Experience is an umbrella term encompassing several related and frequently overlapping constructs, thus it might have been difficult to identify studies that measure the PhD experience. This is why we did not include *experience* among our search terms. Our aim was not only to provide a state-of-the-art database of studies using questionnaires and scales that would be useful for researchers, but also to include the core elements that have traditionally been taken into consideration in measurements of the *PhD experience*, thereby allowing us to describe the status of PhD students and further to clarify this generic term.

Not only does our study facilitate definition of the general PhD experience, it also highlights specific aspects of it that have been broken down into eight themes of research. Fifty one per cent of these concern, on the one hand, to the paths in the PhD process - relevant factors in the starting/(dis-)continuing phases, major challenges, needs & preferences, future steps, and general aspects of student identity- and, on the other, to the learning context -mainly concerning the student's PhD programme and relationships with supervisors-. These two most common themes of research cover the two objectives mentioned in the introduction (enhancing understanding of career development among PhD students and improving doctoral programmes) quite balanced in the literature. Future research should aim not only at maintaining the balance, but also at promoting integration.

The focus in this review is on studies measuring doctoral experience from questionnaires and scales, and studies relying on data collected by other means (in interviews and discussion groups the majority) were not included. It would be interesting to carry out a state-of-the-art review of these more qualitative studies, most of which include fewer participants and emphasise in particular the socialization process and identity construction of PhD students. These studies with their different contents and categorizations would complement our review.

It would also be relevant in future research to focus on intervention and follow-up. Notably, none of the large-scale studies in our review are longitudinal. Analysing the evolution of subjects or comparing different cohorts across generations (and across cultures, especially in Asia and Africa where studies in this field are very scarce) could yield valuable information to researchers interested in analysing paths in the PhD process and/or contributing to the more general assessment of policies, practices and programmes reflecting, from certain signs of success and failure, what does and does not work in doctoral education.

Another consideration for future research would be building up a more robust body of knowledge in some themes of research that are scarce at large-scale, like gender, personality aspects and identity, which would help to screen better the pre-doctoral population. These themes of research have, instead, been well-covered in small-scale studies (Cerrato Lara, 2014).

Finally, despite the diverse research documenting the experiences of doctoral students and although their perceptions have been used as a good assessment indicator for PhD programmesⁱ, in practice these efforts seem to have had little impact on educational reforms, despite claims of generalization or commonality. Indeed the impact of such studies has not been very different from that of research evaluating PhD education based on quantitative data on productivity, equity and efficiency obtained from university databases going back several decades (e.g. Leming, 1977). Future research should consider this crucial aspect. It should also aim to enhance understanding of doctoral graduates and non-completers in the willing to improve the structure and process of graduate education. In any case, it should be borne in mind that researcher development is an emerging fieldⁱⁱ. We are confident that future studies will soon cover the gaps we have highlighted.

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¹This task should not be solely in the hands of those who provide the service such as professors, department heads, and directors or coordinators of doctoral programs, but also of those who receive it.