PhDetectives

PhD Competencies and Employment Trends in Canada

PhDs: Employment overview

69% Of PhD holders rated the importance of their PhD as "very" or "extremely important" in preparing them for their career.

53% Worked in universities

30% Were employed in private, industrial, or commercial institutions

14% Worked in the public sector (social services, government, health, non-university education)

37% Did not have an R&D position

In Canada, a majority of doctoral graduates work in universities. Those working outside academia hold a variety of jobs in public and private organizations. At the same time, 92% of respondents employed in the private sector had a permanent position, while 66% of those employed in academia had a temporary position or a postdoctoral fellowship contract. 60% of respondents working in the private sector do not have an R&D function.

Close-up on competencies

The notion of competencies is central to this study. It helps to establish a common vocabulary between doctoral graduates and the companies that could hire them.

A competency is an identifiable skill or practice (Sadler, 2007), with "competencies" constituting the available resources that a professional should be able to mobilize in order to act competently in specific situations and contexts (Le Boterf, 1994; 2004). Skills are at the heart of the hiring process. It is vital to raise awareness of doctoral skills among doctoral graduates and employers so that they are more fully appreciated. This is, in our view, the most effective way to increase the employability of doctoral graduates in Canada.

Who is involved in PhDetectives?

The PhDetectives project was launched by Adoc Talent Management in partnership with Finance Montréal and Mitacs. The Canadian Association of Postdoctoral Fellows also contributed to the survey. The PhDetectives project was born out of a commitment to better understanding and promoting the skills developed by doctoral graduates in Canada, as well as the skills needs of employers in all sectors.

The PhD

One of the most recognized degrees internationally, the doctorate, is the highest level of university education. It is awarded following the conduct of an original research project of at least three years, the writing of a thesis and its defence before a jury of experts. The doctorate constitutes a professional experience.

FINANCE MONTRÉAL

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CAPS ACSP

PhDetectives

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PhDetectives at a glance

Current transformations in all sectors of the Canadian economy are driving organizations to look for new ways to innovate. Many of these transformations are technological or technical in nature, but all have human dimensions. The PhD is often associated with expertise, discovery and innovation. The contribution and skills of doctoral graduates often remain poorly understood, both by employers and by PhDs themselves, which does not facilitate their career progression within and outside the academic world.

The PhDetectives study was created to better understand the skills and professional paths of doctoral graduates in Canada. To this end, it was addressed to doctoral candidates and PhD holders. A component of the study also assesses the fit betwteen doctoral skills and the needs of Canadian employers.

Results show:

- Doctoral graduates share "core" competencies. The doctoral experience varies from one individual to another for several reasons, but there is a pool of skills shared by a majority of PhDs, regardless of their discipline or personal background. This pool provides an understanding of the doctorate beyond scientific or technical expertise.
- PhDs hold a variety of positions in both the public and private sectors. Their competencies are already highly mobilized in those functions.
- The core competencies of doctoral graduates meet several important employer needs.

Adoc Talent Management

A few figures

Time frame: 18 months

1200 + respondents

155 employer responses

121 competencies analysed

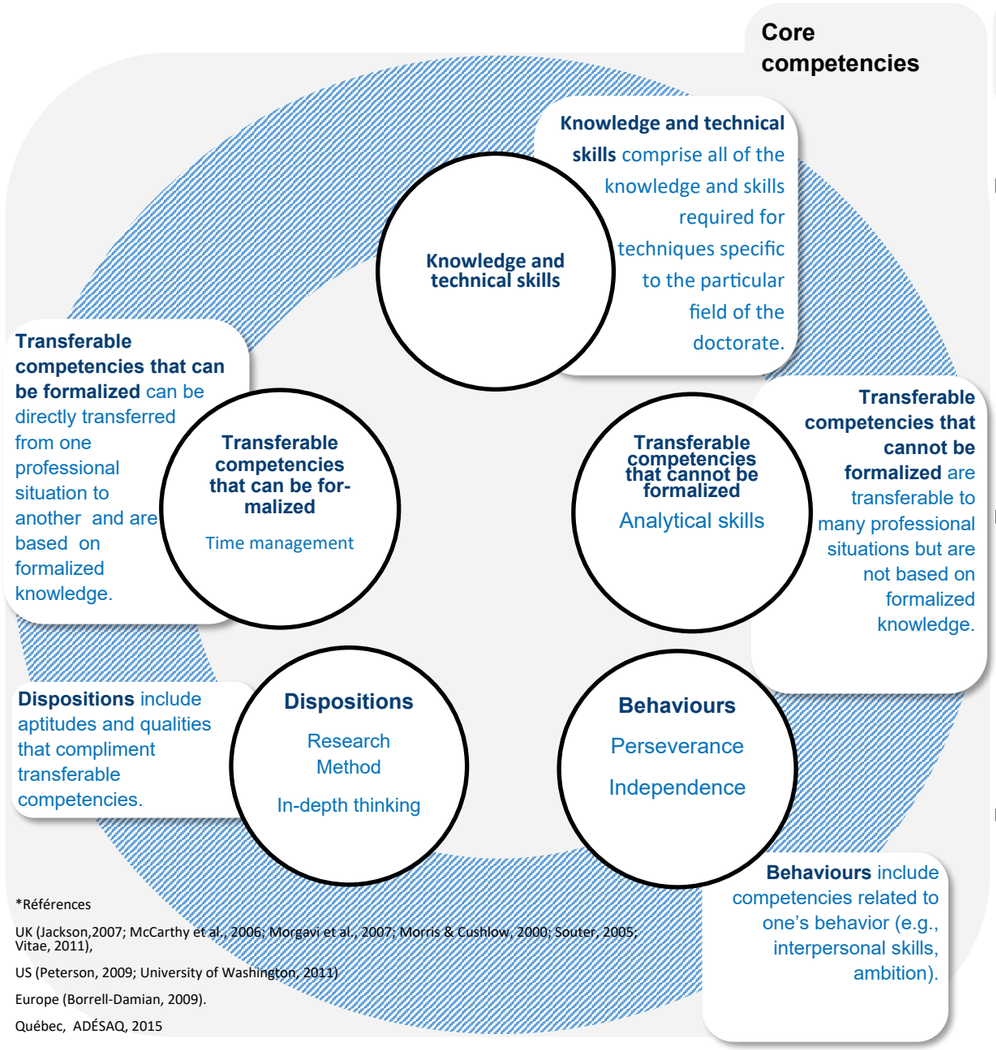
3 partners : Finance Montréal, Mitacs, CAPS/ACSP

Study results

In Canada and internationally, various competency frameworks* have been created to try to clarify and categorize doctoral competencies. However, these frameworks are of limited use to doctoral candidates and employers who wish to better understand the doctorate. They are not specific to Canada or do not focus solely on the doctorate; some only present desirable competencies, not competencies *actually* developed through doctoral training. PhDetectives presents the first Canadian framework synthesizing doctoral competencies. It is based on an analysis of the list of 121 competencies reported and divided into 6 main categories by Durette, Fournier and Lafon (2012-2014).

The pool of PhD competencies

One of the major contributions of the study is the identification of a pool of skills acquired by doctoral graduates in Canada. Doctoral competencies include "core" competencies, which are common to all PhDs. The eight that were most likely to be found in PhDs are presented in the lower-left circles. Specific competencies, the acquisition of which is influenced by such factors as the research discipline, number of years since defence and mode of finance, are presented with examples in lower -right column.



*Références

UK (Jackson,2007; McCarthy et al., 2006; Morgavi et al., 2007; Morris & Cushlow, 2000; Souter, 2005; Vitae, 2011),

US (Peterson, 2009; University of Washington, 2011)

Europe (Borrell-Damian, 2009).

Québec, ADÉSAQ, 2015

Specific competencies

Discipline

Interpretation of results; Knowledge of the industrial environment; Product knowledge; Project initiation

Seniority

Assuming authority; Delegation of responsibilities; Reporting to superiors; Networking; Knowledge of the academic environment

Mode of finance

Boldness; Autonomy; Interpretation of results; Administrative management; Planning; Knowledge of regulations; Emotional intelligence

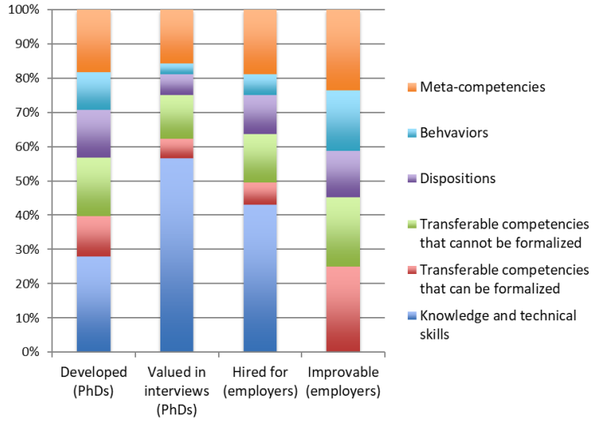
Doctoral skills are in demand

Knowledge and technical skills is by far the most frequently cited skill category by both employers and doctoral graduates. The latter reported having developed a much broader set of skills than they tend to value in job interviews. Similarly, the skills for which employers reported hiring doctoral graduates are more limited than the range of skills that PhDs reported having developed during their doctoral studies.

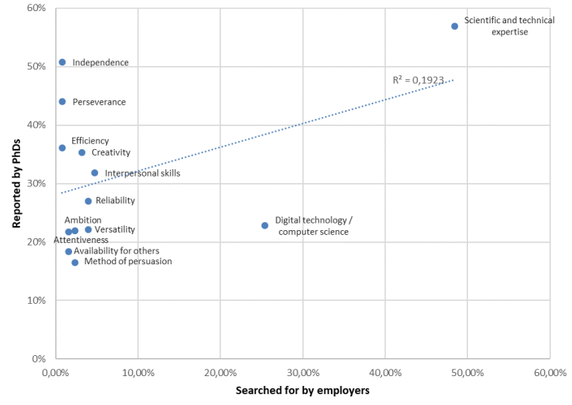
Transferable skills that can be formalized (e.g., written and oral communication, time and conflict management) represent the most obvious gap between the skills developed and valued by doctoral graduates, and those for which employers report hiring doctoral graduates and cite as areas for improvement (Figure 1).

Figure 2 shows the core competencies sought by employers (% of employers) compared to the percentage of doctoral students reporting these competencies. A correlation analysis between these two skill measures showed an average relationship between the basic skills sought by employers and those reported by doctoral graduates (R^2 = 0.19). Overall, we observe that the most frequently sought core competencies are scientific and technical expertise, and that the most significant gaps in this regard are on independence as well as perseverance.

1. Proportion of competency categories as a function of the questions posed to PhDs and employers



2. Alignment of core competencies reported by PhDs and those searched for by employers (%)



We observed discrepancies between competencies developed and valued by PhDs (e.g. during interviews), as well as those for which employers hire PhDs, and those that were reported to be improvable. The data presented importantly highlight that competency categories of behaviors, dispositions, and transferable competencies that can be formalized (e.g., written and oral communication, time and conflict management) are areas that represent misaligned perceptions for both PhDs and employers. **Despite misalignment between some categories of competencies more broadly, there was notable alignment of individual core competencies between those searched for by employers and those reported by PhDs.** Looking more closely at the alignment of these individual competencies, results showed scientific and technical expertise (17%) and digital technology/computer science (9%) to be the most frequent core competencies searched for by employers.