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ACADEMIC AND CAREER PATHS FOR PHD GRADUATES

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Abstract

The Europe 2020 Strategy highlights the importance of investing in research and innovation to ensure the economic and social development of the European society. In order to achieve this objective, a great responsibility is assigned to universities. They must ensure excellence in research and teaching, regional innovation, lifelong learning, community-level interaction, and the development of collaborative activities between specialists and public and private stakeholders. Research and innovation activities mainly take place within the doctoral schools. On the one hand, they ensure the knowledge transfer to the socio-economic environment, and on the other hand, by hiring PhD graduates and involving them in innovation activities, these schools prepare experts who will later contribute to the consolidation of research in different sectors. Our paper focuses on the academic and career paths for PhD graduates. We aim to highlight their path and motivation to graduate from a doctoral program, respectively what are the implications of the doctoral degree on their professional activity. Data was collected within the European funded project SmartDoct (code no. 123008) implemented by the University of Oradea. Results are obtained based on the responses from 83 PhD graduates who completed their doctoral training between 2014-2019 at University of Oradea in different scientific domains. Data shows that PhD graduates mostly develop their professional activity within academia.

Keywords: Academic path, higher education, PhD study programs, PhD professional path

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1. Introduction

One of the three priorities proposed by the Europe 2020 Strategy (European Commission, 2010) is to stimulate a new kind of growth, smart growth and economic development based on education, research, knowledge and innovation. One of the objectives for EU Member States was to improve their research and development and to secure 3% of EU GDP for the R&D sector by 2020 (European Commission, 2010; Veresné Somosi et al., 2016). The European Commission has presented seven initiatives to achieve the proposed objectives. The Union of Innovation is one of these initiatives that aims to stimulate the areas of research, development and innovation through more funding and improved framework conditions in order to ensure the transformation of innovation into new and better products and services. The key role of research, development and innovation is therefore emphasized, both the public and private sectors.

Following the objectives proposed by the Europe 2020 Strategy, member states have been given certain directions to pursue through national and regional policies. With regard to the Union of Innovation initiative, EU Member States were called upon to ensure the conditions for achieving excellence in research and innovation through reforms that stimulate cooperation between academia, research and entrepreneurs, technology transfer at EU level, cross-border cooperation, ensuring priority funding for knowledge and significant investment in research and development (European Commission, 2010).

In the context to empower knowledge transfer, doctoral schools in universities have an extremely important role in promoting results from research and innovation. These results are materialized in the professional activity of those who hold a PhD degree.

The paper presents some of the results obtained in the study conducted within the SmartDoct project, implemented by the University of Oradea, which aimed to highlight the need for transversal skill among PhD graduates. The research also focused on PhD graduates` path and motivation to graduate from a doctoral program, respectively what are the implications of the doctoral degree on their professional activity. The analysis of the academic and professional paths of doctoral graduates provides useful information on career choice, job dynamics and university and job satisfaction (Waaijer et al., 2017). Therefore, the data presented in this paper comes to highlight the position of doctors and the role they have through their professional activity, managing to ensure the visibility of research results in the socio-economic environment and the orientation towards new research and innovation activities.

2. Problem Statement

Research and innovation are the pillars on which today's society is based. In order to develop a knowledge-based society, public entities at regional, national and international level, representatives of the private sector and academia must work closely together. The cooperation between public and private sector entities leads to the creation of an innovative environment, which serves to disseminate knowledge and translate it into improved and new products and services (Etzkowitz & Leydesdorff 2000; Leydesdorff & Meyer, 2003, 2008). In this context, universities have extremely important role, ensuring the transfer of knowledge and contributing to the development of collaborative networks between specialists, private companies and government institutions.

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Etzkowitz and Leydesdorff (2000) introduced the concept of "Triple Helix" which refers to the relationship between universities, industries and governments. The main forms in which this type of collaboration is materialized are: consulting services offered individually by members of the academia to companies, extensive technical support provided by universities to industry, funding provided by industry to universities, research projects developed in partnership between universities and industry, full development of industrial products in universities with industry funding, a situation in which the university can become a direct participant in the market by investing in spin-off companies and developing production activities (Göransson & Brundenius, 2011).

Signs of institutional innovation can be also found in Romanian universities: research laboratories and university institutes which promote knowledge transfer and support innovation; research centers and centers for technology transfer which aim to improve research capitalization through innovation, with impact on economic agents and knowledge transfer; consulting centers, business incubators, technology parks, partnerships with private companies and public institutions, cooperation on joint projects, participation in international research networks, student involvement in research, courses included in the curriculum useful for students to start their own business and to stimulate their interest in research-innovation, and also sponsorships (funding) (Leovaridis & Nicolăescu, 2008). Entrepreneurial universities exploit knowledge as entrepreneurial opportunities and thus contribute to economic and social development through its multiple missions (Guerrero et al., 2014).

Doctoral schools and study programs in universities play a key role in the development of a knowledge-based society (Santos et al., 2016). OECD considers PhD graduates as the most qualified to create, implement and disseminate new knowledge and innovation (Auriol et al., 2012). Mowbray and Halse (2010) conceptualized the competences developed by doctoral students, such as personal resourcefulness, knowledge, research skills and more, in terms of intellectual virtues which lead to the improvement of skills and, thus, to their personal and professional development. Another study presents a number of necessary skills that doctoral students must have to develop research activities, which are also developed during their studies, including reflection, problem-solving and communication skills (Ismail & Meerah, 2012).

The employment of PhD students in the non-academic environment is a necessary condition for companies in order to benefit from technology transfer (Mangematin, 2000). Therefore, doctoral study programs in universities must train graduates not only for a career in the academic environment and research centers (Delanty, 2001; Jairam & Kahl, 2012), but need to change their approach so that PhD graduates can follow a professional career both in academic and non-academic context (Conti & Visentin, 2015; Domínguez & Gutiérrez, 2016; Enders, 2004; Gu et al., 2018; Nerad, 2009).

The orientation of PhD graduates towards the non-academic sector is necessary given the limited number of permanent jobs in universities and research centers (Afonso, 2016; Acker & Haque, 2017; Boulos, 2016; Walters et al., 2020), and is influenced by several factors such as: job security, the opportunity to gain work experience in the private sector and the lack of a stable job in the public sector (Cruz-Castro & Sanz-Menéndez, 2005), financial stability, access to resources, willingness to engage in applied research and development projects (Roach & Sauermann, 2010). The reform of doctoral training is still an ongoing process in our country. Two types of doctoral programs are delineated in Romania:

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research doctorate and professional doctorate. As regards the research doctorate, the focus is on producing internationally relevant scientific knowledge, while the professional doctorate is specific to the artistic and sports fields, aiming to obtain knowledge based on high-level national and international performances (Curaj et al., 2015; Romanian Parliament, 2011).

The analysis of academic and career paths of doctoral graduates provides useful information on their career choice, job dynamics and career satisfaction, as well as academic training (Waaijer et al., 2017). Some studies show that PhD graduates, both within and outside academia, consider that doctoral programs do not provide adequate training for various aspects of their professional activity (Rudd & Nerad, 2015). Moreover, doctoral training is perceived in some countries such as Italy, Portugal, France as an obstacle in developing a career in the private sector (Boulos, 2016), while in Germany, UK and the Scandinavian countries employers show a preference for doctoral graduates due to their complex skills: critical thinking, reflectivity and the ability to work independently (Melin & Janson, 2006). In this context, doctoral programs must be orientated towards the development of generic skills that can be used in multiple professional contexts (Bogle et al., 2011; Boulos, 2016; Heflinger & Doykos, 2016; Lee et al., 2010).

On the other side, it is necessary to educate potential employers to value the benefits of hiring people who hold a doctoral diploma (Boulos, 2016). Previous research (Cruz-Castro & Sanz-Menéndez, 2005) shows that employers' opinion regarding the added value that doctoral graduates could bring into the company is influenced by factors related to the company`s interest in research and innovation: other doctors employed in the company, the existence of a research department and innovation, the emphasis on innovation.

Recruitment criteria differ between the academic and private environment. Those who want to work in the private sector after obtaining the doctoral degree tend to collaborate with private employers during their doctoral studies; this collaboration is a key factor in obtaining a job in the private sector after finishing the doctoral program (Lee et al., 2010; Mangematin, 2000). Moreover, the employability of doctoral graduates in various sectors of activity and the way PhD graduates are perceived by employers in terms of professional qualifications reflect the cultural characteristics of a country. If in countries such as the United States, Germany, UK or Spain the skills of PhD graduates are valued in the private sector, in post-communist countries most PhD holders are employed in academia and the public sector (Kindsiko & Vadi, 2018). 60% of PhD graduates in Estonia choose an academic career, 30% opt for a combined professional path between academia and the private sector, while 10% choose a private career. A noteworthy aspect is that one third of PhD students are pursuing a doctoral program while being employed. People who follow careers in the private sector are part of this category. If in the 1990s it was easy for people with a PhD diploma to get a job in academia, after 2005 the number of doctors in Estonia increased significantly and the number of permanent jobs in universities decreased considerably (Kindsiko & Vadi, 2018). The same situation was seen in Romania between 2004 and 2011, given that the number of PhD students was double compared to the average registered for European Union (Jørgensen, 2014).

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3. Research Questions

Our study is based on some research questions, such as: is there a continuity in the academic path of PhD graduates, what are the main reasons for choosing to enroll in a doctoral program, what are the professional goals of those who hold a PhD degree, what influence does the doctoral degree have on the professional activity. Following these questions, our study was structured in order to pursue three main research objectives.

4. Purpose of the Study

Our research aims to analyze the academic and career paths for PhD graduates of University of Oradea. Research objectives are the following: description of the academic path at bachelor's and master's level, description of the PhD study programs and the motivation to graduate from a doctoral program, identification of the professional paths of the PhD graduates of the University of Oradea and the implications of the doctoral degree on their professional activity.

5. Research Methods

Our study analyses the academic and professional careers of doctoral graduates. The research has an explorative-descriptive approach, following a quantitative research strategy. The research universe consists of graduates of doctoral studies from the University of Oradea. In order to identify the subjects who graduated from doctoral programs, all the scientific fields managed by the PhD schools within the University of Oradea were taken into account. The selection of subjects was made through the opportunistic sampling procedure. The study aimed to obtain an exhaustive group of subjects, but the opportunity situation was taken into account depending on the availability of contact data of the subjects and their availability to participate in the study. The selection of subject was established according to the period in which they obtained the doctoral degree, namely between 2014 and 2019. At the same time, the selection took into account the proportional representation of the population by fields of study.

The data collection was done online, the research tool (questionnaire) being distributed to the subjects using their contact data. At the same time, in order to facilitate the increase in the number of subjects, the distribution of the research tool was carried out with the support of the doctoral coordinators.

The research sample includes 83 subjects, of which 41 are men and 42 women (see Table 1). The average age of the subjects is 40.8 years, the youngest of the subjects is 28 years old, and the oldest is 79 years old.

Table 1. Distribution by field of study and gender

Field of study	Male	Female	Total
Geography	3	1	4
History	5	8	13
Sociology	5	4	9
Biomedical Sciences	7	10	17
Engineering	16	2	18
Economic Sciences	5	7	12
Philology	2	8	10

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6. Findings

6.1. Academic path of PhD graduates

In this section we aim to present some aspects regarding the academic path of doctoral graduates, trying to highlight the continuity of their educational trajectories. First, we will present data regarding the bachelor degrees obtained by them, then we will report data on the master's programs completed. Most of the subjects graduated all three cycles of studies (BA, MA, PhD) at the University of Oradea. Data suggest a certain continuity in terms of the academic path. Thus, most of the subjects continued their academic path started at the University of Oradea, until they obtained their doctoral degree. 52 of the subjects obtained the first bachelor's degree in Oradea. However, among those who are not BA graduates of the University of Oradea, come from universities from nearby cities: Cluj-Napoca (11 of the respondents), Timișoara (7) and Arad (5). 8 of the respondents gained their BA degree in cities from more distant regions: Bucharest, Iași, Craiova and Brașov.

25 graduates have two BA certificates and 4 of them have three BA certificates. Analyzing the academic path of graduates with two bachelor's degrees, we note that in terms of the second specialization, the fields most often mentioned are Legal Sciences (5 subjects), Management (3 subjects) and Psychology (3 subjects). Most of the respondents gained their bachelor degree between 2000 and 2009, 23 of them graduated before 1999 and 14 obtained their BA certificate between 2010 and 2016.

From the 83 subjects who participated in the study, 76 are graduates of master's degree, 16 also obtained a second master's degree and one of the subjects has three master's degrees. 52 of them got their MA diploma at University of Oradea, 6 in Arad, 6 in Timișoara, 5 in Cluj-Napoca and 3 in Bucharest. Most of them graduated in 2011 and 2009.

The average number of diplomas obtained after graduating other types of programs than BA and MA is 2.92 and the maximum number of such diplomas obtained by a subject is 4. Most of the PhD graduates mention programs such as Training for Trainers, Project Manager, Entrepreneurial Skills, ECDL.

In the next section we will present data on the completion of the doctoral program. The average period covered for the doctoral studies (from the enrolment to presentation of the PhD thesis) is 4.24 years. The lowest value is recorded in the field of philology (3.4 years) and the highest value is recorded by the field of biomedical sciences (5.3 years). 36 of the subjects received a scholarship during their doctoral studies.

The most relevant aspects taking into account when deciding to pursue a doctoral program were the interest in the field of research and the research topic, obtaining personal satisfaction, investing in their own intellectual development and acquiring new professional skills. The least important aspects are those related to the salary increase, the career opportunities or the prestige of the diploma (Figure 1). In other words, the respondents know that the doctoral degree does not necessarily bring special opportunities on the labor market, as it offers rewards in terms of visibility in the scientific community, the possibility of pursuing their scientific objectives and promote their research results.

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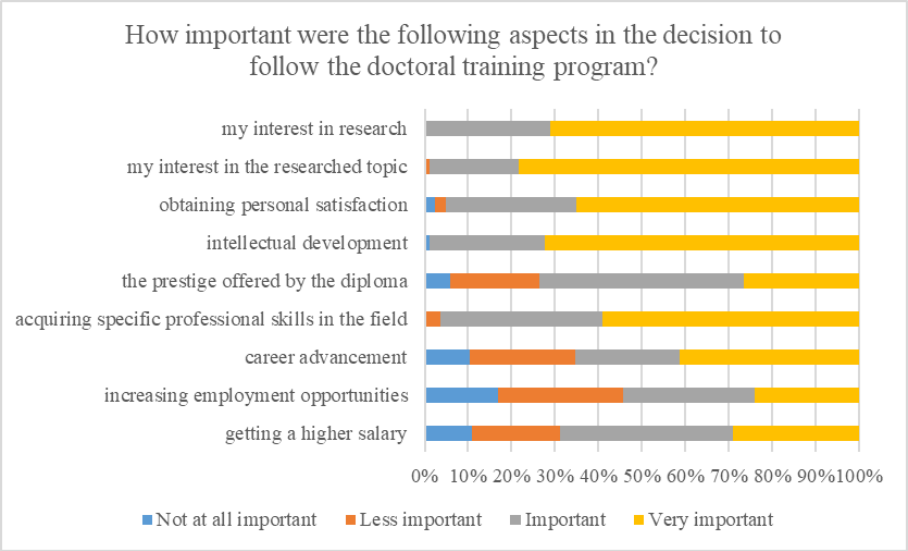

Figure 1. Factors that contributed to the decision to enroll in the doctoral program

An interesting aspect revealed by our data refers to the objectives pursued in their career by PhD gradates. Most of the respondents (73.4%) are oriented towards professional development in the academic environment than outside it (Figure 2). Enrolment in the doctoral study program is somehow justified by the intention of the subjects to work in academia (either to keep their job at university or to get a job in education). In the fields of Sociology, Philology, Engineering and History, most of the PhD graduates wanted a career in the academic environment rather than outside it and this as a consequence of the fact that most graduates in these fields carry out their activity in schools or universities. The answers of the PhD graduates from Economics and Biomedical Sciences are more balanced, due to the opportunities offered by the labor market in these fields.

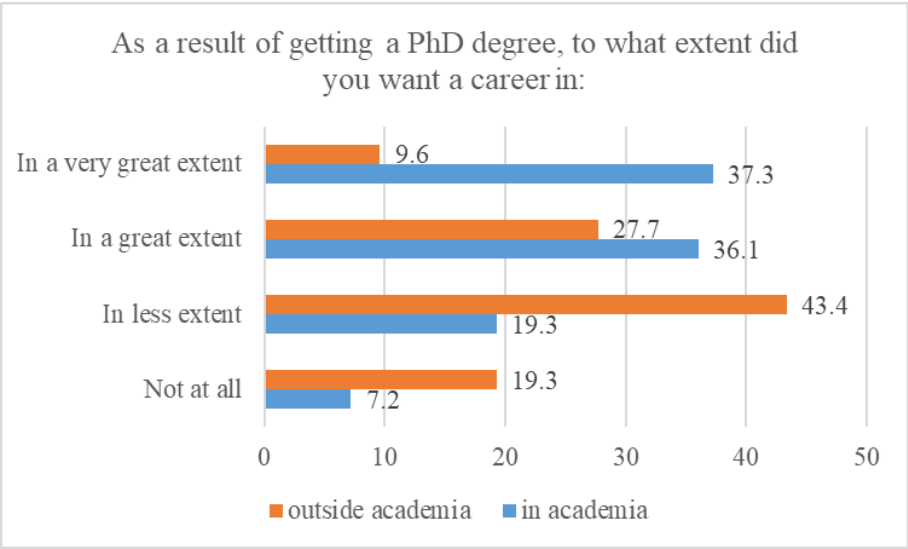

Figure 2. Intention to work in academia or outside academia

Regarding the visibility of the research in the socio-economic environment, the respondents state that they consider the collaboration with professionals from outside the academic field when conducting

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their research as a key-point. This emphasizes the importance of investing in functional partnerships between universities and non-academic environment in order to ensure the applicability of research and innovation. Most of the respondents say that they had this type of collaboration during their doctoral program. More than half of the subjects stated that the interaction with professionals from outside the academic environment contributed to the development of skills and knowledge specific to their field of training (49 subjects), but also to the development of transversal skills (47 subjects).

6.2. Career paths of PhD graduates

The professional path of respondents is presented from four perspectives: professional experience before starting their doctoral studies; professional experience during doctoral studies; professional activity after obtaining the PhD degree and the current professional situation.

Regarding the professional experience before doctoral studies, most subjects had a job before their PhD program (77 respondents). The average number of jobs held by subjects before their PhD training is 2.13. PhD graduates in Sociology have the highest values both in terms of the average number of jobs held before enrolling in the doctoral program (3.33) and as in number of years of professional experience (14.33), while graduates in Biomedical Sciences have the lowest average values in both situations discussed (1.6). Most jobs before doctoral studies were in the public sector (55 cases). The majority of the respondents, regardless of the field of doctoral studies graduated, had previous professional experience, especially in the education system. The previous employment in the public education system suggests that enrolment in doctoral program, regardless of field of study, was a necessary step in their professional development. Obtaining a doctorate could have been an essential condition for continuing the professional activity at the same job, especially in the case of graduates employed in the higher education system, as here, the PhD degree is a mandatory condition for employment. In the case of those employed in the pre-university education system, the professional activity is not conditioned by obtaining the doctoral degree, however the motivation to pursue a doctoral training is still an objective one: pre-university teachers have the obligation to follow specific professional training to obtain a certain number of credits, and doctoral program is considered to be a specialization.

As regards the employment of our PhD graduates in the private sector before starting the doctoral program, the distribution according to the fields of study is rather homogeneous. The exception is represented by the graduates in Engineering who were employed in a higher number in this sector compared to graduates of other fields of study. Another exception is in the case of PhD graduates from Biomedical sciences among which no case of employment in the private sector before starting doctoral studies was registered.

The vast majority of our respondents (71) worked in Romania and only 6 worked abroad. Only 12 respondents held management positions, while 62 were employed in executive positions. From all subjects, only 1 declared he has his own business. More than one third of our respondents (29) had subordinates and 45 stated that their job before their doctoral program did not involve subordinates.

The majority of respondents state that the professional activity carried out before enrolling in the doctoral study program has always been related (46 cases) or most of the time has been related (23 cases) to university studies completed prior to the PhD program (Figure 3).

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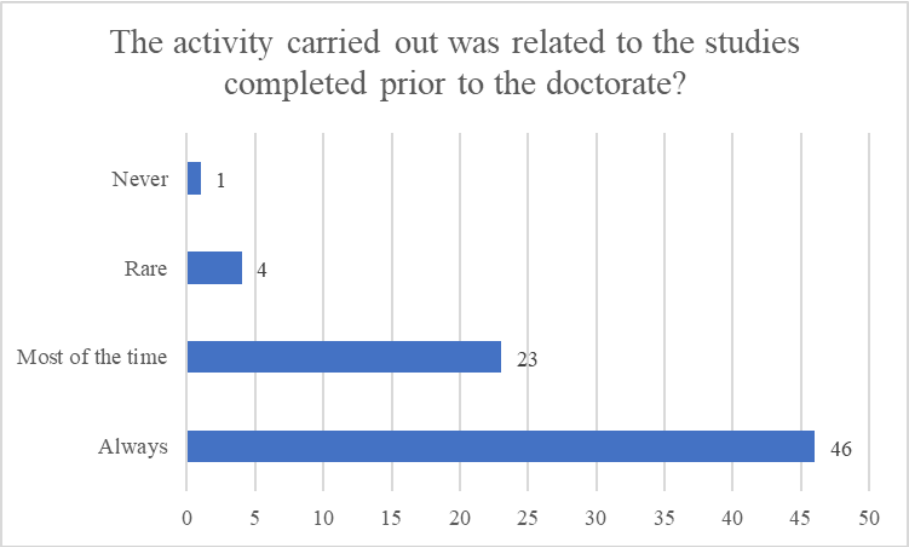

Figure 3. Relation between professional activity before enrolling in the doctoral training and university studies completed prior to the PhD program

Most of the respondents declare that their professional activity before enrolling in the doctoral study program always (11 cases) or most of the time involved (34 cases) research and innovation activities.

In total, 80 subjects stated that they had a job during their doctoral program. The data indicate that 64 of them continued their activity during their doctoral studies at the same workplace held before, while 16 respondents carried out their professional activity at different jobs than those held before the start of their doctorate. After completing the doctoral program and obtaining the PhD degree, 14 subjects had a different job than the one prior to enrolling in doctoral studies.

The analysis of the present professional situation reveals that the activity carried out by the majority of the respondents is correlated with the field of doctoral studies completed. These results may indicate that completing the doctoral program could have been a necessary condition to maintain the job held before enrolling in the doctorate program. This direction of interpretation is supported by the high percentage of those who have kept their current job (65 cases), but also by the higher number of those who are employed in the public sector, especially in education and health systems, compared to those in the private sector. Moreover, the type of professional activity carried out by the subjects is rather research-oriented. They declare to frequently use specialized portals or databases to search for scientific materials, information related to new research, methods, techniques, and working tools in their field. The data collected also aimed at identifying the entrepreneurial spirit among subjects. More than half of the respondents state that they do not intend to develop their own business in the future.

7. Conclusions

The paper presents a very important and relevant topic taking into account the specific context of the development of tertiary education in Romania, a country from the former communist bloc. Shortly after the Romanian Revolution in 1989, universities developed and needed qualified teachers. Thus, most

people who wanted to gain a position at the university pursued a doctoral program. In this sense, an idea was perpetuated: doctoral programs where thought to be relevant only for a career in academia, not in the private sector. The analysis of the academic and professional paths for PhD graduates and their motivations to pursue a doctoral program contributes not only to understand the factors that converge to this career option, but also to emphasize the needs that a private company must cover to attract doctoral graduates, which can have a significant contribution in terms of innovation, research, development and process optimization.

Our research depicted the educational and professional paths for PhD graduates of University of Oradea. We followed their academic path at bachelor's, master's and PhD level, as well as their motivation to pursue a doctoral program. Continuity is the term which best describes the academic path in the case of our subjects. This continuity is highlighted on two directions. First, the same university (or near-by universities within the same geographical region) is chosen by students to graduate from all three cycles of studies at higher education level; secondly, our findings indicate an uninterrupted educational path followed by subjects, starting from bachelor level till PhD level.

On the other hand, the research focused on the professional experience of PhD graduates before doctoral studies, during their doctoral training, and after obtaining the PhD diploma, and highlighted the implications of holding a doctoral degree on their professional activity. As for the career path, most subjects were employed before their enrolment in a doctoral program especially in the public sector. Moreover, data shows that PhD graduates mostly develop their professional activity within academia. In addition, entrepreneurial initiatives are low represented among our subjects, very few declaring to have their own business. However, the willingness to pursue a doctoral program is influenced both by the scientific interest in a specific research field, as well as by the intention to work in academia. In this regard, obtaining a PhD diploma is seen as a “must” if the intention is either to keep a professional position, therefore to continue a professional path in the education system, or to get a job in academia. Our findings show a strong interdependence relation between the need to obtain a PhD diploma and the will to work in academia.

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