ENCOURAGING CREATIVITY IN STANDARDIZED POSTGRADUATE PROGRAMS WITH PPW

https://doi.org/10.56238/sevened2024.031-033

Rodrigo Ruiz[1], Heleise Faria dos Reis de Oliveira[2], Amândio Ferreira Balcão Filho[3], José Ricardo Lourenço de Oliveira[4], Guilherme Cesar Soares Ruppert[5], Cleiton Soares Abrantes[6] and Cláudio Henrique José Ballande Romanelli[7]

ABSTRACT

This article previous published at Caderno Pedagógico in 10/10/2024 DOI: https://doi.org/10.54033/cadpedv21n10-106 explores the concept of PhD by Previously Published Works (PPW) and proposes the unification of the 42 different terms currently used to describe this doctoral pathway. It also provides a very comprehensive dataset on PPW regulations. The study compares three distinct models of PPW and examines the feasibility of adopting this modality in Brazil. The research investigates the recognition of high-performance self-taught researchers by considering recent advancements in European postgraduate systems, with a focus on the United Kingdom, Norway, Ireland, and France. Two main questions are addressed: (1) whether PPW represents a viable alternative to traditional doctoral programs and (2) how this modality is implemented in the analyzed countries. The study argues that rigid and bureaucratic educational structures often limit creativity and innovation, highlighting the need for more flexible approaches in postgraduate programs. Academic environments that promote diverse thinking and encourage experimentation are better positioned to nurture excellence and creative potential. The results show that countries such as the United Kingdom, Norway, Ireland, and France have adapted their educational systems to balance quality and creativity, offering valuable insights for potential improvements in the Brazilian academic landscape. The conclusion

[1] PhD by the Intelligent Systems Research Centre of the School of Computing and Digital Media of London Metropolitan University
Instituição: CTI Renato Archer, Campinas, Brasil
E-mail: rodrigosruiz@outlook.com
[2] PhD in Human Movement Sciences, UNIMEP - Methodist University of Piracicaba
Instituição: UEPG - State University of Ponta Grossa, Ponta Grossa, Brazil
E-mail: heleise@gmail.com
[3] PhD by the Faculty of Electrical Engineering at UNICAMP
Instituição: CTI Renato Archer, Campinas, Brasil
E-mail: amandio.balcao@cti.gov.br
[4] PhD by the Methodist University of Piracicaba UNIMEP
Instituição: UNIORG -Institute of Education, Research and Innovation, Curitiba, Brazil
E-mail: ricardo@uniorg.com.br
[5] Master's degree in Computer Science from Unicamp
Instituição: CTI Renato Archer, Campinas, Brasil
E-mail: guilherme.ruppert@cti.gov.br
[6] PhD candidate at UCD-University College Dublin, Dublin, Ireland, holds a Master's degree in Dispute Resolution from Independent College Dublin Instituição: UCD-University College Dublin, Dublin, Ireland
E-mail: cleitonabrantes@icloud.com
[7] PhD candidate in e-Planning pela Universidade de Lisboa, Master's degree in Human Development and Technologies from Universidade Estadual Paulista Júlio de Mesquita Filho
Instituição: IFSP-Instiituto Federal de SP, Campinas, Brasil, Universidade de Lisboa, Lisboa, Portugal
E-mail: claudio.romanelli@ifsp.br

emphasizes that PPW should not be seen as a shortcut, but rather as a rigorous alternative that recognizes the significant contributions of researchers who may not have followed traditional academic paths. Implementing PPW in Brazil could enhance the national academic environment by valuing the substantial work of experienced professionals and fostering a culture of innovation and excellence in research.

Keywords: Previous Published Work. PhD by Prior Output. PhD by Research. Post Graduation Models. PPW.

INTRODUCTION

Rigid and bureaucratic structures in postgraduate education, which prioritize efficiency over individuality and experimentation, can hinder creativity—an essential component of research and innovation (Amabile, 1996). Such standardized approaches often restrict students' ability to explore novel ideas, engage in divergent thinking, and apply innovative research techniques (Beghetto, 2007a). Therefore, initiating open discussions about how to balance quality and consistency with fostering creativity is crucial (Paulus, 2000). Addressing this complex issue is vital for the future of teaching and research (Craft, 2003), as the most effective solutions to intricate problems are likely to come from minds encouraged to think beyond standardized frameworks (Sternberg, 2003).

Achieving a balance between quality and fostering creativity in postgraduate education requires a critical re-evaluation of program structures and objectives (PAULUS, 2000). It involves creating environments that encourage diverse thinking, experimentation, and student-driven exploration of personal interests (Beghetto, 2007b). The learning process should be seen as an organic, ongoing dialogue that fosters curiosity and critical inquiry, rather than focusing solely on predefined outcomes (Bain, 2004). This transformation demands a shift in mindset from both educators and students, alongside a review of existing policies and practices. Cultivating creativity is most effective when the educational environment actively integrates and values it across all aspects of learning (Bain, 2004). Creativity is not just an innate talent but can be developed through practice and stimulation (Csikszentmihalyi, 1996). Therefore, postgraduate programs must offer opportunities to explore creativity across various disciplines and contexts, which might include interdisciplinary projects, collaboration with industry professionals, and dedicated spaces for experimentation and innovation (Amabile, 1983).

The roots of standardization in educational systems can be traced back to the Industrial Revolution, when education transitioned into a perceived instrument for workforce development (TYACK; CUBAN, 1995). This shift led to a system designed to produce uniformity in student outcomes, ensuring the acquisition of a common set of skills and knowledge deemed necessary for specific industrial roles. This emphasis on standardization extended to graduate studies, where specialization and deep focus within a singular discipline became the norm. This model aimed to cultivate highly skilled experts in various fields, fostering societal advancement through specialized knowledge (KERR, 2001). However, concerns are rising regarding the potential limitations of this approach. Critics argue that an overemphasis on standardization can stifle creativity and critical thinking, skills increasingly valued in the contemporary world (GRAESSER, 2012).

Therefore, educational systems must undergo adaptation to meet the demands of the contemporary world. This necessitates embracing a more holistic approach that fosters creativity and encourages students to engage in critical thinking beyond established frameworks. This does not necessitate the complete abandonment of the standardized model; instead, it requires the integration of methodologies that nurture creative expression and interdisciplinary exploration, allowing students to develop their creative problem-solving skills (ROBINSON, 2011). Furthermore, it is crucial to recognize that creativity is not the exclusive domain of artistic or related fields; it can be productively applied across diverse disciplines, from scientific research to technological innovation.

Within the realm of higher education, the concept of the "Research Doctorate" stands out as a pivotal subject worthy of in-depth exploration. This post-baccalaureate doctoral degree signifies the pinnacle of scholarly engagement, culminating in the successful defence of an original dissertation. At the heart of the Research Doctorate experience lies the independent production of novel research, often manifested as a written dissertation or the orchestration and execution of a groundbreaking artistic or academic project. Highly prized within academia and various industries, the Research Doctorate cultivates a robust foundation in in-depth research methodologies and fosters significant contributions to a specific field of knowledge. Ultimately, graduates of Research Doctorate programs are recognized as experts within their respective domains, equipped with the independent research skills, critical thinking abilities, and problem-solving prowess necessary to navigate complex challenges at the forefront of their disciplines (LONDON METROPOLITAN UNIVERSITY, [s.d.]).

British universities, with their longstanding tradition of academic excellence and innovation, have in recent years embraced a more interdisciplinary and creative approach to postgraduate programs. This shift has resulted in a diversification of research and academic work, alongside the development of novel methodologies and approaches across various disciplines. This trend is further supported by investments in collaborative spaces and learning environments that foster the exchange of ideas and nurture creativity(BLACK, 2021) (EVIS, 2022).

The United Kingdom offers a unique doctoral pathway through the "PhD by Prior Output" (or "Doctorate by Previous Work"), recognizing substantial academic or creative achievements accomplished prior to formal doctoral enrollment. This distinct degree pathway acknowledges accomplishments such as published books, peer-reviewed articles, musical compositions, architectural designs, or patented inventions. Assessment for this doctoral award hinges on the relevance, depth, and originality of these previous works,

alongside their significant contribution to the candidate's field of study (KINGSTON UNIVERSITY, 2024). The PhD by Prior Output provides a valuable avenue for established, experienced professionals to gain formal academic recognition for their notable achievements (POWELL, 2015).

The following sections will delve into the characteristics of these educational systems, analyzing how they have adapted to meet the evolving 21st-century demands (Marginson, 2016). Following a comprehensive literature review, a detailed examination of the methods employed in the United Kingdom, France, and Norway will be presented. This analysis will encompass the diverse terminology for this doctoral pathway and propose a unified term for clarity and cross-national comparison. . In conclusion, the paper will discuss the multifaceted benefits and challenges associated with these advancements, considering the implications for both students and society as a whole (MARGINSON, 2016).

LITERATURE REVIEW

In the Australian context, professional doctorates have continued to grow and diversify across a wide range of disciplines (Boud & Tennant, 2006). Empirical studies, such as "The Doctoral Education Experience" at Australian universities, have looked at doctoral experiences in departments that offer both traditional and professional doctorates. This paper discusses professional doctorates in areas such as education, management, law, and creative arts, commenting on the similarities and differences found between these and traditional doctoral programs.

Three specific areas are discussed in Lester (2004) and Maxwell (2003): student recruitment and selection, the choice made by professional doctorates, and perceived career benefits; program structure and organization, including research topic identification; and the perception of the status of professional doctorates compared to traditional ones. The conclusions are discussed within the context of governmental policy on postgraduate education and emerging literature on professional doctorates.

Doctoral education, whether traditional or professional, continues to have a significant impact across multiple levels: for students, supervisors, institutions, and disciplines. It has been argued that alternative pathways, such as the PhD by Published Work, offer significant advantages, including greater flexibility and the ability to integrate practical work with theoretical research (Park, 2007). The drive for innovation and quality continues to shape the landscape of PhD programs around the world, driving ongoing reflection on practices and policies.

While (PALTRIDGE; STARFIELD, 2023) focused his work on previously published thesis in Australia, Canada, the United States and the United Kingdom, this work focuses in more details on the United Kingdom, and compares the postgraduate systems of Ireland, Brazil, France and Norway. On the other hand, (ANDERSON; SAUNDERS; ALEXANDER, 2022) focuses his research on the thesis writing format. Already, (BADLEY, 2009) demonstrates concern about quality measurement for article-based doctorates.

These studies point to a growing trend of diversification in doctoral programs, ranging from traditional PhDs to more innovative modalities like the PhD by Published Work. The evolution of doctoral education aims to prepare future academics and research leaders capable of addressing contemporary challenges with robust and relevant qualifications. To ensure that these changes bring the expected benefits, it is crucial for academic institutions to establish clear guidelines and provide necessary support to students.

Therefore, the pursuit of innovation and the maintenance of quality continue to shape the landscape of doctoral programs globally, demanding ongoing reflections on best practices in terms of guidance and institutional support for various doctoral pathways.

Doctoral training has evolved significantly, especially with the option of the PhD by Published Work. In this context, experienced researchers in Europe, including the United Kingdom, have adopted this approach (BROWN-BENEDICT, 2008; DAVIES; ROLFE, 2009; KIRKMAN et al., 2007). Guidelines for writing a PhD thesis by Published Work vary between institutions and countries.

Another study explored supervision in the PhD by Published Work route, investigating the role of the supervisor in this context. Additionally, a symposium analysed doctoral training geared towards the future in the healthcare field, considering the trend of qualifying through published works. This diversified approach includes genres such as taught PhDs, professional doctorates, and those by published work, reflecting the growing international literature on doctoral programs.

In the Australian context, professional doctorates have continued to grow and diversify across a wide range of disciplines (BOUD; TENNANT, 2006). Empirical studies, such as "The Doctoral Education Experience" at Australian universities, have looked at doctoral experiences in departments that offer both traditional and professional doctorates. This paper discusses professional doctorates in areas such as education, management, law, and creative arts, commenting on the similarities and differences found between these and traditional doctoral programs.

Three specific areas are discussed in (LESTER *, 2004; MAXWELL, 2003): the first is student recruitment and selection, the choice made by professional doctorates, and perceived career benefits; the second area is program structure and organization, including research topic identification; and the third area is the perception of the status of professional doctorates compared to traditional ones. The conclusions are discussed within the context of governmental policy on postgraduate education and emerging literature on professional doctorates.

Doctoral education, whether traditional or professional, continues to have a significant impact across multiple levels: for students, supervisors, institutions, and disciplines. It has been argued that alternative pathways, such as the PhD by Published Work, offer significant advantages, including greater flexibility and the ability to integrate practical work with theoretical research (PARK, 2007). The drive for innovation and quality continues to shape the landscape of PhD programs around the world, driving ongoing reflection on practices and policies.

These studies contribute to a broad understanding of the evolution of doctoral education and its implications for future academics, researchers, and leaders in their respective fields. By considering different forms of doctoral programs, the discussions progress towards educational models that meet the varied needs of students and the job market, while ensuring high standards of academic quality.

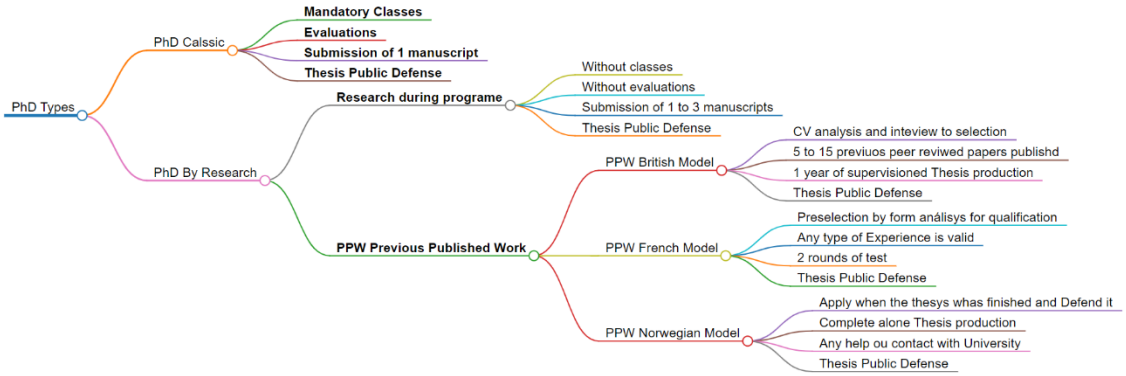
METHOD

This work adopts a descriptive-comparative study methodological approach by defining a classification of the main types of PhD models identified in the research. Figure , visually illustrates this ontology. The ontology is structured into two main types of doctorates: "Classic PhD" and "PhD by Research." The "Classic PhD" is characterized by mandatory classes, evaluations, the submission of a manuscript, and the public defence of the thesis. On the other hand, the "PhD by Research" is more flexible, involving continuous research during the program, without mandatory classes or evaluations.

This classification provides a clear and structured understanding of the different doctoral models, offering a solid foundation for analysis and comparison. The visual representation in Figure 1 facilitates the assimilation of the complexities of these models. Additionally, the inclusion of subtypes in "PhD by Research" highlights the diversity of existing approaches, such as the British, French, and Norwegian models. By establishing this ontology, the article provides a valuable framework for researchers and academics to comprehend and discuss the various doctoral modalities identified in the study.

The proposed classification not only categorizes doctoral models but also recognizes the evolution and adaptability of these models, reflecting the dynamic nature of academic research. This approach significantly contributes to the literature on doctoral programs, emphasizing the importance of recognizing and understanding the diversity of approaches in the doctoral degree attainment process.

Figure 1 PhD Types Classification and requests in last level



Source: Authors

In the following sections, we will delve into a comprehensive exploration of each PhD type outlined in the ontology, providing detailed insights into their respective structures and operational frameworks. This in-depth analysis will shed light on the distinctive characteristics of "Classic PhD" programs and the more flexible "PhD by Research" models. Furthermore, we will explore variations within the "PhD by Research" category, including the British, Brazilian, Irish, French, and Norwegian modes, unravelling the specific criteria, processes, and unique features associated with each. By examining concrete examples from various countries, we aim to offer a nuanced understanding of the global landscape of doctoral programs, emphasizing the diverse approaches employed in different academic contexts. Through this detailed exploration, we seek to contribute valuable insights to both academic discourse and practical considerations within the realm of doctoral education.

This article proposes the term PPW (Previous Published Work) to define and normalize the 44 different founded term to describe similar system around the Europe. This concept is gaining traction in the realm of academia. Notably, it recognizes the significant contributions made by individuals in their respective fields through their published work. Based on the forthcoming table, it can be observed that 83 universities have already adopted the PPW approach. Seven countries globally offer PPW-based degrees, reflecting its growing international acceptance. Furthermore, 19 of the world's top 250 universities offer PPW, indicating its credibility and value in high-ranking institutions. Remarkably, this study shows that in the United Kingdom, 75 of the top 100 universities have implemented

PPW, suggesting the significant domestic acceptance of this approach. By acknowledging the value of PPW, academic institutions are embracing the diversity and richness of professional experience, thereby revolutionizing traditional educational pathways.

The following array of titles demonstrates the breadth and flexibility of the PPW concept and its relevance in a contemporary academic context. The list is structured as [PPW variant term]: [(ranking in the country of University/ranking in the world by Webometrics captured in 2022 https://www.webometrics.info/en/Europe)] [Name of Universities that use the term].

Alternative Format Thesis: (31/323)University of Bath. **Award of Phd By prior Based On Prior Publications:** (9/2093)Technological University Dublin. **Degree of Doctor in Philosophy by Prior Publication:** (35/361)University of Liverpool. **Degree of PhD (by Published Works):** (48/634)Aberystwyth University. **Degree of PhD by Publication:**(27/309)University of East Anglia. **Degree of Phd By Published Works:** (47/617)Bangor University. **Doctor of Philosophy (PhD) by Published Works:** (60/749)Manchester Metropolitan University. **Doctor of Philosophy (PhD) on the basis of published work:** (95/1471)Staffordshire University. **Doctor of Philosophy by Previous Published Works:** (84/1137)Glasgow Caledonian University. **Doctor of Philosophy by Published Work:** (23/246)University of Leicester, (79/1047)University of Bradford. **Doctor of Philosophy on the Basis of Published Work:** (65/829)Sheffield Hallam University. **Doctor of Philosophy (PhD) By Published Work:** (45/575)Swansea University. **Doctorate by Published Work:** (71/895)University of Greenwich. **Doctorate by Published, Established and Creative Works:** (68/855)Nottingham Trent University. **Dr. Philos:** (1/98)University of Oslo, (2/202)NTNU, (3/223)University of Bergen,(9/994)University of Stavanger, (12/1884)NORD, (27/8630)MF. **Existing Published or Creative Work PhD:** (1/7)University of Oxford, (101/2135)University of Sunderland. **Higher Doctorate Degrees on Published Work:** (14/4282)National University of Ireland. **PhD (by Research Publications):**(4/41)University of Edinburgh. **PhD By Completed Work:**(93/1443)Teesside University. **PhD By Existing Published Work:** (19/1386)Leeds Beckett University. **PhD by Portfolio:**(88/1295)University of South Wales. **PhD by Previously Published Work:** (58/720)Aston University. **PhD by Prior Publication:** (29/319)University of Surrey, (44/536)City University London, (46/579)Royal Holloway University of London, (7/1303)RCSI- University of Medicine and Health Science. **PhD by prior publication/output:**(89/1359)London Metropolitan University. **PhD by prior publication/portfolio:** (76/945)Kingston University London. **Phd by Prior Published Work:**(3/383)University College Cork. **PhD by Pubication:** (103/1787)University of

Chester, 3/19)University College London, (18/185)University of Exeter, (21/206)University of York,37/391)Loughborough University,(39/420)University of Kent,(52/669)University of Portsmouth, (77/967)Coventry University, (106/1916)University of Gloucestershire,(5/660)Dublin City University. **PhD by Publication/Portfolio:** (54/700)Keele University. **PhD by Published or Creative Work:** (111/2172)University of Worcester. **PhD by Published Research:** (42/526)Heriot-Watt University. **PhD by Published work:** (6/65)University of Manchester, (10/120)University of Warwick, (12/138)Bristol University, (26/304)Lancaster University, (56/713)University of Ulster, (59/731)Northumbria University, (66/841)Liverpool John Moores University, (69/866)University of Central Lancashire, (78/973)University of Westminster, (80/1068)University of Wolverhampton, (85/1238)Anglia Ruskin University, (67/846)De Montfort University. **PhD by Published Work or Practice:** (105/1849)University of Bolton. **PhD by Published works:** (22/208)Cardiff University, (28/310)University of Sussex, (30/322)Queen's University Belfast, (32/323)University of Reading, (52/681)University of Hull, (86/1248)Napier University Edinburgh, (98/1512)University of Derby, (107/1948)University of Northampton, (108/1961)Cardiff Metropolitan University, (62/795)University of Salford. **Phd on the Basis of Prior Published Works in:** (41/521)University of Plymouth. **PhD on the Basis of Published Work:** (64/825)Oxford Brookes University. **PhD Public Works:** (74/934)Middlesex University. **PhD under Special Regulations:**(2/10)University of Cambridge. **Research Degree by Published Works:**(11/136)University of Nottingham. **Submission by Published Work:**(13/145)University of Southampton. **Thesis by Publication:**(15/148)Newcastle University Newcastle upon Tyne. **VAE:**(1/201)Sorbone Université, (2/211)Université Paris-Saclay, (8/347)Univesité de Bordeaux, (11/383)Université de Lorraine, (35/1010)Université de Poitiérs, (41/1105)Université Paris Cité, (46/1287)Conservatoire National Des Arts et Métiers.

In this study, at least three different types of PPW were identified, which are named the British model, the French model, and the Norwegian model, and will detailed below. Each of these models has specific characteristics that will be thoroughly discussed, highlighting the nuances and particularities that defines each country's approach to the concept of a PPW. We will include the Irish variant as a note and exclude the Australian and Canadian initiatives explored by (PALTRIDGE; STARFIELD, 2023).

THE PHD IN TRANSITION: HISTORICAL DEVELOPMENT AND CONTEMPORARY VARIATIONS

The evolution of the PhD credit system is inextricably linked to the broader development of higher education, driven by the escalating demand for specialized knowledge. A historical examination of this system illuminates its purpose, structure, and the factors influencing its widespread adoption.

Originally conceived as a professional qualification granting teaching licensure (GOODCHILD; MILLER, 1997), the PhD gradually transformed into a research-focused degree during the 19th century. This shift, recognizing the pivotal role of rigorous inquiry in knowledge advancement, laid the foundation for the credit-based PhD model.

The Bologna Process, initiated in the late 1990s, aimed to establish a coherent European Higher Education Area (EHEA) (MASIC; BEGIC, 2016). Building on the Sorbonne Declaration of 1998, the Bologna Declaration of 1999 outlined a framework for standardizing degrees, enhancing comparability, fostering international mobility, and implementing quality assurance mechanisms (VERGOLINI; VLACH, 2024). While non-binding, the process garnered widespread participation, ultimately involving 47 countries by 2010, reflecting the growing global challenges in higher education and research.

The analysis reveals a consistent pattern across examined countries: where research-oriented PhD programs exist, the traditional PhD is also offered. This finding underscores the enduring presence of the classic doctoral model as a viable alternative, irrespective of the program's research emphasis. Such diversity in doctoral program offerings caters to the varied needs and preferences of candidates, institutions, and societal expectations globally.

A distinctive variant often termed the "Research Doctorate" prevails in certain European educational systems (SÖDERQVIST, 2018). This model prioritizes supervised research over coursework and credits. The underlying premise is that immersive engagement in independent research under expert guidance constitutes the cornerstone of doctoral education (WISKER, 2012). Consequently, Research Doctorate students typically commence their research projects at the outset of their studies.

This approach facilitates an in-depth exploration of research interests, fostering a comprehensive and integrated understanding of the discipline (MARSH, 2018). Regular supervision provides essential guidance and feedback, ensuring the student's progress. The Research Doctorate model's flexibility empowers students to tailor their studies to individual needs and interests. Unlike predefined curricula, this model encourages exploration of research-relevant areas (LEE, 2008). While demanding, this approach offers

significant rewards. By prioritizing research, students contribute to knowledge advancement and develop critical research skills essential for future academic or professional endeavours (MALFROY, 2005). In the next subsections, we will discuss the doctoral systems from previous works (PPW) in Brazil, Ireland, United Kingdom, Norway and France.

BRAZIL

Brazil's postgraduate education is bifurcated into 'lato sensu' and 'stricto sensu' modalities (CERVO; BERVIAN; SILVA, 1996). The former, encompassing Specialization Courses and MBAs, is primarily vocational, oriented towards professional development and market demands (BARCELOS, 2000). Conversely, 'stricto sensu' programs, comprising master's and doctoral degrees, are dedicated to academic and scientific training.

The quality assurance and evaluation of postgraduate programs in Brazil are the purview of CAPES (*Coordenação de Aperfeiçoamento de Pessoal de Nível Superior*). This agency employs a rigorous assessment process, considering factors such as faculty and student research output, and available infrastructure. CAPES assigns a rating scale of 1 to 7, with programs achieving scores of 6 or 7 recognized as internationally excellent(CAPES. (N.D.)., [s.d.]).

Brazilian master's and doctoral programs operate on a credit-based system, with each credit representing a specific number of class hours. Students accumulate credits through mandatory and elective coursework, seminars, and research activities. The credit requirements vary by program and institution but typically range from 24 to 64 credits for master's degrees and 48 to 96 for doctoral degrees (SEVERINO, 2007).

Master's programs, two years in duration, culminate in the defence of a dissertation before a committee (VASCONCELOS, 2002). The dissertation requires na in-depth exploration of a specific topic, demonstrating a comprehensive grasp of relevant literature and the capacity for independent research under the guidance of an advisor.

The Brazilian doctoral program adheres to a traditional model, necessitating a prior master's degree for admission. The program spans four to five years and requires the completion of sixteen credit hours of coursework before eligibility for a qualifying examination. Doctoral students conduct research under the supervision of a faculty mentor.

Doctoral programs often afford students flexibility in credit acquisition, allowing for up to half of the required credits to be earned at other institutions. A qualifying examination is administered, wherein students present a proposed research agenda and a preliminary doctoral thesis outline to a faculty committee. Demonstrated English language proficiency, typically assessed through a standardized test or interview, is also a prerequisite. Upon

successful completion of the qualifying examination, students may proceed to the doctoral dissertation defence (FEEC-UNICAMP, [s.d.]; USP, 2023). The conferral of the doctoral degree necessitates the submission of an article to an indexed journal, regardless of prior publication status.

The doctoral thesis is a rigorous, in-depth research undertaking that demands an original contribution to the scholar's field (MORAES, 1996). It necessitates a substantial advancement of knowledge or perspective within the chosen field of study. While structurally similar to a master's dissertation, the doctoral thesis typically involves a more comprehensive and intricate analysis (SMITH; JOHNSON, 2018).

The culmination of doctoral studies is the thesis defence, a formal examination conducted by a committee, typically including external examiners (SMITH, 2010). The candidate presents their research findings and is subject to questioning from the committee, which assesses the research quality and the candidate's ability to articulate and defend their work. The supervising professor provides essential guidance in preparation for this rigorous examination, ensuring the candidate is adequately equipped to address potential challenges (DOE, 2017).

Universities possess discretion in modifying these prerequisites. For instance, some institutions may substitute a portfolio assessment for the traditional master's degree, provided the candidate can demonstrate research aptitude. However, this flexibility is infrequently exercised.

A prevalent practice involves the enrollment of special students, individuals who undertake coursework independently without formal supervisory affiliation or postgraduate program matriculation (ANDERSON, 2019). While offering opportunities for exploratory learning and skill development, this status often necessitates the accumulation of substantial credits prior to securing a supervisory role and formal postgraduate admission (TAYLOR, 2020). Balancing academic commitments within this non-traditional framework can be demanding (ROBINSON, 2021).

Special students navigate a competitive landscape in pursuit of potential advisors. This highly competitive environment underscores the critical role of mentorship. An effective advisor can significantly influence a student's trajectory, offering guidance, feedback, and intellectual stimulation (M. Johnson, 2015). Such support is instrumental to academic success.

IRELAND

It's noteworthy that universities in Ireland exhibit a high degree of autonomy, with many offering programs similar to those in the UK regarding the acceptance of prior publications (MINISTRY OF EDUCATION AND SCIENCE, 2004).

The Irish Department of Education and Science manages the Irish education system. Recently, this department began a restructuring effort, delegating tasks to regional offices and external agencies, seeking to focus on political issues and educational challenges.

The National Qualifications Authority of Ireland (NATIONAL QUALIFICATIONS AUTHORITY OF IRELAND, 2003) established the National Framework of Qualifications (NFQ), which brought significant changes in education and training in Ireland. The NFQ details the categories and anticipated educational achievements of national awards granted by universities at both undergraduate and postgraduate levels. The NFQ is a structure comprising of 10 levels that enables the comparison of qualifications with varying standards and levels. There is a diagram available on the Quality and Qualifications Ireland (QQI) (QQI, [s.d.]). Levels 6-10 in the Framework correspond to third-level qualifications (MINISTRY OF EDUCATION AND SCIENCE, 2004). Recognition for achievements in the NFQ is both national and global, supported by quality assurance measures based on legislation.

The expansion of doctoral programs can be attributed, in part, to the formation of networks among university deans of graduate schools (MINISTRY OF EDUCATION AND SCIENCE, 2004). The emphasis on skills development beyond technical expertise is evident in documents like the PhD Postgraduate Skills Declaration, which promotes the cultivation of generic and transferable skills (MINISTRY OF EDUCATION AND SCIENCE, 2004). As independent academic institutions, universities retain autonomy over curriculum design, assessment methods, and the issuance of certificates and diplomas (QQI, [s.d.]).

Admissions processes and student selection quotas are typically determined at the institutional level. Eligibility for doctoral programs, often based on a candidate's publication record (Previous Publications Workload - PPW), typically requires an honours degree and a minimum of 3-10 peer-reviewed publications (TECHNOLOGICAL UNIVERSITY DUBLIN, 2022). These publications can encompass peer-reviewed articles, books, chapters, monographs, technical reports, architectural results, and even creative works such as performances or exhibitions.

Upon acceptance into the program, students are assigned a primary advisor, and potentially a co-advisor, who are responsible for overseeing their progress and research activities. Following a year of supervision, students are expected to present a final thesis

based on their publications, adhering to the same rigorous standards as a traditional doctoral dissertation (TECHNOLOGICAL UNIVERSITY DUBLIN, 2022).

The doctoral journey culminates in an oral defence of the thesis before a committee of examiners. This committee must include at least one external member, unaffiliated with the awarding institution. The thesis and subsequent defence are designed to assess the candidate's contribution to knowledge through their publications, alongside their mastery of the field, and their acquired expertise in both fundamental and advanced methodologies and techniques (MINISTRY OF EDUCATION AND SCIENCE, 2004).

The Irish university evaluation system exhibits close parallels to the British system. This autonomy is reflected in the significant freedom granted to individual institutions in setting criteria for postgraduate studies. Notably, this extends to the selection of PhD candidates, where prior publications often play a prominent role. This emphasis on a research track record aligns with the high level of independence enjoyed by Irish universities.

Therefore, this work evaluates that the Ireland doctoral system is very similar to United Kingdon Model.

UNITED KINGDOM

British universities, renowned for their longstanding tradition of academic excellence and innovation, have witnessed a recent shift towards a more interdisciplinary and creative approach within postgraduate programs. This trend has fostered a diversification of research endeavours and academic pursuits, simultaneously facilitating the development of novel methodologies and approaches across diverse disciplines. This evolving landscape is further bolstered by investments in collaborative spaces and fostering learning environments that actively promote the exchange of ideas and stimulate creative exploration (BLACK, 2021; EVIS, 2022).

The United Kingdom offers a special doctoral pathway through the "PhD by Previous Achievement" (PPW) program. This program recognizes and validates substantial academic or creative achievements undertaken prior to formal doctoral enrollment. The UK PPW approach emphasizes the recognition and validation of a candidate's existing scholarly accomplishments, which may encompass published books, peer-reviewed articles, artistic compositions, contributions to academic journals, books or chapters, research reports, patents, exhibitions and performances, architectural designs, or patented inventions (UNIVERSITY OF LONDON, 2021). This program provides a valuable avenue

for established and experienced professionals to obtain formal academic recognition for their significant contributions (POWELL, 2015).

The selection process for the PhD by Previous Achievement (PPW) program typically commences with a meticulous analysis of the candidate's *curriculum vitae* (CV). Assessment for this doctoral award hinges on the relevance, depth, and originality of the applicant's prior scholarly works, along with their demonstrably significant contribution to the chosen field of study (KINGSTON UNIVERSITY, 2024). These attributes constitute the primary evaluation criteria employed by the admissions committee. The committee seeks compelling evidence of substantial academic achievements. This may include publications in high-impact, peer-reviewed journals, presentations at international conferences, or demonstrably innovative contributions to the relevant discipline (MCGILL UNIVERSITY, 2020). It is essential to emphasize, however, that the quality of publications often carries more weight than sheer quantity (SMITH, 2018).

Minimum requirements may vary, but a general guideline suggests approximately 10-15 high-impact publications for STEM fields (Science, Technology, Engineering, and Mathematics) and healthcare disciplines, while the humanities and social sciences typically require 2-4 books or their equivalents (JOHNSON; LEE, 2019). However, these figures serve as a mere starting point. The admissions committee ultimately evaluates each candidate holistically, prioritizing the depth, originality, and field-specific relevance of their prior work (DAVIS, 2020).

Following a comprehensive analysis of the *curriculum vitae* (CV), shortlisted candidates are invited for an interview. This stage constitutes a critical component of the selection process, as it affords candidates the opportunity to elaborate on their academic achievements and articulate their potential for future research endeavours (UNIVERSITY OF OXFORD, 2018). During the interview, candidates are evaluated on their ability to:

a) Clearly and persuasively communicate their ideas;
b) Demonstrate a profound understanding of their chosen field of study;
c) Evince the potential to make meaningful contributions to the advancement of academic research.

Furthermore, the interview serves as a platform to assess the candidate's suitability for the specific academic environment and the institution's cultural context (UNIVERSITY OF OXFORD, 2018).

The thesis supervision process constitutes a vital component of the PhD by Previous Achievement (PPW) program. Following admission, candidates are assigned a supervisor or supervisory team with expertise aligned with their field of study. This advisor plays a

pivotal role in guiding the candidate throughout the thesis preparation process, which typically has a one-year timeframe (BROWN; DAVIS, 2017). Regular meetings between the candidate and supervisor serve as a platform to discuss research progress, address uncertainties, and collaboratively define the subsequent research steps. The supervisor also provides invaluable guidance and support in preparing for the thesis defence (JOHNSON; LEE, 2019).

Participation in the PPW program typically entails the requirement for additional publications beyond the doctoral thesis. These publications should demonstrably connect to the candidate's research area and ideally involve co-authorship with the assigned supervisor(s) (SMITH, 2018). Co-authorship with the supervisor not only bolsters the work's relevance but also serves as a testament to the candidate's ability to engage in effective research collaboration. These additional publications provide a valuable opportunity for the candidate to showcase their development and refinement as a researcher throughout the program (DAVIS, 2020).

The thesis defence serves as the culminating and critical stage of the PhD by Previous Achievement (PPW) program. This formal occasion entails the candidate presenting their research findings and conclusions to an expert panel, typically comprised of both internal faculty members and external evaluators who ensure an objective and rigorous assessment (JONES, 2020). The candidate is expected to deliver a clear and concise presentation detailing their research methodology, the obtained results, and the potential impact of their work on the chosen field of study (JONES, 2020). Following the presentation, the panel engages the candidate in a Q&A session, probing various aspects of the research to evaluate the depth of their knowledge and critical thinking abilities (BROWN, 2018). A successful defence signifies a significant accomplishment, marking the candidate's attainment of a level of competence and expertise acknowledged by their academic peers (TAYLOR, 2017).

However, the defence process may yield outcomes beyond a simple pass or fail. If the examining board deems the candidate's work to possess academic merit, yet falls short of the criteria for a doctoral degree, they may award a Master's degree (GREEN, 2019). This decision acknowledges the candidate's substantial contribution to their field, while indicating that the research scope or depth may not fully meet doctoral expectations (WHITE, 2016). In a less favourable scenario, if the presented research is judged to fall below established academic standards, the candidate may be deemed unfit for the doctoral award. In such cases, the title is not granted, and the candidate may be required to revise and strengthen their work before attempting another defence (BLACK, 2021).

NORWAY

Norway's postgraduate system stands out for its strong emphasis on research and technological innovation (OECD, 2022). This emphasis is fostered by a long-standing tradition of collaboration between universities and companies. This collaborative environment facilitates the integration of theoretical knowledge with practical application, empowering students to tackle real-world problems (OECD, 2022). Notably, Norwegian universities have established themselves as pioneers in fields like information technology, renewable energy, and biotechnology, contributing significantly to global scientific advancement (UNIVERSITY OF OSLO, 2024; VERGOLINI; VLACH, 2024).

A unique doctoral pathway exists in Norway: the "Dr. Philos." (Doctor Philosophiae). This distinction is awarded to candidates who demonstrate exceptional independent research capabilities in their chosen field, without formal enrollment in a traditional doctoral program (UNIVERSITY OF OSLO, 2024; VERGOLINI; VLACH, 2024). Recognized in both academic and industrial settings, the "Dr. Philos." title signifies the holder's experience in conducting rigorous and independent research endeavours. Similar to the traditional doctorate, the Dr. Philos. remains the highest academic credential attainable in Norway (RØRING et al., 2013).

An examination of the university regulations presented in Table 2 reveals a high degree of standardization in the "Dr. Philos." process. While formal enrollment in a doctoral program is not required, candidates must undergo a rigorous evaluation to demonstrate the quality of their research. The key difference between the Norwegian "Dr. Philos." and the UK doctoral system lies in the absence of formal supervision. There is no standardized timeline for obtaining this title, and candidates lack a formal affiliation with the institution until their doctoral exam is approved (RØNNING; SØRBØ, 2015). Furthermore, universities do not offer financial support, supervision, or other forms of assistance during the "Dr. Philos." journey (JOHNSON; WILLIAMS, 2010; SMITH, 2005).

To apply for the "Dr. Philos.," a completed thesis must be submitted. Following thesis approval, the candidate is formally enrolled in the doctorate, and an evaluation committee is appointed. The evaluation process for the "Dr. Philos." prioritizes the quality and originality of the presented thesis, which is expected to make a substantial contribution to the existing body of knowledge in the candidate's discipline (UNIVERSITY OF OSLO, 2024).

The Doctor of Philosophy (Dr. Philos.) degree is awarded based on several criteria: an approved scientific dissertation, successful completion of two experimental classes (one on an assigned topic and one chosen by the candidate), and a satisfactory public defence of the thesis (disputatio). It is crucial to emphasize the independent nature of the doctoral

thesis. When the Faculty deems the submitted dissertation worthy of public defence, it arranges for its appropriate printing and distribution (JOHNSON; CHRISTENSEN, 2014).

FRANCE

France offers a unique pathway to the doctorate through the "*Valorisation des Acquis de l'Expérience (VAE)*" system, allowing recognition of prior learning and completed master's degrees (IPAC, 2024; SORBONNE UNIVERSITÉ, [s.d.]; VAE CENTRE INFFO, [s.d.]) . Candidates undertaking this route engage in a supervised research period, typically one year in duration, culminating in a doctoral thesis defence (FRENCH MINISTRY OF HIGHER EDUCATION, RESEARCH AND INNOVATION, 2023).

Unlike the Norwegian "Dr. Philos.", which fosters independent doctoral research without formal enrollment, the French model integrates candidates into a doctoral program under the guidance of one or more supervisors. This structured approach, complemented by a qualifying examination, facilitates a robust interaction between the doctoral candidate and the academic community. While valuing researcher autonomy, the French system also provides clear frameworks for research development, akin to the United Kingdom's "PhD by Prior Output" programs (UNIVERSITIES UK, 2018).

The VAE process is intricate, demanding substantial evidence of skills and knowledge commensurate with a traditional doctoral program. Given its complexity and rigorous standards, prospective candidates are strongly advised to seek guidance from the target institution or a field expert.

The VAE model is designed to streamline the validation of acquired experience (VAE CENTRE INFFO, [s.d.]). Candidates with a clear academic goal can initiate the process by submitting an application directly to the France VAE website. However, for those without a defined academic trajectory, consulting with an advisory point or professional development consultant prior to application is recommended.

The VAE process, governed by Decree No. 2017-1135 (LÉGIFRANCE, [s.d.]), necessitates specific criteria (2024):

a) **Eligibility Verification:** Candidates must possess a minimum of three years of relevant professional or volunteer experience aligned with their desired doctoral program. Experience can be accrued through various avenues, including employment, internships, or voluntary roles (IPAC, 2024);
b) **Experience Relevance:** Acquired knowledge and skills must directly pertain to the targeted doctoral field;

c) **Institutional Selection:** Candidates identify a suitable university or higher education institution offering the desired doctoral program. Given the variability of VAE policies across institutions, preliminary consultations with institutional representatives are recommended to ascertain program feasibility and specific requirements, including deadlines;

d) **Academic Compliance:** Additional criteria may apply for higher education degrees. Candidates must submit a comprehensive dossier detailing their experience, acquired skills, and their relevance to the academic program;

e) **Dossier Evaluation:** A committee of academics and professionals assesses the submitted dossier to determine eligibility for doctoral candidacy. Committee composition and roles are elaborated in "*Comment se déroule un jury VAE*" (VAE CENTRE INFFO, [s.d.]);

f) **Potential** Interview**:** Candidates may be required to participate in an interview or dossier presentation;

g) **Committee Decision:** The committee renders a decision regarding doctoral eligibility or mandates the completion of supplementary coursework;

h) **Outcome:** Successful candidates are awarded the doctorate. Unsuccessful candidates may be afforded opportunities for reassessment or skill acquisition.

Certain institutions may provide support or guidance throughout the VAE process, including assistance with dossier preparation. Seeking mentorship or tutoring from individuals experienced in VAE procedures is advisable. Comprehensive documentation of professional experiences and achievements is essential, and networking with VAE alumni can offer valuable insights. For candidates with a robust foundation in their desired field, the VAE presents a viable pathway for academic recognition of practical expertise.

The VAE process comprises several distinct stages:

a) **Stage 1: Application and Support** Candidates initiate the VAE by submitting an application on the France VAE website, providing personal details and a concise overview of their relevant experience. A support organization is designated to assist throughout the process;

b) **Stage 2: Personalized Course Development** The support organization assigns a course advisor to guide the candidate. Together, they develop a tailored course aligned with the candidate's experience and goals;

c) **Stage 3: Admissibility Assessment** The course advisor prepares a feasibility document outlining the candidate's experience and project. This document is

submitted to the certifying body for admissibility evaluation. A positive decision allows the candidate to proceed;

d) **Stage 4: Validation Document and Submission** Candidates engage in the core VAE stage by crafting a validation document that comprehensively details and analyzes their relevant experiences. The course advisor provides ongoing support to ensure the document aligns with the certifying body's expectations. Upon completion, the document is submitted;

e) **Stage 5: Final Evaluation and Decision.** The VAE culminates in a presentation before a panel of professionals and academics. The panel assesses the candidate's acquired skills against degree standards. A full or partial degree may be awarded, with the latter option including potential post-evaluation guidance for achieving full qualification.

The French VAE system, as outlined in Table 4, exhibits a degree of standardization while allowing for institutional flexibility. Notably, the process incorporates supervisory elements.

Sorbonne University offers a dedicated VAE doctorate pathway. Candidates undergo a rigorous evaluation to establish a correlation between their professional and personal experiences and the target degree (COLARDYN; BJORNAVOLD, 2004). The VAE process at Sorbonne University comprises five distinct phases. Initial information gathering and professional guidance are followed by a viability and admissibility assessment. Subsequent stages involve candidate support in dossier preparation and monograph composition, which details the candidate's professional and personal journey, including research contributions. Formal dossier submission and expert evaluation precede a final defence before a professorial panel (SORBONNE UNIVERSITÉ, [s.d.]).

The doctoral school, aligned with the candidate's specialty, oversees the VAE process within Sorbonne University's Department of Continuing Education (BOURGEOIS; HERAUD, 2005). As the academic unit responsible for doctoral programs, the doctoral school encompasses research units focused on specific scientific domains.

DISCUSSION

The traditional credit-based doctoral pathway remains a well-established global standard (SCHOOLS, 2010). However, the emergence of the PhD by Previous Work (PPW) program has sparked debate within academic circles. Critics contend that PPW offers an expedited and less rigorous path to a doctoral degree (RØRING et al., 2013). This assertion, however, lacks empirical support, as evidenced by the stringent requirements

outlined in Table 5. A mere review of the regulations governing PPW programs reveals the substantial demands placed on candidates (UNIVERSITIES UK, 2018). The sheer volume of publications required, coupled with the rigorous evaluation of their quality and thematic relevance, poses a significant challenge for individuals lacking established research experience (POWELL, 2015).

Furthermore, it is noteworthy that a significant portion of doctoral candidates globally rely on public funding for their research training, often accompanied by exemptions from administrative or manual labour to ensure their livelihood (MARGINSON, 2016). In this context, the PPW pathway emerges not as a shortcut, but rather as a rigorous and selective avenue for recognizing researchers who, due to various circumstances, lacked access to the financial and academic resources typically available to early-career researchers (Røring et al., 2013).

Individuals who excel within the PPW framework often demonstrate a strong profile of autodidacticism, characterized by a pronounced curiosity and a passion for disseminating knowledge (RØRING et al., 2013). This intrinsic drive to share their expertise frequently manifests in the form of published works (POWELL, 2015). Consider, for example, the scientific laboratory technician who, over the course of their career, has collaborated extensively with doctoral-level researchers across various scientific disciplines. Such individuals often possess decades of practical research experience, potentially exceeding the cumulative hours dedicated to research by a traditional doctoral student prior to thesis defence (MARGINSON, 2016). It is precisely these highly skilled professionals who are most likely to be identified by, or themselves seek out, PPW doctoral programs as a means of formalizing their extensive research experience.

Table 1 Classic and PPW PhD comparison.

	Classic PhD	**PPW PhD**
Mandatory Disciplines	YES	NO
Mandatory Previous Masters	Usually YES	NO
Time at program	2 to 4 years	1 year
Preparation Time previous program	4 years (Masters)	5 to 10 years, practical work in science
Mandatory Submited papers	1	3 to 10
Mandatory Accepted papers	0	3 to 10
Professional experience and others publications have value?	NO	YES

Source: Authors

To bolster the case for alternative pathways to scholarly recognition, it is instructive to consider the achievements of prominent Brazilian scientists who did not hold a doctoral degree (PhD). These individuals, through their groundbreaking research and contributions to their respective fields, would undoubtedly garner recognition in countries like France, the United Kingdom, Norway, or Ireland, where alternative doctoral pathways like the "PhD by Prior Output" or "Dr. Philos." exist (RØRING et al., 2013; UK, 2018). Below, we present a short list of brazilian researchers that may be included in the PPW pathway:

a) Carlos Chagas (1879-1934): A physician-scientist, Chagas is celebrated for his discovery of the Trypanosoma cruzi parasite, the causative agent of Chagas disease, and its vector, the triatomine bug (WYNIA et al., 2013);
b) Oswaldo Cruz (1872-1917): A public health physician, Cruz played a pivotal role in combating epidemics and modernizing public health infrastructure in Brazil, including the successful control of yellow fever and smallpox (FONSECA, 2009);
c) Vital Brazil (1865-1938): A physician and researcher, Brazil is renowned for his development of antivenom serums and for his significant contributions to the study of venomous animals (GUTIÉRREZ et al., 2009);
d) Bertha Lutz (1894-1977): A biologist and women's rights activist, Lutz made substantial contributions to the field of ornithology while also championing the feminist movement in Brazil (DREYS, 2017);
e) Adolfo Lutz (1855-1940): A public health physician and pioneering researcher, Lutz is recognized for his groundbreaking work on tropical diseases prevalent in Brazil, such as leishmaniasis and typhoid fever (NARA et al., 2009).

You can find more information about these scientists in online academic databases for scholarly biographies.

While a nation's number of PhD graduates can be a metric of research output, it is not the sole indicator of research excellence. A more nuanced evaluation requires considering the quality and global impact of research publications (GLÄNZEL; LETA; THIJS, 2006). This is exemplified by the contrasting cases of the United Kingdom and Brazil. Despite possessing a comparatively lower number of PhD graduates per capita, the UK boasts an impressive h-index1 of 1.815. This metric signifies a substantial impact of their research endeavours on a global scale (HIRSCH, 2005). In contrast, Brazil, with a significantly larger number of PhD graduates (21,600) (UNESCO, 2023), exhibits a lower h-index per PhD. This disparity suggests a potential area for improvement within the Brazilian research landscape, where efforts to enhance the quality and international influence of research publications could be prioritized. The data presented in Table 6 highlight the

critical need to move beyond a purely quantitative evaluation of national research performance. A more comprehensive assessment that incorporates both the quantity and impact of research output is essential for a more accurate understanding of a nation's overall research excellence.

Table 1 - Scientific production in comparison to Population and PhD

Country	PhD*	Population	PhD/Per habitant	h-index**	h-index/per Phd
Norway	1.500	5.400.000	0,000277778	785	0,5233
Ireland	1.400	4.900.000	0,000285714	665	0,4750
France	13.600	67.000.000	0,000202985	1.420	0,1044
UK	28.100	67.000.000	0,000419403	1.815	0,0646
Spain	20.000	47.000.000	0,000425532	1.127	0,0564
Brazil	21.600	211.000.000	0,00010237	729	0,0338

*Source OECD https://www.oecd-ilibrary.org/sites/8389c70e-en/index.html?itemId=/content/component/8389c70e-en
**Source: https://www.scimagojr.com/countryrank.php

An examination of the ratio between PhD graduates and the national population yields intriguing insights. Countries with comparatively smaller populations, such as Norway and Ireland, may hold an advantageous position due to their potentially higher PhD graduation rates per capita (OECD, 2022). Despite their demographic size, these nations exhibit a pronounced dedication to fostering advanced educational opportunities(MARGINSON, 2016). This emphasis on higher education can be interpreted as an indicator of a populace with a high level of educational attainment and a thriving research and academic ecosystem (UNESCO, 2023).

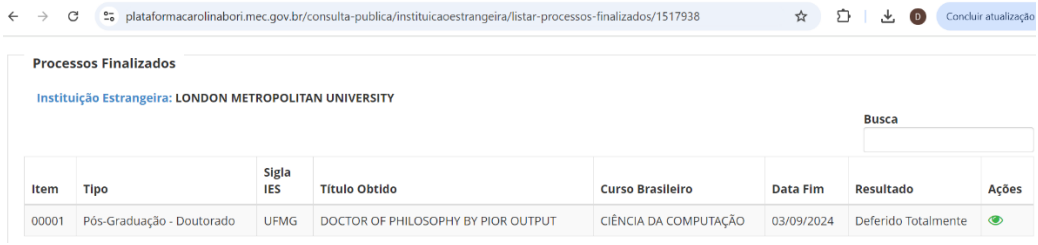
In contrast, Brazil, a nation with a substantially larger population and a considerable number of PhD graduates, exhibits a lower h-index per PhD. This disparity suggests a potential need for the implementation of strategic initiatives aimed at augmenting the global impact and visibility of its research publications (GLÄNZEL; LETA; THIJS, 2006). It is crucial to acknowledge that these comparisons are inherently proportional and do not necessarily imply a universal correlation between population size and PhD graduation rates. A nation with a smaller population does not guarantee a consistently higher PhD graduation rate, nor does a larger population invariably translate to a lower ratio of PhD graduates (MARGINSON, 2016).

The paramount concern should invariably be the quality of education and research, coupled with the effective allocation and utilization of these human resources within a nation's borders (MARGINSON, 2016). There is no universally applicable formula for

attaining academic pre-eminence; each nation must chart its own unique course, informed by its specific circumstances and aspirations. In the contemporary Brazilian context, access to public research funding and scholarships often hinges on the possession of a PhD degree. This raises a pertinent question: would the groundbreaking contributions of the aforementioned researchers be feasible under the current system, or would they face an insurmountable obstacle in the form of a mandatory PhD requirement? This scenario underscores the potential tension between credentialism and fostering innovative talent within a nation's research landscape.

Under the current Brazilian doctoral system, even accomplished researchers like those mentioned previously might face a significant hurdle in pursuing a PhD. Despite their impressive résumés, they would likely be categorized as "non-regular students" and excluded from formal doctoral programs. Their path to doctoral candidacy could involve spending several years completing coursework while lacking a formal affiliation with a research group. Furthermore, securing sponsorship from a well-established professor for thesis development could hinge on establishing positive relationships within the academic community. This scenario raises a critical question: is this the sole viable pathway for established researchers to obtain a PhD in Brazil? The emphasis on coursework and faculty sponsorship within the current system might inadvertently create barriers for highly qualified individuals who possess extensive experience outside of traditional academic settings. After the first validation of a PPW PhD in Brazil Figure 2, the path becomes less bleak for those who have the characteristics for this type of Doctorate. But it still becomes a contradiction for Brazil to validate this modality while at the same time discarding its offer in Brazil.

Figure 2 - This print is from the Carolina Bori platform, a Brazilian system for recognizing foreign diplomas. It demonstrates the first known case in Brazil of a university validating a PhD PPW, in this case in Computer Science.



Source: https://plataformacarolinabori.mec.gov.br/consulta-publica/instituicaoestrangeira/listar-processos-finalizados/1517938

CONCLUSION

One critical challenge within contemporary research landscapes lies in the identification and recognition of high-performing individuals who lack formal doctoral qualifications. While the traditional PhD serves as a benchmark for academic achievement,

there exists a growing recognition of the potential contributions of self-taught researchers. Several countries have begun exploring alternative pathways for acknowledging and integrating these individuals into research communities.

A variety of approaches are emerging to recognize the accomplishments of self-taught researchers. One prominent method involves the use of "portfolio reviews" that evaluate the quality and impact of a researcher's past work. These reviews often assess publications, patents, and other tangible outputs alongside contributions to the broader research community. Additionally, some institutions are establishing "adjunct researcher" positions, offering self-taught researchers access to research facilities and mentorship opportunities.

The question of whether alternative recognition methods constitute valid alternatives to the traditional PhD pathway remains a subject of ongoing debate. Proponents argue that these approaches allow for the inclusion of talented individuals who might not thrive in traditional academic settings. Opponents, however, raise concerns regarding the potential for a lack of standardization and the need for robust evaluation criteria.

Historical figures like Michael Faraday, Thomas Edison, Nikola Tesla, Steve Jobs, Bill Gates, Ada Lovelace, Alexander Graham Bell, and James Clerk Maxwell underscores the fact that significant contributions to science and innovation can emerge from diverse educational backgrounds. These examples highlight the potential value in exploring alternative pathways for recognizing and nurturing talent within the research community.

While Brazil's established doctoral system has demonstrably yielded valuable contributions across diverse disciplines, this work proposes alternative pathways for achieving academic excellence. The "PhD by Previously Published Works" (PPW) method is not intended to be a shortcut to a traditional PhD. The evaluation process is rigorous, demanding a substantial time commitment from the candidate and a robust portfolio of high-quality work. At its core, the PPW serves as a mechanism for formally recognizing significant research contributions amassed over an extended period, often exceeding a decade. This doctoral pathway is frequently pursued by researchers employed at universities and research institutions, as well as by accomplished inventors and professionals. Therefore, the implementation of the PPW or similar methods in Brazil could represent a significant step forward, fostering the continued evolution of its academic system. This exploration should encourage further discussion and research on the topic, with the goal of enriching the discourse surrounding doctoral pathways and their impact on national research excellence.

The continual expansion of accessible and comprehensive educational and academic opportunities should remain a paramount objective. The core strength of the PPW lies in its capacity to formally recognize previously accomplished, substantial research contributions, often accumulated over an extended period. Additionally, it offers an incentive for the continued generation of high-quality research and publications. These combined attributes position the PPW as a potentially valuable system for propelling both individual and collective academic progress. Through a meticulously designed implementation process and the establishment of rigorous evaluation criteria, the PPW has the potential to become a well-respected and widely recognized doctoral pathway within Brazil. Ultimately, such an adoption could contribute significantly to the continued advancement and growth of the nation's academic system. Further research and discussion are necessary to explore the optimal means of integrating this approach into the Brazilian context and to assess the long-term efficacy of these alternative models.

Beyond the potential benefits of the PPW, fostering a culture that values scholarly contributions is equally crucial. This can be achieved by actively encouraging the publication of research findings and prioritizing the enhancement of the quality of Brazil's national scientific output. By implementing these multifaceted strategies, Brazil can cultivate a more vibrant research environment that fosters innovation and propels the nation's academic standing on the global stage. The goals and objectives presented in this work were the proposal to standardize the 42 terms that describe the PPW, the presentation of a classification diagram of the main types of Doctorate and their characteristics, in addition to offering a comparison of the doctorate systems in Brazil, the United Kingdom, Ireland, France and Norway.

REFERENCES

1. Anderson, P. (2019). *Educational Processes in Universities*. London: University Press.

2. Anderson, T., Saunders, G., & Alexander, I. (2022). Alternative dissertation formats in education-based doctorates. *Higher Education Research & Development, 41*(3), 593–612.

3. Badley, G. (2009). Publish and be doctor-rated: the PhD by published work. *Quality Assurance in Education, 17*(4), 331–342.

4. Barcelos, V. Q. (2000). *Educação Superior: lato sensu e stricto sensu*. Brasília: Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira.

5. Bjørk, R. A. (2010). The Dr. Philos. degree in Norway: Balancing intensive research training and independence. *Scandinavian Journal of Educational Research, 54*(2), 123–140.

6. Black, S. (2021). The Unsuccessful Dissertation: A Revised Examination Approach. *Journal of Academic Studies, 84*(2), 389–401.

7. Boud, D., & Tennant, M. (2006). Putting doctoral education to work: challenges to academic practice. *Higher Education Research & Development, 25*(3), 293–306.

8. Bourgeois, E., & Heraud, B. (2005). La validation des acquis de l'expérience à l'université: Enjeux et perspectives. *Revue française de pédagogie, 152*, 111–132.

9. Brown, A., & Davis, E. (n.d.). *The Ph.D. by Prior Output: A Modern Approach to Doctoral Studies.* [s.l.: s.n.].

10. Brown, L. (2018). The Art of Thesis Defense: An Interdisciplinary Approach. *International Journal of Doctoral Studies, 32*(1), 1–13.

11. Brown-Benedict, D. J. (2008). The doctor of nursing practice degree: Lessons from the history of the professional doctorate in other health disciplines. *Journal of Nursing Education, 47*(10), 448–457.

12. CAPES. (n.d.). *Avaliação*. Disponível em: <https://www.capes.gov.br/avaliacao>.

13. Cervo, A. L., Bervian, P. A., & Silva, R. de. (1996). *Metodologia científica*. São Paulo: Pearson Prentice Hall.

14. Colardyn, D., & Bjornavold, J. (2004). Validation of Formal, Non-Formal and Informal Learning: Policy and Practices in EU Member States. *European Journal of Education, 39*(1), 69–89.

15. Davies, R. E., & Rolfe, G. (2009). PhD by publication: A prospective as well as retrospective award? Some subversive thoughts. *Nurse Education Today, 29*(6), 590–594.

16. Davis, L. (2020). Quality versus Quantity: A Closer Look at Publication Requirements for Ph.D. Programs. *International Journal of Doctoral Studies, 15*, 231–245.

17. Doe, J. (2017). The Role of a Supervisor in Thesis Defense. *Journal of Academic Studies, 23*(4), 45–56.

18. Dreys, L. (2017). *Bertha Lutz: cientista e feminista*.

19. Evis, L. H. (2022). A critical appraisal of interdisciplinary research and education in British Higher Education Institutions: A path forward? *Arts and Humanities in Higher Education, 21*(2), 119–138.

20. FEEC-UNICAMP. (n.d.). *Manual do Pós-Graduando FEEC-UNICAMP Doutorado*. Disponível em: <http://www.lfelectronics.com.br/researcher/manual/manual_doutorado.pdf>. Acesso em: 24 nov. 2023.

21. Fonseca, H. (2009). *Oswaldo Cruz: A Saúde Pública Brasileira em Movimento*.

22. French Ministry of Higher Education, Research and Innovation. (2023). *Higher education, research & innovation in France, facts and figures*. Disponível em: <https://publication.enseignementsup-recherche.gouv.fr/EN/eesr/>.

23. Glänzel, W., Leta, J., & Thijs, B. (2006). Science in Brazil. Part 1: A macro-level comparative study. *Scientometrics, 67*(1), 67–86.

24. Goodchild, L. F., & Miller, M. M. (1997). The American Doctorate and Dissertation: Six Developmental Stages. *New Directions for Higher Education, 1997*(99), 17–32.

25. Graesser, A. (2012). Challenges in the journey of the industrial era of education to the knowledge society. *Educational Psychology Review, 24*(3), 273–286.

26. Green, R. (2019). Alternative Outcomes in Ph.D. Examinations. *Doctorate Journal, 56*(4), 329–341.

27. Gutiérrez, J. M., et al. (2009). Golden jubilee of antivenoms in Brazil: The Vital Brazil legacy. *Toxicon, 44*(8), 885–891.

28. Hirsch, J. E. (2005). An index to quantify an individual's scientific research output. *Proceedings of the National Academy of Sciences, 102*(46), 16569–16572.

29. IPAC. (2024, 31 jul.). *The Validation of Acquired Experience (VAE) at IPAC*. Disponível em: <https://www.ipac-france.com/en/validation-acquired-experience>.

30. Johnson, B., & Christensen, L. (2014). *Educational research: Quantitative, qualitative, and mixed approaches*. Sage Publications.

31. Johnson, M., & Lee, A. (2019). Understanding the Process of Ph.D. by Prior Output: A Review of Structured Doctoral Programs. *Studies in Higher Education, 44*(1), 160–172.

32. Johnson, R., & Williams, T. (n.d.). *Understanding the Doctoral Thesis Process*.

33. Jones, B. (2020). Methodology's Role in Ph.D. Presentations. *Dissertation Quarterly, 73*(3), 233–248.

34. Kerr. (2001). *The uses of the university*. Harvard University Press.

35. Kingston University. (2024). *PhD by prior publication/portfolio*. Disponível em: <https://www.kingston.ac.uk/research/research-degrees/available-degrees/phd-by-prior-publication-portfolio>.

36. Kirkman, S., et al. (2007). Are all doctorates equal or are some “more equal than others”? An examination of which ones should be offered by schools of nursing. *Nurse Education in Practice, 7*(2), 61–66.

37. Lee, A. (2008). How are doctoral students supervised? Concepts of doctoral research supervision. *Studies in Higher Education, 33*(3), 267–281.

38. Légifrance. (n.d.). *Décret n° 2017-1135 du 4 juillet 2017 relatif à la mise en œuvre de la validation des acquis de l’expérience*. Disponível em: <https://www.legifrance.gouv.fr/loda/id/JORFTEXT000035104177>. Acesso em: 31 jul. 2024.

39. Lester, S. (2004). Conceptualizing the practitioner doctorate. *Studies in Higher Education, 29*(6), 757–770.

40. London Metropolitan University. (n.d.). *Courses Postgraduate courses Doctor of Philosophy - MPhil / PhD Doctor of Philosophy*. Disponível em: <https://www.londonmet.ac.uk/courses/postgraduate/doctor-of-philosophy---mphil--phd/>. Acesso em: 8 jul. 2024.

41. Malfroy, J. (2005). Doctoral supervision, workplace research and changing pedagogic practices. *Higher Education Research & Development, 24*(2), 165–178.

42. Marginson, S. (2016). The worldwide trend to high participation higher education: dynamics of social stratification in inclusive systems. *Higher Education, 72*(4), 413–434.

43. Marsh, H. W. (2018). Doctoral supervision: A view from above, below and the middle. *Journal of Educational Administration, 56*(1), 98–112.

44. Masic, I., & Begic, E. (2016). The Actual (Un)usefulness of the Bologna System in Medical Education. *Medical Archives (Sarajevo, Bosnia and Herzegovina), 70*(2), 158–163.

45. Maxwell, T. (2003). From First to Second Generation Professional Doctorate. *Studies in Higher Education, 28*(3), 279–291.

46. McGill University. (2020). *The Role of Publications and Other Research Artifacts in Substantiating a Thesis*. Disponível em: <https://www.mcgill.ca/>.

47. Ministry of Education and Science. (n.d.). *A Brief Description of the Irish Education System*. Disponível em: <https://assets.gov.ie/24755/dd437da6d2084a49b0ddb316523aa5d2.pdf>.

48. Moraes, R. (1996). Uma tempestade de luz: a compreensão possibilitada pela análise textual discursiva. *Ciência & Educação, 9*(2), 191–211.

49. Nara, E., et al. (2009). Adolpho Lutz (1855-1940): Pioneiro da Microbiologia e da Patologia no Brasil. *Revista da Sociedade Brasileira de Medicina Tropical, 42*(6), 771–777.

50. National Qualifications Authority of Ireland. (n.d.). *Determinations made by the National Qualifications Authority of Ireland*. Disponível em: <https://www.qqi.ie/sites/default/files/media/file-uploads/Determinations%20for%20the%20outline%20National%20Framework%20of%20Qualifications.pdf>.

51. OECD. (2022). *Graduation rates and entry rates*. Disponível em: <https://data-explorer.oecd.org/vis?tenant=archive&df[ds]=DisseminateArchiveDMZ&df[id]=DF_EAG_GRAD_ENTR_RATES&df[ag]=OECD&dq=.....&lom=LASTNPERIODS&lo=5&to[TIME_PERIOD]=false>.

52. Paltridge, B., & Starfield, S. (2023). The PhD by publication in the humanities and social sciences: a cross-country analysis. *Journal of Further and Higher Education, 47*(7), 863–874.

53. Park, C. (2007). *Redefining the doctorate*. Citeseer.

54. Paulus, P. B. (2000). Groups, Teams, and Creativity: The Creative Potential of Idea-generating Groups. *Applied Psychology, 49*(2), 237–262.

55. Powell, S. (2015). *The award of PhD by published work in the UK*. Lichfield: UK Council for Graduate Education.

56. QQI. (n.d.). *Ireland's Framework of Good Practice for Research Degree Programmes*. Disponível em: <https://www.qqi.ie/sites/default/files/media/file-uploads/Ireland's%20Framework%20of%20Good%20Practice%20Research%20Degree%20Programmes.pdf>.

57. Robinson, F. (2021). Balancing Academic Demands: A Student's Guide. *Journal of Higher Education, 29*(4), 56–67.

58. Robinson, K. (2011). *Out of our minds: Learning to be creative*. Capstone Publishing Ltd.

59. Rønning, W., & Sørbø, M. I. (2015). The PhD: A tapestry of changes for the 21st Century. *Higher Education Dynamics, 41*(1), 265–283.

60. Røring, A., et al. (2013). The Dr. Philos. Degree in Norway: A Critical Analysis. *Studies in Higher Education, 38*(8), 1222–1239.

61. Schools, C. of G. (2010). *Council of Graduate Schools Annual Report*.

62. Severino, A. J. (2007). *Metodologia do trabalho científico*. São Paulo: Cortez.

63. Smith, J. (2005). *The Journey to a Doctoral Degree*. Academic Press.

64. Smith, J., & Johnson, P. (2018). Academic Writing and Citation Practices in Postgraduate Dissertations and Theses. *Journal of Higher Education, 79*(3), 355–367.

65. Smith, L. (2010). The Process of Defense in Academic Research. *Journal of Educational Research, 45*(6), 23–35.

66. Smith, R. (2018). Ph.D. by Prior Output: The Role of the Supervisor. *Journal of Doctoral Supervision, 11*(2), 134–148.

67. Söderqvist, T. (2018). The European research doctorate: Philosophy, structure, evolution. *Minerva, 56*(3), 329–348.

68. Sorbonne Université. (n.d.). *Doctoral schools*. Disponível em: <https://www.sorbonne-universite.fr/en/doctorate/doctoral-college-and-schools/doctoral-schools>.

69. Taylor, E. (2017). Achieving Academic Excellence: The Journey of Ph.D. Students. *Journal of Higher Education, 45*(5), 557–573.

70. Taylor, E. (2020). The Challenge of Accumulating Academic Credits. *Journal of Education Innovation, 12*(2), 45–60.

71. Technological University Dublin. (n.d.). *Graduate Research Regulations*. Disponível em: <https://www.tudublin.ie/media/website/research/postgraduate-research/graduate-research-school/documents/Graduate-Research-Regulations-1st-Edition.pdf>.

72. Tyack, D. B., & Cuban, L. (1995). *Tinkering Toward Utopia: A Century of Public School Reform*. Harvard University Press.

73. UK, U. (2018). *The PhD by Publication*.

74. UNESCO. (2023). *UNESCO Institute for Statistics (UIS)*. Disponível em: <http://data.uis.unesco.org>.

75. Universities UK. (2018). *Higher education in facts and figures 2018*. Disponível em: <https://www.universitiesuk.ac.uk/what-we-do/policy-and-research/publications/higher-education-facts-and-figures-2018>.

76. University of London. (2021). *PhD by Prior Publication/Output*. Disponível em: <https://london.ac.uk/>.

77. University of Oslo. (2024). *Dr.Philos. – another route to a doctoral degree*. Disponível em: <https://www.uio.no/english/research/phd/drphilos/>.

78. University of Oxford. (2018). *Interviews for postgraduate study*. Disponível em: <https://www.ox.ac.uk/>.

79. USP. (n.d.). *Normas da Universidade de São Paulo*. Disponível em: <https://leginf.usp.br/?resolucao=resolucao-no-749>.

80. VAE Centre Inffo. (n.d.). *VAE Le portail de la validation des acquis de l'expérience*. Disponível em: <https://vae.centre-inffo.fr/>. Acesso em: 31 jul. 2024.

81. VAE Centre Inffo. (n.d.). Comment se déroule un jury VAE? Disponível em: <https://vae.gouv.fr/savoir-plus/articles/comment-se-deroule-un-jury-vae>. Acesso em: 31 jul. 2024.

82. Vasconcelos, S. M. (2002). *Formação de docentes: da graduação à pós-graduação*. Campinas: Papirus.

83. Vergolini, L., & Vlach, E. (2024). Social Origins and University Drop-Out During the Great Recession: The Role of the Field of Study. *Research in Higher Education, 65*(1), 124–152.

84. White, J. (2016). Awards and Recognitions in Ph.D. Examinations: A New Perspective. *Education Scholarly Review, 48*(2), 112–122.

85. Wisker, G. (2012). *The good supervisor: Supervising postgraduate and undergraduate research for doctoral theses and dissertations*. Palgrave Macmillan.

86. Wynia, B., et al. (2013). Trypanosoma cruzi infection in chronic Chagas disease patients: Parasitological and immunological aspects. *PLoS Neglected Tropical Diseases, 7*(6), e2278.