

REVIEW OF RESEARCH PUBLICATIONS ON POSTDOCTORAL RESEARCH FELLOWSHIP: IMPLICATIONS FOR AFRICAN INSTITUTIONS

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ABSTRACT

The recent surge in global knowledge production has attracted focus on postdoctoral research fellowship in developed countries, leaving this group of African academics in the shadows. This article reported the results of a systematic review of research of postdoctoral research fellowship. The database of this review comprised 44 mixed sources located via a systematic method. The social justice theory was adopted to analyse and interpret the findings. The analysis of data relied on the use of descriptive statistics and graphing techniques. The review found literature published predominantly in European and Anglo-American societies, affirming the emerging status of the African society in the contribution to global knowledge production. Recommendations were made for funding research activities, curbing brain drain and increasing research output in Africa. The study highlighted milestones of progress along topics, methodologies and “blind spots” for future research practice and appraises evidence based decision making by policy makers.

Key words: research review, postdoctoral research fellowship, social justice, Africa, systematic review

INTRODUCTION

There has been a surge in global knowledge production in recent years (Hallinger 2017), which has attracted focus on postdoctoral research fellowship. Nonetheless, the geographic distribution of global knowledge in this critical domain is uneven. Historically, postdoctoral research fellowship has been known to be a European academic practice for a long time and later adopted by the United States of America (USA) (Lembani et al. 2016). Meanwhile the disciplines of psychology, engineering and biological sciences have used postdoctoral research fellowship (PDRF) as a form of strengthening and advancing training beyond graduate level (Williams, Sayegh, and Sherer 2018). Today PDRF has been adopted in almost every discipline to an extent that Silberbogen et al. (2018) emphasise that it is increasingly becoming a requirement for acquiring a permanent position in academia or as a scientist.

Indeed, although PDRF remains within an evolutionary phase (Bodin et al. 2018), it has

evolved over the years to become more global in nature (Self et al. 2018). Such developments have, and are, coinciding with a fast globalising society (Lee 2013). The rise and spread of the knowledge economy in developing regions has influenced hegemony of contemporary knowledge production, putting increased pressure on all societies to succumb to global values, products and services (Sawyer 2004). The field of knowledge production has realised an increased focus on PDRF as a platform for specialisation, marketability and competency for entry into practice (McQuaid, Aosved, and Belanger 2018). PDRF is increasingly considered as a means to concentrate on knowledge production to compete in the global market. However, literature indicates that PDRF constitutes the most vulnerable group in academia.

As an aid to advance PDRF in Africa we sought to conduct a systematic review of research, as literature has shown that this promising new field has not been thoroughly investigated. Currently there is dearth of systematic literature reviews in PDRF in Africa. The review was designed to capture international studies on the phenomenon and deduce how it can benefit the betterment of the field on the African continent. Dearth in PDRF research literature limits recommendations about best practices and methods (Self et al. 2018) that enrich insights into PDRF experiences essential for the future of higher education. Research review of the broader PDRF domain has the potential to yield some principles that may be helpful to African universities and other developing regions, hence this systematic research review (SRR). Utilising the topographical analysis, the review aimed at ascertaining the current state of field of PDRF and synthesise the divergent studies. The following questions guided this review:

1. What is the volume postdoctoral research fellowship research?
2. What is the pattern of distribution of knowledge production across societies and journals?
3. What are the characteristics of PDRF in terms of topics and methodology?
4. What are the implications to PDRF in African universities?

The rationale of this review of PDRF literature is grounded in the concept that research is a global product (Black and Stephan 2010). We begin this review by explaining the social justice as a theory and conceptual framework. Next, we present the methods used to identify sources included in this review, data extraction and analysis. Thereafter we present the findings of the SRR that have explored PDRF research. This is followed by discussion of findings, limitations, implications and conclusion.

THEORETICAL FRAMEWORK

This review adopted social justice as the theoretical framework, based on the premise that its

main focus is reducing inequalities, making society fairer (Bright 2015), endeavours for full and equal participation of all in a society mutually shaped to meet their needs (Francis and Le Roux 2011). The notion of addressing individual needs implies treating other people to what they are entitled. The concept of identity emerges; individuals come to PDRF with diversity based on nationality, social class, race, ethnicity, language and culture. These factors shape and influence how they develop independent research skills. Similarly, their personal and academic experiences influence their transition to their academic career. This view of identity affects an individual's effort in navigating the way forward and at the same time deals with structural constraints and unexpected opportunities. Social justice goes to the heart of injustices and oppression which is in the hands of established power hierarchies, and focuses on how unjust practices shape the experiences of their victims.

METHODOLOGY

Many times, the SRR is contrasted with traditional literature review because it is objective, replicable, systematic and comprehensive, and it uses the same reporting manner as the empirical research (Parris and Peachey 2013). The current SRR explored PDRF research studies with the aim to guide African empirical researchers by identifying areas where there is insufficient research. If conducted and reported appropriately (Klassen, Jadad, and Moher 1998), SRR provide knowledge about milestones of progress and point to a way forward as to productive conceptualisations, topics and methodologies for further research by identifying “intellectual dry wells” as well as “blind spots” (Hallinger 2013). In summary, reviews of research scholarly enhance empirical and theoretical contributions to knowledge production (Garrard 2017). More importantly, research reviews serve as a crucial resource for evidence based decision making to researchers, practitioners and policy makers (Garrard 2017). In other words, research reviews lay beacons on the path of knowledge production (Hallinger 2013). Thus, this review relied on an extensive electronic search of relevant databases with the goal of making sure all studies on PDRF were identified, and ensuring that the literature was pertinent to our research questions. We explain the identification of sources, data extraction, and data analysis.

IDENTIFICATION OF SOURCES

Previous studies have confirmed Africa is an emerging contributor to global knowledge economy (Hallinger 2017; Moyo 2019; Nkomo and Ngambi 2009). Indeed, it emerged during our initial search of the African continent that the topography of PDRF research was unevenly distributed; it was predominantly outside Africa. Since the aim was to evaluate the current state

of field of PDRF, and refine possible future trends, we extended the search to the globe – where knowledge production takes place.

An unbounded search for English-language peer reviewed journal publications, book chapters and conference publications began, irrespective of publication dates. The search identified one peer reviewed journal article in South Africa. Considering the aim of this review and the magnitude of its contribution to the knowledge economy, we decided to extend the search to the globe, more especially that: (1) knowledge production is global, (2) Africa as an emerging literature needs to stand on the shoulders of established knowledge bases, (3) what is in the global knowledge economy has implications to upcoming scholars. Hence, the search was extended to the globe.

Sources that met the criteria: (1) peer reviewed English-language, (2) conference publications, (3) book chapters, (4) available full text related to PDRF, (5) discuss PDRF as the main topic were downloaded and saved. Topics and abstracts were then analysed to verify suitability. Search engines and databases were repeatedly searched, leading to duplicates which were deleted after reviewing topics and abstracts. References of downloaded studies were further examined for related or potential articles meeting the inclusion criteria. Studies were screened against the inclusion criteria. The screening criteria required that we set a cut-off date from 2005 to 2018. Excluded studies were journalistic, book reviews, opinion, editorial and mostly written by PDRFs but not examining PDRF as the main topic and did not meet the criteria in the abstract, results or discussion. Additional studies meeting the inclusion criteria were identified upon examining biographies of resources and references.

SAMPLE

A mixed source type of 44 studies formed the database of this SRR. In all a total of 74 studies were retrieved using the search terms as outlined above in the inclusion and exclusion criteria. Five appropriate studies were identified through the secondary search, using biographies and references. After duplicates and excluded sources were deleted, a total of 44 studies remained, meeting the inclusion criteria. Hence the final sample consisted of 41 peer reviewed articles, one conference publication and two book chapters.

DATA EXTRACTION

The extracted sources (44) were stored on a Microsoft Excel spreadsheet according to; (1) name of author, (2) year, (3) topic, (4) type (conceptual/commentary, empirical review), (5) methodology (quantitative, qualitative, mixed methods), (6) research design, (7) data analysis, (8) aim, (9) major findings. Studies were coded (Gough 2007) to allow for subsequent

quantitative analysis (Hallinger 2017).

DATA ANALYSIS

Descriptive statistics were used to analyse the data (Hallinger 2017). Graphs were used to emphasise the trends within the PDRF research. The aims of data analysis were to deduce the characteristics of knowledge production and identify modal trends in the domain of PDRF. More importantly, the trends were related to the African society and infer the implications of African universities in the “invisible” yet a substantial constituency in research focused universities (Baral et al. 2018). In addition, the identified trends were compared to earlier reviews and literature.

RESULTS

Overall, the database of this review highlights that PDRF research has been conducted more in developed countries such as USA, UK, Canada, Australia, Spain, Germany, Sweden and of course only one in South Africa, across different disciplines, contexts and themes. Our database consisted of 44 studies conducted in quantitative, qualitative and mixed method methodologies. The following discussion of results is organised around the big picture of knowledge production in PDRF, composition of literature and research topics.

The big picture of knowledge production in PDRF

As we analysed the studies by year of publication, it emerged that the highest number of publications were primarily recent (see Figure 1). The largest volume of publications (20%) was realised in 2018, yet the year is not yet complete. It is notable that the second highest number of publications was realised in 2010 (14%), followed by 2015 (11%), 2014 (9%), 2005, 2013 and 2015 (7%) respectively. The lowest was in 2011 and 2012 and nothing was identified for 2006 and 2017.

These trends confirm reports dominating the PDRF research that historically PDRF research has been “invisible” although they contribute substantially to knowledge production in universities (Baral et al. 2018; Lee 2013; Ghaffarzadegan, Hawley, and Desai 2014; Van der Weijden 2016). Although it is beyond the scope of this article to analyse factors leading to the increase of PDRF research studies in 2018, the reason could be the spread of PDRF to other disciplines, other than medicine and the health sciences, where it originated.

Furthermore, our sample illustrated that eight out of the 41 articles were published in a range of journals from general education, review and primarily in health and biomedical science journals.

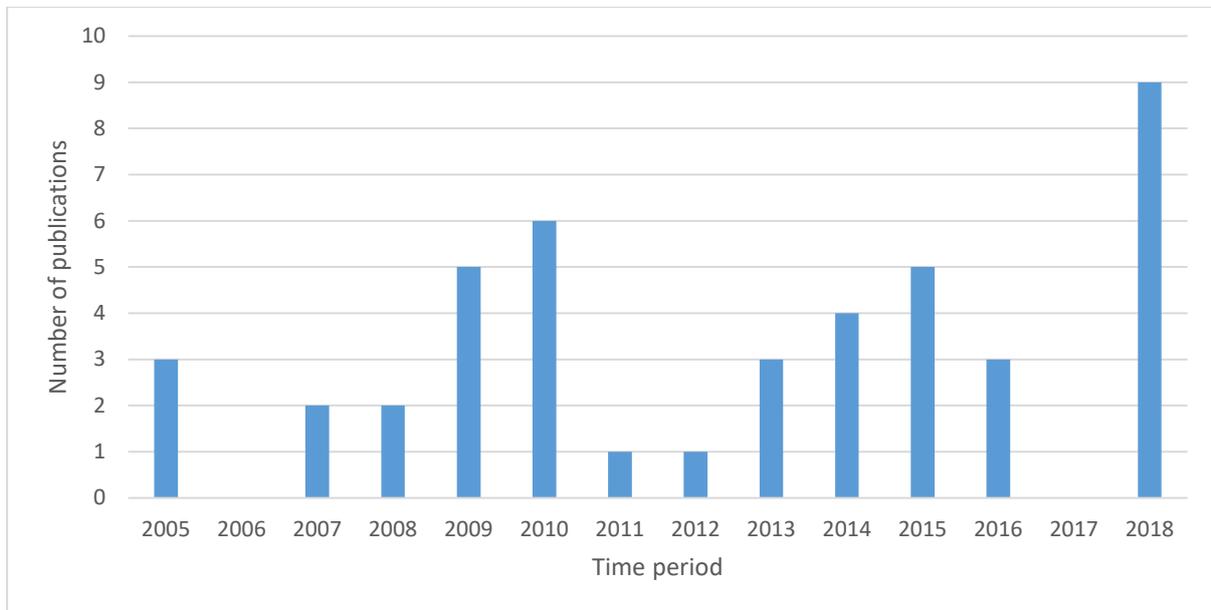


Figure 1: Pattern of PDRF research

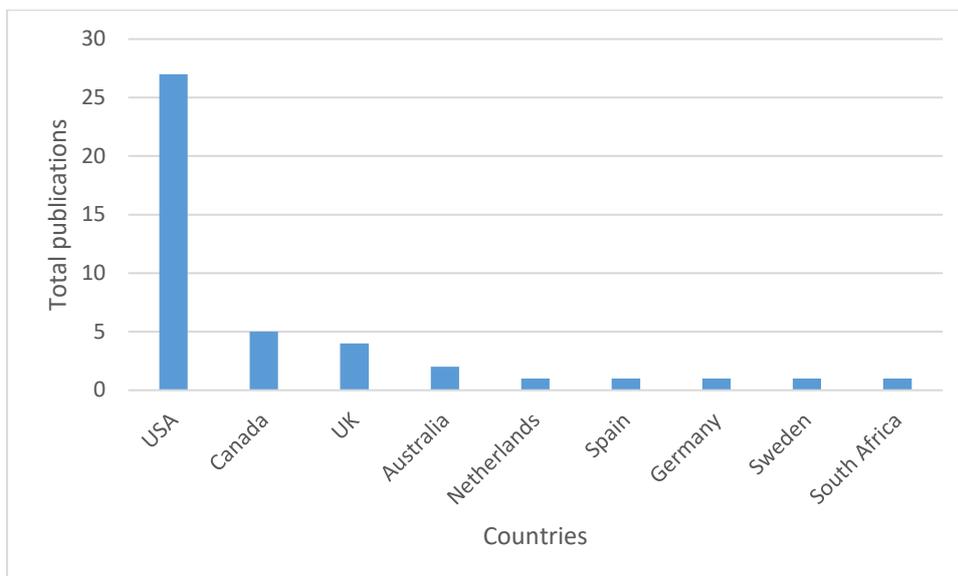


Figure 2: Distribution of publications by countries

The highest number of studies was published in *Training and Educational Psychology*, the health sciences journals – 43 per cent, followed by general education with 11 per cent. Nonetheless, surfacing of publications in humanities journals for example *Higher Education*, *Higher Education Research and Development*, point to variable disciplines.

Composition of literature

The 44 studies making up the sample of this review were further categorised into three types of papers, that is; (1) empirical, (2) Conceptual/commentary, (3) research review. Although these

types of studies contribute to the knowledge economy, how they are distributed across within domains or societies reflects different priorities and research capacity (Hallinger 2017). The results of assigning studies into the three categories yielded the following; 24 (54%) studies were classified as empirical, 10 (23%) conceptual/commentary and 10 (23%) as research reviews. Within the subset of 24 empirical studies, 12 (50%) used the quantitative methods, 7 (29%) qualitative methods and 5 (21%) mixed methods.

A closer analysis of the database, according to countries, showed that the majority of publications -27 (62%) – were conducted in the USA followed by Canada with 5 (11%), UK 4 (10%), Australia 3(7%), Netherlands 1 (2%), Spain 1 (2%), Germany 1 (2%), Sweden 1 (2%) and South Africa 1 (2%).

In contrast, European and Anglo-American societies have demonstrated more capacity to produce knowledge in the PDRF domain than developing societies. Nonetheless, these findings provide a starting point for practice and provide evidence for scholars and policy makers looking for possibilities of increasing knowledge production and finding a way forward in Africa.

Research topics

The 44 publications were classified according to topics. The analysis revealed six broad categories of topics. Each study was assigned to a single category. The overall count of the topics is as follows: purpose and function of PDRF (6 studies), benefits and opportunities (9 studies), development of skills and career opportunities (8 studies), funding and support (5 studies), gender issues (5 studies) and challenges (12 studies).

Purpose and function of PDRF

Six studies examined the roles and responsibilities of PDRF. These scholars focused on the purpose of PDRF, for instance Akerlind (2005) employed mixed methods in examining the roles, functions and career prospects of PDRFs. The field of Health Services Psychology received prominent attention, scholars seeking to gain insight into the pros and cons of PDRF, (Silberbogen et al. 2018), purpose of PDRFs (McQuaid and McCutcheon, 2018), recruitment and selection of PDRFs (Bodin et al. 2018). Lembani et al. (2016) investigated the usefulness of PDRF approach for capacity building in health policy and systems research, while Williams et al. (2018) explored the promotion of scholarly training in a clinical psychology PDRF. These studies have offered insight into the definition, purpose and function of PDRF. All the studies were focused on the health field except Akerlind (2005) who did not identify the speciality area. These studies have provided a guiding framework in terms of what the PDRFs should do.

Benefits and opportunities

A number of studies (nine) showed interest in unearthing the benefits and opportunities of PDRF. Cantwell and Taylor (2013) focused on the demand of international PDRFs in the UK and the USA while Su (2009) looked at how PDRF and departmental prestige shape scientists' productivity. They developed a model for assessing national and institutional variables that are likely to shape employment of international PDRFs. Stephan, Franzoni, and Scellato (2016) analysed global competition for scientific talent through a survey of research scientists in 16 countries. Their aim was to establish decisions of PDRFs prioritising the USA versus another country. Leea et al. (2010) evaluated the impact of PDRFs' mobility on research output and Streatfield, Allen, and Wilson (2010) investigated information literacy to PDRFs. Akerlind (2009) used mixed methods to ascertain PDRF as preparation for an academic career. Davis (2005) study relied on quantitative methods to examine ways of improving the PDRF experience. There was also interest to research the role of research in PDRF and how PDRFs navigated complexities of academic work (Mcquaid, Aosved, and Belanger 2018; Williams et al. 2018). This body of studies has not specified particular areas except Mcquaid, Aosved, and Belanger (2018) who focused on clinical psychology. Otherwise, these studies are useful in planning PDRF programmes across a variety of disciplines.

Development of skills and career prospects

Eight studies in our database explored skills development and career prospects in PDRF. This group of studies investigated career satisfaction of PDRFs in relation to their future expectations (Van der Weijden et al. 2016), influence of personality on career management style and preference (Blackford 2010), effects of PDRF mobility on academic performance (Zubieta 2009), usefulness of PDRF in preparation for specialisation in mental health (Stacy, Klee, and Jansen 2018). Another study, through mixed method, summarises research and professional activities for onsite PDRFs in small business enterprises (Renner and Ayers 2014). A review study by Self et al. (2018) maps the challenges and state of the field of PDRF, while Yang and Webber (2015) examined whether PDRF contributed to academics' careers and earnings 10 years later. Ghaffarzagdegan et al. (2014) documented the success of USA in research production. They described a model that can be used to analyse the flow of national and international researchers in and out of PDRF. These studies have critical implications for policy development and practice in African universities.

Funding and support

Five studies typically examined funding and support in PDRF, for instance, comparison of

funding of PDRF in China and USA (Ahmed et al. 2015), impact of support on PDRF activities to prepare for academic careers (Chen, McAlpine, and Amundsen 2015), impact of PDRF grants on scientific productivity (Dolan and Johnson 2009; Jacob and Lefgren 2011; Robertson, Klingensmith, and Copersmith 2007). Although the least number of studies in our database examined the topic of funding and support, scholars have proved predictions that can be used to develop possible future trends. These studies have assumed greater importance in making the transition to academic career a success.

Challenges

The most prevalent studies focused on the challenges of PDRF. Five studies explored the challenges in the context of internationalisation; role of foreign PDRFs in knowledge production (Black and Stephan 2010), the false halo of internationalisation – exploitation of foreign scholars (Lee 2013), unionisation of PDRF – breaking the silence (Camacho and Rhoads 2015), analysis of the dark side of mobility (Cantwell and Lee 2010; Göran 2005). Muller and Kenney (2014) utilised qualitative methodologies to critically discuss and address issues related to the politics in life science PDRF. Baral et al. (2018) study also used qualitative methods to raise awareness about the need of the neglected community of PDRFs. Muhammad's (2008) conceptual study analysed challenges ranging from preparedness of institutions to support the transition, structural support, institutional professional development and leadership programmes. In addition, scholars provide an overview of PDRF and recommend possible ways of navigating the complexities, especially of more structural barriers (McAlpine and Amundsen 2015; Mendoza et al. 2013). The studies in this category have offered insights into the impediments of PDRF and have important implications to nurture the transition to ensure success in Africa as a developing society.

Gender issues

Few scholars demonstrated interest in studying gender issues, although these were less than expected; exploring impact of gender on scientific output (Bernd and Ute 2012; Borrego et al. 2010), dilemmas faced by female PDRFs and ways to retain them (Paravina et al. 2010) and gender and perceived family support are linked to job satisfaction (Moors, Malley, and Stewart 2014). Indeed, these studies predominantly analysed barriers experienced by female PDRFs. Nevertheless, a research review is necessary to update trends of access by female scholars to PDRF which has implications for policy and practice. Furthermore, while the use of quantitative methods in this body of studies increases generalizability, qualitative methods could, through their conceptual framework, practice of data collection and data analysis, offer possible

approaches for discovering and synthesising social life and individuals who live it.

INTERPRETATION OF FINDINGS

It came as a surprise in this review that only one study has been conducted on PDRF in Africa and from South Africa. Clearly, this is an indication that this group of academics is still ignored in Africa. The majority of studies included in this review are widely dispersed in North America, Europe and Australian continents. The studies were largely visible from 2005, suggesting that the PDRF community has long been neglected. The trend also confirms Africa as an emerging contributor to the global knowledge economy (Hallinger 2017). This review is timely as the current debate on African context originated knowledge production gains prominence.

It is also worth noting that the studies were unevenly distributed across Europe and Anglo-American societies. The USA topped the list with 62 per cent followed by Canada 11 per cent, UK 9 per cent, Australia 7 per cent, and Netherlands, Spain, Germany, Sweden and South Africa with a single study each respectively. The reason for the lack of literature on PDRF in Africa could be that academics which migrate to developed countries write about destination countries and ignore where they come from. Hence, the USA has taken the global lead in research production. However, there is a lot to learn for research based decision makers in Africa as an emerging economy in relation to organisation and funding.

The PDRF literature reviewed in this study were predominantly quantitative. The studies relied more on survey research designs and multivariate statistical tests. The predominant use of quantitative methods in PDRF research limits opportunities for giving voice to the voiceless. In the eyes of social justice, PDRFs are marginalised. Only a few others used descriptive and correctional statistical tests. The mixed methods studies used focus groups and in-depth interviews to obtain data. One other study used personal narratives of PDRF authors. On the other hand, the non-empirical studies were dominated by commentary papers. The use of more empirical research within the qualitative methods in future research could enhance in-depth understanding of the dynamics of PDRF.

Further, this review identified several topics upon which future systematic reviews can be undertaken. Country level reviews for instance in the USA, where a large body of knowledge production was documented. The PDRF must be examined in other disciplines other than health and the sciences. Equally important, it is critical that reviews be conducted on structural factors for instance supervision, management and recruitment of PDRFs, as it contributes to their purpose and wellbeing. It might be difficult to implement policies and procedures when there is no clear definition.

DISCUSSION OF THE FINDINGS

Scholars have realised the need to give attention to the field of PDRF to offer alternative approaches to smooth the transition to independent research (PDRF to academic career). The current systematic research review was conducted to address the dearth of prior endeavours to report and synthesise literature on PDRF. Lack of data and research on PDRF research promotes and propagates stereotypes that can continuously be sustained and go unchallenged. Akerlind (2009) reports that this limits supervisors' mentoring on career possibilities and PDRFs are not supported on making informed career decisions.

LIMITATIONS

Firstly, the search process was limited to a mixed source of 44 peer reviewed journal articles, conference papers and book chapters published in English-language publication outlets. Thus, this review did not include dissertations, because they are not peer reviewed. Given that the included publications were located from European and Anglo-American societies, it is possible that publications in other languages from non-English speaking societies were left out. Therefore, the findings of this review may not be representative of the full literature. However, the current review relied on a systematic search criteria to an extent that the database was presumably indicative of the PDRF research literature as a whole. Secondly, the database comprised of studies predominantly conducted in developed countries and mainly in the health and sciences disciplines. Transferability to developing regions, as well as other disciplines for instance social sciences and humanities, may be contextually affected. Thirdly, the review did not strive to analyse the findings established in the included studies, rather its purpose was to lay a foundation for future research in PDRF in Africa by mapping out the current state of the discipline, knowledge that could be useful to future and further research as well as policy and practice. Fourthly, although this review relied on a systematic search criteria to identify sources, no search method claims to absolutely capture all literature. It is possible that some sources were omitted, especially that our initial aim was to identify African originated publications. We failed to identify the sources until the search was extended to the globe. Nonetheless, scholars who are going to further this research may be able to surface the missing sources. Further empirical research in Africa is warranted as well as reviews on French and Arab languages.

IMPLICATIONS

The primary audience for this review of research are the scholars focusing not only indigenisation of knowledge production in Africa, but who intend to increase the continent's

contribution to the global knowledge economy as well as other developing regions of the globe. More importantly, this review coincides with the ongoing debate on supervision for social justice. The first of the several intriguing implications for directions for future research emerged from the unavailability of publications on PDRF in Africa, highlighting the need for researchers to empirically investigate the causes of this trend. In addition, future research reviews should include master theses, doctoral dissertations, technical reports, and books as this comprises a substantial portion of African literature.

Secondly, it is surprising that a surge of African PDRFs has been documented in developed countries (see for example Black and Stephan 2010; Camacho and Rhoads 2015; Cantwell and Lee 2010; Göran 2005; Lee 2013). Also, it is worth noting that the recent world university rankings have pushed institutions to prioritise research publication (Hallinger 2017). The authors pose these questions: does it mean that all African PDRFs have migrated to developed countries? If no, where are they? If yes, what can be done to retain Africa's talent? Does it mean that host countries are benefiting from the international talent of PDRFs? Gaining more insights into this feature may offer new avenues and possibilities of more productive policies applicable to African institutions that have remained invisible in the global knowledge economy.

The third implication flows from the dominance of European and Anglo-American nations in the discipline of PDRF. African scholars should conduct comparative research reviews and follow recommended directions of future and further research. Topics like funding, development of skills, career prospects and barriers need to be studied in-depth to guide institutions on how the PDRF can be used to enhance knowledge production. Where possible, publications in other languages should be included (Walker and Hallinger 2015). Similarly, this review suggests the adoption of ideas from developed countries to enrich their own.

Another implication for research emerging from this review is the unclear purpose of PDRF (see for example Akerlind 2005; Bodin et al. 2018; Silberbogen et al. 2018). They suggest the possible disregard of PDRFs. Through the lens of social justice, capacity development and the provision of infrastructure, financial support, appropriate mentorship, clear expectations pertaining to research competency development and output (McQuaid, Aosved, and Belanger 2018) may yield visibility of PDRFs. Understanding their purpose and experiences helps to address systematic constraints and pace up with the changing organisational patterns. Additionally, given the fast pace of mobility of workers, this review suggests a critical inquiry on potential unequal treatment of PDRFs. Empirical research should look into the best practices for implementing successful PDRF, and indeed, minimise impediments. Such research may inform governments and other organisations of the need to

invest in PDRF funding, as this is likely to be the main factor pushing PDRFs to resourced institutions.

The use of complementary methods (mixed methods) is critical; it adds value as it draws from both domains of quantitative and qualitative approaches. Over reliance on quantitative methods limits the in-depth mining of the hidden voices, as a number of scholars have attested to the fact that PDRFs are powerless, invisible, inferior, marginalised and prone to labour exploitation. The use of qualitative methods to examine gender issues is timely as it coincides with the heightened quest to eradicate gender inequalities. Such efforts will accelerate the current debate on supervision for social justice and provide perspectives to make impactful contributions to the global knowledge economy. Regional comparison reviews will provide further guidance and direction.

CONCLUSION

This review has provided groundwork upon which to explore new terrains. It has offered directions to guide future and further research in PDRF in Africa as well as policy and practice. The African society needs to adopt ideas from developed nations, and ground them in the capacity of their own resources, to crack the global knowledge economy. As we conducted this review, we were prompted to compare trends between the developed world and the developing society. Hence, although this review was based on European and Anglo-American literature, predominantly in health and sciences, the findings are valid for other nations and different disciplines. It is our hope that African scholars will embark on efforts to unearth the trends in the forgotten PDRF in future.

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