Synthesis Report

Towards African Collaborative Doctoral Programmes

Prepared by

Human Sciences Research Council

Samuel Fongwa, Angelique Wildschut, Thierry M. Luescher and Zama Mthombeni

December 2022

Table of Contents

Acronyms and abbreviations

AAU	Association of African Universities
ACG	African Collaboration Grant (Stellenbosch University)
AHRC	Arts and Humanities Research Council (UK)
AOSTI	African Observatory of Science, Technology and Innovation
ARUA	African Research Universities Alliance
ASEAN	Association of South-East Asian Nations
AU	African Union
BMBF	Germany Federal Ministry of Education and Research
BMD	Bachelors-Master's-Doctorate
BRICS	Brazil, Russia, India, China, South Africa
CAHEA	Central Asian Higher Education Area
CAMES	Conseil Africain et Malagache pour l'Enseignement Supérieur
CCA	Centre for Collaboration in Africa (Stellenbosch University)
CGPA	Cumulative grade point average
COE	Centre of Excellence (ARUA)
DAAD	German Academic Exchange Service
DOC-CAREERS II	Promoting Collaborative Doctoral Education for Enhanced Career Opportunities
EAC	East African Community
ECOWAS	Economic Community of West African States
EHEA	European Higher Education Area
EJD	European Joint Doctorate

EU	European Union
EUA	European Universities Association
GPA	Grade point average
GSB	Graduate School of Business (Stellenbosch University)
HSRC	Human Sciences Research Council
ICT	Information and communications technology
IT	Information technology
IUCEA	Inter-University Council of East Africa
MoA	Memorandum of agreement
MoU	Memorandum of understanding
NGO	Non-governmental organisation
NRF	National Research Foundation (South Africa)
PASGR	Partnership for African Social and Governance Research
PhD	Doctor of Philosophy
REC	Regional economic community
REESAO	Réseau pour l'Excellence de l'Enseignment Supérieur en Afrique de l'Ouest
Rhodes	Rhodes University
SADC	Southern African Development Community
SARChI	South African Research Chairs Initiative
SARUA	Southern Africa Regional Universities Association
SDG	Sustainable Development Goal
SU	Stellenbosch University
TORs	Terms of reference
UCAD	Université Cheikh Anta Diop

UCT	University of Cape Town
UK	United Kingdom
UKRI	UK Research and Innovation
UKZN	University of KwaZulu-Natal
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UoM	University of Mauritius
UP	University of Pretoria
US	United States
WADDP	Wits Advanced Drug Delivery Platform
WASCAL	West African Science Service Centre on Climate Change and Adapted Land Use
Wits	University of the Witwatersrand
4IR	Fourth industrial revolution

List of tables

List of figures

Acknowledgements

Executive Summary

1. Introduction

This report is based on a study commissioned by the African Research Universities Alliance (ARUA) from the Human Sciences Research Council (HSRC) in December 2021 with the aim of producing a baseline understanding of the current nature, structure, and process of doctoral training at the alliance's 16 member universities,[1] so that areas of convergence and prospects for developing collaborative doctoral programmes across these institutions may be identified. It provides a synthesis of ten country reports[2] that consider the implementation of 32 humanities and natural sciences doctoral programmes across the member universities within their institutional and national contexts.

In the context of globalisation and internationalisation, national higher education systems and institutions across the world have grappled with the challenge of increasing competition in the sector and have increasingly reflected on how they can produce knowledge and develop high-level skills more effectively, as well as on the intended outcomes of such knowledge production and skills development. One response has been to seek to develop collaborative teaching and research programmes at the undergraduate and postgraduate levels in order to improve structures; the quality of the student experience; and the quality and relevance of the skills being developed. However, although the higher education systems in countries and regional blocs in the Global North have made significant strides towards various forms of collaboration leading to more harmonised systems, progress within African higher education systems has been limited in this regard, notwithstanding the efforts of the African Union (AU) and regional bodies on the continent in this regard.

Doctoral training represents a critical function of universities in their role promoting the knowledge-development enterprise of their societies; and the function has been prioritised by ARUA as a path to being more responsive to the continent's knowledge and development needs and ensuring increased global competitiveness in selected fields of research. However, the production of the next generation of African knowledge-producers has been challenged by

---

[1] The ARUA member universities are: Addis Ababa University (Ethiopia); University of Ghana; University of Nairobi (Kenya); University of Mauritius; University of Ibadan and University of Lagos (Nigeria); University of Rwanda; Université Cheikh Anta Diop (Senegal); University of Dar es Salaam (Tanzania); Makerere University (Uganda); and Rhodes University, University of Cape Town, University of KwaZulu-Natal, University of Pretoria, Stellenbosch University and University of the Witwatersrand (South Africa).

[2] Country reports were produced for: Ethiopia; Ghana; Kenya; Mauritius; Nigeria; Rwanda; Senegal; South Africa; Tanzania; and Uganda.

relatively low participation rates in higher education across much of sub-Saharan Africa compared with other regions of the world. The generally low levels of capacity to train and produce doctoral graduates across African institutions has led to calls for collaboration, internationalisation and harmonisation as strategies that could improve capacity.

Accordingly, this report and the research on which it is based interrogate the characteristics of doctoral training across the alliance's member universities, including in relation to the nature of present collaboration across these institutions around such training. To this end, it juxtaposes the findings from the original research that underpins it against the body of existing literature on higher education collaboration and doctoral training in other regions, in order to develop recommendations relevant to ARUA and the African context.

Specifically, the research had six main objectives, to:

1. Review the structure and content of selected doctoral programmes at ARUA member universities, considering them in terms of current and emerging best practices from other regions;

2. Review the admissions requirements of selected doctoral programmes at these universities;

3. Identify potential areas/disciplines in which ARUA might support collaborative doctoral programmes at member universities in the natural sciences, humanities and social sciences;

4. Determine whether and how selected doctoral programmes may need to be restructured/reconfigured for the purpose of collaboration at these universities;

5. Determine whether and how admission requirements for doctoral programmes may need to be modified at the universities; and

6. Propose to ARUA any modifications to doctoral programmes and standards that may be necessary at the member universities to facilitate collaboration and the implementation of joint activities.

2. Collaboration, internationalisation and harmonisation in higher education

Globally, collaboration has been recognised as a critical aspect of efforts to streamline higher education's response to research and knowledge demands; develop relevant high-level skills; and support the current and future labour market. Collaboration is viewed as crucial to the

success of internationalisation and harmonisation efforts. In addition, it has been found that learning that is collaborative helps to develop higher level thinking skills and contributes to the development of students in terms of self-esteem.

Harmonisation can be understood as the efforts that are made to streamline the provision of degrees and academic credits; quality assurance; and the academic calendar in a given region. It requires agreement and coordination across relevant higher education systems to strengthen institutional capacity and responsiveness to societal needs. It entails access to reliable, transparent information; networking among relevant stakeholders in higher education systems; sharing of best practices with a view towards improving inter-regional mobility, and resource-sharing towards a common purpose. The Association of African Universities has noted that harmonisation should promote the comparability of degree programmes and foster recognition of their equivalence across the continent in order to facilitate the mobility of staff and students.

Internationalisation of higher education is defined as the intentional process of integrating an intercultural or global dimension into the purpose, functions and delivery of post-secondary education, in order to enhance the quality of teaching and research for all students and staff, and to make a meaningful contribution to society

2.1 Internationalisation and harmonisation in Africa and elsewhere

The Bologna Declaration which was adopted by the education ministers of 29 European countries in 1999 proposed a European Higher Education Area in which students could move freely among countries, using the prior qualifications that they had obtained in one country to meet the entry requirements for further study in another. The subsequent Bologna process aimed to integrate European higher education and has provided an important, much-emulated example of intra-continental collaboration and how policy convergence can result in harmonisation and internationalisation. A common aspect of the Bologna Declaration; the collaboration that has taken place among higher education systems in the Association of Southeast Asian Nations (ASEAN); and the development of a Central Asian Higher Education Area has been agreement on the minimum standards required to attain particular academic qualifications so that they are recognised across each of these regional blocs.

Internationalisation and harmonisation of academic programmes in Africa has been promoted by the AU and by the continent's regional economic communities (RECs), as well as by a number of regional university association networks and partnership programmes, including in the East African Community, the Southern African Development Community (SADC) and the

Economic Community of West African States (ECOWAS). It has been argued that such initiatives, especially as they relate to PhD programmes at African research universities, should be scaled up and supported so that African universities can compete more effectively with higher education institutions on other continents. At the same time, it has been noted that South-South, including intra-continental, collaboration among higher education institutions in Africa remains much lower than North-South collaboration.

2.2 Tensions and opportunities in promoting harmonisation and internationalisation

Efforts to harmonise and internationalise higher education in support of greater student, academic and programmatic mobility may be undertaken in pursuit of a number of goals and for a range of reasons. Such efforts may take the form of various types of agreement; produce a range of qualification outcomes; and entail different kinds of collaboration.

The models and approaches differ from country to country and from one university to the next, depending on their histories, priorities and political circumstances. Arguably, the development of successful partnerships is predicated on addressing conflicting group identities; incompatible views; power struggles; funding disagreements; unclear contractual agreements; differing academic calendars; divergent admission and graduate requirements; a lack of flexibility in learning and adapting best practices; confusing partnership roles; differing leadership values; and cultural differences. A list of practices which are essential to the success of international partnerships have been identified. These include: the establishment of appropriate communication guidelines and timeframes; the provision of cross-cultural awareness training; efforts to build trust through competency, contracts and face-to-face interactions; and demonstration of internal and external commitment.

Given the possibility of weaker systems being assimilated by stronger ones, it is important to create common higher education spaces which acknowledge the diversity inherent in each of the component systems and institutions. In this regard, it has been noted that the African preference for collaboration with systems and institutions in the Global North may be linked to the relative lack of harmonisation at the continental and sub-continental level in Africa. Against this background, higher education policymakers should be aware that collaboration undertaken in this context can perpetuate neo-colonial dependencies rather than mutual engagement and capacity building on an equal footing. ARUA's plans to establish new forms of collaboration may help change this trend and shift established power relations around knowledge production.

The literature shows that political will at the regional, national, or institutional level is crucial to the success of harmonisation and internationalisation efforts. In this regard, it has been noted that Africa faces similar regionalisation challenges to those faced by Europe before the 1990s and may accordingly, although with caution, draw lessons from the Bologna process in Europe and apply these to its own harmonisation and collaboration efforts.

The achievements of the Bologna process include that in its drive to facilitate common recognition of studies and qualification across higher education institutions and systems, it preserved contextual identities at the national and institutional levels; and integrated different national and institutional objectives in relation to Europe's scientific capacity and in support of the modernisation, competitiveness, and attractiveness of the continent's higher education sector; and facilitated common recognition of studies and qualifications. There is a clear opportunity for an inter-institutional, Africa-wide alliance such as ARUA to play a leading role in this respect.

Theories of convergence and integration which seek to describe and analyse how regional organisations come about and operate may be of use in defining the kinds of approach that would work best in Africa to promote the harmonisation and internationalisation of higher education, including in relation to doctoral programmes.

2.3 Emerging trends in doctoral harmonisation and internationalisation

Analysis of emerging trends in the development of collaborative training in other parts of the world may inform the goals that should be set for collaboration in Africa. For example, in Europe, an important aspect of the doctoral training process has been the development of "mobility doctoral programmes" which enable researchers to gain international perspectives and support the acquisition of interdisciplinary experience. Another trend in Europe has been to foster links with business and industry through a range of collaborations and knowledge-exchange activities which have aimed to respond to the needs of society and prepare doctoral graduates for careers beyond academia.

According to the Salzburg II recommendations which were produced in 2010 by the European Universities Association (EUA) in support of the Bologna process, a key goal has been to shift the higher education system of the continent from one without much accountability, career guidance or institutional support to one of rights and responsibilities with training for a wider labour market, and with the institution taking responsibility and offering support.

In order to achieve such a shift, African policymakers at the systemic and institutional levels need to consider carefully the admission and assessment criteria and structure of doctoral programmes, as well as the experience offered by these studies, and how these components may need to be adapted and harmonised in support of greater inter-institutional collaboration.

Collaboration in support of improved doctoral training should seek to foster seven key programmatic attributes: research excellence; an attractive institutional environment; interdisciplinary research options; exposure to industry and other relevant employment sectors; international networking; transferable skills training; and quality assurance.

3. Key findings with recommendations

The research conducted at the 16 ARUA member universities produced key findings and programmatic recommendations in a number of areas.

3.1 Admission

In general, either a Master's degree (7 out of 16 institutions) or a Master's degree with a specified aggregate (7 out of 16 institutions) was required for admission into the relevant doctoral programme. Most programmes specified that the degree in question needed to be obtained in a related field and most often with a high mark. There were no major differences in terms of the admission requirements for doctoral programmes in the humanities and those in the natural sciences. From ARUA's point of view, this could indicate that admission requirements can be aligned quite readily at the institutional level without the field of study standing in the way. In general, a Master's in a cognate field should be seen as a minimum requirement and there should be mutual recognition of qualifications by member universities. Collaborating member universities will also need to agree when the doctoral candidacy period starts – prior to or after proposal acceptance.

Other factors relating to access must also be considered, including: whether certain coursework, which may be credit-bearing, must be completed; a wide range of pre-admission requirements which need to be met; and the pre-selection/identification of a doctoral supervisor, which was found to be an informal but important pre-requisite for admission at most of the institutions in the study. In relation to this last factor, members of admissions committees and programme chairs should be trained in order to provide greater transparency and efficiency in the candidate selection and recruitment process.

3.2 Modes of funding

The research found that there was little convergence in how doctoral programmes across the alliance and even within the same country were funded, whether by the student; the institution; or a mixture of both. Lack of funding can restrict access; harm the student experience; and lead to late completion of the PhD, even forcing candidates to abandon their efforts. However, this does not mean that the success of collaborative doctoral programmes depends entirely on greater funding. Rather, more detailed mapping of pilot programmes is required so that a fuller assessment of the kind and extent of funding requirements may be made.

In relation to student fees, higher education institutions participating in ARUA-led collaborative PhD programmes should provide transparent financial requirements and conditions for registration, and integration of visiting students and staff.

3.3 Coursework

It was found that 7 out of 16 doctoral programmes in the humanities featured a coursework component; and 6 out of 16 natural sciences programmes required such a component. Importantly, where a coursework component was included, it was compulsory and tended to form part of a continuous assessment process which monitored the student's competence. None of the programmes considered by this study featured a non-compulsory coursework component, although there were other non-compulsory aspects to these programmes.

At the same time, it seems that there is an increasing emphasis on the inclusion of specified content to develop generic skills through doctoral training. In this regard, coursework is seen as crucial to expedite proposal development; build research skills and generic (soft) skills; and ground candidates in the foundational and most recent literature in the field.

At the continental level, different countries have different types of credit-accumulation systems; and alignment among these, which would be highly complex, should be considered in order to produce collaboration across doctoral programmes in Africa.

3.4 Examination and assessment requirements

In many of the programmes under study (14), assessment included an examination of the original thesis which was presented as a monograph. In 12 programmes, assessment took the form of a monograph alongside a number of publishable or published papers. Meanwhile, five programmes employed a hybrid model under which the candidate was assessed on the basis of either a thesis monograph or a series of academic papers. A significant number of the programmes under study were moving towards assessment via a monograph plus papers or a

hybrid model. There was significant variation in the requirements for undertaking a PhD through the production of publishable articles. In addition to the written outputs, a *viva voce* (oral) examination of the doctoral thesis also formed part of the assessment process at most of the universities under study.

Some universities have rules regarding the involvement/non-involvement of their supervisor or supervisors in the examination process, and regarding the appointment and qualifications of examiners, including whether these may be appointed from the home institution and the same country. Common rules will need to be agreed on these issues as part of ARUA's drive to establish collaborative programmes. Automatic mutual recognition of examination process among collaborating institutions will need to be enshrined in a memorandum of understanding.

3.5 Duration

At nine of the 16 universities under study, candidates were expected to dedicate at least two or three years to undertaking their PhDs. At the remaining universities, they were supposed to allocate at least four years to the task. However, once part-time students are included in the equation, the average time for completing a PhD typically rises to between five and seven years. Some ARUA universities fail to graduate any doctorates in under three years and doctoral graduation rates in general are quite low, which lengthens the average completion time.

The most important factor affecting duration is whether a doctoral programme is organised as thesis only; integrated coursework and thesis; or a combination of both models. In this regard, given that a structured model of doctoral education comprising integrated advanced coursework and supervised research represents a more robust form of doctoral education, compared with the thesis-only model, a longer duration of four to five years for a full-time PhD may be required. An agreed standard must be specified among the ARUA universities engaged in doctoral collaboration on the basis of whether the student participation is part- or full-time.

3.6 Staffing and supervision

The main model of doctoral supervision at the programmes under study was still the traditional apprenticeship model, which was adopted by 18 programmes. The remaining programmes (14) reported employing a team supervision model. Meanwhile, although there are a number of established cohort programmes across many of the member institutions under study, none of the focus programmes, surprisingly, employed this model of supervision.

The supervisory model tends to be driven by programme- and department-specific considerations, including supervisory capacity. Many universities across Africa assert that they

struggle with low supervisory capacity for doctoral students. In this respect, some of the universities under study reported high percentages of staff with doctoral qualifications but quite low doctoral graduation rates. By contrast, others with fewer staff equipped with doctoral degrees, boasted significantly higher doctoral graduation rates. Such discrepancies between the percentage of staff with doctoral qualifications and the percentage of doctoral graduates may indicate that having a doctoral qualification does not necessarily entail being able to supervise doctoral students effectively. On the other hand, many of those scholars who have the capacity to supervise doctoral students can be overwhelmed by the number of students assigned to them.

In cases where doctoral programmes are offered in collaboration between or among institutions, there will need to be alignment in terms of the supervision model, particularly in relation to the possibility of introducing collaborative forms of supervision. In this regard, given that co- and team supervision is beneficial for student throughput and success, mixed collaborative team and cohort supervision is recommended in project-based programmes. Meanwhile, the different models of supervision that are employed should be investigated in relation to whether their use may increase doctoral student participation.

3.7 Supporting structures and facilities

The data collected for this research indicated that most of the universities are increasingly providing support structures and initiatives to improve the experience of students throughout their doctoral studies. However, although most of the universities confirmed the presence of modern infrastructural facilities such as libraries, laboratories and resource centres, some of them reported struggling with outdated, inadequate infrastructure.

It is evident from the study that ARUA members are presented with an opportunity to work more collaboratively, sharing resources and jointly addressing resource constraints, such as in relation to expertise, equipment, laboratories and supervision, without having to foster dependence on institutions external to the alliance.

Minimum standards of support should be described and prescribed, including in relation to research facilities and equipment, and study space, and certain resources should be shared – for example, online libraries and database access, and institutional software licences.

3.8 Collaboration in doctoral programmes

A key finding was that there appeared to be an established culture across member universities to collaborate with other institutions as part of doctoral training programmes. Furthermore, it was found that while the general tendency was towards collaboration with an international

partner or partners rather than a national partner or partners, most of the collaborations – in 18 of the programmes under study – a included one or more African partners.

It was found that most of the well-funded programmes – and thus the programmes with the largest graduate numbers – featured some form of funding from the Global North as part of efforts to promote North-South collaboration. However, such arrangements can perpetuate dependencies.

Against this background there should be greater efforts to foster collaboration among ARUA member universities, such as by establishing joint doctoral degrees and providing joint supervision; offering student and staff exchanges; forging common coursework components; and arranging laboratory work-visits. Collaboration may also take the form of the inclusion of common skills development components such as data-analysis packages in the doctoral programmes of member universities.

4. Conclusions and recommendations

4.1 Constraints

4.1.1 National regulatory environment

Across a number of countries, the national policy environment was reported as constraining the development of doctoral education in general and international collaborative programmes in particular. The reported constraints include a lack of policies to facilitate collaboration and international PhD programmes across borders by easing visa requirements.

4.1.2 Inadequate funding for higher education

In several countries, it was noted that funding flows from the public purse to universities had been on the decline and were affecting access to doctoral education. To compensate for a lack of public funding, some institutions were increasingly seeking to commercialise their academic offerings, including postgraduate education. However, when institutions respond by seeking to raise money through the commodification of programmes and degree offerings, they are seen as undermining their purpose as government-funded providers of a public good. In this context, a well-considered balance must be struck.

4.1.3 Regulation of higher education

In many countries, accreditation, quality assurance, and monitoring and evaluation systems have effectively become a constraint to academic agility and have accelerated the managerialisation of university governance. However, de-regulating and opening higher

education sectors to cross-border trade as if they were a commodity, can undermine the public-good value and local relevance of the provision. In this context, ARUA member universities should be vigilant in relation to the reasons for establishing collaborative doctoral programmes, which should be to foster sustainable, relevant knowledge production rather than to enable a particular university to enhance its income and prestige.

4.1.4 Institutional policies and practices

Both over-regulation and under-regulation at the institutional, faculty and departmental levels were found. A number of the country reports made mention of a lack of professionalism in establishing and managing doctoral programmes. Some featured claims of inadequate selection and training of academics as doctoral supervisors, as well as allegations of the over-enrolment of students in some programmes and fields, and under-enrolment in others. Identified challenges also include the failure to match supervisors with candidates properly.

It was found that under-enrolment could be the result of overly stringent requirements for admission. In this regard, the institutional regulatory environment and the governance and management of the doctoral studies in question, rather than funding constraints, were seen as the main factors inhibiting a growth in numbers and greater gender parity in doctoral education.

4.1.5 Capacity and resource constraints

The country reports noted that the most significant constraints on doctoral education related to capacity and resource shortfalls in the implementation of the programmes themselves, including, particularly, a lack of sufficient quality supervision, as well as a lack of: specialised equipment and resources; appropriate facilities; finances to support student access to resources elsewhere; and capacity to induct students into national and international scholarly networks.

4.2 General recommendations

ARUA should conduct a survey among present and past doctoral students at its member universities, focusing on African cross-border and overseas students, to gauge their opinions on the present state of doctoral education at ARUA member universities. It would be useful to gain insights into the challenges they perceive; the opportunities offered by an African brand of collaborative doctoral programmes; and ways in which the attractiveness, accessibility, quality, and relevance of the doctoral programmes on offer may be enhanced.

The constraints imposed by national regulatory environments, including in relation to visa laws and regulations, as well as those arising at the level of higher education systems, including in relation to accreditation and funding, will need to be considered in the design of collaborative

doctoral programmes and the choice of programme hosts. In this regard, a systematic review of the relevant policy architecture should be commissioned in order to produce a comprehensive understanding of the various policy synergies and constraints that would need to be addressed in establishing collaborative programmes.

ARUA should identify field- and discipline-specific industry and private sector partners with whom they can develop medium- to long-term collaborative research projects and related doctoral programmes across two or more member universities.

Internationally competitive, authentic, Africa-branded collaborative doctoral programmes would be the most likely to attract appropriate funding and would be the most successful. Such programmes would need to be relevant to the African and Global South context and should address some of the large, intractable developmental challenges facing the continent, the Global South and the world at large.

The ARUA Centres of Excellence (COEs) may be seen as a natural home for collaborative doctoral programmes, as well as other collaborative initiatives such as summer schools and academies, and may become the sites where such initiatives are piloted and entrenched within the network. Accordingly, it is recommended that those COEs which have not yet become fully functional should be developed while support should continue to be provided to the more functional centres.

There is a need to establish specific agreements between and among ARUA members towards initiating collaborative doctoral programmes. These agreements would then be presented to ARUA and a range of external funders, including industry partners; local and international grant-making bodies; and national governments, for funding and support. ARUA should establish a process to support the development of such agreements, including through the establishment of a collaboration steering committee to liaise with all member universities; the organisation of inter-institutional workshops and funding conferences; the establishment of a collaboration hub; and the development of relevant materials, such as terms of reference, guidelines and memoranda of understanding.

A high-level memorandum of agreement on collaborative doctoral programmes should be established between and among ARUA universities to identify the purposes, goals, objectives and values that should be agreed with respect to such programmes in general, and to provide a foundation for the development and implementation of these programmes at the COEs. Programme-specific agreements should be established to ensure that due consideration is paid

to all project-specific matters, processes and procedures, as well as the context, requirements and constraints of the specific member universities, including the host institution and the partnership bodies involved in a particular collaborative programme.

In general, the aim should not be to reinvent the wheel but rather to build on existing strengths and best practices. In this regard, current practices as well as those that reflect international best practice should be preferred.

4.3 Further areas for study

There are limits to the conclusions that may be drawn from the present study given that the case-study approach deployed by the research focussed only on specific doctoral programmes. Accordingly, further research that may be undertaken to support ARUA in the development of collaborative doctoral programmes in Africa may include:

- A survey of past and current doctoral students in ARUA member universities;
- A systematic analysis of national immigration laws and regulations applying to doctoral student and staff mobility; and
- A systematic analysis of the various qualifications frameworks, credit regimes, and quality assurance requirements for doctoral programmes across different national systems and institutions.

1. Introduction and background to the study

1.1 Introduction

This report provides a synthesis of ten country reports[3] that document the landscape of selected doctoral programmes across the 16 African Research Universities Alliance (ARUA) member universities[4] with the aim of identifying areas of convergence and prospects for developing collaborative doctoral programmes within the humanities and natural sciences. The report presents a broad overview of the selected doctoral programmes within their institutional and national contexts identifying possibilities and challenges that may inform collaboration.

The global higher education sector has responded in diverse ways to the widening effects of globalisation and internationalisation. There have been calls for improvements, and a recognition of increasing competition and the many challenges facing the sector that require each institution to reflect critically on: how they produce knowledge and develop high-level skills; and the intended outcomes of such knowledge production and skills development. One response to the challenges faced has been to seek to develop collaborative teaching and research programmes at the undergraduate and postgraduate levels (Adamu, 2021). The intention of such programmes can be to improve structures; the quality of the student experience; and the quality and relevance of the skills being developed. While the higher education systems in countries and regional blocs in the Global North have made significant strides towards various forms of collaboration leading to more harmonised[5] systems, progress within African higher education systems has been limited.

In response to such limitations, the African Union (AU) and other regional organisations have advocated for more collaboration. Attention has increasingly shifted towards ensuring greater collaboration within the higher education systems at regional level – that is in Eastern, West, North, Southern and Central Africa – and greater intra-regional collaboration across the

---

[3] Country reports were produced for: Ethiopia; Ghana; Kenya; Mauritius; Nigeria; Rwanda; Senegal; South Africa; Tanzania; and Uganda.

[4] The ARUA member universities are: Addis Ababa University (Ethiopia); University of Ghana; University of Nairobi (Kenya); University of Mauritius; University of Ibadan and University of Lagos (Nigeria); University of Rwanda; Université Cheikh Anta Diop (Senegal); University of Dar es Salaam (Tanzania); Makerere University (Uganda); and Rhodes University, University of Cape Town, University of KwaZulu-Natal, University of Pretoria, Stellenbosch University and University of the Witwatersrand (South Africa).

[5] Harmonisation can be defined as "a process of ensuring articulation, both horizontal and vertical between programmes and institutions among various higher education systems" (Woldegiorgis, 2013, p. 13).

continent. The calls for such collaboration recognise the critical role that higher education plays in human and economic development.

The Addis Ababa Convention, formally known as the Revised Convention on the Recognition of Studies, Certificates, Diplomas, Degrees and Other Academic Qualifications in Higher Education in African States was adopted in 2014. While only seven states signed it initially, it has now been ratified by 13 member states, which is beyond the required 10 ratifications required to activate the agreement. A main argument of the convention is that the role of higher education in achieving the United Nations (UN's) Sustainable Development Goals (SDGs) established in 2015 should be recognised. As the UN Educational Scientific and Cultural Organization (UNESCO) noted in relation to the convention:

> Supporting academic mobility and exchange within the African States will not only strengthen trust and capacity building in the quality enhancement of institutions and systems, it will also provide a pivotal network for advancing the SDG targets for equitable access in the region (UNESCO, 2019).

Another parallel initiative aimed at establishing a continent-wide policy on higher education collaboration and development has been the establishment of the African Research Universities Alliance in 2015. One of the core aims of ARUA, as recently articulated in its strategic plan, is to function beyond the regional or supranational blocs and strengthen African universities towards developing greater research capabilities; being more responsive to the continent's knowledge and development needs; and ensuring increased global competitiveness in selected fields of research (ARUA, 2022). One of the six strategic objectives that have been promoted in an effort to achieve this vision is "to contribute significantly to developing good quality PhD[6] graduates for other African universities". In order to achieve this objective, a baseline understanding of the current nature, structure, and process of doctoral training at ARUA's member universities needs to be established.

---

[6] While the plan makes explicit reference only to PhD graduates, the intended meaning is clearly to refer to all types of doctoral-level training, of which PhD qualifications are but one kind.

1.2 Overview of the African higher education context

The present higher education system in most of Africa remains characterised by traces of its colonial legacy. The oldest and typically most prestigious African universities were originally created as colleges of a colonial "parent university" during the colonial or the immediate post-colonial era. Most university systems in the English-speaking African countries continue to be oriented towards the Anglo-Saxon system, while those in French-speaking countries follow the French system with modifications. Lusophone countries largely adopted Portuguese systems; while the North African countries have strong links to Arab countries and their universities.

Efforts towards harmonising African higher education are not new. For instance, during the 1960s, as most African states won independence, Africanists expected the formulation of a new philosophy for an African university (Ndlovu-Gatsheni, 2017). This led to the establishment of some of the most prestigious universities of the time, including the University of East Africa, which later split into the University of Nairobi, the University of Dar es Salaam and Makerere University, as well as a number of other universities, most of which are now members of the ARUA group. However, the anticipation for a new African university with a more social and human soul quickly faded as African universities increasingly came to serve the interests of elites and became symbols of the nation states established after independence (Mosha, 1986). This function of the African university is noted by Castells (2001) who describes how universities can serve as mechanisms for elite formation and in support of national ideologies.

The prospects of the university in Africa serving a broader social function were further compromised in the 1980s when most African states were affected by a global recession which led to an economic crisis across the continent. The crisis was compounded by poor governance. In response, African governments applied for financial and economic rescue from the Bretton Woods institutions – the International Monetary Fund (IMF) and the World Bank – which attached strict governance conditions to their loans. The so-called Structural Adjustment Programmes which were developed by the IMF as a result restricted government spending for tertiary education in favour of a focus on primary education, which was considered to produce a better return on investment (Psacharopoulos & Patrinos, 2018). For more than a decade, low resourcing for higher education and universities contributed to their knowledge-production function being neglected and led to a brain drain with many academics leaving African universities for better conditions in institutions in the Global North (Sawyerr, 2004). Thus, higher education and universities between the late 1980s and early 2000s were characterised

by a myriad of institutional and systemic challenges (see Sawyerr, 2004; Assié-Lumumba, 2006), some of which continue to plague the system to this day.

The African university has undergone many changes. There has been a change in the profile of student participation and a rapid expansion in the number and size of institutional student bodies along with changes in student funding. There have been changes in staff composition, including in relation to casualisation. There has been a vocationalisation of university education and the introduction of market-ready qualifications. There has been the managerialisation of university governance (Mamdani, 2009). At the same time, established and new pockets of excellence have made their mark in knowledge production, including in relation to addressing societal needs and in terms of attracting international collaboration and funding. These developments have occurred in a context in which private, religious and international higher education providers have mushroomed on the continent.

It is clear that such shifts across multiple dimensions will produce tensions. Some have argued that these developments have led to an impoverishment of the intellectual community (Shivji, 2022); while others have argued that the increased diversity in the African higher education system provides the basis for specialisation (Mohamedbhai, 2022). The latter argument has been linked to calls for greater differentiation that would result in more diverse university types, including teaching, research, and technical and vocational institutions (Clark, 1978; van Vught, 2005)). The drive towards the various objectives has produced tension around what has been viewed as a core function of the university, that is, research and knowledge production, which includes training the next generation of African academics and knowledge producers. In this regard, doctoral training represents a critical function of universities in their role promoting the knowledge-development enterprise of their societies (Cloete et al., 2015).

The production of the next generation of African knowledge producers has been challenged by a low gross enrolment rate (or participation rate) in higher education across much of the continent. Sub-Saharan Africa continues to record the lowest overall participation rate among the youth when compared with other continents. At the national level in Africa, Mauritius has the highest ratio at 44%, followed by South Africa at 24% and Ghana at 19%. South Africa, however, lags significantly behind fellow emerging economies in the BRICS (Brazil, Russia, India, China and South Africa) bloc. Both Russia (84%) and China (50%) have significantly

higher participation rates (World Bank, 2022[7]). The generally low levels of capacity to train and produce doctoral graduates across African institutions has led to calls for collaboration, internationalisation and harmonisation as strategies that could improve capacity. However, it is crucial that a clear understanding of the existing structures and practices for doctoral training be produced before embarking on such strategies.

In this regard, this report is a response to a call made by ARUA to document some of the core characteristics of doctoral programmes across the alliance's member universities, including in relation to their admission requirements, structure, similarities, and differences; and to make recommendations for developing a range of collaborative programmes for doctoral studies within the natural sciences and the humanities. Accordingly, this report and the research on which it is based seek to interrogate the nature, intensity and forms of present collaboration across institutions. To this end, this report adopts a range of methodologies; triangulates sets of primary and secondary data; and juxtaposes the findings from the original research that underpins it against the body of existing literature on higher education collaboration and doctoral training in other regions and contexts, in order to develop a set of recommendations relevant to ARUA and the African context.

Section 2 of this report addresses the constructs of collaboration, internationalisation and harmonisation from a conceptual or theoretical standpoint, reviewing the relevant literature. This section aims to site the specific objectives of this project in relation to the present debates. Section 3 presents the methodological approach adopted by the present study and its sample. Section 4 presents the main findings from the study. Section 5 adds some reflections on what can be learnt from international examples and offers some recommendations for ARUA towards the development of collaborative doctoral programmes across the alliance's member universities.

---

[7] School enrolment, tertiary (% gross) | Data (worldbank.org)

2. Collaboration, internationalisation and harmonisation within higher education systems

Globally, collaboration has been recognised as a critical aspect of efforts to streamline higher education's response to research and knowledge demands; develop relevant high-level skills for 21st-century society; and support the current and future labour market. Collaboration is viewed as crucial to the success of internationalisation and harmonisation efforts. In addition, learning that is collaborative helps to develop higher level thinking skills and contributes to the development of students in terms of self-esteem and confidence (Tran, 2019).

Harmonisation can be understood as the efforts that are made to streamline the provision of degrees and academic credits; quality assurance; and the academic calendar in a given region (Yavaprabhas, 2014). It requires agreement and coordination across relevant higher education systems to strengthen institutional capacity, as well as responsiveness to societal needs. It entails access to reliable, transparent information; networking among relevant stakeholders in higher education systems; sharing of best practices with a view towards improving inter-regional mobility, and resource-sharing towards a common purpose (Delong & Dowrick, 2002). The Association of African Universities (AAU) (2007) has noted that harmonisation should promote the comparability of degree programmes and foster recognition of their equivalence across the continent in order to facilitate the mobility of staff and students. In line with this view, the AU's strategy for harmonisation focuses on fostering cooperation in relation to information exchange; the comparability of qualifications; and the standardisation of curricula (African Union, 2007).

Internationalisation of higher education is defined as "the intentional process of integrating an international, intercultural or global dimension into the purpose, functions and delivery of post-secondary education, in order to enhance the quality of education and research for all students and staff, and to make a meaningful contribution to society" (de Wit et al., 2015).

2.1 Examples of internationalisation and harmonisation

The Bologna Declaration which was adopted by the education ministers of 29 European countries in 1999 proposed a European Higher Education Area (EHEA) in which students and graduates could move freely among countries, using the prior qualifications that they had obtained in one country to meet the entry requirements for further study in another. In effect, the declaration proposed the adoption of a system of common terminology and standards that

would result in comparable qualifications under which degrees were categorised as either undergraduate or postgraduate and were governed by common rules for completion and minimum length of participation. The subsequent Bologna process aimed to integrate European higher education and provides an important example of intra-continental collaboration and how policy convergence can result in harmonisation and internationalisation.

This process has been emulated to some extent by the Association of Southeast Asian Nations (ASEAN) (Wang, 2022), which recently led to the production of a *Roadmap on the ASEAN Higher Education Space 2025* The ASEAN process has been accompanied by efforts to coordinate more closely with the higher education systems in China, Japan and South Korea as part the ASEAN Plus Three group. An ASEAN plan for a higher education area produced aimed "at creating a systematic mechanism to support the integration of universities across Southeast Asia" (Olds & Robertson, 2014). To this end, student mobility; credit transfers; quality assurance; and research clusters were identified as the four main priorities to harmonise the ASEAN higher education system which encompassed some 6,500 higher education institutions with 12 million students across its 10 member states (Olds & Robertson, 2014).

The Central Asian Higher Education Area (CAHEA) offers another example of regional integration. In this case, the ministries of education of Central Asian countries have agreed to create a unified regional higher education area under which a credit system akin to the European Credit Transfer System will be established; the regional mobility of students and staff will be fostered; and cooperation in the development of education programmes, practical training and scientific research will be promoted (Sabzalieva, 2021). Similarly, coordination among Southeast Asian higher education systems has been premised on four key principles: transparency, comparability, compatibility, and harmonisation of qualifications and programmes (Hahn & Teferra, 2013).

A common aspect of the Bologna Declaration, the collaboration among ASEAN higher education systems and the development of the Central Asian Higher Education Area has been agreement on standards, including the minimum standards required to attain a qualification, so that the degrees which are obtained are recognised across the particular regional higher education bloc.

2.2 Internationalisation and harmonisation in Africa

Turning to Africa, it has been argued that internationalisation has been one of the major forces shaping the higher education sector on the continent in the 21st century (Jowi, 2009). In 1981,

a Regional Convention on the Recognition of Studies, Certificates, Diplomas, Degrees and Other Academic Qualifications in Higher Education in African States was adopted in Arusha, Tanzania. The convention is widely considered to be the first framework towards harmonising higher education on the continent. It represents one of five regional initiatives supported by UNESCO to "promote international cooperation in higher education through facilitating academic mobility and recognition of studies and degrees within the regions" (Adamu, 2021). However, 30 years later there were only 20 signatories to the convention, indicating a vacuum in understanding, political will, or know-how in relation to implementation of this agreement. In 2014, a Revised Convention on the Recognition of Studies, Certificates, Diplomas, Degrees and Other Academic Qualifications on Higher Education in African States was promulgated in Addis Ababa. The promulgation of this convention was preceded by the establishment of an African Higher Education and Research Space (Mohamedbhai, 2013) which sought to stimulate greater collaboration in research and increase the continent's research capacity and knowledge creation. In 2015, Agenda 2063 – The Africa We Want was adopted by the African Union as a blueprint for achieving inclusive, sustainable development for the continent.

Meanwhile, in African Francophone countries the African and Malagasy Council for Higher Education[8], known by the acronym for its French name CAMES (Conseil Africain et Malgache pour l'Enseignement Supérieur) was established in 1968. The focus of CAMES is the harmonisation of Francophone qualifications in line with the Bachelor-Master's-Doctorate (BMD) model. In Eastern Africa, the Intra-University Council for East Africa is a product of the East African community (EAC) Common Market Protocol agreed in 2009, which, among other issues, aims to address concerns related to the mutual recognition of qualifications; the standardisation of curricula; and accreditation of institutions in order to promote freer movement of skills within the region among the five signatories.[9] In North Africa, the Association of Arab Universities undertakes harmonisation initiatives among countries in North and Eastern Africa,[10] and Arab countries in the Middle East.

Internationalisation and harmonisation of academic programmes in Africa has also been promoted by the continent's regional economic communities (RECs) and a number of regional

---

[8] The members of CAMES are Benin, Burkina Faso, Guinea, Guinea-Bissau, Ivory Coast, Mali, Niger, Senegal, and Togo in West Africa; Burundi, Cameroon, Chad, the Central African Republic, the Democratic Republic of the Congo, Equatorial Guinea, Gabon, the Republic of the Congo and Rwanda in Central Africa; and Madagascar in Eastern Africa.

[9] Burundi, Kenya, Rwanda, Tanzania and Uganda.

[10] Algeria, Djibouti, Egypt, Libya, Mauritania, Morocco, Somalia, Sudan and Tunisia.

university association networks and partnership programmes, including in the East African Community, the Southern African Development Community (SADC) and the Economic Community of West African States (ECOWAS).

The SADC Protocol on Education and Training of 1997 was established to promote collaboration towards harmonisation of the higher education space (SADC, 1997). The protocol includes agreements on access to universities with respect to student and staff mobility; undergraduate and postgraduate studies; and other spheres of collaboration. It notes:

> Member States agree to work towards harmonisation, equivalence, and eventual standardisation of university entrance requirements. […]

> Member States agree to recommend to their universities: (a) to co-operate in the design of academic programmes where appropriate, in particular programmes which are jointly taught; (b) to establish links between and among themselves bilaterally and multilaterally for purposes of joint or split-site teaching, collaborative research and consultancy work, and for other academic activities where appropriate (SADC, 1997, pp. 6-8).

Similarly, the Economic Community of West African States has also established a protocol on education and training which is overseen by the Network for Excellence in Higher Education in West Africa, known by its French acronym REESAO (Réseau pour l'Excellence de l'Enseignment Supérieur en Afrique de l'Ouest). The network aims to introduce the Bachelor-Master's-Doctorate format across the region as its contribution to the operationalisation of the 2014 Addis Ababa Convention.

Scholars within these economic blocs have also come together to promote internationalisation and collaboration among the member countries. The Inter-University Council of East Africa (IUCEA) and the Southern Africa Regional Universities Association (SARUA) have undertaken a number of initiatives towards harmonisation of academic programmes and policies, and in support of regional education quality assurance frameworks and academic exchanges (Jowi, 2010). It has been argued that such initiatives, especially as they relate to PhD programmes at African research universities, should be encouraged and need to be scaled up and supported so that these universities can compete more effectively with higher education institutions on other continents (Wilson-Strydom & Fongwa, 2012).

In relation to the issue of collaboration more broadly, it has been noted that South-South collaboration remains much lower in Africa than North-South collaboration. African universities and scholars, including among the ARUA institutions, tend to collaborate with scholars and institutions from the Global North, including those from Europe and the United States (US), rather than with peers in the Global South in general and in Africa in particular. In this regard, the African Observatory of Science, Technology and Innovation (AOSTI, 2014, p. xvi) notes that collaboration in the form of co-authorship among scholars from different AU countries. Is infrequent, occurring in only 4.1% of scientific papers. In 2005–2007; and in only 4.3% of papers in 2008–2010. The reasons for this are explored further in section 2.4 below in which the tensions and challenges associated with harmonisation and internationalisation are discussed.

2.3 Different forms of collaboration towards harmonisation and internationalisation

Efforts to harmonise and internationalise higher education in support of greater student, academic and programmatic mobility may be undertaken in pursuit of a number of goals and for a range of reasons (Campbell et al., 1998). Such efforts may take the form of various types of agreement; produce a range of qualification outcomes; and entail different kinds of collaboration.

Types of agreements

Under franchising agreements, a "home" institution grants a separate "host" institution permission to provide one or more of its programmes and degrees. Under such arrangements, the education provided is recognised by the "home" institution under its degree-awarding capacity, but the actual teaching of the programme is the responsibility of the "host" institution.

Under twinning agreements, two institutions offer the same programme. Students at both institutions follow the same courses, have the same materials and pass the same examinations. The academic staff at one or both of the institutions may be engaged locally. Twinning agreements allow students (and staff) to study a portion of their programme at the other institution. In some countries, twinning programmes are called franchise programmes (Knight, 2004).

Under a system of articulation, programmes are not jointly developed. Rather, students are enrolled in a programme in a first institution, which leads to an accumulation of credits. These

credits are then recognised by another institution and can count towards the credit requirements of that institution's programmes. For instance, students can undertake their first year in a local institution and then use the credits acquired to enrol at a more advanced level in a programme in another institution.

Types of qualification outcome

Successful completion of joint programmes may result in a number of qualifications outcomes, such as a "joint degree" under which one degree is issued jointly by the participating institutions, with both institutions' credentials on the certificate. A "double degree" is provided when two certificates (and thus two degrees) are issued by the relevant institutions, although the student undertakes only one programme jointly offered by the two bodies. Similarly, "multiple degrees" are issued by the various institutions jointly offering the particular programme undertaken by the student. Students may also be offered a mix of degrees. For example, three institutions may offer a joint program, with two of them offering it as a joint degree while the third offers it as a separate, stand-alone qualification. In this way, the student is issued with a joint degree certificate and a separate degree certificate.

Forms of collaboration

In the Canadian context, Knight (2012) identifies six forms of collaboration in support of internationalisation (see Table 1). The range of collaborative programmes identified by Knight (2012) are typical of harmonisation and internationalisation processes across much of the Global North, including in the US, the United Kingdom (UK) and the rest of Europe, and Australia, as well as in some emerging economies. The descriptions and linkages to the appropriate degrees provide a useful outline of how collaborative programmes can be structured.

Table 3: Forms of internationalisation of education and collaboration

Type of collaboration /mobility	Description	Who awards credentials or credit
1. Full degree programme in collaborating country	Students move to a collaborating country to complete a degree	Degree awarded by host institution
2. Short-term study-abroad experience as part of degree	Students undertake a short-term academic visit to another university or branch campus	Degree awarded by home institution.

programme at home institution		Credits from foreign institution accepted
3. Cross-border collaborative degree programme between two or more institutions	Students enrol in a degree programme involving two or more institutions working collaboratively to offer a qualification. These include franchise, twinning, joint degree or multiple degree programmes offered at the home institution Sandwich programme at foreign institution	Different models for awarding degrees exist
4. Research, laboratory work, and fieldwork at foreign or collaborating institution	Research, laboratory work or fieldwork as agreed by the home institution	Home institution
5. Internship and practical experience	Compulsory or optional component of degree at home institution	Home institution
6. Study tour, workshops, coursework	Part of or independent of degree programme at home institutions	Not usually credit-bearing.

2.4 Tensions and challenges

There is no single ideal model for internationalisation or harmonisation. The models and approaches differ from country to country and from one university to the next, depending on their histories, priorities and political circumstances. Arguably, the development of successful partnerships is predicated on addressing conflicting group identities; incompatible views; power struggles; funding disagreements; unclear contractual agreements; differing academic calendars; divergent admission and graduate requirements; a lack of flexibility in learning and adapting best practices; confusing partnership roles, differing leadership values; and cultural differences. Heffernan and Poole (2005) have identified a list of practices which are essential to the success of international partnerships, including the establishment of appropriate communication guidelines and timeframes; the provision of cross-cultural awareness training; efforts to build trust through competency, contracts and face-to-face interactions; and demonstration of internal and external commitment.

In this regard, it is important to address issues of power explicitly. As Ngalim (2014) notes, given the possibility of weaker systems being assimilated by stronger ones, it is important to create common higher education spaces which recognise the diversity inherent in each of the component systems and institutions. In this regard, Adamu (2021, p. 119) describes how the African preference for collaboration with systems and institutions in the Global North may be linked to the relative lack of harmonisation at the continental and sub-continental level in Africa. Collaboration undertaken in this context presents the risk of perpetuating neo-colonial dependencies rather than mutual engagement and capacity building on an equal footing. ARUA's plans to establish new forms of collaboration among African higher education systems and institutions may help change this trend and shift the established power relations around knowledge production. Efforts to establish the conditions for increased pan-African collaboration may also foster greater recognition of African forms of knowledge and promote the decolonisation of knowledge more generally.

Commitment to harmonisation and internationalisation among systems and institutions is crucial to the success of such efforts. Without buy-in, little can be achieved. The Bologna process clearly identified the differences among the higher education systems in Europe but also fully engaged them in developing a compatible, comparable system across the countries to ensure greater collaboration. While preserving contextual identities at the national and institutional levels, the process integrated different national and institutional objectives, including in relation to Europe's scientific capacity and in support of the modernisation, competitiveness, and attractiveness of the continent's higher education system (Klemenčič, 2019); as well as facilitating common recognition of studies and qualifications. Meanwhile, in the African space, several regional initiatives seeking to create platforms for sustainable collaboration have been undertaken with varying degrees of success. In this context, there is a clear opportunity for an inter-institutional, Africa-wide alliance such as ARUA to play a leading role.

The literature shows that political will at the regional, national, or institutional level is crucial to the success of harmonisation and internationalisation efforts. Such political will may be made evident through actions and the establishment and implementation of strategies and frameworks. In this regard, Adamu (2021, p. 117) observes:

In Africa, the political commitment of most countries [and institutions] is also one of the biggest challenges and threats to the implementation and sustainability of the strategies for harmonisation [collaboration] of higher education.

Political will may be expressed through the establishment of support structures for collaborative initiatives within universities and among them at an inter-institutional level – for example, in the form of university associations. It may also be expressed through the amount of funding made available for such initiatives at the institutional, national, and regional levels.

Mohamedbhai (2013) reflects that in terms of harmonisation, internationalisation and collaboration within the higher education space, Africa faces similar challenges to those faced by Europe before the 1990s. He suggests that Africa may therefore and with caution draw lessons from the Bologna process in Europe which may be applied to its own harmonisation and collaboration efforts. In this context, the next sub-section examines the theory of convergence and integration outlined by DeLong and Dowrick (2002), including in relation to neo-institutional theory (Olsen, 2007) and neo-functionalism (Breslin & Hook, 2002) insofar as these conceptual approaches apply to the discourse around the harmonisation and internationalisation of higher education.

2.5 Theory of convergence and integration

Simply defined, convergence is the act of coming together, becoming more similar and moving towards union or uniformity. According to DeLong and Dowrick (2002), the term was widely used in economic theory during the industrial revolution in Europe to describe the process of creating common economic and market areas for the free flow of capital and labour in particular regions. In an economic context, convergence refers to the forces and policies that make different economies look more alike. Accordingly, in a higher education context, the Bologna process and the harmonisation that it sought to promote may also be viewed as an attempt at convergence, coordinating different national systems through a set of agreed policies and structures towards "eliminating major differences and creating minimum requirements standards", thus introducing greater similarity and uniformity (Okeke, 2012). Under the theory of convergence, harmonisation, internationalisation and collaboration represent efforts towards ensuring uniformity among higher education systems.

At the same time, as Woldegiorgis (2013) notes, harmonisation is not aimed at achieving identical regulations or standards that eliminate local diversities, rather it seeks convergence in

relation to common elements which can be leveraged to improve higher education at the regional level.

2.5.1 Neo-functionalism

Neo-functionalism focuses on how regional integration is achieved through supra-national non-state institutions (Wiener & Diez, 2009). As conceived by Haas (in Woldegiorgis, 2013, pp. 16-17), integration is achieved, first, through recognition of the interdependence of states and the need to shift integration initiatives and functions away from nation-state control towards more supra-national institutions. In this regard, neo-functionalism describes the transfer of allegiance from national institutions towards supra-national ones which are perceived as providing more effective channels for achieving agreed objectives at the national and regional levels.

This trend has been fostered by globalisation which has increasingly led to the integration of distinct national systems of higher education into more regional and continental systems. Woldegiorgis (2018) argues that, driven by policy convergence forces in Europe and elsewhere, a number of supra-national organisations have emerged which have precipitated the establishment of a number of international sectoral bodies governing large territories, including in the field of higher education. The European Union (EU), the African Union, the Association of South-East Asian Nations and the Arab League are some of the supranational organisations from which efforts to harmonise the higher education sectors of member states have emerged. The supra-national drive to convergence is also seen as ushering in a redefinition of interests towards a regional rather than parochial national orientation, as part of which "the former set of separate national group values will gradually be superseded by a new and geographically larger set of beliefs" (Woldegiorgis, 2013, p. 16).

Haas and his colleagues, however, identify several caveats to the wholesale adoption of a neo-functionalist approach. They give warning of what they refer to as the "problem of transferability" and the "problem of the dependent variable". The "problem of transferability" relates to how different contexts are characterised by different realities which need to be referenced and acknowledged in any integration initiative. The "problem of the dependent variable" relates to how far integration processes may be taken – in other words, their endpoint.

In general, the adoption of a neo-functionalist perspective towards collaboration focuses attention on the level of collaboration that may be desired and the importance of understanding the context within which the prospective collaborations will take place. As Lindberg (1963)

notes, there are several important preconditions for the application of neo-functionalist theory in relation to integration efforts. These include: the need for a central institution and policies that may be adopted by all members; the capacity to adapt and implement the policies in the national context and beyond; and links between the interests of the member states and the goals of the integration process.

2.5.2 Neo-institutional theory

One of the outcomes of harmonisation or internationalisation in higher education is integration; and integration is characterised by isomorphism – that is, similarity among organisations. Isomorphism, which is a fundamental concept in institutional theory, can manifest in the harmonisation or internationalisation of higher education through three main mechanisms: coercion, mimicry, or normative forces (DiMaggio & Powell, 1983). Coercive forces are formal and informal pressures exerted by cultural, political, or social organisations, which can be overt or subtle, and can take a variety of forms including invitations made by stronger institutions, such as the state and supra-national bodies, to access resources and social support or even to align with them. Mimicry takes place when institutions or organisations seek to respond to uncertainty or try to become more effective or legitimate by emulating the practices, policies or postures of other successful organisations. Normative isomorphism is associated with the diffusion through everyday social discourse of common ideas and practices that are generally accepted to be important and useful for organisational success. Such ideas and practices can be developed and promoted through networks and alliances. In this context, it has been argued that access to various kinds of resources and control can drive institutional isomorphism. In general, neo-institutional theory highlights the power dynamics inherent in efforts to foster harmonisation and internationalisation.

The notions of convergence and coercive forces indicate the kinds of opportunities that may be leveraged by ARUA as it seeks to promote collaborative doctoral programmes, as well as the limitations, constraints, and pitfalls that it faces in this regard. Learning from the Bologna process and other such efforts, the ways in which convergence can produce beneficial change become clear. In addition, it seems that the adoption of a normative position to create common ground, values and practices in pursuit of more, better doctoral training in the alliance and across the continent may prove an effective strategy. However, in this respect, it is important that any potential external coercive forces align with the goals and commitments of ARUA members (Liu, 2016, p. 40). It can be expected that tensions will emerge during efforts to prepare common ground. Indeed, this is an important part of the process of framing ways in

which different institutions will respond to, and engage in, collaboration. Some of the potential tensions and their sources are indicated in the data analysis in Section 4 below.

2.6 Emerging trends in doctoral collaboration and internationalisation practices

Since its establishment in Berlin more than 200 years ago, the PhD degree has evolved across different countries and higher education systems. Most countries and regions which have witnessed growth in the quality and numbers of doctoral graduates have developed vibrant research environments, fostering policies, practices and strategies to create international-standard research-driven environments and achieve excellence in doctoral training.

In Europe, an important aspect of the doctoral training process has been the development of "mobility doctoral programmes". Such programmes have enabled researchers to gain international perspectives and have supported the acquisition of interdisciplinary experience. In addition, many links to business and industry have been developed and encouraged in Europe through a range of collaborations and knowledge-exchange activities and programmes which have aimed to respond to the needs of society and prepare doctoral graduates for careers beyond academia.

The establishment of the League of European Research Universities;[11] the Bologna process; the Russell Group universities in the UK;[12] and, in Australia, the "sandstone universities",[13] indicate the importance attached to collaboration among universities on research and knowledge production, especially at the doctoral level. In Europe, the establishment of the European Universities Association (EUA) as a supra-national body linked to the Bologna

---

[11] University of Amsterdam; Universitat de Barcelona; University of Cambridge; University of Copenhagen; Trinity College Dublin; University of Edinburgh; University of Freiburg; Université de Genève; Universität Heidelberg; University of Helsinki; Universiteit Leiden; KU Leuven; Imperial College London; University College London; Lund University; University of Milan; Ludwig-Maximilians-Universität München; University of Oxford; Université Paris-Saclay; Sorbonne University; University of Strasbourg; Utrecht University; and University of Zurich.

[12] University of Birmingham; University of Bristol; University of Cambridge; Cardiff University; Durham University; University of Edinburgh; University of Exeter; University of Glasgow; Imperial College London; King's College London; University of Leeds; University of Liverpool; London School of Economics and Political Science; University of Manchester; Newcastle University; University of Nottingham; University of Oxford; Queen Mary University of London; Queen's University Belfast; University of Sheffield; University of Southampton; University College London; University of Warwick; and University of York.

[13] University of Adelaide; University of Melbourne; University of Queensland; University of Sydney; University of Tasmania; and University of Western Australia.

process has further promoted reforms in relation to doctoral training. According to the Salzburg II Recommendations released by the EUA in 2010:

> The important positive message is that Europe's universities have taken the lead and are strongly exercising their responsibility for transforming doctoral education from a private supervisor-supervisee relationship to an area that has the institutional support required for such a vital function. It has been a move from a system without much accountability, career guidance or institutional support to one of rights and responsibilities with training for a wider labour market, and with the institution taking responsibility and offering support (EUA Council for Doctoral Education [CDE], 2010).

The promotion of collaboration in higher education in Europe has shown the way for other regions, including Asia and Africa.

Accordingly, this section presents a broad review of some of the trends and practices in doctoral training across Europe and North America. As suggested by Barnett et al. (2017), the doctoral training systems in these two continents are seen as having dominated global practices in relation to doctoral training and assessment. The EUA in its Salzburg II Recommendations for doctoral training noted:

- The unique character of doctoral training which sets it apart from other cycles of the higher education system;
- The importance of assuring the independence and flexibility needed by doctoral candidates as they pursue their "highly individual and by definition original" paths; and
- The need to develop "special structures and instruments" as well as flexible regulation in order to foster institutional autonomy and accountability which are key values for doctoral training.

In seeking to develop appropriate structures and instruments, it becomes important to understand, adapt and adopt some of the structures that have been developed in more successful systems. In the field of higher education in Africa, a number of regional bodies aiming to standardise qualifications, regulations and standards have been established. At the same time, the African Research Universities Alliance's strategic objective of developing good-quality PhD graduates indicates a shift towards adopting transformative and more supportive principles for doctoral training. Principles that can guide the establishment of collaborative

doctoral training are outlined in greater detail below after discussion in the following sub-sections on the key aspects of such training, which include the admission criteria for doctoral programmes; the structure of doctoral programmes; and the experience offered by doctoral programmes, including in relation to assessment. Understanding these three components can help individual institutions to design doctoral programmes that are "inclusive of rights and responsibilities with training for a wider labour market, and with the institution taking responsibility and offering relevant support" (EUA-CDE, 2010, pp. xx).

2.6.1 Admission criteria to doctoral programmes

Admission requirements to doctoral programmes differ across systems. In the US, most universities will admit students with a Bachelor's degree into their doctoral programmes which are quite long, although they offer an exit point at the MPhil level. A Master's is not a pre-requisite for entry into PhD programmes in the US. Students in pursuit of a PhD are provided with an "umbrella" entry whereby they are admitted into a common two-year programme which is built around a core curriculum and offers opportunities to sample a range of laboratories and disciplines. Students are only assessed for the PhD programme once this initial training has been completed and a qualification exam has been passed. (This process is similar to the Master's degree which is a pre-requisite for most Canadian and European PhD programmes.) Time to completion of the PhD after initial admission can be as long as seven years (Barnett et al., 2017).

PhD candidates in Europe and the US Are also required to undergo an interview by an independent panel similar to a job interview (Barnett et al., 2017). In this respect, transparency and accountability are enhanced by openly advertising the PhD positions on offer and by establishing and implementing fair interview procedures. Prior relationships between candidates and the academic leader, institution or programme involved in this process can be indicative of success in applying for a PhD.

According to Shin et al. (2018), admissions to doctoral programmes globally (UNESCO, 2017) have witnessed a significant steady increase linked to two main factors:

- The massification of the higher education system which has been characterised by an increase in the numbers and diversity of students including international students and females; and
- Changes in the economic landscape towards more industrialisation and the knowledge economy, with the advent of the fourth industrial revolution (4IR). This factor, which

has been characterised by a shift in aspirations among students, is of particular relevance in Africa.

With research indicating that only about 30% of PhD graduates enter academia, admissions into, and the structure and the experience of, the doctoral process must prepare graduates to become not just scholars but also entrepreneurial workers within a knowledge economy.

The UK's Arts and Humanities Research Council (AHRC) collaborative doctoral programme found that a higher proportion of women entered collaborative programmes compared with men. It was further found that the students within the collaborative programme were much older (in their 30s, 40s and 50s) compared with those in the standard programme, who were mainly in their late 20s, having just come through their Bachelor and Master's degrees with little or no breaks in their education and no work experience.

2.6.2   Structure of doctoral training

The structure of doctoral programmes varies in relation to their duration, content and relevance to future academic and other careers.

In relation to duration, most PhD candidates in the US are still registered seven years after admission. In Canada, the aim is to complete one's PhD in four years. In Europe, the time limit is three to four years depending on the extent of the coursework component or lack thereof It has also been observed that, in general, it takes longer to complete a PhD in the life sciences than one in the humanities.

In relation to the content of PhD training, students undertake a qualifying exam and a dissertation and are also exposed to a number of predetermined courses in relation to the content of the particular subject and the need for research-skills development. This coursework, which is set on the basis of the student's own needs or the recommendations io the supervisor, is seen by Altbach (2004) as a distinctive feature of the US doctoral programme.

In Europe, a PhD generally comprises a full thesis and coursework is generally not included in the doctoral programme. In the UK, the AHRC doctoral programme operates along two routes: a standard doctoral programme and a collaborative one. Under the standard doctoral programme, a student develops a research idea and uses the proposal expressing this idea to apply for admission and funding into the programme. Meanwhile, the collaborative programme is project-based, with the subject matter for the doctoral research agreed among the relevant

partner organisations. These bodies then work together to recruit the best-qualified student to undertake the research for the agreed project (Hill & Meek, 2019, p. 5).

At the same time, with the rise of the knowledge economy and amid changing career and skills dynamics, an increasing number of PhD programmes are integrating generic skills-development components into their curriculum in order to prepare graduates for non-academic career pathways. A national "TraCE" initiative tracking PhD students in Canada undertaken by Paul Yachnin at McGill University has confirmed earlier findings indicating the low probability of PhD students embarking on an academic career. Nelson (2021, p.1) echoes Yachnin's earlier call for a more outcome-based approach to PhD training as they found that no more than 25% of PhD graduates secure tenure-track positions after graduation and that on this basis there should be "significant revisions of PhD curricula across the board".

Nelson (2021) has identified five areas in relation to PhD training that need restructuring: career counselling; the curriculum and professional skills development; assessment and evaluation; recruitment; and funding. Shin et al. (2018, p. 153) conclude that irrespective of the geographical context (Asia, Europe or the US) "a major challenge remains in finding better ways to reform the doctoral education so that there is a closer link between the knowledge we produce and local social and economic development". At the same time, recent studies suggest that PhD students who are part of the academic staff component may be more likely to succeed academically compared with doctoral students who are continuously perceived as students during their doctoral training (Cummings & Bain, 2018).

2.6.3   Experiencing the PhD programme

In the US, the belief is that those who undertake PhDs become more complete academics with significant teaching and research experience. Most Asian PhD programmes are adopting the US system with flagship universities on the continent aligning their doctoral training processes with those promoted in the US system and its focus on fostering the teaching competencies of doctoral candidates. For example, the National University of Singapore exposes PhD candidates to teaching and research as part of its doctoral programme (Shin et al., 2018).

The terms used to describe those supervising PhD candidates vary across countries, indicating differing expectations in relation to their roles. In the US, the term "study mentors" is widely used. In Europe, the term "supervisors" seem to be the dominant one. In Canada, the term "study advisors" is widespread (Barnett et al., 2017). The differences in terminology are accompanied by differences in supervision structure. In the US, supervision mainly takes place

through a mentoring committee which can comprise three to five faculty members, including a mentor, a co-mentor and members of a thesis committee. In Europe, PhD candidates are adopted into a research group by their supervisors who are then responsible for the student's planning and execution of the research project. The emphasis is on supervision usually undertaken by an individual professor, sometimes with a co-supervisor, under an "apprenticeship model". At the same time, some collaborative programmes feature cohort or joint-supervision models, under which candidates have one supervisor across the collaborating universities with the supervision guidelines provided by the university where the candidate is registered.

Financial support has been identified as a critical factor in relation to accessing and completing doctoral programmes. Funding can be provided by scholarships, fellowships and grants, and also through waged employment as a member of the academic staff or as an employee of an external organisation. In the US, teaching assistantships, especially in the humanities, and research assistantships in the natural and life sciences provide additional funding support for PhD candidates. Scholarships and fellowships cover most of the students' funding needs in many European countries, including Italy, Belgium, Germany, Netherlands, Sweden and the UK, as well as in Brazil in Latin America. However, funding for doctoral studies is increasingly becoming a challenge even in wealthier countries, particularly for international students (US National Science Foundation, 2017).

Linked to the Bologna process, most PhD programmes in Europe have a mobility component whereby candidates are expected to spend a minimum of one semester in a collaborating university in pursuit of a European Joint Doctorate (EJD). Such doctorates entail joint degrees, double degrees or multiple doctoral degrees being awarded through a range of "innovative training networks". In this context, Kezar (2005, p. 846) observed that for effective collaboration, institutions must develop three values – they must be "student centred, innovative and egalitarian". By being student-centred they provide common ground for students to collaborate; by being innovative they promote an ethos of experimentation; and the egalitarian ethic helps collaborators to see the value in other people and overcome some of the barriers that characterise elite culture, including the preoccupation with international university rankings, and hierarchies of discipline and staff position, such as in relation to the status accorded faculty staff versus that accorded administrators,.

AHRC's collaborative doctoral programmes have been praised for exposing students to diverse people from different social, academic, and cultural backgrounds and for fostering students' career development. As one student noted:

> The collaborative nature of the project meant I learnt how to deal with different people with different priorities and needs, and how to … explain work to people from diverse backgrounds in completely diverse ways. These are skills that helped me hit the ground running in my job and use every single day (Hill & Meek, 2019, p. 23)

The collaborative nature of the programmes also enhanced employability, according to the participating students:

> It placed me in a position where I have a competitive advantage when applying for jobs/residencies as an ... academic researcher (Hill & Meek, 2019, p. 23)

Sall and Ndjaye (2007, p. 52) argue that "African inter-academic cooperation can be boosted if it is inspired by cooperation models existing in the European academic space". In this context, the Association of African Universities has noted that "higher education in Africa would benefit from the adoption of the Bologna or similar process, especially in fostering regional collaboration" (Okeke, 2010, p.4).

It is also important to reflect on the exit requirements of doctoral programmes. In the US system, the assessment of a doctoral programme generally comprises formative assessment which takes place throughout the training and monitors progress while providing feedback to the student to enhance their development. In Europe, the approach generally comprises summative assessment under which the doctoral student is evaluated on the basis of a set of predefined standards and outputs. In most US universities, the emphasis is on formative assessment which seeks to monitor intended learning outcomes such as subject knowledge and understanding; proficiency and aptitude; and the development of research, teaching, and other generic skills required of a scholar. The assessment is undertaken by the student's thesis committee which tracks various aspects of the student's development from enrolment onwards. The panel will only agree that the student can submit their thesis once a number of intended learning outcomes have been achieved (Barnett et al., 2017). In the European system, the emphasis seems to be more on summative assessment under which the student defends their thesis in front of a committee of examiners. This committee usually includes professors from the university, as well as a number of academics external to the university. The practice of defending one's thesis in this way has been deemed to be quite impartial given that both internal

and external professors sit on the assessment committee; and it is considered more impartial than the system for final assessment in the US system under which some of the students' mentors sit on the assessment committee. Against this background, Barnett et al. (2017, p. 1,451) have suggested that "the ultimate best practice would encompass structured formative assessment at defined time periods during the doctoral programme, as well as an impartial final summative assessment".

Different universities make different demands in terms of the published and presented outputs, including theses and papers, that should be produced to acquire a PhD. At Vanderbilt University in the US, the stated goal is to produce a body of work that has been agreed by the thesis committee including the production of a paper, written by the candidate alone or as the first author, which has been accepted for publication. A number of universities in Europe demand that between one and three academic papers should have been published or accepted. Most Canadian universities state the number of papers required, although some are quite flexible in terms of the quantitative requirement. Considering the great differences in publications cultures across academic disciplines, as well as the differences in how rigourous publishers may be across regions, it is difficult to quantify a standard around this requirement. However, it is generally agreed that the work should reflect three to four years of scientific research work at an international level. In this context, presentations at international conferences, which are seen as an important part of the training process, may be considered in meeting the publication requirements.

2.7   Principles that can guide the establishment of collaborative doctoral training

A major trend in doctoral training globally has been the development of collaborative doctoral training programmes building on the Bologna process. In response to a growing number of doctoral training programmes and the need for expansion of research capacity in Europe, the European Research Area initiated a study to map practices in doctoral training across Europe and beyond. The aim of the research was to identify the essential elements within doctoral training programmes. The report identified seven principles of an innovative doctoral training programme. While these principles do not seek to change the nature of the PhD qualification, which is advancement of knowledge, they recognise that doctoral training must increasingly meet the needs of an employment market that is wider than academia. These principles include the following: research excellence; attractive institutional environment; interdisciplinary

research options; exposure to industry and other relevant employment sectors; international networking; transferable skills training; and quality assurance (O'Carroll et al., 2012). Figure 2 below provides an outline of these principles.

Figure 1: The principles of an innovative doctoral training programme in Europe
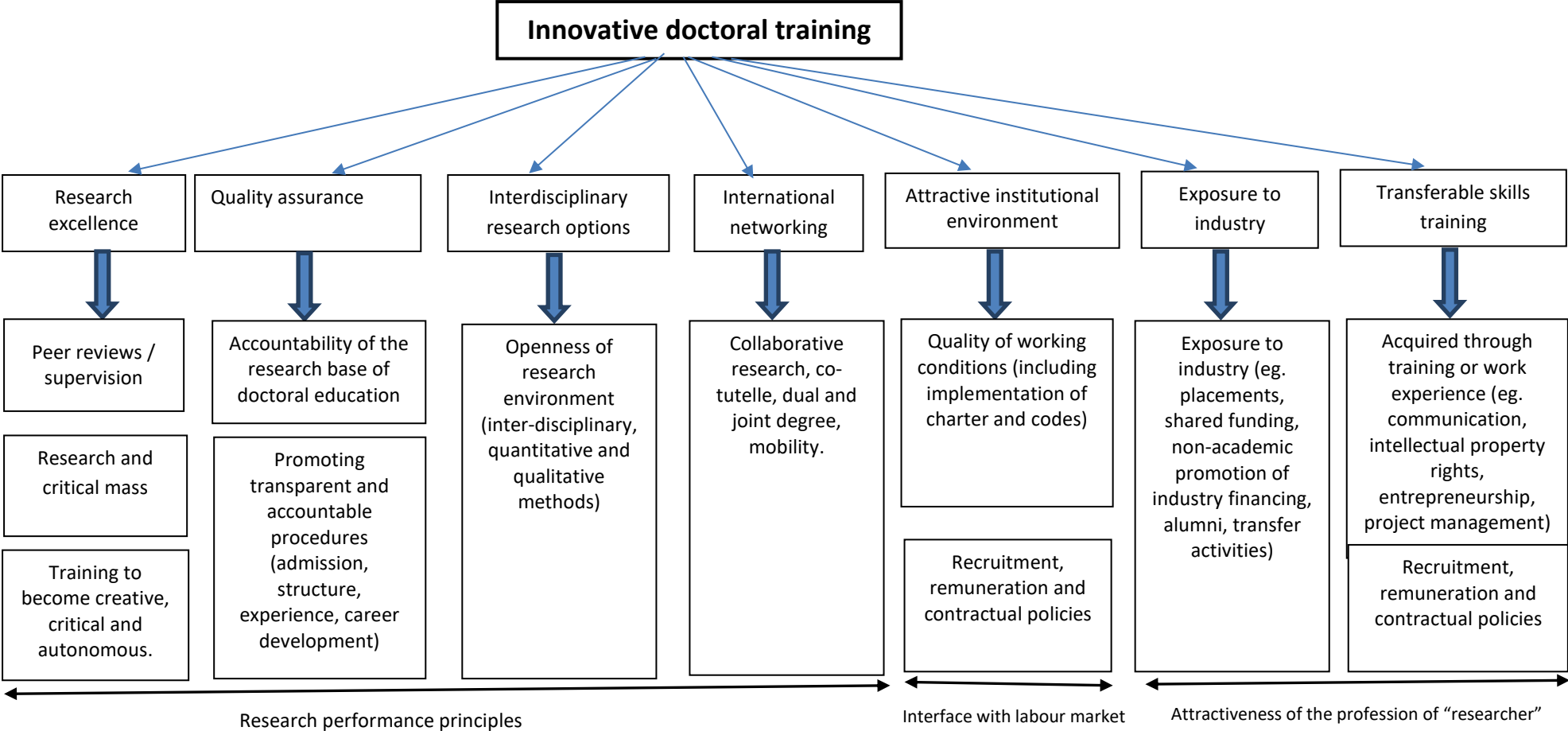
Source: IDEA Consult, based on Report of Mapping Exercise on Doctoral training in Europe (2011)[14]

---

[14] Report of Mapping Exercise on Doctoral Education in Europe (hrk.de)

Further studies by the European University Association on doctoral collaboration in Europe such as a 2009-2012 project "Promoting Collaborative Doctoral Education for Enhanced Career Opportunities" (DOC-CAREERS II) can also offer some useful insights, especially with regards to collaborative doctoral programmes. DOC-CAREERS II, which tested the feasibility of regional workshops as an instrument to foster university-business/enterprise collaboration, found that collaborative models were generally shaped by: the characteristics of the research project; the profile of the university; the nature and character of the external partners; and the regional context within which the collaboration took place. It was found that regions which sought to build their institutional, national, or regional competitiveness valued collaborative doctoral programmes and the skills doctoral candidates acquired through such collaboration. According to Borrell-Damian et al. (2015), successful collaborations are characterised by a number of values (see Figure 2 below).

Figure 2: Components of collaborative doctoral research
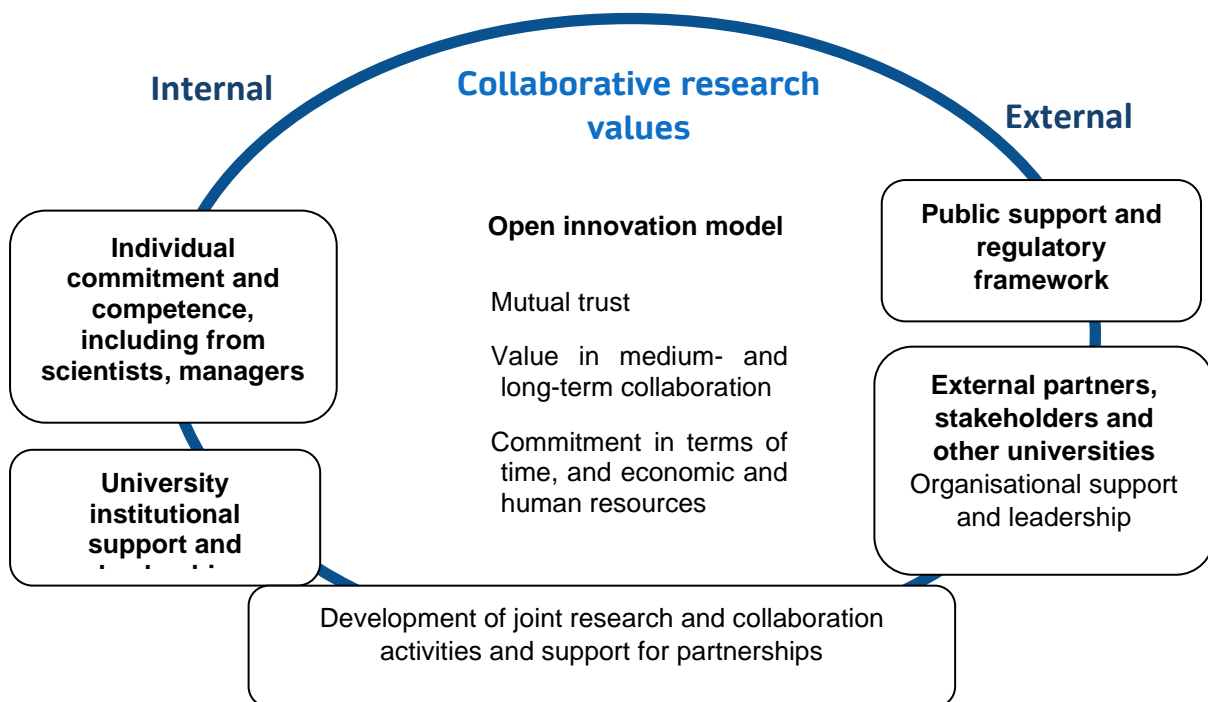
Source: Adapted from Borrell-Damian et al. (2015).

Borrell-Damian et al. (2015) note that successful collaboration depends on regions and institutions establishing appropriate policies and legal frameworks that support research collaboration. The absence of institutional, national, and regional policies can act as a major obstacle to effective, sustained collaboration in doctoral training. The establishment of such

policies and structures should include the identification of funding mechanisms to support the collaboration.

Borrell-Damian et al. (2015) also identify the importance of including business, industry and other external stakeholders in the design and implementation of the particular collaboration. Businesses can act as a funding and training partner and also help to provide rapid transition into employment for the graduates of the particular programme, as well as further training of the academic staff involved. Beyond engaging business and industry, there are other local and regional players who can endorse the credibility of the collaboration and provide other varying forms of support.

In summary, collaborative doctoral training as conceived within the DOC-CAREERS project indicates how an expansive approach to doctoral training may work through the engagement of business, industry and other stakeholders in the design, funding and implementation of such training.

3. Research overview: aims, objectives and methodology

3.1 Research aim and objectives

The aim of the present study was to conduct a review of doctoral programmes in ARUA member universities to develop a body of findings and recommendations towards creating globally competitive collaborative doctoral programmes among these institutions. Based on the study, this report aims to describe the underlying principles and standards that may be adopted to promote more harmonised provision of doctoral programmes across the alliance.

Specifically, the research had six main objectives, to:

7. **Review the structure and content of selected doctoral programmes** at ARUA member universities, considering them in terms of current and emerging best practices from other regions;

8. **Review the admissions requirements of selected doctoral programmes** in ARUA member universities, considering them in terms of current and emerging best practices from other regions;

9. **Identify potential areas/disciplines in which ARUA might support collaborative doctoral programmes** at member universities in the natural sciences, humanities and social sciences;

10. **Determine whether and how selected doctoral programmes may need to be restructured/reconfigured for the purpose of collaboration** at ARUA member universities in view of ARUA's mission;

11. **Determine whether and how admission requirements for doctoral programmes may need to be modified** at ARUA member universities in view of ARUA's mission; and

12. **Propose to ARUA any modifications to doctoral programmes and standards that may be necessary at ARUA member universities to facilitate collaboration** and the implementation of joint activities, considering national and institutional variances and contexts, and the various rules and regulations on graduate training and accreditation requirements.

The research aims to provide information and knowledge on the nature of doctoral programmes across ARUA member universities and how they can be better aligned towards collaboration, efficiency and their relevance to the continent and beyond. In this respect, Figure 3 below presents a snapshot of the spatial distribution of member universities alongside selected indicators of interest for the project.

Figure 3: Spatial distribution of ARUA universities across selected indicators
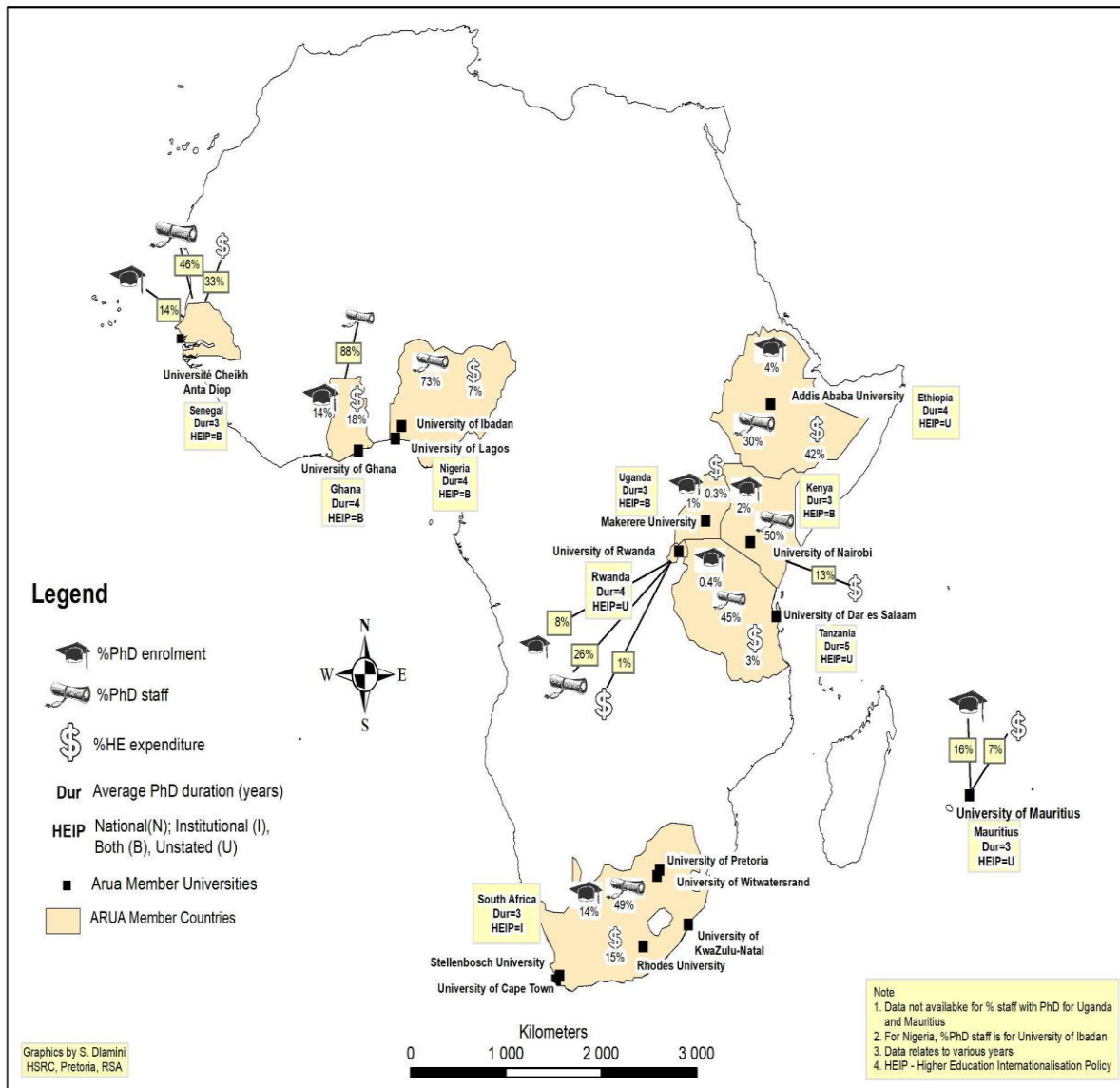
3.2 Research methodology

The study followed a multi-phase, multi-method, qualitative approach. The methodology was staggered, comprising three main phases. The first phase entailed a review of institutional and national higher education data and policy documents in each of the ten countries where the

study was conducted and a review of secondary literature pertaining to each country under study. This provided the contextual knowledge and empirical basis to inform the next two phases of the research.

The second phase entailed the identification of two doctoral programmes at each of the ARUA member universities as case studies. This process was facilitated through the ARUA secretariat who introduced the study and the research team to the alliance's member universities. Follow-up emails were sent to the institutional representatives, including to deputy vice-chancellors for research; deans of research; heads of doctoral programmes; and other academics. The selection of the case-study doctoral programmes from the universities was typically negotiated between the research team and representatives at the various institutions' research offices. Although a set of selection criteria was proposed, the universities had the discretion to suggest their preferred programmes from among the humanities and natural sciences. The original set of criteria included but was not limited to:

1. The quality of academic staff;

2. Academic productivity of the programme (that is, the number of graduates and research outputs produced);

3. Internationalisation of the programme (for example, in relation to the number of international partners, staff and students involved);

4. Financial sustainability of the programme in relation to funding and resources; and

5. The extent to which the programme was well-recognised nationally and internationally.

The 32 doctoral programmes selected for the final study were chosen on the basis of these criteria. Table 3 below provides a summary of the selected programmes across the universities that were the subjects of this study. Using a standardised data collection tool, a local research team member with expertise in each member university's higher education system collected institutional and programme-specific data. This data was cross-checked and compared at joint research-team meetings. In May 2022, preliminary country, institution, and programme-specific findings were presented and discussed at a meeting with ARUA in Accra, Ghana.

Table 4: List of selected doctoral programmes across the member universities

ARUA member university	Humanities programme	Natural sciences programme
Addis Ababa University	Economics	Plant Ecology
University of Dar es Salaam	Law	Climate Change and Sustainable Development
University of Ghana	Development Economics	Biochemistry / Molecular Cell Biology
University of Mauritius (UoM)	Economics	Biomaterials and Nanomedicine
Makerere University	Gerda Henkel Programme in Historic and Humanities Science	Physics
University of Nairobi	Economics	Biotechnology
University of Ibadan	Sociology	Chemistry
University of Lagos	Education Administration and Planning Sustainable Urbanisation (ARUA Centre of Excellence [COE])	Pharmaceutical Chemistry
University of Rwanda	General Management	Internet of Things
Université Cheikh Anta Diop (UCAD)	Judicial Science	Mother and Child Health
University of Cape Town (UCT)	Economics (coursework)	Climate Change (ARUA COE)
University of Pretoria (UP)	Public Administration and Management	Plant Science (ARUA COE)
University of the Witwatersrand	Psychology	Palaeosciences
Stellenbosch University (SU)	Economics	Earth Science
University of KwaZulu-Natal (UKZN	Development Studies	Physics
Rhodes University (Rhodes)	Environment and Sustainability Education	Water Science

The third phase of the research data-gathering process entailed conducting short interviews with the vice-chancellors or deputy vice-chancellors of the member universities. ARUA facilitated this process by sending out emails to its member universities asking the vice-chancellors to assist the research team with these interviews in June and July 2022. Interviews were held with just over a third of the vice-chancellors from ARUA member universities. The interviews were particularly insightful, providing deeper reflection on the positions of the various institutions with regards to collaboration and in relation to the various national policy contexts, and offering an opportunity to check some of the data and emerging findings. As a result, a more detailed analysis of the selected doctoral programmes was made possible.

4. Key findings of the study

This section draws on the detailed data collected at each focus doctoral programme across the ARUA member institutions. The research team codified and synthesised the data in an effort to interpret the information clearly and in order to be able to offer high-level, overarching findings. This section considers those aspects of the case-study doctoral programmes on which consistent data was provided, that is: admission and access; funding; structure, content and duration; supervisory model and support; examination and assessment; and collaboration. Where appropriate, some of the insights that emerged from the qualitative analysis across the literature and the country reports are included in this quantitative and summative overview. The data has been collated and triangulated to reflect on areas of convergence and divergence at programme, institution and country levels. The resulting insights can guide ARUA as it considers what is required to strengthen collaborative doctoral level programmes across its member institutions and even beyond.

4.1 Findings relating to admission and access to the programmes

The figures in this section are derived from codification and aggregation of data collected for the focus case-study programmes. Although many of the findings are at an institutional level, a number of them can be interpreted as being of broader relevance.

4.1.1 Requirements for admission

A few points can be highlighted from the analysis of admission requirements across the selected programmes. First, it was found that, in general, either a Master's degree (7 out of 16 institutions) or a Master's degree with a specified aggregate (7 out of 16 institutions) was required for admission into the relevant doctoral programme. Most programmes specified that the degree in question needed to be obtained in a related field and most often at a high grade point average (GPA) score, or that a Master's pass mark of over 60% was required (see Figure 4 below).

Figure 4: Admission requirements disaggregated by programme type and institution
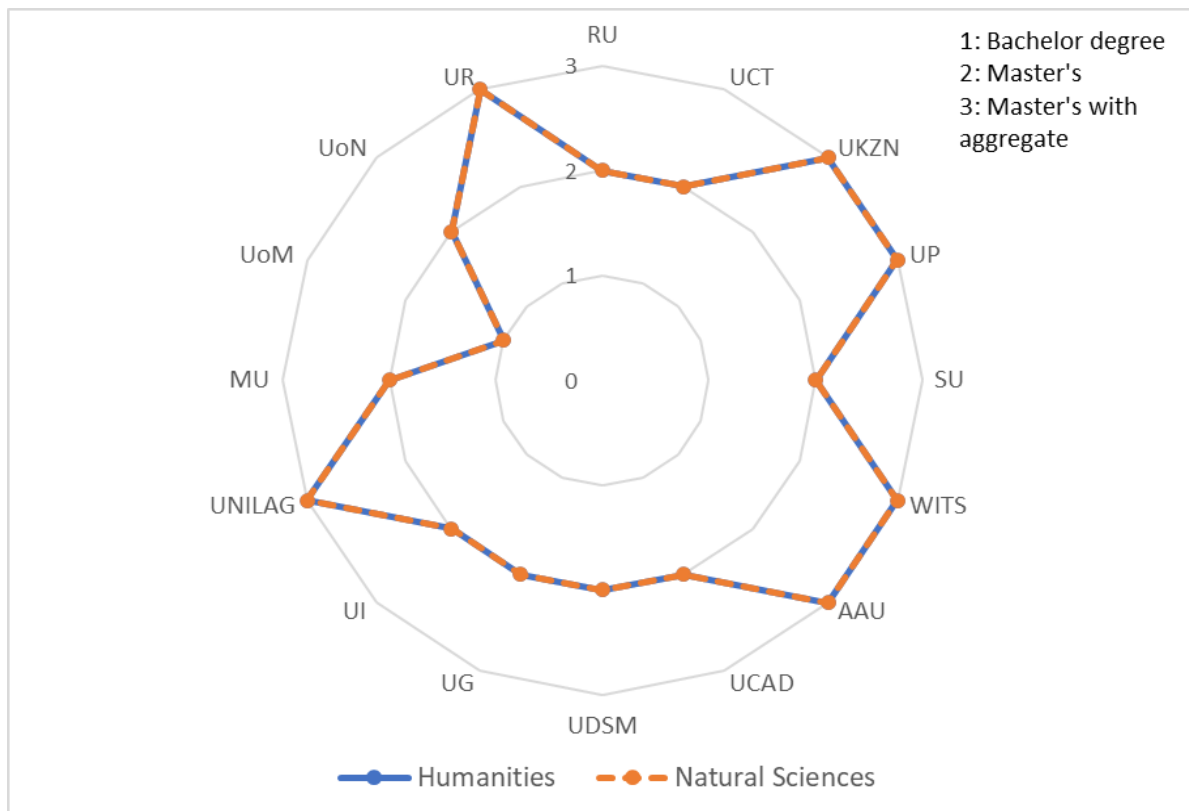
Some institutional differences can be highlighted. Based on this three-point categorisation, the programmes at the universities of Ibadan, Lagos, Rwanda, KwaZulu-Natal, Pretoria, the University of the Witwatersrand and Addis Ababa featured the most stringent admission criteria. In the case of the University of Rwanda, "routes appear to be stringent and elite in nature and in practice as they are likely to keep the majority of prospective doctoral students from applying for PhD studies at UR" (Rwanda country report, p. 15). At Addis Ababa University, it was confirmed that in order to qualify for a PhD in Economics and a PhD in Plant Ecology prospective applicants must have at least a Master's degree (or qualifications recognised as equivalent to a Master's degree) from a recognised university with an MA/MSc thesis in a specific field of study or related field. The PhD programme in Plant Ecology, for instance, admits applicants who hold an MSc degree in Biology, Plant Sciences, Forestry, Natural Resources Management and other biology or plant biology related fields" (Ethiopia country report, p. 15). In addition, a cumulative grade point average (CGPA) of at least 3.4 was stipulated.

At Ibadan, candidates seeking access to the PhD programme in chemistry "must hold a Master's degree with a PhD grade (total weighted average of at least 60% or a CGPA of 5.0 in

the relevant written examinations of the three semesters of the MSc programme)". Meanwhile, candidates for a PhD in sociology "must have obtained a Master's degree with PhD or MPhil/PhD grades in any of the units in sociology or cognate disciplines" (Nigeria country report, p.18).

In South Africa, some of the doctoral programmes featured stringent requirements for admissions, while others featured less stringent requirements. It was found that "the requirements for admission tend to be a Master's degree or an equivalent. While some institutions, such as Stellenbosch University and Rhodes University, do not specify a particular percentage score that should have been achieved at Master's level, some are more prescriptive in this regard. For example, the University of Pretoria specifies a minimum average score of 65% at Master's level for admission into their programmes. While the University of Cape Town does specify a minimum level for admission in the focus humanities programme (economics), this is only a second class (lower division) achievement at Master's level" (South Africa country report, p. 21).

Programmes at the University of Mauritius featured the least stringent criteria, accepting individuals without a Master's level qualification and with only a Bachelor's degree, although at a stipulated level: "The minimum admission requirements for the MPhil/DPhil programmes in economics and biomaterials and nanomedicine (the focus programmes in the case) are successful completion of an undergraduate degree with a second-class honours in the relevant field or equivalent, or a grade point average not less than 2.5 out of 4 or equivalent from a recognised higher education institution" (Mauritius country report, p. 13). It is important to note here that these admission criteria are for an MPhil/DPhil programme and not directly into a DPhil programme. Given that the MPhil aspect of the programme operates almost as a pre-admission evaluation of competency, the access requirements in Mauritius do not diverge from the standard set by the other member institutions as much as may first appear. In Nigeria, a Bachelor's degree is the entry requirement for many doctoral programmes but not for those considered by this study..

It is important to note that, in general, the data did not find any major differences in terms of the admission requirements for doctoral programmes in the humanities and those in the natural sciences (see Figure 4). From ARUA's point of view, this could indicate that admission requirements can be aligned quite readily at the institutional level without the programme type (field of study) standing in the way. In support of such an approach, it was found that "in

Ethiopian higher education institutions in general, the admission requirements for the postgraduate programmes are not set at the national level but determined institutionally" (Ethiopia country report, p. 15).

However, although alignment in terms of the standard qualification levels for access into a doctoral programme is an important consideration for collaboration, other factors relating to access must also be considered. For example, some institutions require that certain coursework must be completed, and in some cases examined, before the candidate can move on to preparing their thesis manuscript or writing papers for journals. There is also variation in terms of whether such coursework is credit-bearing or not (see section 4.2.1 where coursework is discussed further). Meanwhile, some institutions, such as in Ethiopia and Mauritius, insist on a pre-admission process under which the doctoral proposal is presented to a departmental committee which evaluates it. In some case, certain departments require reference letters, nominations and even evidence of funding from PhD candidates.

At Université Cheikh Anta Diop, students seeking to enrol in a natural sciences doctoral programme "need to be attached to a doctoral laboratory before admission" (Senegal country report, p. 20). It was further found that "each doctoral school is linked to several laboratories which are entry points for students seeking admission to PhD training. The relationship between a student seeking admission and a doctoral laboratory is somehow informal. It requires a student to identify a supervisor/mentor at the laboratory whose availability will determine the acceptance of the student's application for admission to a doctoral school through the graduate school. This lack of capacity at the level of the doctoral laboratory (supervisors and mentors) may present a problem to ARUA in terms of negotiating collaborative programmes" (Senegal country report, p. 26). In this regard, it was found that the selection/identification of a supervisor before commencing with a proposal was an informal but important pre-requisite for successful admission at most of the institutions in the study.

In South Africa, the informal pre-identification of a supervisor which favours internal candidates has implications for collaborative programmes. At Stellenbosch University, it was found that "while this process ensures higher success rates in the acceptance of a proposal/PhD project and alignment with appropriate supervisors alongside budget availability, from the perspective of a so-called 'outsider' or random application, the process is much more closed … applications, where there has been no prior contact between potential supervisors and prospective students are invariably unsuccessful, principally because no thought has been given

to the project's running expenses and to bursary support for the candidate. Experience of not being able to match project and project design with the candidate's capabilities has tended to result in very low probabilities of a candidate being accepted on a so-called random application" (South Africa country report, p. 31). In this regard, Louw and Muller (2014) suggest that members of admissions committees and programme chairs should be trained in order to provide greater transparency and efficiency in the candidate selection and recruitment process. The implementation of common standards for admission by such committees across institutions could ensure that candidates from less represented backgrounds, regions and countries are increasingly admitted into PhD programmes.

4.1.2 Modes of funding

Access to and full participation in a doctoral programme depends on sufficient funding being made available. Some programmes enforce the provision of appropriate funding as a condition for acceptance. Others might accept a candidate but only register their project or title after funding has been secured.

To get a sense of the typical funding requirements across member institutions and doctoral programmes, the available data was coded into three categories: self-funded, partially funded and fully funded programmes. The analysis showed that seven programmes were fully funded, nine had partial funding and the remainder, which is the majority (13), were self-funded.

Figure 5: Predominant modes of funding disaggregated by programme type and institution
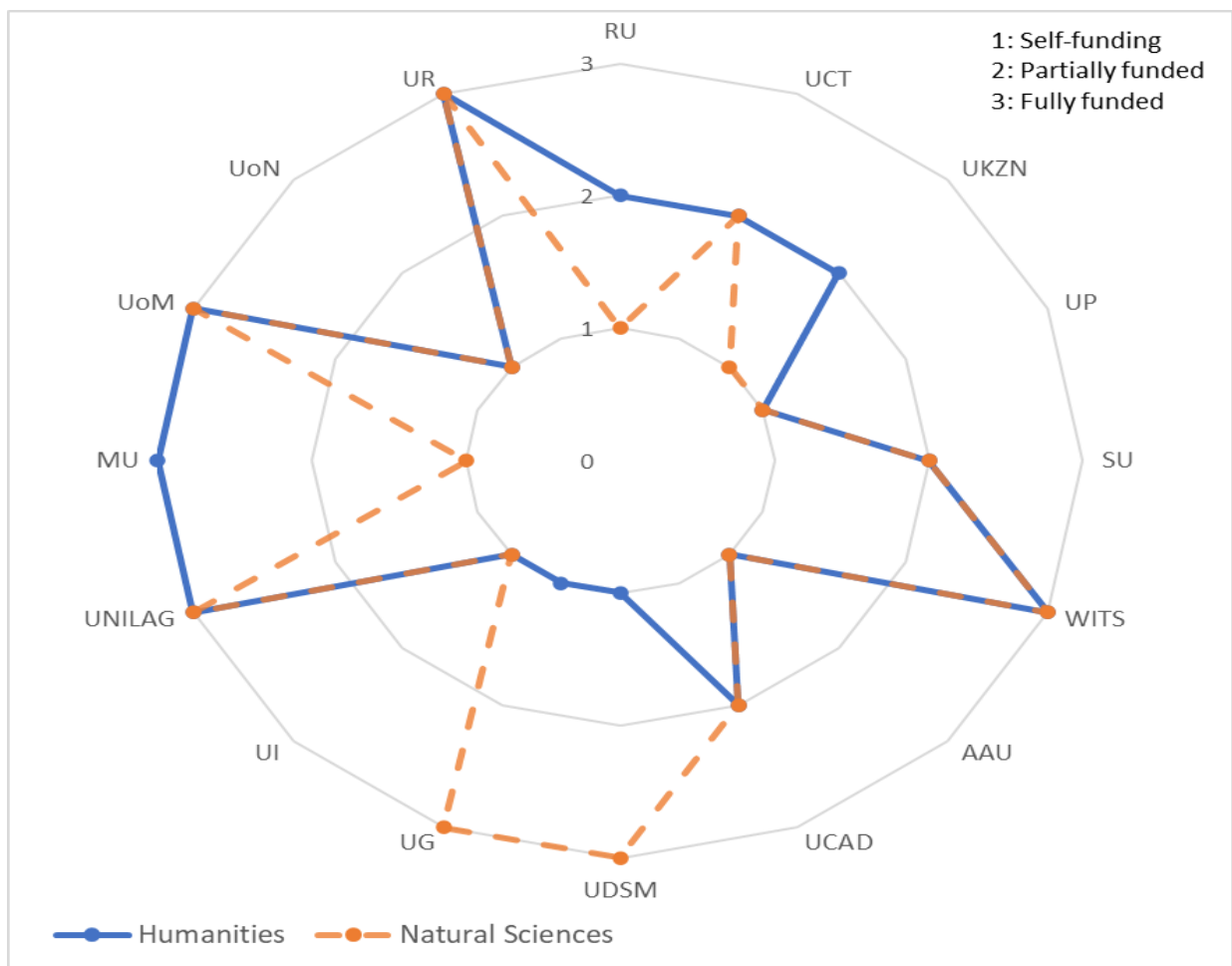
There are several points to note from Figure 5 above. First, there was little convergence in how doctoral programmes across the alliance and even within the same country were funded. For example, in South Africa, the programmes at Wits were fully funded; those at UCT and Stellenbosch were partially funded; those at the University of KwaZulu-Natal and Rhodes were either part-funded or self-funded; and the programmes at the University of Pretoria were self-funded. In general, it was found that "the model of higher education funding in South Africa is one of cost-sharing, whereby a student, including doctoral students, are typically required to

self-fund their studies" (South Africa country report, p. 27). In this regard, the fully funded nature of the programmes at Wits was the exception. The remaining South African programmes under study were all either partially or completely self-funded. A related challenge in the South African case was that where funding was available it was directly primarily, indeed almost exclusively, towards full-time study. As the South Africa country report noted: "This was illustrated in both the UCT and UP cases where financial assistance is only available to full-time students [and there is] a limited number of scholarships available for international students, with not much available on an all-inclusive 'full-cost-of-study' basis. In the case of the UKZN, it appears that efforts have been made to remove funding as a potential stumbling block to gaining access to PhD level training. But even in this case, it is full-time students that enjoy advantage [and are] eligible for [a] fee remission period [of] 36 months (six semesters) for a doctoral student. During the fee remission period, no tuition fees are payable by the student. Reliance on the National Research Foundation (NRF), in conjunction with funding from supervisors through grants, was also found to be the main modality for students to gain access to funding at Wits and Rhodes" (South Africa country report, pp. 23-24).

In Nigeria, the programmes under study at the University of Lagos were fully funded, while those at the University of Ibadan were self-funded. For example, the PhD in Sustainable Urbanisation at the University of Lagos was supported as "a German Academic Exchange Service (DAAD)-funded SDG [Sustainable Development Goal] Graduate School Programme[15]" (Nigeria country report, p. 22). At Ibadan by contrast "candidates are not funded for the PhD programme, either in the form of stipends or research support, [however] opportunities for bench/laboratory work are often done outside the country, mostly in Europe through the students' and supervisors' networks" (Nigeria country report, p. 19).

Access to funding can determine when and whether PhD training commences and is successfully completed. Access to funding also shapes the nature of the student experience; the possibility of collaborative efforts; and the extent of the resourcing and supporting infrastructure available to a particular doctoral programme. At the University of Nairobi, "PhD programmes are unfunded by the institution, except for a few that benefit from external collaborative linkages. Students usually seek admission and use the admission letter to source funding. This means that once a student is admitted, there would be a time lag to registration,

---

[15] A partnership between the University of Witwatersrand, Technical University Berlin and University of Lagos as well as the UK Research and Innovation (UKRI)-funded African Research Network on Urbanization and Habitable Cities (a coalition of 10 African universities and four UK universities) (Nigeria country report, p. 22).

depending on how one secures funding support, and develops the proposal as a requisite to registration. In the case of the envisaged collaborative programmes, dedicated funding and available supervisors will be critical to the smooth and timely function of the collaboration" (Kenya country report, pp. 22-23).

In Tanzania, it was found that different levels of funding had clear implications for resourcing at the University of Dar es Salaam, including in relation to the quality of the infrastructure available to the programmes. It was found that "variations are due partly to differences in terms of resources between, and among, units and programmes. The main determinant of the variations is the funding, and particularly, external funds dedicated to specific units or programmes … only units or programmes which are funded mainly by external funders are the ones with better infrastructure. There is so much variation between and among units; some are better off, some are not. Especially those which have external funds, you find that they have new buildings and have put some infrastructure. But still, if you compare with other universities, particularly in developed countries, we are very much behind" (Tanzania country report, p. 21).

Meanwhile, the fully funded nature of the doctoral humanities and natural sciences programmes at the University of Lagos, the University of Rwanda, Wits and the University of Mauritius may be seen as promoting the prospects of the PhD students at these institutions. The literature suggests that guaranteed funding for doctoral studies can lower attrition rates and lead to earlier completion (see Ehrenberg et al., 2010). Meanwhile, partial or self-funded doctoral studies on the continent can lead to casualisation (Obamba, 2017). Looking beyond Africa, it seems that there is a wide range of funding regimes. In some cases, full funding is made available for doctoral students, including in European countries such as Sweden and Norway. In some places, partial funding for doctoral students is supplemented by earnings as a laboratory or teaching assistant. In the US, PhD candidates tend to be appointed as full-time teaching assistants which leads to their PhD tuition fees being waived (Kehm, 2005).

Funding is a critical consideration as it has implications for the entire doctoral pathway. Lack of funding can restrict access; harm the student experience; and lead to late completion of the PhD or even force the candidate to abandon their efforts to acquire a doctorate. However, this does not mean that the success of collaborative doctoral programmes depends entirely on greater funding. Rather, more detailed mapping of pilot programmes is required so that a fuller assessment of the kind and extent of funding requirements may be made. For example, it should

be determined whether the main funding shortfalls exist at the programmatic or institutional level; the nature of the funding requirements before and after admission and registration; the kinds of funding arrangements that are needed to ensure completion; and the funding levels that are required to ensure appropriate supervision and improve the student experience.

4.2 Characterising the structure of the typical doctoral programme

Three aspects of the structure of the doctoral programmes were considered by the study: work requirements; examination requirements; and the duration of the programme.

4.2.1 Coursework

It was found that 7 out of 16 doctoral programmes in the humanities featured a coursework component; and 6 out of 16 natural sciences programmes required such a component. Importantly, where a coursework component was included, it was compulsory and tended to form part of a continuous assessment process which monitored the student's competence as he or she moved through the programme. None of the programmes considered by this study featured a non-compulsory coursework component, although there were other non-compulsory aspects to these programmes at the institutional level.

Figure 6: Structure of doctoral programmes by content type and institution
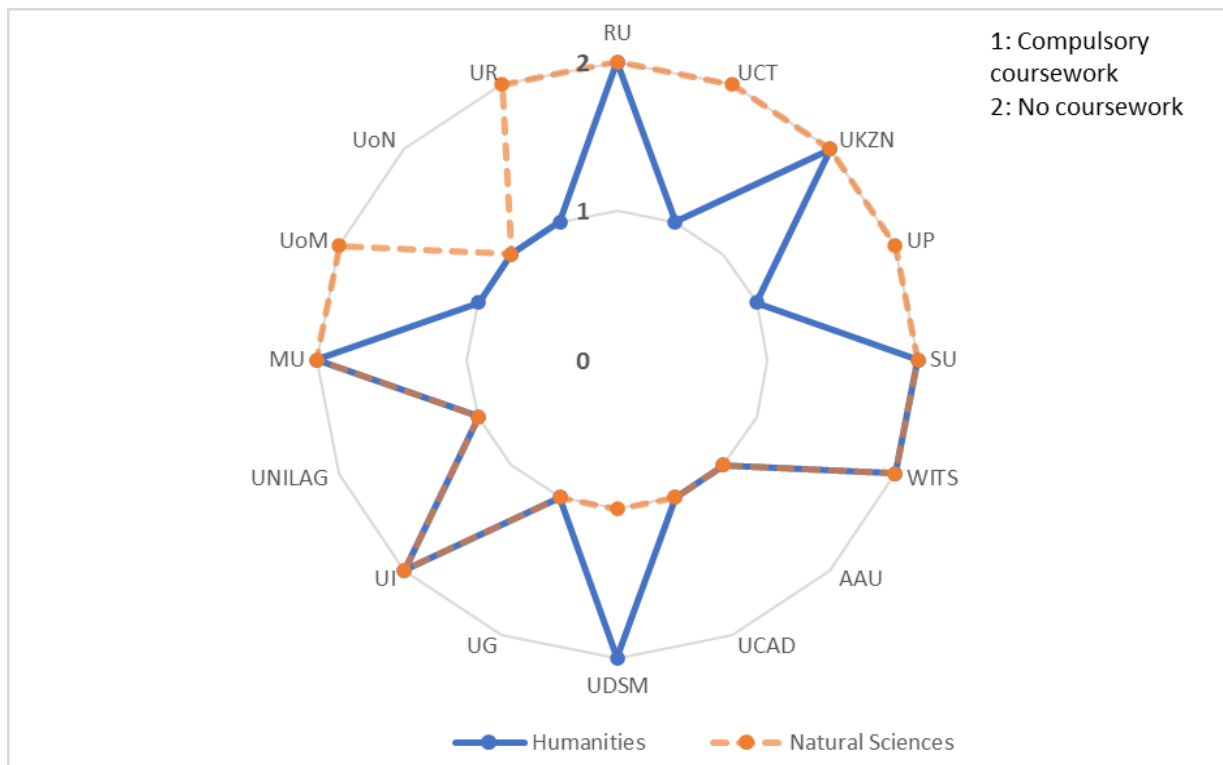
In some institutions, coursework was required across disciplines; in others, there was divergence. In Ghana, compulsory coursework was a component of both the humanities and natural sciences programmes under study. For example, the PhD in Biochemistry/ Molecular Cell Biology of Infectious Diseases was offered on a full-time basis, comprising "two semesters of course work; a PhD qualifying examination; one proposal seminar; three progress seminars; and one thesis defense seminar (PhD *viva voce*). All activities of the programme are assessed and graded" (Ghana country report, pp. 18-19). Similarly, the PhD programme in Development Economics at the University of Ghana "consists of a year of coursework, followed immediately by a comprehensive examination, and three years of thesis writing ... The core courses include, applied econometrics, advanced macroeconomics, advanced microeconomics, applied theories, and methods of economic development. The elective courses are: applied natural resource economics, applied agricultural economics, applied health economics, advanced international economics, advanced monetary economics, advanced labour economics, and political economy of African development" (Ghana country report, pp. 18-19).

In some programmes, the coursework was found to be credit-bearing such as in the humanities programme on offer at Université Cheikh Anta Diop (Senegal country report, p. 37). In others it was not. For example, the humanities (Economics) programme at the University of Cape Town featured compulsory coursework that was not in itself credit-bearing – although knowledge of this coursework was tested and the candidate had to pass an examination on it and produce a dissertation from the coursework as part of the requirements to obtain the final PhD degree. At the University of Pretoria, the Public Management and Administration programme featured several seminars at which attendance was mandatory. These included seminars on modules covering qualitative and quantitative data analysis; micro and macro theories; and the development and defence of a PhD proposal. The course also featured a number of elective seminars on topics decided by the staff on the basis of the students' academic needs. However, as with the UCT programme, these seminars and modules were not credit-bearing.

In this regard, it should be noted that the South African national qualifications framework makes provision for doctoral degrees with a credit-bearing coursework component (as well as work-integrated learning) under which the non-research component must comprise less than 40% of the total degree (CHE, 2013, p. 41). Of course, at the continental level, different countries have different types of credit-accumulation systems; and alignment among these

would be highly complex, although this must be considered as part of the planned efforts to produce collaboration across doctoral programmes in Africa.

At the same time, it should be noted that the research for this report found that structured doctoral programmes which included coursework and other requirements, as well as stricter prescriptions around minimum duration which mainly related to funding availability, were the exception, rather than the rule – although, referring back to the discussion in section 2.6.2, it appears from the literature that there is increasing emphasis on the inclusion of content to develop generic skills through doctoral training.

4.2.2 Examination and/or assessment requirements

Another dimension evaluated as part of the structure of the doctoral programmes was their final outputs. In a large proportion of programmes (14), assessment included an examination of the original thesis which was presented as a monograph. Twelve programmes assessed this monograph alongside a number of publishable or published papers produced by the candidate. Five programmes employed a hybrid model under which the candidate was assessed on the basis of either a thesis monograph or a series of academic papers (see Figure 7).

Figure 7: Predominant modes of examination disaggregated by programme type and institution
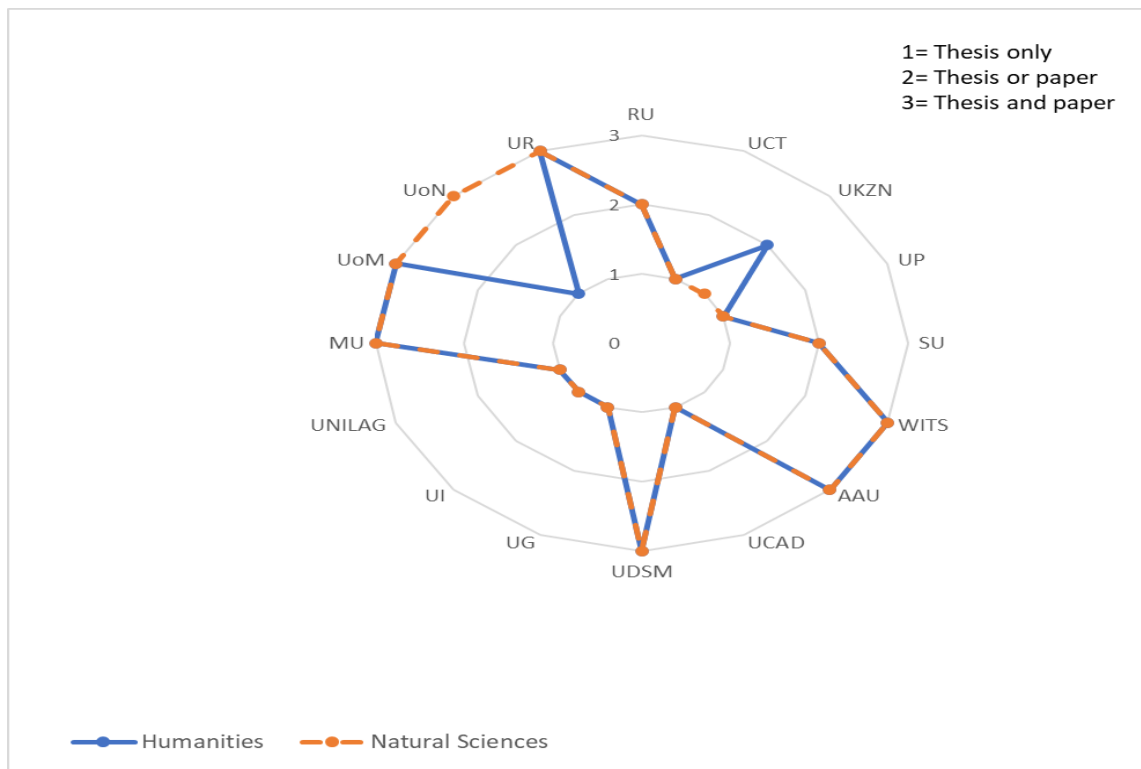
So, although the thesis monograph remained a crucial examination requirement in most cases, a significant number of the programmes under study were moving towards other types of assessment, including a monograph plus papers or a hybrid model under which the doctorate could be undertaken in the form of a research monograph or in the form of a series of publishable or published research articles. In this respect, there was also significant variation in the requirements for undertaking a PhD through the production of publishable articles, including within institutions. For example, at Stellenbosch University, the humanities programme required three papers of publishable quality, while the natural sciences programme required two published papers, including one in an international journal.

The humanities programme under study at the University of Rwanda was found to have particularly stringent, even onerous output requirements for its PhD candidates. The programme insisted on the production of at least two published articles, on the basis that "in practice and ideally, the demand for publications prior to graduation provides an important experience for PhD candidates, which also contributes to knowledge production. However, the practicality of such a requirement is complex given the demand of a doctoral project as well as the complexities involved in the process of writing and producing a journal article, which is dependent on the efficiencies of the particular journal and review process. The question that one may ask is how many PhD candidates are able to produce two publications to meet the doctoral degree completion requirement within the minimum four years of studies?" (Rwanda country report, p. 17).

In addition to the written outputs, a *viva voce* (oral) examination of the doctoral thesis also formed part of the assessment process at most but not all of the universities under study. For example, at the natural sciences programme under study at the University of Ghana, "the comprehensive examination is made up of three components: 1) A written examination consisting of questions related to all the courses taken during the first year of the PhD programme as well as general cell and molecular biology. Material covered in departmental seminars and workshops may also be included. 2) A research proposal: this should be in the general area of interest of the PhD candidate. The proposal should be different from the candidate's thesis research proposal, and 3) An oral examination: the PhD candidate is required to make an oral presentation of the submitted research proposal by PowerPoint and answer questions on the proposal and related areas" (Ghana country report, p. 19).

At the University of Addis Ababa in Ethiopia, it was found that "the Dissertation will eventually be subjected to a *viva voce* and must be completed at least with a grade of 'Satisfactory' or a letter grade of 'C+', in accordance with the University Legislation on Grading Thesis and Dissertations. Furthermore, as per the most recent legislation of 2019, a PhD candidate shall publish or produce evidence of acceptance for publication of at least two articles in reputable journals to graduate (Dissertation + Journal Article). Unless they fulfil this requirement, they would not be cleared to graduate and awarded the PhD Degree in economics" (Ethiopia country report, p. 14).

In addition, some universities have rules regarding the involvement/non-involvement of their supervisor or supervisors in the examination process, as well as rules regarding the appointment and qualifications of examiners, including whether examiners may be appointed from the home institution and the same country; and how many, if any, must be international. Common rules will need to be agreed on these issues as part of the drive to establish collaborative programmes.

4.2.3 Duration of the programmes

At nine of the 16 universities under study, candidates were expected to dedicate at least two or three years to undertaking their PhDs. At the remaining universities, they were supposed to allocate at least four years to the task. For example, a PhD programme at the University of Ghana was typically four years in duration: "There is a generic module of having coursework examined after either the first and only, or both the first and second year, with the subsequent two years dedicated to the research component of the programme" (Ghana country report, p. 6). At the University of Rwanda "PhD studies can only be undertaken by research only in all the disciplines and the duration is at least three years. However, doctoral students take about four years to complete their studies" (Rwanda country report, p. 20).

Figure 8: Minimum duration of PhD disaggregated by programme type and institution
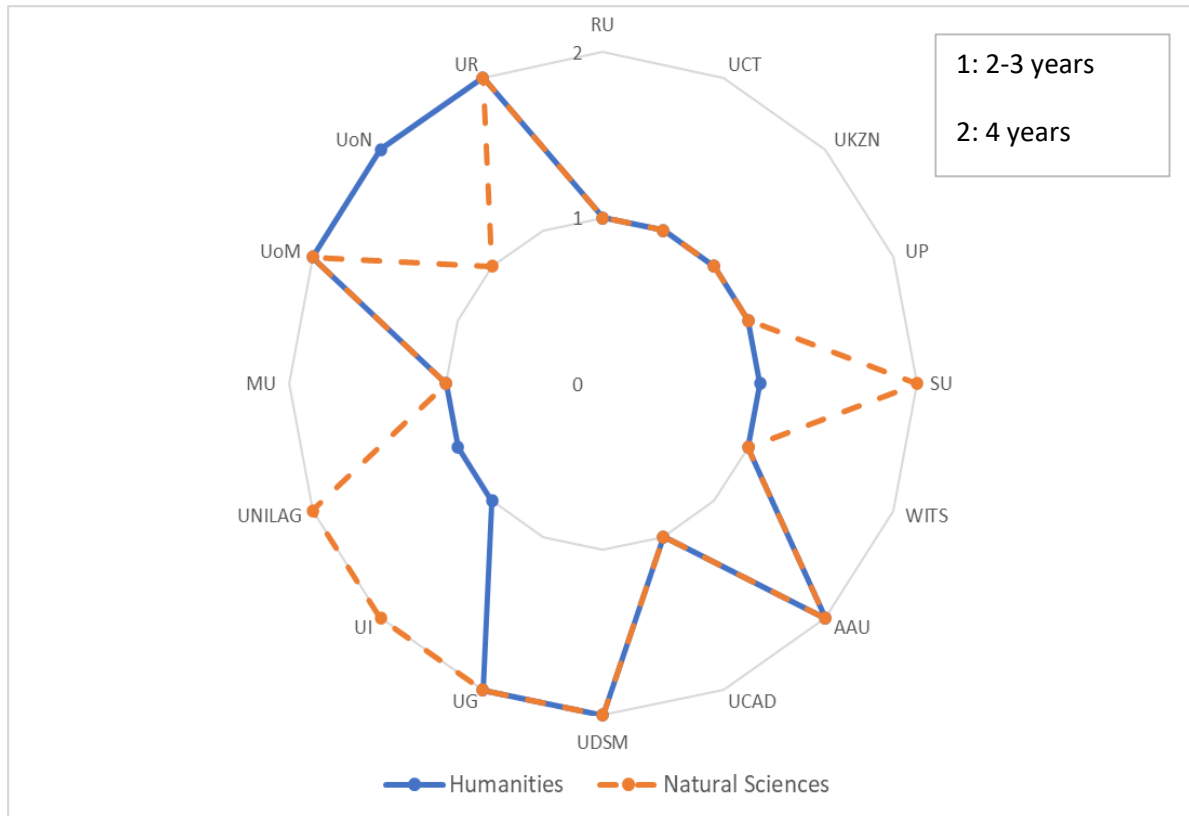
The above findings should not be considered surprising. In South Africa, the stipulated minimum duration for a full-time PhD is two years (CHE, 2013, p. 40); and universities are rewarded for timely completion of doctoral study through a system of higher education subsidies that provides funding for up to three years for PhDs. In this regard, institutional policies at the universities tend to pay close attention to the subsidy requirements. Nevertheless, Cloete et al. (2015) found that in about 50% of cases it takes around six years to complete a PhD. In other countries in Africa, full-time students tend to complete their PhDs in three or four years. Cloete and colleagues show that once part-time students are included in the equation, the average time for completing a PhD in South Africa typically rises to between five and seven years.

In the case of Senegal, students "take up to 7-10 years due to funding and supervisory challenges" (Senegal country report, p. 22). On average, part-time doctoral students in South

Africa complete their PhDs within about five years, with the subsidy model covering the first six years for part-time students. At the same time, institutional data and higher education reports indicate that some ARUA universities fail to graduate any doctorates in under three years and that doctoral graduation rates in general are quite low, which lengthens the average completion time across these institutions.

As is shown in section 2.6.2, the duration of doctoral programmes in other regions is linked to their structure. Based on evidence from six African countries,[16] Obamba (2017, p. 40) argued in a report on "Constructing 'innovative' doctorates" that "the most important dimension in this regard [in relation to duration] is concerned with whether a doctoral programme is organised as thesis only, integrated coursework and thesis, or a combination of both models. The internal structuring of content as well as pedagogical and assessment practices are also examined." The report goes on to note that "a more structured model of doctoral education consisting of integrated advanced coursework and supervised research represents a more robust form of doctoral education for Africa compared to the unstructured thesis-only doctoral model" (Obamba, 2017, p. ii). Such a structure would require a longer duration of at least four to five years for a full-time PhD, as has been shown in other countries and regions.

4.3   The student experience of doctoral studies

Scholarly literature identifies a number of factors that have an impact on how students experience their PhD studies and their prospects of completion, including personal, psychological, familial, cultural, and bio-social, as well as academic factors. Unfortunately, it was beyond the scope of this investigation to explore the impacts of these factors comprehensively. A recent review on these impacts can be found in the relevant literature, such as in a study undertaken by Daniel-Oghenetega (2020). The present research only analysed a limited number of so-called institutional factors that may have an impact on the doctoral-study experience. In this context, this section of the report focuses on three institutional factors that can impact the doctoral student experience: staffing and supervision; supporting structures; and the extend and kind of inter-institutional collaboration.

4.3.1 Staffing and supervision

This sub-section considers the supervisory model adopted by the various programmes, which, to a large extent, is shaped by the programme's structure and requirements; and the extent of

---

[16] Botswana, Ghana, Kenya, Nigeria, Tanzania and South Africa.

the supervisory capacity on offer, which is both a programmatic and institutional concern (and also has implication for access as alluded to in section 4.1.1).

Figure 9 below shows that the main model of doctoral supervision at the programmes under study was still the traditional apprenticeship model, which was adopted by 18 programmes. The remaining programmes (14) reported employing a team supervision model. Meanwhile, although there are a number of quite well known, established cohort programmes across many of the member institutions under study, none of the focus programmes, surprisingly, employed a cohort model of supervision.

Figure 9: Supervisory models disaggregated by programme type and institution
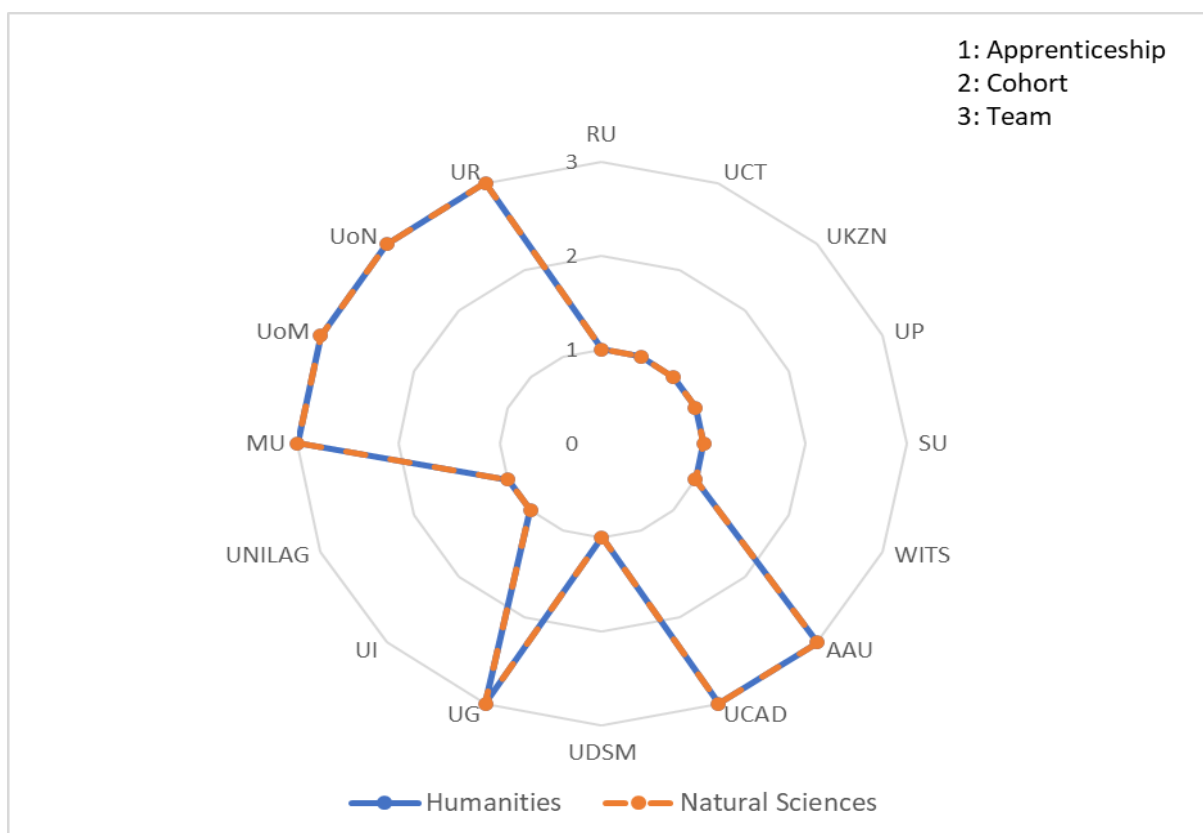
The apprenticeship model allocates one supervisor to one student in a one-on-one supervision relationship. Team supervision involves a team of supervisors, for example, in a co-supervision relationship, supervising a doctoral student. Cohort supervision is a model under which several students are supervised together simultaneously as a cohort by one or more supervisors (Daniel-Oghenetega, 2020, pp. 25-29). However, the boundaries between these different models are not always that clear. For example, under the apprenticeship model, while one student is assigned to one supervisor, this supervisor could have more than one student (in some cases as many as 10) assigned to him or her at any given time. Similarly, while team supervision is

defined as one student to more than one supervisor, there is arguably a significant difference between having one co-supervisor, which is common, and having, say, three co-supervisors.. In the main though, as observed from the case-study universities, co-supervision is common and cohort supervision seems to be the exception.

At Makerere University, the focus programmes adopted "a team supervision model, where one student has several supervisors. In most instances, the student has two or three supervisors: the 'main' supervisor and the 'co-supervisor(s)'. The PhD programme in the natural sciences similarly adopts the one student-several supervisors (team supervision model) approach" (Uganda country report, p. 26). The tendency towards team supervision appears to stem from a need to address low capacity since this arrangement allows the load and responsibility of supervision to be shared. At the University of Rwanda "all PhD candidates are required to work under a supervisory team … consisting of one main supervisor and two co-supervisors. In some cases, PhD students are supervised by external supervisors who are familiar with the university and programme regulations and expectations" (Rwanda country report, p. 19).

As mentioned earlier, the supervisory model tends to be driven by programme- and department-specific considerations, including supervisory capacity within departments, across the institution, and even at national level (see also section 4.1.1 which addresses the issue of the assignment of supervisors). Many universities across Africa assert that they struggle with low supervisory capacity for doctoral students (Jowi, 2021). In this regard, this study found that a lack of adequate academic staff to support quality supervision of doctoral students was reported in several countries. In Ethiopia, limited supervision capacity was described as a key challenge in relation to doctoral training on the continent, with 85% of survey respondents agreeing that there was a high mismatch between the number of students and available supervisors (Nega & Kassaye, 2018). In this regard, the present study observed that countries have widely varying percentages of scholars with doctoral degrees among their academic staff, ranging from about 15% in some systems to about 75%.

In this respect, although a low supervisory capacity has been noted across the continent through the country reports, some of the ARUA universities reported high percentages of staff with doctoral qualifications. For example, although graduation rates for the selected programmes in Nigeria remained low at about 12% over the past four years, the universities under study in this country boasted a relatively high percentage (100%) of staff with doctorates at the University of Lagos. By contrast, academic staff with PhDs at South African member universities ranged

from about 49% to 75%, although these institutions boasted significantly higher doctoral graduation rates. Further investigation is needed to make greater sense of this data.

Such discrepancies between the percentage of staff with doctoral qualifications and the percentage of doctoral graduates may indicate that having a doctoral qualification does not necessarily entail being able to supervise doctoral students effectively. On the other hand, many of those scholars who have the capacity to supervise doctoral students can be overwhelmed by the number of students assigned to them. For example, it was found that some supervisors at Université Cheikh Anta Diop had "up to 40 [students] due to staff shortages" (Senegal country report, p. 25).

It was found at the programmes under study that programme type did not appear to play a distinctive role in relation to the model of supervision that is deployed. However, the different models of supervision that are employed should be investigated in relation to whether their use may increase doctoral student participation. In cases where doctoral programmes are offered in collaboration between or among institutions, there will need to be alignment in terms of the supervision model, particularly in relation to the possibility of introducing collaborative forms of supervision.

4.3.2 *Supporting structures and facilities established to improve the doctoral study experience*

It is important to reflect on other forms of support, including in relation to the provision of institutional and programme-specific resources, that can have a bearing on the student experience of doctoral studies and even on doctoral throughput rates. The data collected for this research indicated that most of the universities are increasingly providing support structures and initiatives to improve the experience of students throughout their doctoral studies. However, although most of the universities confirmed the presence of modern infrastructural facilities such as libraries, laboratories and resource centres, some of them reported struggling with outdated, inadequate infrastructure which failed to enhance the doctoral-study experience. In this regard, a recent study by Fetene and Tamrat (2021, p.25) found that doctoral students in Ethiopia:

> are dissatisfied with the poor standard and availability of resources such as IT [information technology] and computer facilities, personal work or study space, library and electronic research resources and services, quality of library holdings, and availability of laboratory, clinical, or related physical facilities.

From Uganda, Muriisa (2015) notes that, regardless of the quality and competence of the students who enrol, the context of the programme on offer is a key factor in relation to completion rates. In Ghana, Alabi and Mohammed (2018) found that 51% of respondents believed there was inadequate research infrastructure including laboratories and workshops, compared with 32% who felt that these facilities were adequate. Many respondents have indicated that access to recent analytical technology, particularly in the natural sciences, could determine whether laboratory data-work and PhD theses would be completed on time (James, 2022).

It is evident from the study that ARUA members are presented with an opportunity to work more collaboratively, sharing resources and jointly addressing resource constraints, such as in relation to expertise, equipment, laboratories and supervision, without having to foster dependence on institutions external to the alliance.

4.3.3 Collaboration in doctoral programmes

One of ARUA's aims is to facilitate collaboration in the provision of doctoral programmes. Against this background, this study found that nine of the programmes under study featured no national or international collaboration with other universities. Meanwhile, five programmes entailed collaboration with an international partner or partners and most of the programmes (18) entailed collaboration with one or more African institutions.

Figure 10: Extent of collaboration disaggregated by programme type and institution
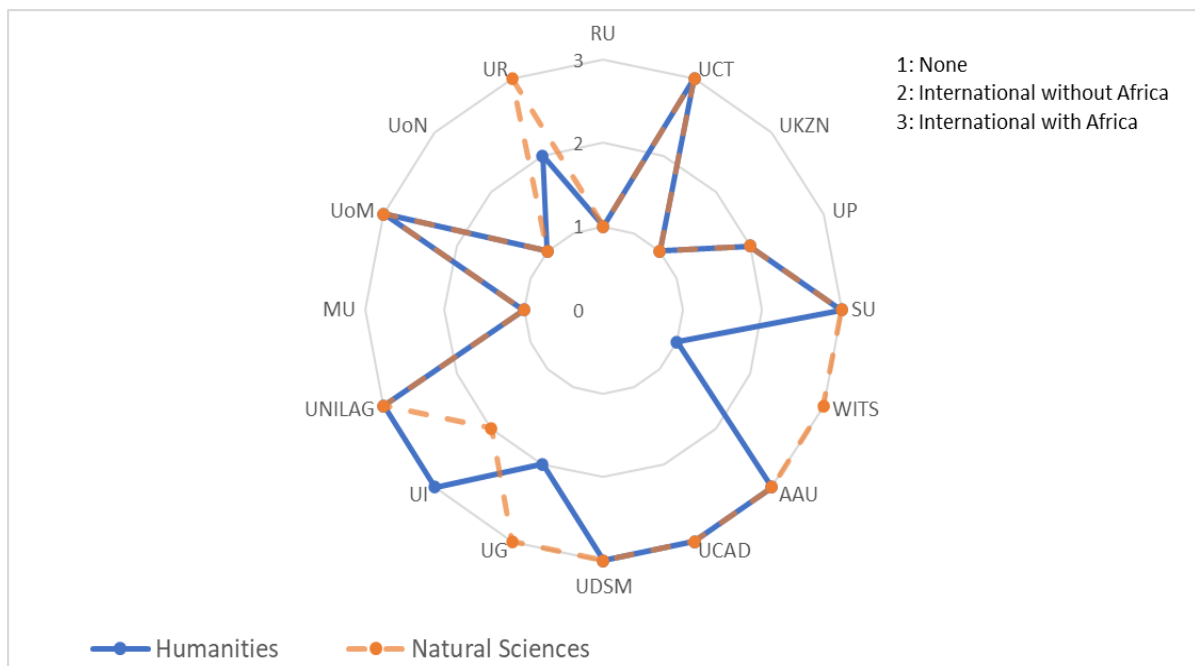
It must be noted that the notion of collaboration deployed in relation to this study concerned only collaboration with other institutions and doctoral programmes and not collaboration with industry. Furthermore, the focus was on collaboration within the case-study doctoral programme under review, rather than in relation to other collaborative research taking place at the institutions under study.

A key finding is that there appears to be an established culture across member universities to collaborate with other institutions as part of doctoral training programmes. Furthermore, it was found that while the general tendency was towards collaboration with an international partner or partners rather than a national partner or partners, most of the collaborations included one or more African partners. The PhD in Sustainable Urbanization at the University of Lagos constituted a prime example of a programme featuring international collaboration, including with an African partner. The programme was funded by the German Academic Exchange Service as part of a Graduate School Programme which is a partnership between the University of the Witwatersrand, the Technical University Berlin and the University of Lagos, and as part of the UK Research and Innovation (UKRI)-funded African Research Network on Urbanization and Habitable Cities which comprises a coalition of 10 African universities and four UK ones. The objectives of the collaborative PhD programme, which has been described as the first of its kind in Africa, were to address the 17 Sustainable Development Goals established by the UN in 2015 (Nigeria country report, p. 22). In another example, the MPhil/DPhil in economics, biomaterials, and nanomedicine at the University of Mauritius entailed collaboration "with the University of Witwatersrand, South Africa [an ARUA peer], on an Advanced Drug Delivery Platform (WADDP), as well as with German universities to exchange collaborators' labs, which is critical for the acquisition of new skills" (Mauritius country report, p. 15).

Meanwhile, the doctoral programme in Climate Change Economics at Université Cheikh Anta Diop was found to be a "collaborative programme under the auspices of the West African Science Service Centre on Climate change and Adapted Land Use (WASCAL) funded by the Germany Federal Ministry of Education and Research (BMBF). The focus is capacity building by facilitating academic exchanges and doctoral training for universities in 10 West African countries in collaboration with German institutions through the Graduate Studies Programme … the programme selects students from each of the WASCAL member countries through open calls for applications (scholarship and fee-paying students)" (Senegal country report, p. 28).

The only collaboration among those studied that included a national partner was the humanities programme at the University of Ibadan. However, since the collaboration was also with the Kenyan non-governmental organisation (NGO), the Partnership for African Social and Governance Research (PASGR), as well as the University of Kenya and the University of Pretoria, "where five doctoral students were supported in the first year of the first cohort" (Nigeria country report, p. 20), it was categorised as an "international with Africa" collaboration in the findings.

In South Africa, it was found that Stellenbosch University "has various collaborative efforts to produce PhDs with African and international universities, and important institutional structures to mobilise towards collaboration (such as its Graduate School of Business [GSB] and the African Doctoral Academy). The African collaboration grant and co-supervision arrangements between universities, arrangements where PhDs are part of research projects, or staff exchange are all elements that can facilitate the collaborative production of PhDs. The South African Research Chairs Initiative [SARChI] was also found to be important [as a] structural element that draws funding for PhDs in certain fields, and also facilitates collaboration. In the natural sciences, however, it does appear that collaboration is strongly driven by the nature of PhD production, through projects funded through the supervisor or even national funding agencies. In the humanities, while there is a strong project structure underpinning the infrastructures, national and international collaborative projects tend to be funded by specific grants, such as the Africa Collaboration Grant (ACG).[17] In addition, the …ACG supports [Stellenbosch] postdoctoral fellows to nurture partnerships with institutions in other African countries and provides support to postgraduate students to attend conferences throughout Africa" (South Africa country report, pp. 35-36).

The findings in the country reports indicate that there is a close correlation between well-funded PhD programmes and graduate numbers. However, it was also observed that most of these well-funded programmes featured some form of funding from the Global North as part of efforts to promote North-South collaboration. As already noted, one needs to be aware that such arrangements can perpetuate dependencies (South Africa country report, p. 13)

---

[17] The Centre for Collaboration in Africa (CCA) at Stellenbosch University offers this grant to staff to host and visit partners in other African countries; support emerging scholars; and contribute towards workshops.

5. Recommendations and conclusion: Towards common principles and standards for ARUA doctoral programmes

The purpose of this report is to show "the lay of the land" with respect to doctoral education across the ARUA member universities (see sections 3.1 and 3.2 above). Against the background of a review of current literature and international best practices, this report has presented a synthesis of findings from ten country studies covering 32 doctoral programmes across the 16 ARUA member universities.

At each institution, one doctoral programme was selected for study from among the humanities and social sciences, and one from among the natural sciences, with the aim of identifying the divergences and convergences among the various rules, requirements and practices shaping these diverse programmes and so that clarity may be reached about how collaborative doctoral programmes among ARUA member universities should be configured to achieve global competitiveness (see the discussion in section 3.2 above). With this in mind, the report has sought to present the study findings from the ground up in order to offer a broad overview of the current requirements, criteria, rules and practices in operation across the 32 programmes at the 16 universities.

In this context, this section seeks to consider the challenges and constraints that ARUA member universities are currently facing in relation to doctoral education at the selected programmes, and offers recommendations that emanate from the study findings. In this respect, this section should be read together with section 4; and, where more detail is required, in conjunction with the ten country reports which provide more detailed findings on the focus programmes within their national contexts, as well as more specific recommendation

5.1 Constraints facing existing doctoral programmes in ARUA member universities

The ten country reports show that existing doctoral programmes across the ARUA member universities face a range of challenges and constraints, some of which are unique and others of which are quite common and widespread.

5.1.1 National regulatory environment for collaborative doctoral education

Across a number of countries, the national policy environment was reported as constraining the development of doctoral education in general and international collaborative programmes in particular. The reported constraints include a lack of policies to facilitate collaboration and international PhD programmes, such as an effective cross-border higher education or internationalisation policy. In addition, respondents in some countries noted the existence of policies, laws, and regulations that impeded cross-border student and staff mobility. In this regard, onerous work- and study-permit regulations were cited as a particular challenge (for example, South Africa country report, section 4.1.3).

5.1.2 Inadequate funding for higher education, commodification and commercialisation

In several countries, it was noted that funding flows from the public purse to universities had been on the decline and were affecting access to doctoral education. To compensate for a lack of public funding, some institutions were increasingly seeking to commercialise their academic offerings, including postgraduate education. In this regard, findings from the University of Nairobi indicated how institutions had started to target part-time (working) students with (marketable) executive modules, often at the expense of the research component of the programmes on offer (Kenya country report, p. 14).

Inadequate funding has also put pressure on supervisors who must contend with heavy workloads at their home institutions while engaging in part-time teaching elsewhere to supplement their low salaries. All of this affects doctoral-programme quality and throughput rates.

Inadequate public funding presents a vexing conundrum for public higher education in Africa. It can harm provision and quality. However, when institutions respond by seeking to raise money through the commodification of programmes and the commercialisation of degree offerings, they are seen as undermining their purpose as publicly-funded providers of a public good (Knight, 2014, p. 84). In this context, a well-considered balance must be structured.

5.1.3 Regulation of the higher education sector

National accreditation, quality assurance, and monitoring and evaluation systems are typically put in place to enhance quality and articulation and to make relevant information available at all levels so that challenges may be readily identified and improvements made. However, in many countries these systems have effectively become a constraint to academic agility and have accelerated the managerialisation of university governance. The development and timely

implementation of new academic offerings can be seriously hampered when internal and external accreditation processes for new programmes can take two years or more to run their course. Increasing scrutiny of foreign academic credentials and academic credits, including in relation to their recognition and transfer, has also put the brakes on local institutions acknowledging foreign academic credits or offering franchised foreign programmes.

On the one hand, stringent regulation may impede the internationalisation of the sector; impede international academic mobility; and make cross-border provision of higher education difficult. On the other hand, de-regulating and opening a national or regional higher education sector to cross-border trade as if it were a commodity, can undermine the public-good value and local relevance of the higher-education provision. Deregulation is often implemented through international agreements that focus on cross-border trade, and economic and political interests rather than higher education interests. This can lead to a one-sided homogenisation – typically a Westernisation – of the sector, which may then become a tool for neo-colonisation and soft-power, undermining more democratic forms of cultural and knowledge exchange (Knight, 2014, pp. 84-85).

In this context, ARUA member universities should be vigilant in relation to the reasons for establishing collaborative doctoral programmes. If the main goal is to enhance member universities' income and prestige, it is unlikely that the broader purpose of higher education will be achieved and sustainable, relevant and knowledge-productive doctoral programmes will be established. In this regard, attention should be paid to the principles that have been identified as important for innovation and for collaboration at a doctoral level (see section 2.6 above).

5.1.4 Institutional policies and practices

Several country reports for this study mention over-regulation and under-regulation at the institutional, faculty and departmental levels. For example, a number of the country reports make mention of a lack of professionalism in establishing and managing doctoral programmes (see section 4.3.1 above which discusses how supervisor selection can be quite formal and structured in some cases and quite informal in others). The country reports feature claims of inadequate selection and training of academics as doctoral supervisors; and allegations of the over-enrolment of students in some programmes and fields, and under-enrolment in others (see, for example, Kenya country report, p. 24). Identified challenges also include the failure to match supervisors with candidates properly, which may be as a result of a lack of clear criteria

for this process, and subsequent problems stemming from mismatches between supervisory expertise and the topic of the doctoral project.

There is a perception that under-enrolment into PhD programmes could be the result of overly stringent requirements for admission including high GPA requirements). In this regard, the institutional regulatory environment and the governance and management of the doctoral studies in question, rather than funding constraints, were seen as the main factors inhibiting an increase in the number of doctoral students and greater gender parity in doctoral education.

5.1.5 Capacity and resource constraints

In general, the country reports noted that the most significant constraints on doctoral education related to capacity and resource shortfalls in the implementation of the programmes themselves. These included: a lack of sufficient quality supervision, which was the single most frequently mentioned constraint facing doctoral education at the African universities under study (see sections 4.1.1 and 4.3.1 above); a lack of specialised equipment and resources, including sophisticated laboratory equipment and consumables, and computing equipment and programmes; a lack of appropriate facilities, including conducive spaces for research (see section 4.3.2 above); a lack of finances to support student access to resources elsewhere – for example, to travel to places for fieldwork or to laboratories with the required equipment; and a lack of capacity to induct students into the national and international scholarly community – for example, by sponsoring attendance at conference

5.2   General recommendations in support of ARUA collaborative doctoral programmes

A number of general recommendations are proposed towards the development of collaborative doctoral programmes across ARUA member universities and the region.

5.2.1   Why ARUA collaborative doctoral programmes?

The main reasons for developing ARUA collaborative doctoral programmes are to enrich collaboration among the member universities; leverage synergies; share facilities and resources and mobilise additional ones; increase staff and student mobility; expand enrolments, knowledge outputs and the number of doctoral graduates; and enhance the quality and relevance of doctoral education more broadly. In the process, ARUA seeks to establish a distinct, prestigious African brand of collaborative doctoral programme that is globally

competitive. Such an Africa-branded programme must offer more than is supplied by those doctoral programmes on offer elsewhere in the world which have been re-branded as African. Potential doctoral students with an interest in pursuing their doctoral education in an African research university (rather than at a research university in Europe, for example) will expect authenticity and relevance alongside quality. They will want to be able to carve out their niche of research excellence with reference to the African context.

Accordingly, it is recommended that ARUA conducts a survey among present and past doctoral students at its member universities, focusing particularly on African cross-border and overseas international students, to gauge their opinions on present the state of doctoral education at ARUA member universities. It would be useful to gain insights into the challenges they perceive; the opportunities offered by an African brand of collaborative doctoral programmes; and ways in which the attractiveness, accessibility, quality, and relevance of the doctoral programmes on offer may be enhanced.

5.2.2   *Addressing national and higher education system constraints*

The constraints imposed by national regulatory environments, including in relation to visa laws and regulations, as well as those arising at the level of higher education systems, including in relation to accreditation and funding, will need to be considered in the design of collaborative doctoral programmes and the choice of programme hosts. In this regard, a systematic review of the relevant policy architecture should be commissioned in order to produce a comprehensive understanding of the various policy synergies and constraints that would need to be addressed in establishing collaborative programmes. For example, collaborations at the doctoral level could enable students and staff from less resourced universities to travel to better-resourced partner universities so that they may use their technology to conduct data analysis more efficiently, which would help them to complete their PhDs more quickly.

5.2.3   *Mobilising strategic funding towards the African doctorate*

Collaborative projects depend on sustainable income streams and reliable funding partnerships if they are to succeed. Identifying strategic, long term funding partners within and outside the continent to support doctoral training is therefore an imperative. Based on the evidence from other regions, such as the DOC-CAREERS II funding model, ARUA should identify field- and discipline-specific industry and private sector partners with whom they can develop medium- to long-term collaborative research projects and related doctoral programmes across two or

more member universities. Meanwhile, it is to be expected that international African doctoral programmes would attract funding from multinational and international organisations, particularly if they address relevant research niches in a globally competitive way. In general, collaborative programme offer the possibility of leverage to attract strategic funding that individual institutions may not be able to attract on their own.

5.3 Programme-level recommendations

In keeping with the research brief, the key dimensions that should be taken into consideration at programme level when seeking to establish collaborative doctoral programmes include: the requirements, criteria and practices that govern and facilitate access to doctoral education, such as: admission requirements and modes of funding; the structure and configuration of doctoral programmes including, for example, coursework requirements (whether such work is credit bearing or not); duration of programmes; modes of examination and other exit requirements; matters of staffing and supervision; student support structures and the resources (including research facilities, etc.) required for doctoral study; and matters related to existing collaborations between and among institutions.

5.3.1 Details of programme-level recommendations

The programme-level findings and related recommendations proposed by this report are discussed at length in Section 4. In this section they are summarised with cross-references. It should be noted that the principled basis for the recommendations is that collaboration should be founded on established, well-functioning practices. The aim is not to reinvent the wheel but rather to build on existing strengths and best practices as shown by the international literature and the empirical data that has been collected. In this regard, current practices and/or those that reflect international best practice (as discussed in section 4; Knight, 2012) are preferred. In addition, the recommended actions should be scalable. Table 3 summarises the programme-level recommendations.

Table 3: Dimensions for collaboration

Dimension	Recommendation
Form of collaborative programme	Joint degree. Further details of collaborations could include joint supervision; student and staff exchanges; coursework components; and laboratory work visits.
Admission	Master's in a cognate field as a minimum requirement; mutual recognition of qualifications by member universities. Collaborating member universities will need to agree when the doctoral candidacy period starts (prior to or after proposal acceptance).
Supervision	Co- and team supervision is beneficial for student throughput and success; mixed collaborative team and cohort supervision is recommended in project-based programmes.
Student fees	Fees range from as little as USD500 to over USD10,000 per annum. Training costs differ by country and institution. In some countries, doctoral education attracts substantial public subsidies. While standardisation at an average rate might not be feasible, consideration could be given to offering part-funding in pilot collaborative doctoral programmes, which could be scaled up to full funding if throughput is found to be good (this must be considered in relation to the other suggestions on funding). Participating institutions should also provide transparent financial requirements and conditions for registration, and integration of visiting students and staff as part of collaborative PhD programmes.
Funding	Several options: (1) Fully funded: research project-based and project-funded degree programmes (funded by industry partners).

	(2) Partially to fully funded: degree programmes linked to donor funding covering all programme costs and most living expenses. (3) Partially funded: degree programmes linked to contract work which would be either project-specific or university-based (lecturing, lab assistance, etc.). (4) Partially to self-funded: degree programmes linked to scholarships from various sources (for example, endowments, chairs, donor funding) with appropriate criteria. Special consideration should be given to the way staff candidates are accommodated in ARUA collaborative doctoral programmes.
Full/part-time	Depends on the funding model. Currently, while the majority of registrations seem to be for full-time studies, the lived reality is that most students study on a part-time basis. This affects duration of studies, with students not completing in regulation time.
Coursework	Some compulsory coursework is beneficial for student throughput and success and is thus recommended. In some countries only non-credit bearing coursework is accepted, in others it can be credit bearing (for example, in the South African "professional doctorate"). Coursework is especially crucial to expedite proposal development, build research skills and generic (soft) skills, and ground candidates in the foundational and most recent literature in the field. The infusion of coursework components in the doctoral programmes can take various forms including online courses and joint summer schools (see "Periphery of doctoral education" below).
Facilities and support	Minimum standards of support should be described and prescribed (for example, research facilities, instruments, and study space) and

	certain resources should be shared (for example, online library and database access; and institutional software licenses).
Periphery of doctoral education	The inclusion of skills development components such as data-analysis packages (SPSS, Atlas.ti, methodological seminars, etc) in the doctoral programmes of member universities can serve as elements of collaboration beyond a particular doctoral programme. This doctoral education periphery can include ARUA-branded summer schools and training academies, ARUA doctoral conferences, and the like. These interventions may be hosted by one or several ARUA Centres of Excellence and offered to students from several ARUA collaborative doctoral programmes and even to non-ARUA doctoral students from member and non-member universities.
Duration of programmes	An agreed standard must be specified according to type of student participation (part and full-time). From the international literature an average time of four years would accommodate a course component and an exchange component and provide adequate time for the necessary empirical research and write-up.
Examination	By monograph or by papers (hybrid); and examination process may include *viva voce*. Automatic mutual recognition of examination process among collaborating institutions must be enshrined in a memorandum of understanding (MoU).

5.3.2 Identifying fields/disciplines for collaboration and the role of the ARUA Centres of Excellence in promoting collaboration

The doctoral programmes in the natural sciences, and the humanities and social sciences, which were studied as part of the present research project were selected on the basis of their usefulness in contributing to an overview of the current requirements, criteria and practices at ARUA member universities in relation to doctoral education and collaboration. However, any decision on whether programmes in certain academic fields and disciplines should be chosen for support

over programmes in other fields and disciplines goes beyond the remit and scope of this study and cannot be justified on the basis of the data and evidence presented here.

Nevertheless, it would seem clear that, given the purposes and objectives of collaboration (as discussed in section 5.2 above), internationally competitive, Africa-branded collaborative doctoral programmes would be the most likely to attract appropriate funding and would be the most successful. Such programmes would need to be relevant to the African and Global South context and should address some of the large, intractable developmental challenges facing the continent, the Global South and the world at large.

In September 2022, representatives of ARUA member universities who met in Accra, identified a number of potentially important topics for collaborative programmes. They prioritised addressing public health challenges such as communicable and non-communicable diseases; and a number of key "wicked" problems afflicting Africa, the Global South and the world, including inequality and poverty, climate change, environmental sustainability, and food insecurity.

Meanwhile, there have been increasing efforts to encourage the expansion of doctoral education into new fields and disciplines. For example, Zeleza (2022) has advocated that doctoral programmes should engage with the multiple African knowledge libraries, including African indigenous knowledge systems. In addition, in the context of the fourth industrial revolution, African universities face a responsibility to develop information and communication technology (ICT)-related skills among the next generation of scholars and to foster practices in support of Africa's emergence within the global ICT landscape.

The ARUA Centres of Excellence (COEs) may be seen as a natural home for collaborative doctoral programmes, as well as other collaborative initiatives such as summer schools and academies, and may become the sites where such initiatives are piloted and entrenched within the network.

The aim should be to establish the ARUA COEs as places where innovative, cutting-edge, transformative, interdisciplinary research is conducted, and leading researchers from Africa and elsewhere gather to focus on African research problems, and to pursue global partnerships. In this way, they should be able to build on the existing infrastructure and capabilities in the host university while creating synergies in collaboration with ARUA partner universities. The functions of the ARUA COEs should also include strengthening capacity building and providing high-quality environments for postgraduate and postdoctoral training. Accordingly,

the ARUA COEs may be the best places to pilot ARUA collaborative doctoral programmes, linking the doctoral students in these programmes to the facilities, resources, and capabilities available across the ARUA partner universities and among the project- and/or programme-specific partnership organisations.

However, the research conducted for this study indicates that the COEs are at present functioning at different levels. Accordingly, it is recommended that those COEs which have not yet become fully functional should be developed while support should continue to be provided to the more functional centres. For the sake of parity, ARUA should plan the establishment at least one COE at every member university and, as is currently the policy, restrict member universities to hosting no more than two COEs each.

5.3.3 Towards programme-level and high-level memoranda of agreement

The detailed list of programme-level recommendations (see Table 3 above) implies that there is a need to establish specific agreements between and among ARUA members towards initiating collaborative doctoral programmes. These agreements would then be presented to ARUA and a range of external funders, including industry partners; local and international grant-making bodies; and national governments, for funding and support.

In this regard, ARUA should establish a process to support the development of such agreements between and among institutions and programme partners. The support on offer could take the form of: a collaboration steering committee established by the alliance to liaise with all member universities; the organisation of inter-institutional workshops and funding conferences; the establishment of a collaboration hub; and the development of relevant materials, such as terms of reference (ToRs), guidelines and memoranda of understanding (MoUs).

A distinction should be made between high-level agreements on principles and intentions, and programme-specific agreements that address contractual commitments in relation to programme-level matters. A high-level memorandum of agreement (MoA) on collaborative doctoral programmes between and among ARUA universities would identify the purposes, goals, objectives and values that should be agreed with respect to such programmes in general, and would provide a foundation for the development and implementation of these programmes at the COEs. Programme-specific agreements would ensure that due consideration is paid to all project-specific matters, processes and procedures, as well as the context, requirements and constraints of the specific member universities, including the host institution and the partnership bodies involved in a particular collaborative programme.

5.4 Conclusion and areas for further research

Section 1 of this report sketched the rationale for the study of 32 doctoral programmes across the 16 ARUA member universities in ten African countries. Section 2 addressed constructs of collaboration, internationalisation and harmonisation that have been established from a conceptual or theoretical standpoint, including from the perspective of a review of relevant international literature and best practices on doctoral collaboration. Section 3 presented the methodology and design for this study, while section 4 synthesised the main findings from the empirical study at the programmatic and institutional levels. Section 5 offered some reflections on the findings including in relation to the literature and what may be learnt from international examples with the aim of crystalising some recommendations that may inform the development of collaborative doctoral programmes across the member universities.

The report has also highlighted further research that may be undertaken to support ARUA in the development of collaborative doctoral programmes in Africa. The proposed additional areas of research include:

- A survey of past and current doctoral students in ARUA member universities;
- A systematic analysis of national immigration laws and regulations applying to doctoral student and staff mobility; and
- A systematic analysis of the qualifications frameworks, credit regimes, and quality assurance requirements across different national systems and institutions.

While the insights produced by this project offer some understanding of the nature of possible collaborative programmes within the alliance, there are limits to the conclusions that may be drawn given that the case-study approach deployed by the research focussed only on specific doctoral programmes. Some of these case-study programmes may not represent the typical doctoral programme at the respective institution that accurately. Moreover, the study is essentially a "snap-shot" of the state of doctoral education at the member universities in 2022. Any subsequent changes in policy development and implementation and in practices may produce a quite different picture at a later stage.

Knight (2012) cautions against adopting rigid normative or ideological positions on collaboration and asserts that while internationalisation and collaboration can enhance the educational and learning experience, establishing a system to monitor the intended and unintended consequences of such efforts remains critical. Such an evaluative process, she

argues, would ensure that benefits to individuals, institutions, nations, and society outweigh the risks and potential pitfalls. In this regard, ARUA can learn from the experiences of the Global North. Adopting sustainable collaborative programmes is a process that necessitates adopting the right principles; values and guidelines; and agreements, all of which should be informed by evidence.

6.   References

Adamu, A.Y. (2021). Harmonisation of higher education in Africa: 20 years after the Bologna Process. *Tuning Journal for Higher Education, 9*(1), 103-126. https://doi.org/10.18543/tjhe-9(1)-2021pp103-126

African Observatory of Science Technology and Innovation. (2014). Assessment of scientific production in the African Union 2005–2010. The African Observatory of Science, Technology and Innovation (AOSTI).

African Union. (2007). *Harmonization of Higher Education Programmes in Africa: A Strategy for the African Union.* African Union.

African Research Universities Alliance. (2022). *Strategic Plan 2022 – 2027*. African Research University Alliance.

Alabi G., & Mohammed, I. (2018). *Research and PhD capacities in Sub-Saharan Africa: Ghana Report.* British Council.

Altbach, P.G. (2004). The United States: Present, realties, and future trends. In J. Sadlak (Ed.), *Doctoral studies and qualifications in Europe and the United States and prospects* (pp. 259-278). United Nations Educational, Scientific and Cultural Organization (UNESCO).

Assié-Lumumba, N. T. (2006). *Higher Education in Africa Crises, Reforms, and Transformation*. Working paper. Council for the Development of Social Science Research in Africa. https://www.academia.edu/7686173/Higher_Education_in_Africa_Crises_Reforms_and_Transformation_Working_Paper_Series

Association of African Universities. (2007). *The Contribution of Higher Education to National Education Systems: Current Challenges for Africa*. Proceedings of forum on Higher Education, Research & Knowledge 2nd Regional Research Seminar for Africa. UNESCO.

Barnett, J.V., Harris, R.A., & Mulvany, M.J. (2017). A comparison of best practices for doctoral training in Europe and North America. *FEBS Open Bio, 7*(10), 1444–1452. https://doi.org/10.1002/2211-5463.12305

Borrell-Damian, L., Morais, R. & Smith, J. H. (2015). *Collaborative Doctoral Education in Europe: Research Partnerships and Employability for Researchers*. Report on DOC-CAREERS II Project. EUA Publications.

Breslin, S., & Hook, G. (2002). Micro-regionalism and World Order: Concepts, Approaches and Implications. In S. Breslin, & G. Hook (Eds.), *Microregionalism and World Order* (pp. 1-22). Macmillan. http://doi.org/10.1057/9781403940155

Campbell, R., McBurnie, G., & Pollock, A. (1998). Transnational Education: An Australian Example. *International Higher Education*, *10*, 12-14. https://doi.org/10.6017/ihe.1998.10.6414

Castells, M. (2001). Universities as dynamic systems of contradictory functions. In J Muller, N. Cloete. & S. Badat (Eds.), *Challenges of Globalisation: South African debates with Manuel Castells* (pp. 206–223). Maskew Miller Longman.

Clark, B. R. (1978). Academic Differentiation in National Systems of Higher Education. *Comparative Education Review, 22*(2), 242-258.

Cloete, N., Mouton, J., & Sheppard, C. (2015). *Doctoral education in South Africa: Policy, discourse and data.* African Minds.

Council on Higher Education (CHE). (2013). *The Higher Education Qualifications Sub-Framework.* CHE.

Cummings, W. K., & Bain, O. (2018). US doctoral study to early career. In J. C. Shin, B. M. Kehm. & G. A. Jones (Eds.), *Doctoral education for the knowledge society: Convergence or divergence in national approaches?* Forthcoming.

Daniel-Oghenetega, B.O. (2020). *Doctoral Study in South Africa: Exploring practices adopted by African students to attain completion in the University of the Western Cape.* PhD thesis submitted at the Institute for Post-School Studies, University of the Western Cape.

DeLong, J., & Dowrick, S. (2002). Globalisation and Convergence. In M. Bordo, A. Taylor, & J. G. Williamson (Eds.), *Globalisation in Historical Perspective*. University of Chicago Press.

De Wit, H., Hunter, F., Howard, L., & Egron-Polak, E., (2015). *Internationalisation of Higher Education*. European Union.

DiMaggio, P., & Powell, W.W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organization fields, *American Sociological Review, 48*(2), 147-160. https://doi.org/10.2307/2095101

Ehrenberg, R., Zuckerman, H., Groen, J. A., & Brucker, S. M. (2010). *Educating Scholars: Doctoral Education in the Humanities*, Princeton University Press.

European Universities Association. (2010). *Salzburg II Recommendations.* https://eua.eu/resources/publications/615:salzburg-ii-%E2%80%93-recommendations.html

Fetene, G. T., & Tamrat, W. (2021). The PhD journey at Addis Ababa University: Study delays, causes and coping mechanisms. *International Journal of Doctoral Studies, 16*, 319-337. https://doi.org/10.28945/4744

Hahn, K., & Teferra, D. (2013). Tuning as an instrument of systematic higher education reform and quality enhancement: The African experience. *Tuning Journal for Higher Education 1*, 127-163. https://doi.org/10.18543/tjhe-1(1)-2013pp127-163

Hill, J. D., & Meek, A. (2019). *AHRC-funded collaborative studentships: Their nature and impact on partners, subject areas and students*. The British Museum

Heffernan, T., & Poole, D. (2005) In search of "the vibe": Creating effective international education partnerships. *Higher Education 50*, 223–245. https://doi.org/10.1007/s10734-004-6352-2

James, A. (2022). Concerns over the time PhD candidates take to complete studies. *University World News*, 11 August. https://www.universityworldnews.com/post.php?story=20220807094806215

Jowi, J. O. (2009). Internationalisation of higher education in Africa: Developments, emerging trends and policy implications. *Higher Education Policy, 22*(3), 259–261.

Jowi J. O. (2010). Africa. In J. Knight, & C. Sehoole (Eds.), *Internationalisation of Higher Education. Global Trends Regional Perspectives*. IAU.

Jowi, J.O. (2021). Doctoral training in African universities: Recent trends, developments and issues. *Journal of the British Academy, 9*(1), 159-181. https://doi.org/10.5871/jba/009s1.159

Kehm, B. M. (2005). Developing doctoral degrees and qualifications in Europe. Good practice and issues of concern. *Beiträge zur Hochschulforschung, 1*(27), 10-33.

Kezar, A. (2005). Redesigning for collaboration within higher education institutions: an exploration into the development process. *Research in Higher Education. 46*(7), 831-860. https://doi.org/10.1007/s11162-004-6227-5

Klemenčič, M. (2019). 20 Years of the Bologna Process in a Global Setting: The external dimension of the Bologna Process revisited. *European Journal of Higher Education*, *9*(1), 2-6. https://doi.org/10.1080/21568235.2019.1570670

Knight, J. (2004). Internationalization Remodeled: Rationales, strategies and approaches. *Journal of Studies in International Education*, *8*(1), 5-31. https://doi.org/10.1177/1028315303260832

Knight, J. (2012). Student mobility and internationalisation: Trends and tribulations. *Research in Comparative and International Education, 7*(1), 20- 33. https://doi.org/10.2304/rcie.2012.7.1.20

Knight, J. (2014). Is internationalisation of higher education having an identity crisis? In Maldonado-Maldonado, A., & Bassett, R. M. (Eds.), *The Forefront of International Higher Education* (pp. 79-91). Springer.

Liu, S. (2016). Higher education quality assessment and university change: A theoretical approach. *Quality Assurance and Institutional Transformation Higher Education in Asia: Quality, Excellence and Governance*, 15-46. https://doi.org/10.1007/978-981-10-0789-7_2

Louw J., & Muller J. (2014). *A Literature Review on Models of the PhD*. Centre for Higher Education Transformations (CHET).

Mamdani, M. (2009). *Scholars in the Market Place: The dilemmas of neo-liberal reform at Makerere University 1989-2005*. HSRC Press.

Mohamedbhai, G. (2013) Towards an African Higher Education and Research Space. Association for the Development of Education in Africa.

Mohamedbhai, G. (2022). Interview with Prof. Goolam Mohamedbhai, 17 May 2021. https://hsrc.ac.za/our-research/learning-activity-4-reimagining-the-african-university/

Mosha, H. J. (1986). The Role of African Universities in National Development: A Critical Analysis. *Comparative Education*, *22*(2), 93–109. https://doi.org/10.1080/0305006860220202

Muriisa, R. K. (2015). The state of doctoral education in social sciences in Uganda: Experiences and challenges of doctoral training at Mbarara University of Science and Technology. *Journal of Education and Practice, 6*(10), 204-213.

Ndlovu-Gatsheni, S. J. (2017). The emergence and trajectories of struggles for an 'African university': The case of unfinished business of African epistemic decolonisation. *Kronos*, *43*(1), 51-77. https://doi.org/10.17159/2309-9585/2017/v43a4

Nega, M., & Kassaye, M. (2018). *Research and PhD capacities in sub-Saharan Africa: Ethiopia report.* British Council.

Nelson, B., (2021). *We need an outcomes-based approach to doctoral education*. Online publication. https://www.universityaffairs.ca/opinion/in-my-opinion/we-need-an-outcomes-based-approach-to-doctoral-education/

Ngalim, V. B. (2014). Harmonisation of the Educational Sub-system of Cameroon: A multicultural perspective for democratic education, *Creative Education, 5,* 334-346. https://doi.org/10.4236/ce.2014.55043

Obamba, M. O (2017). *Constructing "Innovative" Doctorates: Scoping Evidence on Doctoral Structure and Practices from Six African Countries*. Scoping Report to the Partnership for African Social and Governance Research (PASGR).

O'Carroll, C., Purser, L., Wislocka, M., Lucey, S., & McGuinness, N., (2012). The PhD in Europe: Developing a system of doctoral training that will increase the internationalisation of universities. In A. Curaj, P. Scott, L. Vlăsceanu, & L. Wilson (Eds.), *European Higher Education at the Crossroads: Between the Bologna Process and National Reforms.* https://doi.org/10.1007/978-94-007-3937-6

Okeke, C. (2010). A Neglected Impediment to True Africanisation of African Higher Education Curricula: Same Agenda, Differential Fee Regimes. *Journal of Higher Education in Africa, 8*(2), 39-52.

Olds, K., & Robertson, S. (2014). Towards harmonization of higher education in Southeast Asia. *insidehighered.com,* blog, 13 April. https://www.insidehighered.com/blogs/globalhighered/towards-harmonization-higher-education-southeast-asia

Olsen, J. (2007). *Europe in Search of Political Order. An institutional perspective on unity/diversity, citizens/their helpers, democratic design/historical drift, and the co-existence of orders*. Oxford University Press.

Psacharopoulos, G. & Patrinos, H. A. (2018). *Returns to Investment in Education: A Decennial Review of the Global Literature*. Policy Research Working Paper No. 8402. World Bank.

Sall, H. N., & Ndjay, B. D. (2007). Higher Education in Africa: Between Perspectives Opened by the Bologna Process and the Commodification of Education. *European Education, 39*(4), 43-57. http://doi.org/10.2753/EUE1056-4934390403

Sawyerr, A. (2004). Challenges Facing African Universities: Selected Issues. *African Studies Review, 47*(1), 1-59. https://doi.org/0.1017/S0002020600026986

Shin, J. C., Postiglione, G. A., Ho., K. C. (2018). Challenges for doctoral education in East Asia: A global and comparative perspectives. *Asia Pacific Education Review, 19*(3), 141-155. https://doi.org/10.1007/s12564-018-9527-8

Shivji, I. (2022). Interview with Prof. Issa Shivji, 21 June 2021. https://hsrc.ac.za/our-research/learning-activity-4-reimagining-the-african-university/

Tran, V. D. (2019). Does cooperative learning increase students' motivation in learning? *International Journal of Higher Education, 8*(5), 12-20. https://doi.org/10.5430/ijhe.v8n5p12

UNESCO. (2017). Distribution of enrolment by level of tertiary education. Retrieved from http://data.uis.unesco.org/

UNESCO. (2019). UNESCO's 'Addis Convention' on higher education to enter into force. *UNESCO NEWS.* 20 December. https://www.unesco.org/en/articles/unescos-addis-convention-higher-education-enter-force

US National Science Foundation. (2017). *Doctoral Recipients from U.S. Universities: 2015*. Webpage. https://www.nsf.gov/statistics/2017/nsf17306/

van Vught, F. (2005). *Diversity and differentiation in higher education systems*. Paper delivered at CHET anniversary conference. 16 November. https://www.universityworldnews.com/filemgmt_data/files/Frans-van-Vucht.pdf

Wang, L. (2022). Towards a common higher education space in Southeast Asia. *University World News*. https://www.universityworldnews.com/post.php?story=20220810215556491

Wiener, A. and Diez, T. (Eds.) (2009). *Theories of European Integration*. Oxford University Press.

Wilson-Strydom, M., & Fongwa, S. N. (2012). *A profile of higher education in Southern Africa: A regional perspective*. Southern African Regional Universities Association.

Woldegiorgis, E. (2013). Conceptualizing Harmonization of Higher Education Systems: The Application of Regional Integration Theories on Higher Education Studies. *Higher Education Studies, 3*, 12. https://doi.org/10.5539/hes.v3n2p12.

Woldegiorgis, A. (2018). Harmonization of higher education in Africa and Europe: Policy convergence at supranational level. *Tuning Journal for Higher Education, 5*, 133. https://doi.org/10.18543/tjhe-5(2)-2018pp133-157.

Yavaprabhas S. (2014). The harmonization of higher education in Southeast Asia. In A. Yonezawa, Y. Kitamura, A. Meerman, K. Kuroda (Eds.), *Emerging International Dimensions in East Asian Higher Education* (pp. 81-102). Springer.

Zeleza, P. (2022). *Managing Institutional Change in an African University*. Post on LinkedIn. https://www.linkedin.com/pulse/managing-institutional-change-african-university-paul-tiyambezeleza/?trackingId=j1YKlDQMQtWDhan7vWqkrQ%3D%3

Country reports (provided separately).

Ethiopia country report. Ayele, B. W., Fongwa, S., & Wildschut, A. (2022). *Experiences from Addis Ababa University, Ethiopia*. Human Sciences Research Council (HSRC) report.

Ghana country report. Mosi, L., Wildschut, A., & Fongwa, S. (2022). *Experiences from the University of Ghana, Ghana*. HSRC report.

Kenya country report. Oanda, I., Fongwa, S., & Wildschut, A. (2022). *Experiences from the University of Nairobi, Kenya*. HSRC report.

Mauritius country report. Ayele, B. W., Wildschut, A., & Fongwa, S. (2022). *Experiences from the University of Mauritius*. HSRC report.

Nigeria country report. Oluwatosin, L., Fongwa, S., & Wildschut, A. (2022). *Experiences from the University of Ibadan and University of Lagos, Nigeria*. HSRC report.

Rwanda country report. Mtawa, N., Fongwa, S., & Wildschut, A. (2022). *Experiences from the University of Rwanda, Rwanda*. HSRC report.

Senegal country report. Oanda, I., Wildschut, A., & Fongwa, S. (2022). *Experiences from Université Cheikh Anta Diop, Senegal*. HSRC report.

South Africa country report. Wildschut, A., Fongwa, S., & Mthombeni, Z. (2022). *Experiences from South African universities*. HSRC report.

Tanzania country report. Mtawa, N., Wildschut, A., & Fongwa, S. (2022). *Experiences from the University of Dar es Salaam, Tanzania*. HSRC report.

Uganda country report. Lutomiah, A., Fongwa, S., & Wildschut, A. (2022). *Experiences from the Makerere University, Uganda*. HSRC report.