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**Capacity building using PhD education in Africa**

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**Abstract:**

Globally the field of doctoral education is changing, with a move towards more internationalisation and away from traditional education. More PhD educational programmes use blended and e-learning elements and have an increasing number of working professionals enrolled in a PhD, or PhD students with jobs engaged in writing a dissertation. In Sub-Saharan Africa, the PhD scene reflects this change. Yet, not much is known about PhD capacity in Africa. While in terms of scientific output the continent is left behind, and thus doctoral education is an area to focus on, research on the effectiveness of doctoral education, and how to improve the educational offering is lacking. In this study, we offer an update of the literature related to doctoral education in Africa, an overview of the needs in the field according to both African PhD fellows and their supervisors, and a discussion on the role of e-learning innovations in supporting capacity building.

**Key words:**

Doctoral education, community of learning, Sub-Sahara Africa, E-Learning

**JEL Codes:**

I23 - Higher Education

I24 - Education and Inequality

I25 - Education and Economic Development

I26 - Returns to Education

O15 - Human Development

O55 - Africa

## 1. Introduction

In terms of scientific output, the African continent is lagging behind, and the relatively few scientific contributions stem largely from South African researchers. In order to improve the scientific output, and build academic capacity in Sub-Saharan Africa locally, we need to be aware of the present conditions of higher education in the region, as well as the specific local contexts that need to be taken into account when developing PhD programmes. Little information is available on the state of higher education in Africa in general. Research on the functioning of African PhD programmes, or the needs of students undertaking such programmes in Sub-Saharan Africa is even scarcer.

PhD education globally has been changing alongside rapid technological developments and mobility of the masses. With graduate education becoming more popular, the numbers of post-graduate applicants have increased but the type of student pursuing advanced degrees is also changing (Rehm & van de Laar, 2015; Pearson 1999). In addition to traditional PhD programmes, many programmes are now offered to mid-career professionals to obtain their doctorates. Globalisation also plays an important role, with individuals enrolled in traditional and professional programmes inclined to interact with other researchers and students globally. This globalisation creates a network of more informal and interactive relationships between students, their supervisors, and their peers, using technology to support their relationships (Rehm et al, 2015).

In this paper, we study the PhD educational system in Africa and the needs of African PhD students to increase their learning during their PhD trajectory. We systemically explore what is known academically about PhD education in Africa, and specifically explore which technological aids are actively used in higher education. We study the state of art education in an all-inclusive literature review. In section two we explain the methodology of the systemic and traditional literature review undertaken and include a literature review with focus on the current status of higher education in Africa, capacity building in Africa and E-learning in Africa. In section three, we explore the present situation of African PhD students working in Social Sciences, and by means of a needs assessment held among 119 PhD fellows and their supervisors, we offer a detailed description of the biggest pitfalls in the current continental offerings. In section four we discuss the opportunities a community of learning can offer to support the current students and their supervisors as an add-on service. Section five concludes.

## 2 PhD education in Africa – a literature review

### 2.1 *Global developments in doctoral education*

In recent years, the demand for and the supply of graduate education has increased greatly, and the focus of programmes has become more globalised. With more information provided online about available PhD programmes, electronic distant application processes and increased use of online selection mechanisms, it is easier to apply to programmes around the world. This innovation increases the chances of being accepted in graduate education outside of one's home country. Moreover, where in the past, graduate education was a privilege available only to a small elite population, recently this "massification of graduate education" offered opportunities for a far more inclusive and diverse group of students (Pearson, 1999).

In this more global playing arena we also see the types of PhD students changing. In the past, PhD students were generally young full time students, starting their PhD research after completing their Master education at their local universities. More recently, there is a variety of programmes offered to full time PhD students, part-time PhD students and professional level students, who combine the PhD work with a job. Often, instead of the PhD research being undertaken as a full job, it is combined with other work, either within or outside the academic institution. (e.g. Rehm et al, 2015; Pearson, 2004; Lester, 2004; Neumann, 2007). With the change from younger full time fellows, to more international mature part time fellows, the needs of the student also change.

When looking specifically at the African continent, this shift from traditional PhD to a more blended approach combining work with study is also present. By obtaining scholarships in developed countries mainly in North America, Europe and Asia, many of the best African master students find their way to renowned institutions outside their home countries. Obtaining top education, with high quality facilities is beneficial to those students at the individual level, but by training those students abroad it is not certain capacity in their home country is built. Inversely, PhD students affiliated to Sub-Saharan African universities face a situation with less favourable financial and institutional settings. Many African students are working while studying, for instance teaching undergraduate students while working on their PhD or maintaining a family while starting their masters. The luxury of dedicating a few years to full time PhD research, while being paid to do so, has been rare for African students. The majority of African PhD students remain active in their local region, with often less than ideal institutional conditions to support them. Yet, the development of, and current state of the landscape of PhD education in Africa is under researched and little is known on how to improve this landscape, either on the ground or with long-distance support.

### *2.2 the Systematic and Traditional Literature Search*

In a systematic review, during the first stage a search for peer reviewer articles from 2005/2015, 167 articles were identified as relevant for this study.<sup>2</sup>

INSERT FIGURE 1 ABOUT HERE

In the second stage of the systematic review, all 167 articles were reviewed based on title and abstract. Articles included in the final literature review fell within one or more of the defined themes of Capacity Building, Education, or e-Learning and Africa. We found 11 papers directly relevant for our study (see table 1 for a summary).

In addition to the systematic literature search a traditional search was undertaken. This additional search included relevant grey literature and older articles, using key word search with various combinations of the terms “Higher education”, “Africa”, “E-learning” and “University” on google scholar and web of science. Literature was selected based on a review of the title and abstract. We found 3 articles to be most relevant to the subject of e-learning and capacity building in higher education that we added to the articles for this review. As such, the total list of articles included in the study is 14.

INSERT TABLE 1 ABOUT HERE

When categorising the relevant literature, we classified the articles as either focusing on 1) higher education in general, with specific focus on doctoral education, 2) capacity building by means of higher education in Africa and 3) e-Learning activities in Africa. As figure two shows, the literature to build the analysis on is scarce, and those numbers in itself urge for more study.

INSERT FIGURE 2 ABOUT HERE

## **3 Higher Education in Africa**

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<sup>2</sup> For the systematic literature review, we used search engines Econlit and Web of Science, for the period 2005/2015. In Econlit, we used Boolean connectors for the key terms `poverty, migration, conflict, crisis, institutions, economic development, capacity building, policy, governance, technology, innovation, entrepreneurship, education, higher education`. This resulted in a set of 96 articles. See annex 1  
In Web of Science a basic and refined selection of articles was made, with the same terms in various combination used as basic search criteria, and all relevant disciplines or research area's as refinement criteria. We ended up with 74 articles. There was no overlap in articles between Web of Science and Econlit, the total list of selected articles this included 167 papers. See Annex 1.

### *3.1 Introduction to Higher education in Africa*

Reviewing the African educational enrolment, it is evident that the higher the educational level, the smaller the enrolment rate<sup>3</sup>. In Uganda for example, less than 1% of the population in the year 2007 was enrolled in a higher education institution (Bisaso, 2010). Tertiary education includes bachelor, master and doctoral education as well as post-secondary vocational training. With only small percentage of the population enrolled in university education, it is apparent that the number enrolled in PhD programmes is even smaller (Bisaso, 2010). Furthermore, the quality of higher education is not consistent in any given country or region. The continent hosts several excellent institutions<sup>4</sup> and local education hubs that attract good students. Specifically capital cities like Cape Town, Accra, or Addis Ababa generally host good universities with generally rural institutions lagging behind.

Cloete (2014) found that huge investments in the South African higher education system could only little improve the quality of education. A transformation strategy is needed to develop capacities. Furthermore, in terms of scientific output, the African continent is lagging behind. While South Africa remains a leader of research and publications on the continent, it falls far behind its global competitors, particularly BRIC countries. Despite increased spending on research and development, lack of personnel and overall drop in enrolment rates and retention/completion rates continues to be a major problem. The number of researchers has not increased in conjunction with spending and development practices, essentially creating a knowledge gap (Cloete, 2014; Confraria & Godinho, 2014)). Diversity in scientific research staff is also a concern. Research output in the country is still dominantly published by the white male professor. The continent stands to gain by a more inclusive development, with catch up of other countries and more equality in productivity by race and gender.

One reason to increase attention to higher education specifically is an existing demand from employers for highly educated staff. Hall & Thomas (2005) argue that there is a need for dialogue between employers and higher education institutions. It is crucial that the graduates from higher education are trained with knowledge and equipped with skills that are directly needed in the local labour market. Increased dialogue between institutions and employers as well as bridges for communication for knowledge exchange can greatly benefit students at all levels. A curriculum review of higher education based on international trends as well as the needs of the local and international community can be assessed and met by developing knowledge networks (Hall & Thomas, 2010).

Doctoral students are less often enrolled in training to serve the local labour market, and are more likely interested in employment within academia at the national or global level. Doctoral students are also more willing to migrate, internally and internationally, making the quality of their degree important, as future employers will hire based on international requirements (Hercog and van de Laar, 2016). State of the art content classes as well as accurate skill development (such as technical skills related to use of for instance software, genetic skills such as presentations or writing skills, and academically relevant skills, such as dissemination skills and fund application skills) will be needed in order to apply for jobs in the global labour market, to compete for funding, and to cooperate with international partners.

### *3.2 Capacity building in Africa*

To provide long term knowledge generation and capacity in universities in Africa, Sawyer (2004) stresses the importance of the knowledge society in order to be competitive in the global economy. Individual research capacity is highly contingent upon the appropriate training programmes and courses. African universities are prime agents to the knowledge system and need to expand its research efforts to public research institutes, private institutes, and firm-based research units. Environmental (institutional or logistic) and human research capacity both influence the

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<sup>3</sup> Primary education enrolment in sub-Saharan Africa is almost 100% with enrolment in secondary education falling to less than half the population continent wide and tertiary education at less than 10% in 2013 (the World Bank Group, adapted from UNESCO Institute from Statistics, 2016).

<sup>4</sup> Examples are the University of Ghana and the University of Cape Town, both members of the Worldwide University Network – a network of global excellent research universities.

research capacity development in African universities. Quality of education is the driving force for sustained and effective research. With insufficient laboratories, equipment, libraries, and effective system of information storage, obtaining high quality teaching and research outcomes is unlikely. Also non-conventional bottlenecks such as lack of vibrant graduate programmes, ineffective research management systems, and lack of institutional culture supportive of research were mentioned (Sawyer, 2004)

Kruss et al. (2012) call for necessary structural change that allows for growth of the knowledge economy in Africa. Lack of coordination between various actors (students, institutions and firms) is holding the African student behind. While Kruss et al (2012) primarily refer to basic university education, this argument also holds for higher education at other levels. In the African context, as already noted, PhD students are often combining work and research duties. While these individuals are often already part of the work force, they may lack the ability to find jobs outside of academia. Without proper coordination, it is likely that knowledge building and sharing suffers and so does participation in civic society through employment. Better coordination and stronger networks between actors will allow for a more meaningful exchange of knowledge and contribution in the workforce.

Innovating education by building networks of knowledge, internationalisation and use of technology is called for (Novelli & Burns, 2010; Wang, 2013; Youtie & Shapira, 2008; Confraria & Godinho, 2014)). The simple fact that universities have gone from being “knowledge factories to knowledge hubs” illustrates how necessary dialogue and access to information is for innovation and development (Youtie & Shapira, 2008). As the world changes, so must the way knowledge is delivered. However, African institutions face a unique situation where funding is limited, and often tied to government budgets, keeping rates of publication low and preventing innovative solutions to build capacity (Bisaso, 2010; Kruss et al., 2012).

Capacity building for PhD education can be strengthened through the use of knowledge networks, peer-to-peer learning models, strengthening of supervisors and engaging experts with an international background. While internationalisation of institutions is encouraged, African universities must also take charge of their own development. Adopting idealisation of western knowledge and “west is the best” ideology in teaching and learning is not necessarily the best way forward. Smit and Williamson et al (2013) argue that the best way forward is by “...mobilizing domestic resources in tandem with development assistance so that African Resources are optimized and Africa claims ownership of its own development”. They state that open education resources and open and free distance learning is the best way to accommodate these partnerships, however there is a strong need for further research in this field (Smit & Williamson et al, 2013).

### *3.3 E-learning in higher education in Africa*

The phenomenon of e-learning on the African continent has gained momentum only recently and is thus subject to new exploration (Rohleder et al, 2007). In South Africa a study has been conducted to better comprehend the challenges and setbacks of e-learning. Rohleder et al have identified that a major advantage of e-learning is the ability to provide education in a more egalitarian manner, and that it allows for easy communication and access to information. On the negative spectrum, the research discovered that unequal access to computers; disjoint communication and the need for more face to face interaction were challenges in the provision of effective e-learning.

With the hype of MOOCs offering “solutions for development for all” ending, the awareness that solutions tailored to specific institutions, with unique local cultures and conditions, has increased. Efficient incorporation of e-learning strategies to build institutions requires collaboration between multiple stakeholders and networks (Ossiannilsson & Landgren, 2011). Quality e-learning environments should be personalised, easily accessible, more flexible and interactive among platforms, courses and instructors. Generally speaking, educational reform to accommodate e-learning must account for multiple stakeholders and a more complicated learning environment. This may require dealing with, infrastructural challenges such as lack of internet access or limited electricity supply. Cultural hurdles



may also exist. Interactions between students and staff in face-to-face settings is generally hierarchical and e-learning settings require more peer-to-peer interactions and less traditional hierarchy between the teacher and the student..

Massive investments by institutions in e-learning solutions do not mean the solutions will function. One pitfall when introducing e-learning solutions includes the lack of attention on course content for students, due to lack of experienced instructors in developing quality educational resources (Mtebe & Raisamo, 2014). Additionally, inadequate ICT infrastructure hinders the usage of e-learning as access to computers is limited and the internet service unreliable. While Open Educational Resources (OER) are widely known to most students, instructors and staff, and students use the internet to share notes, the adoption of OERs is largely limited (Oyo & Kalema, 2014). The e-learning Africa community and use and implementation of e-learning solutions is growing. However, few experiences are described in academic literature. Furthermore, very few e-learning solutions are implemented in at the doctoral level; instead focus remains on the bachelor and master level, or general research methods and writing courses for professionals (e.g. Author AID, INASP). Inclusiveness is one of the main issues: internet is scarce and expensive, making it very important to have an offline functioning library platform and offline access to online courses to counter the barriers created by lack of infrastructure or lack of trained professionals (Oyo & Kalema, 2014).

#### 4 Needs Assessment

Research about e-learning (and its benefits) for doctoral students is largely limited, and research about the experiences of doctoral students in Africa is largely absent. Graduate education is constantly changing, however, African institutions continue to fall behind in terms of innovative teaching, research output and capacity building (Cloete, 2014; Smit et al., 2013). This is in part due to lack of infrastructure and facilities, lack of adoption of new (dynamic) teaching methods, lack of coordination between universities, their students, and firms and the lack of resources in general (Smit et al., 2013). Overall, while some universities are actively engaging students and adapting to a more globalised world, most universities suffer from a staff that mistrusts or does not have experience with education media and technology (Kruss et al., 2012; Mtebe & Raisamo, 2011). The known information provided a limited view of the use of media and technology in higher education, and also excludes PhD education within this field. In order to understand the status of doctoral education in Sub-Saharan Africa, and what doctoral students and their supervisors perceive as their greatest challenges and needs, we implemented a needs assessment.<sup>5</sup>

##### 4.1 Needs Assessment Design

In order to understand better how doctoral education in Africa is organised, what African PhD fellows and supervisors need and miss, a needs assessment survey was developed. The survey was distributed electronically to the researchers identified by a web of science search, targeted based on topic area and region of research.<sup>6,7</sup> Following a refinement, including only those papers within social science discipline, over 16000 published researchers were identified.

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<sup>5</sup> It is worth noting here, that the study is not attempting to suggest a reformation of the PhD curriculum in African universities but endeavours to identify bottlenecks students face and assist in providing a proactive solution for an enhanced learning environment.

<sup>6</sup> Researchers were selected if they had published articles in the areas of poverty, migration, conflict, crisis, institutions, economic development, capacity building, policy, governance, technology, innovation or entrepreneurship. More specifically, these search terms were combined with terms referring to locations such as “southern Africa”, “Eastern Africa”, “Western Africa”, “Sub-Saharan Africa” and/or “Africa” so as to ensure the sampling found researchers working in specific topic areas as identified about in Africa or about African issues and connected with African institutions.

<sup>7</sup> Papers that focused on topics such as medicine, environment, agriculture, psychology or other topics unrelated to those identified were excluded using the refine search option on web of science categories.

In April 2015 the needs assessment was sent to those 16000 individuals. The survey specifically asked what the institutional and employment setting of researchers was, the researchers (both PhD fellows and their supervisors) available resources, and what additional services they believed they would benefit from. To extend reach, a snowball sampling was built into the survey and supervisors and fellows were asked to send the survey to their fellows and supervisors respectively. No activities to increase response rates were undertaken, as we did not target a specific outcome in terms of number of responses for the needs assessment.

264 Responses were recorded, and categorised according to host institutional nationality. 49.24% of respondents were from Southern Africa, 21.21% from North American or European Institutions (see Graph 1). 56% of all respondents are supervisors and 44% are currently research/PhD fellows. Due to snowball sampling strategy and lack of response strategy, the sample is not representative for African higher education institutions. Responses likely include an overrepresentation of South Africa, Nigerian and Ethiopian responses. Due to the electronic survey format used, the responses are biased towards the better developed and established institutions, with internet access. Furthermore, the inclusion bias towards more developed institutions and well known researchers due to selection through publication of peer-reviewed publications will have excluded doctoral students without publications from the study. Respondents from rural institutions or lesser known institution are likely to have poorer internet connectivity, electricity blackouts or less access to computers. Under the assumption that responses reflect the needs of more well-off English speaking institutions we can make the further assume that when institutions that lack capacity, infrastructure and facilities, this situation would be must worse.

INSERT GRAPH 1 ABOUT HERE.

As graph 2 indicates, African doctoral students are in majority working students, having additional employment to provide for a source of living. About one third of the students are doing their doctorate in a more traditional way, with main income offered to do the PhD research. All fellows indicate that their interaction with their supervisors is frequent, timely and offered both in online and face to face communication.

INSERT GRAPH 2 ABOUT HERE

Yet there is an obvious demand for support outside of the home institutions, indicated by both PhD fellows and their supervisors. In the survey, we requested what support needed specifically. In graph 3, areas of need are indicated, with main request for skills building, job market support, research design and analysis, and literature review requirements. It became clear from the answers that all PhD students have local supervisors, yet the support the local supervisory team can offer is limited due to institutional capacity and national higher education weaknesses. Supervisors themselves lack access to basic services and report lack of access to basic state of art peer reviewed journals, resulting in outdated knowledge. Furthermore, due to limited funds, their ability to join conferences may result in a lack of an academic network and a preference to engage in more income rewarding activities. In bigger universities, often located in capital cities, access to internet and resources is less of a problem. Still, we find that access to specific research software and awareness about open resources or software for data analysis is low. Fellows and supervisors specifically indicate that they do not have “online journal access away from University”, or are “not familiar with the software services”. Moreover, both fellows and supervisors are open to the idea of online learning communities provided that the local context and lack of internet connectivity in some regions are kept in mind. However, some respondents have stated that while an online community might be interesting for African researchers, a lack of face-to-face interaction remains a concern.

INSERT GRAPH 3 ABOUT HERE

## **5 Discussion**

The literature and needs assessment both indicate a need for reform in higher education in Africa. With limited resources devoted to higher education, and poor educational infrastructural development, knowledge creation in Sub-Saharan Africa lags behind. Scientific output from African researchers is relatively low, and the majority of publications offered stem from South African established universities. In order to support capacity building in the institutions, the largest change should come from within the countries and the institutions themselves. Investments in higher education institutions, facilities and staff capacity (numbers and training), will benefit the quality and scale of services provided. Similarly, offering doctoral students and university staff funding will allow them to focus on their research, rather than spending time on other jobs in order to provide income for their families. Higher quality local education will not prevent the best performing students to seek education abroad, but it will allow the good students who decide to remain in their home country a better chance to build capacity locally.

The results from the needs assessment survey show that there is also a great need and desire for support through network building, course development/offering, and access to knowledge in sub-Saharan Africa. Being relatively isolated from the academic world, due to lack of access to the most recent publications, limited ability to participate in conferences and lack of access to academic software will create local rather than international academic networks that are not necessarily linked to the current state of art in the field. In addition, with, by nature, a limited number of staff in each university (especially in rural areas) the costs of meeting the experts in the field face-to-face are high.

Some of the pitfalls of the current system might be overcome using e-solutions. The needs assessment shows us there is a willingness to cooperate and use e-solutions, and the literature suggests that in the urban areas the basic facilities to engage in e-solutions is present. Most students confirm having access to internet, having access to phones and laptops, and the younger generation confirms being comfortable with using the equipment. In rural areas the facilities are less, and the needs for capacity building are greater. If we are able to offer e-learning facilities that supplement the local educational services, doctoral students might benefit greatly.

Our institutional contribution is to develop a community of learning, designed specifically to train young researchers, offer facilities to access open educational resources and software, and connect to the academic community beyond their local university. The aim of the Community of Learning for African PhD students, currently developed by UNU-MERIT and the School of Governance (Maastricht University) is to offer an add-on service available for free for all African PhD students. This community, designed in Moodle, is built on three pillars, being the course provision (MOOCs and SPOCS), a repository of open educational resources and a community of peers interacting, offering feedback and supervising. In 2015, we set up the platform and tested the functioning of the coursework. Initial findings, based on a pilot suggest that both fellows and supervisors appreciate the service, and welcome an expansion of the platform. In particular, the state of art course offering and repository of OERs was evaluated positively. The network of peers is not developed, and thus not used yet. With the aim to offer a full set of basic services, free of charge for African doctoral students, the pilot projects will be continued and the platform will be developed further.

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*Table 1 Summary table of peer-reviewed literature from the systemic and traditional search*

Reference	Research Question	Methodology	Main findings	Category
<b>Bisaso, R. (2010). Journal of Higher Education Policy and Management, 32(4), 343-351.</b>	How can Uganda prioritize budget allocation for higher education as private-public partnerships continue to grow? And how can Uganda maintain functioning and increase enrolment in these institutions?	Qualitative policy analysis	Private funding helps to increase enrolment, as do more flexible course and study options	Higher Education/ Capacity Building
<b>Cloete, N. (2014). Studies in Higher Education, 39(8), 1355-1368</b>	How to strengthen regional and national development of African universities to enable their more meaningful participation in the global knowledge economy and society?	K-means analysis based on standardized scores, measuring knowledge production by a combination of output variables, including indicators for numbers of masters and doctoral graduates, proportion of PhD graduates to permanent staff	Huge investments in the South African higher education system could only little improve the quality of education. Knowledge is necessary, not only for research and development but also to increase the proportion of academic staff with doctorates and to respond to the increasing demand for PhDs within the professional sector. Transformation strategy is needed to develop capacities.	Ph.D. Education/ capacity building
<b>Hall, D., &amp; Thomas, H. (2005). Journal of Higher Education Policy and Management, 27(1), 67-69.</b>	How do we define higher education and how does it affect outcomes and success for students?	Qualitative policy analysis	There is a need for dialogue to address issues of facilitation between stakeholders	Capacity Building
<b>Kruss, G., Adeoti, J., &amp; Nabudere, D. (2012). Journal of Development Studies, 48(4), 516-530.</b>	How do firms and universities interact in order to effectively support students as they enter the work-place	Descriptive	Firms and Universities lack dialogue and capacity to work with each other. As the knowledge economy changes, both firms and higher education institutions must adapt to allow more flexible dialogue and transition for students	Higher Education
<b>Mtebe, J. S., &amp; Raisamo, R. (2014). International Review of Research in open and Distance Learning, 15(1).</b>	What are challenges that hinder instructors to adopt and use OER? How can we elicit instructors' behavioural intention to use and adopt OER?	Regression analysis	Effort expectancy had significant positive effect on instructors intention to use OER. No significance for performance facilitating conditions' and social influence. Inadequate ICT infrastructure hinders the usage of e-learning. Many instructors of existing OER do not have expertise in developing quality educational resources and lacking knowledge of copyrights	Higher education/ e-learning
<b>Novelli, M., &amp; Burns, P. (2010). Development Southern Africa, 27(5).</b>	How do values, perceptions and attitudes alter as a result of knowledge exchange, cross cultural interactions and peer-to-peer capacity building?	Qualitative analysis, Field Research, Interviews with participants	Field trips can improve the quality of learning and help give students different/thorough perspectives on the subject of study	Capacity Building
<b>Ossiannilsson, E. &amp; Landgren, L. (2011) Journal of Computer Assisted Living, 28(1), 42-51.</b>	Gain a picture of the situation with regard to e-learning, and offer an overview of how these conditions appear from a European perspective"	First Dual-Mode Distance Learning Benchmarking Club, NAHE's e-learning quality model	Universities need to undergo structural changes to establish distance learning, collaboration and connectivity on multiple levels are essential	e-learning
<b>Oyo, B., &amp; Kalema, B. M. (2014). International Review of Research in open and Distance Learning, 15(6)</b>	How should MOOCs be designed for developing countries such as those in Africa?	Post-secondary education delivery method for the majority poor/needy students in Africa.	Poor students are often excluded from studying as they cannot afford to pay tuition fees. There are five requirements for implementation of national accredited MOOC curriculum, namely electronic content development and development of an online and offline eLearning platform, establishment and funding of MOOC coordination units at public HEIs, and establishment of MOOC access hubs at strategic locations.	e-learning, higher education, policy

<b>Salmon, G. (2000). Gilly E-Moderating</b>	Description and exploration of practice of E-Learning	Development of a Model that conceptualizes E-Learning	A E-Learning platform requires active tutors and motivated students for the effective operation of a E-Learning platform	E-Learning
<b>Sawyer, A. (2004). Journal of Higher Education Africa (JHEA/RESA), 2(1), 211-240.</b>	How to develop long term knowledge generations and application capacities.	Qualitative Study	There is a knowledge deficit arising from the limited capacity of indigenous institutions for generating and applying modern knowledge to production, management, and social life.	Capacity Building, Higher Education
<b>Smit, B. W. (2013). Studies in Higher Education, 38(3), 441-455.</b>	How did the South Africa–Netherlands Research Programme on Alternatives in Development (SANPAD) evolve from an aid programme to an exemplary model of innovation?	The South Africa–Netherlands Research Programme on Alternatives in Development (SANPAD) aid model of international collaboration between North and South partners.	SANTRUST in its relationship with research universities has matured into an example of sustainable national and international cooperation within a knowledge network paradigm. PhD capacity building can be strengthened through knowledge networks, including peer learning, supervisors and experts with an international background. Strong need for further research in the field of open distance learning.	Capacity building, e-learning, PhD Education
<b>Rohleder, P et al. (2008). Higher Education, 56(1), 95-107.</b>	How do students evaluate the use of e-learning in a collaborative project between two South African universities?	Case Study	Despite the positive experience of E-Learning the students discovered a number of challenges related to the technical difficulties faced when acquiring working skills and working on an open source e-learning platform as well as the disjointed experience of communication.	E-Learning, Higher Education
<b>Wang, L. (2013). Journal of Higher Education Policy and Management, 35(3), 305–315.</b>	How do Chinese practices differ from the Western model in the process of internationalisation of education?	Qualitative study	Chinese education has continued to internationalize at a higher rate than anticipated. Institutions in China have adopted western and other principles while Chinese methods of teaching and institutions have been exported around the world. The Chinese are also encouraging and incentivizing students from abroad (specifically Africa) to attend universities in China, sometimes through.	Capacity Building/ Higher Education
<b>Youtie, J., &amp; Shapira, P. (2008). Research Policy, 37, 1188-1204.</b>	How can universities expand their capacity to deal with and adopt new technologies, methods of teaching and higher enrolment in a changing economy?	Case Study: financial analysis and comparative, qualitative time series study	Universities are transforming from knowledge factories to knowledge hubs. However, they have limited capacity and ability to adapt quickly to rapidly changing needs of students. More complex knowledge transfer models have emerged to facilitate better and more interactive learning that will enable to students to make links between the classroom and "real life"	Higher Education/ Capacity Building

Figure 1: Systemic Literature Setting

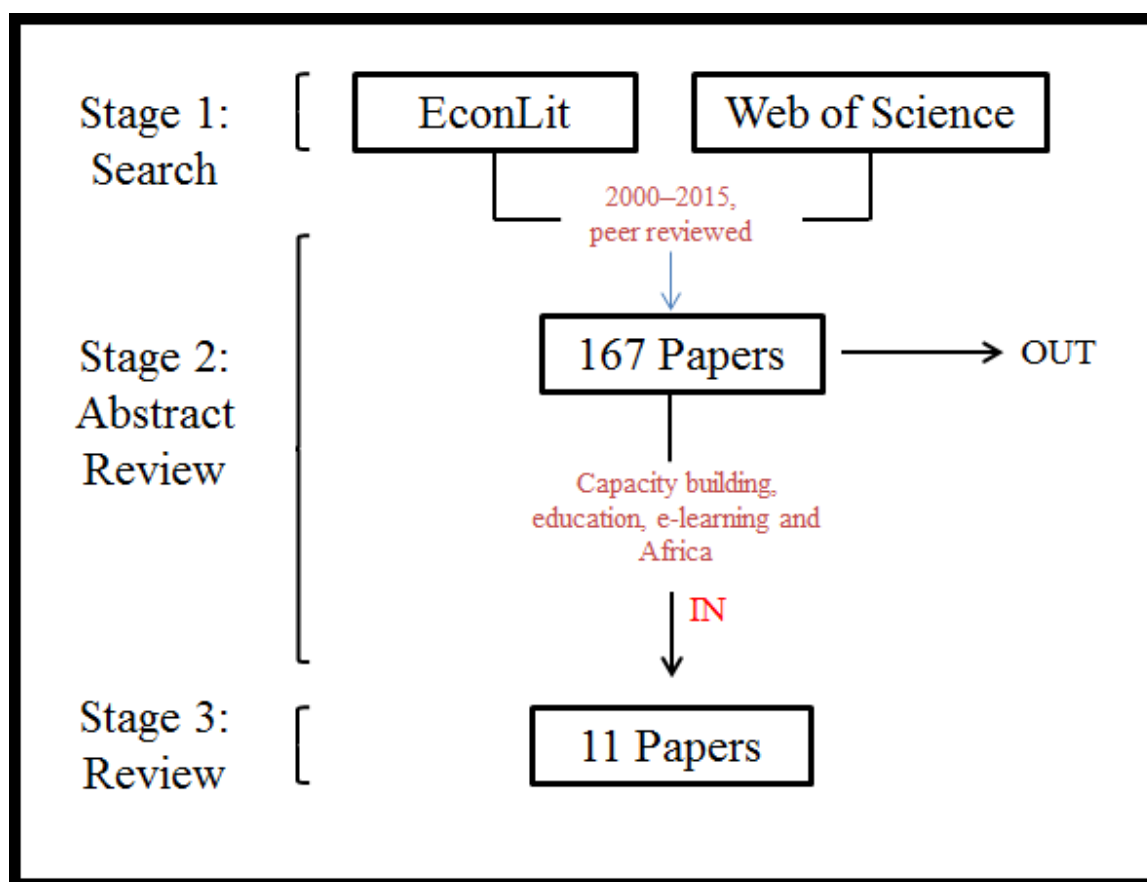
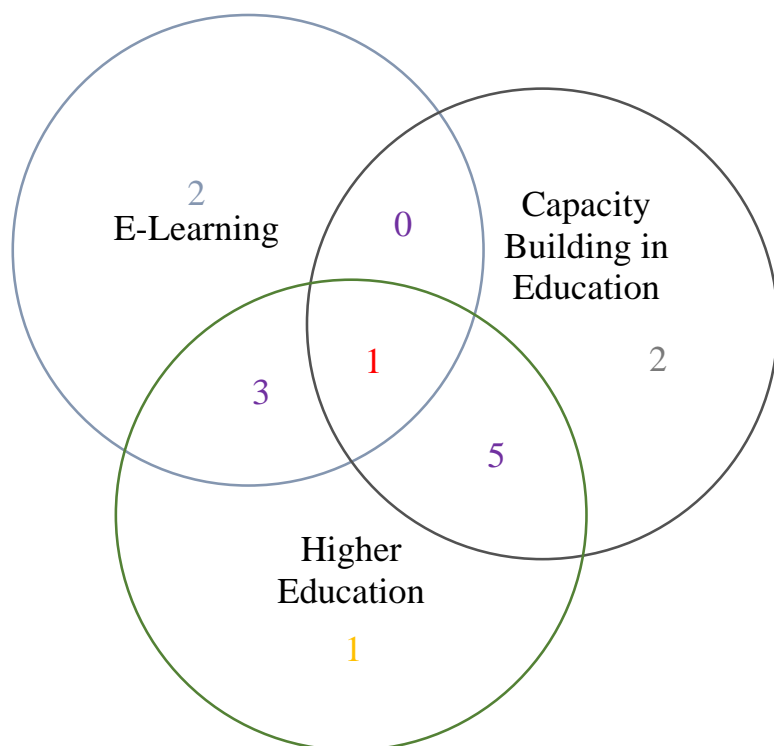
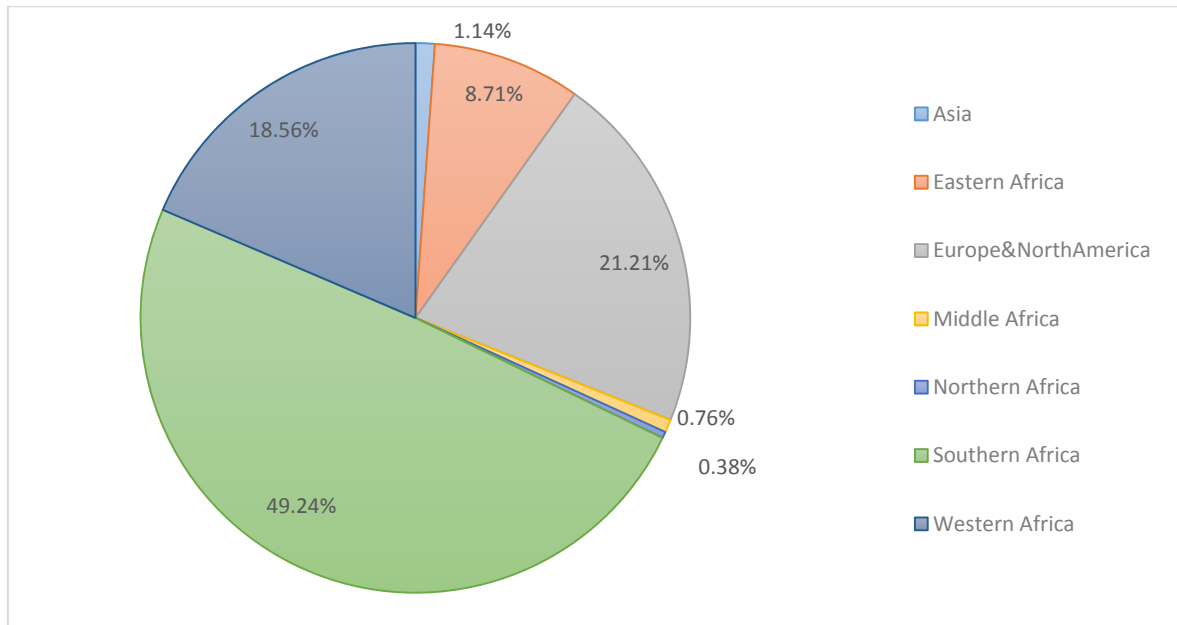




Figure 2 Categorisation of Literature Reviewed

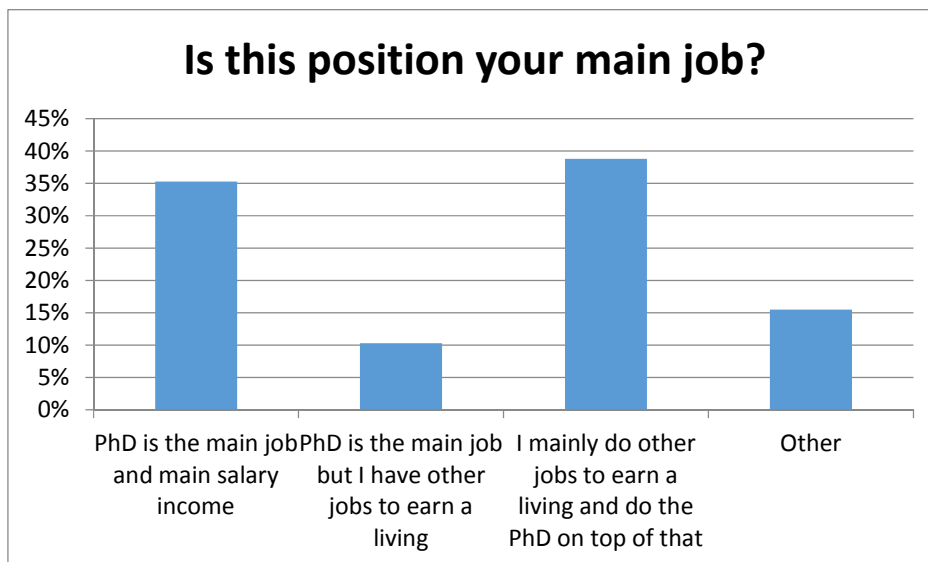


Graph 1: Response Rate by Region

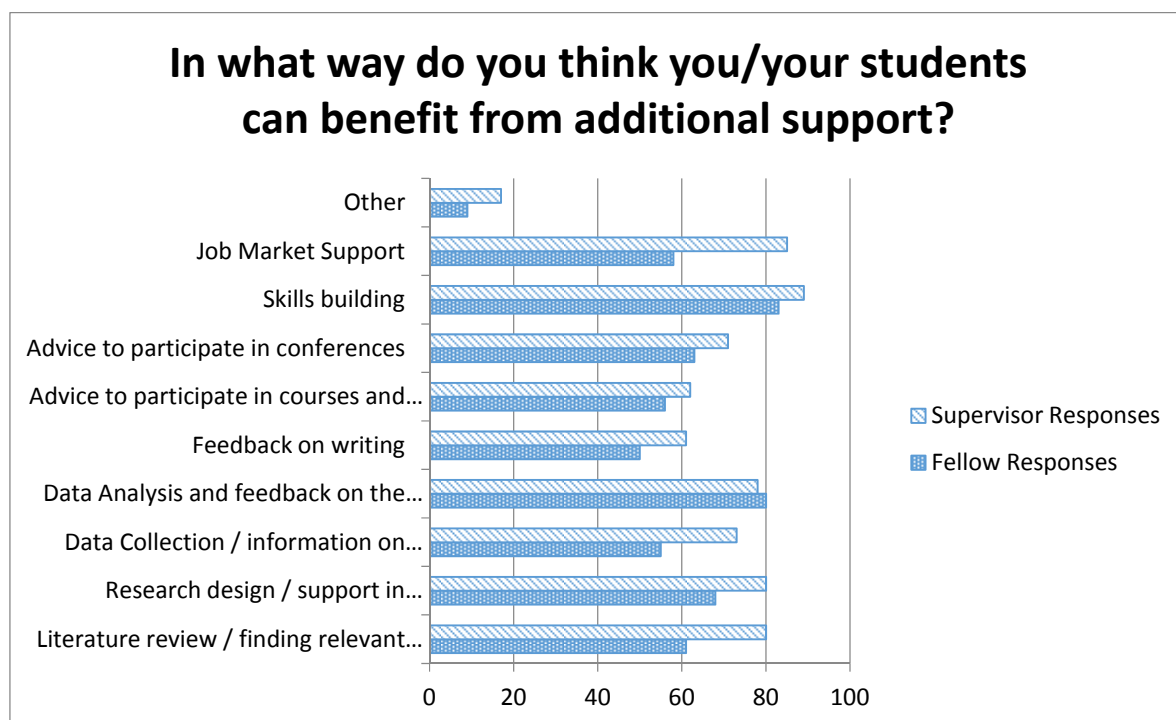


Graph 2: Primary source of income for PhD fellows

(% of respondents that selected this option)



Graph 3: Identified areas of support for African Institutions



## Annex 1

Search Criteria	Number of hits
Higher Education + Policy + Governance AND East Africa	0
"Higher Education" + Policy +OR Governance AND East Africa	0
Innovation in "Higher Education" in East Africa	0
Innovation + Governance + Institutions + Technology AND Africa	2
Innovation + Education AND Africa	14
Capacity Building + Education + Policy AND Africa	1
Capacity Building + Education + Policy + Governance AND Africa	0
Education + Economic Development + Poverty AND Africa	74
"Higher Education" + Innovation + Capacity Building	3
"PhD Education" + Innovation + Capacity Building	0
Higher Education AND E-learning AND Africa	0
innovation AND Africa AND higher education	3
higher education OR Africa OR phd OR capacity building	4
PhD Education AND elearning	0
public policy AND elearning AND capacity building	0
innovation AND Africa AND phd	0
entrepreneurship OR capacity building OR innovation OR elearning	1
South Africa AND elearning	0
education AND economic development AND technology	0
higher education AND innovation OR technology	1
Sub Sahara OR higher education OR elearning	1
higher education AND phd needs	0
innovation OR capacity building OR education OR Africa	1
elearning AND South Africa	1
elearning AND South Africa AND capacity building	0
Southern Africa AND elearning	0
higher education AND elearning	59
innovation AND Africa AND higher education (WITHOUT tagging criteria boxes)	2
<b>TOTAL</b>	<b>167</b>

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