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Envisioning the future of the African University: Needed reform, and adjustments to respond to the emerging challenges

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ABSTRACT

The paper shares the author's perspective on the future of African higher education through a university lens. It identifies global trends and regional agenda that will influence change within the African university systems in the next decade. The paper is divided into eight (8) sections as follows: Section 1 introduces the background and purpose of the paper and its organization. Section 2 reviews the historical developments that influenced the emergence of the Multiversity in the nineteenth and twentieth centuries in the western world, especially the United States and Europe; and the implications for the reforms of university systems in the twenty first century. Section 3 reflects on the current global trends affecting the university governance, and driving change by reviewing a plethora of models of governance, especially the Anglo-Saxon, Homboldtian, Napoleonic, and Japanese models. Section 4 describes the role of university innovation and entrepreneurship in the fulfillment of the 'third mission' besides university core business of teaching and research. Section 5 covers the integration of technology in learning and transitioning of universities to Education 4.0 in order to serve the unfolding Fourth Industrial Revolution. Section 6 highlights the role of academic rankings in measuring success and fueling reputational competition; thus, leading to improvement in research output and impact, and influencing strategic choices in higher education globally. Section 7 reflects on the causes of stagnation of African higher education in comparison to BRICs' explosive expansion in the last two decades, and proposes strategies for closing the gap in terms of graduate enrollment ratios and differentiation. Conclusions and key recommendations for reforms in African university are made in Section 8 and include massification of African higher education sector through cost-sharing, differentiation and vocationalization; less government regulation and more autonomy to universities; corporatization of management to improve academic leadership; cultivation of innovation and entrepreneurialism; integration of technology, and transitioning to Education 4.0 in order to serve African Agenda 2063 and Fourth Industrial Revolution.

Key words: Africa, Higher Education, transformative change

RÉSUMÉ

L'article partage le point de vue de l'auteur sur l'avenir de l'enseignement supérieur africain à travers une optique universitaire. Il identifie les tendances mondiales et l'agenda régional qui influenceront le changement au sein des systèmes universitaires africains au cours de la prochaine décennie. Le document est divisé en huit (8) sections comme suit: La premiere section présente le contexte et le but du document et son organisation. La seconde section passe en revue les développements historiques qui ont influencé l'émergence de la Multiversité aux XIXe et XXe siècles dans le monde occidental, en particulier aux États-Unis et en Europe; et les implications pour les réformes des systèmes universitaires au XXIe

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siècle. La troisième section se penche sur les tendances mondiales actuelles qui affectent la gouvernance universitaire et conduit le changement en passant en revue une pléthore de modèles de gouvernance, en particulier les modèles anglo-saxon, homboldtien, napoléonien et japonais. La quatrième section décrit le rôle de l'innovation et de l'esprit d'entreprise dans les universités dans la réalisation de la «troisième mission» en plus de l'activité principale de l'enseignement et de la recherche. La cinquième section couvre l'intégration de la technologie dans l'apprentissage et la transition des universités vers l'éducation 4.0 afin de servir la quatrième révolution industrielle en cours. La sixième section met en évidence le rôle des classements universitaires dans la mesure du succès et dans la promotion de la concurrence en matière de réputation; ainsi, conduisant à une amélioration de la production et de l'impact de la recherche et influençant les choix stratégiques dans l'enseignement supérieur à l'échelle mondiale. La septième section examine les causes de la stagnation de l'enseignement supérieur africain par rapport à l'expansion explosive des BRIC au cours des deux dernières décennies, et propose des stratégies pour combler l'écart en termes de taux d'inscription aux cycles supérieurs et de différenciation. Les conclusions et recommandations clés pour les réformes dans les universités africaines sont présentées dans la huitième section et incluent la massification du secteur de l'enseignement supérieur africain par le partage des coûts, la différenciation et la professionnalisation; moins de réglementation gouvernementale et plus d'autonomie pour les universités; corporatisation de la direction pour améliorer le leadership académique; culture de l'innovation et de l'esprit d'entreprise; intégration de la technologie et transition vers l'éducation 4.0 afin de servir l'Agenda 2063 africain et la quatrième révolution industrielle.

Mots clés: Afrique, enseignement supérieur, changement transformateur

1. INTRODUCTION AND BACKGROUND

Higher education reform is mostly driven by what happens in universities (Keeling 2006). Hence, the goal of this paper is to share the author's perspective on the future of African higher education through university lens based on global and regional trends influencing reforms in higher education sector, and to propose necessary policy interventions in order to realise that future or vision. It also aims to catalyze the debate and provide insights to others to emulate. To do this, the paper will strive to imagine how the African university systems can adjust in order to tackle the challenges facing the African society today and in the next decade or so; against the backdrop of African Agenda 2063, UN Agenda for Sustainable Development Goals 2030, globalization of higher education market, corporatization of universities, the impact of technology and the advent of Fourth Industrial Revolution, in addition to many other important mega trends. These regional, and global agendas and mega trends, will have impacts on how African universities teach, produce knowledge, and serve the African and global communities.

At the outset, it is worth pointing out that African universities, like their counterparts in the developing countries, were latecomers to the global higher education scene compared to European and American universities whose histories date back to medieval era and seventeenth century respectively. Michael Shattock opined that longevity of a university, improves its success opportunities (Shattock, 2009). And although African universities were initially conceived as extensions of the British and French university systems, in practice, they fell short of Oxbridge's and grande école's models that they were purported to replicate. Instead, initial goal of the early universities in Africa was to focus on training of colonial administrators and political elites of African post-colonial era (Cloete and Maasen, 2015).

What is more, the expansion and development of African higher education sector, especially in the sub Saharan region in the three decades that followed independence, was slowed down by the publication in 1986 of a hugely influential World Bank's higher education policy report (Psacharopoulous *et al*., 1986). The report claimed that the returns to a dollar spent on primary education were twice the returns to a dollar spent on higher education (ibid:8). Following this 1986 publication, the World Bank and other international agencies active in field of education began to promote educational and funding policies that prioritized primary education and treated higher education as a luxury (Cloete Maassen, 2015). The result was a decline in average public expenditure per tertiary education student from a high USD 6,800 in 1980 to a very low average of USD 981 per student in some 33 sub Saharan African countries by 2009 (World Bank, 2009), or an astonishing reduction of 82% (Cloete Maassen, 2015). To this date, Sub Sahara Africa tertiary education enrollment ratio also remains the lowest globally.

Moreover, although African higher education has started to expand relatively in the late 1990 and early 2000, there has been hardly any differentiation. Rather, what we have at the moment are mostly over crowded elite higher education institutions (ibid.)

In contrast, starting in mid 1990s and for the next two decades that followed, the governments in Asia, Eastern Europe, and Latin America, especially the BRIC countries-- Brazil, Russia, India, and China—succeeded in expanding their higher education systems considerably by making more resources available to tertiary education through a mix of subsidies and charging of tuition fees and expansion of private higher education (Carnoy *et al*., 2013). The reasons and causes of this divergence, and the lessons to be learned from BRICs' experience, will be discussed in Section 7 of this paper.

While acknowledging the unique challenges that are still impacting the performance of the African university as a latecomer to higher education sector, the African university system is not an island unto itself, but forms part of dynamic global higher education systems that must continuously adapt their traditional roles, their internal organisations, their leadership modes, their governance structures, their intellectual cultures and values, their funding models, and their mode of operation and service delivery in response to new trends and demands placed on them by society (Bok, 1982; Kerr, 2001; Castells, 2009). Hence, Section 2 explores the global scene of higher education—including review of how university systems developed in the Western world from medieval era to present day, in order to identify and discuss the critical success factors and frameworks that must be met or followed in order to launch "the next generation" African university that is able to serve the unfolding Fourth Industrial Revolution, while able to tackle the pressing national, regional, and global agendas.

The paper is organised as follows: Section 1 presents a background introduction and sets the purpose of the paper; as well as describing how the paper is structured. Section 2 reviews the historical development that culminated in the emergence of multiversity in the nineteenth and twentieth centuries in the United States; and its implications for the development of university systems in the twenty first century. Section 3 reflects on the global trends affecting the university governance, and the factors driving change in university management and leadership by examining different university governance models, especially the Anglo-Saxon, Homboldtian, Napoleonic, and Japanese models. Section 4 examines the role of innovation and entrepreneurship in universities in fulfillment of 'third mission' that complements teaching and research as core businesses of the university in the 21st century. Section 5 covers integration of technology in learning and transitioning

to Education 4.0. Section 6 describes the role of academic league tables in measuring university success and fueling reputational competition amongst universities, and leading to improvements in the quality of research and driving change in higher education. Section 7 reflects on the state of African higher education and proposes areas of focus and change as it responds to global trends that are impacting global university systems; as well as how it may respond to challenges facing the African region socially, and economically. Conclusions and key recommendations for reforms in African university are made in Section 8.

2. The origin of modern university and birth of multiversity

A quick overview of the literature of historical and contemporary development in higher education in major western economies will help us identify the trends that had shaped in the past or continue to shape higher education globally in the present time. This in turn will help African university leaders as well as policy makers see what lessons to learn in order to transform higher education sector on the continent in the next few decades, as well as highlighting the policy interventions that will be needed in order to bring about the desired outcomes. Therefore, this section reviews the literature on the functions of university in the United States and Europe (Asby, 1958; Kerr 2001), and summarizes how the higher education sector has changed over decades to respond to societal challenges after the World War II in the major developed and developing economies (Bok, 1982; Bowen, 1982; Clark, 1998; Kerr, 2001; Shattock, 2009; Shattock, 2010; Frenkel, 2012; Carnoy *et al*., 2013; Graf, 2013; Shattock, 2014).

From Greek academies to modern multiversity

The idea of university, as a central institution of higher education, has origin traceable to the Greek academies that were established by Plato, Sophists, and Pythagoreans in the sixth century. Plato academies were devoted to discovery of truth for its own sake and teaching philosophy to future kings; the Sophists gave instructions in rhetoric needed by their students to succeed in life; while the Pythagoreans taught mathematics and astronomy to natural philosophers (Kerr, 2007).

Henceforth, higher education began to evolve gradually from an informal education system and a low-base involving person-to-person interaction between teacher and student (ibid.). This early education system (also referred to as education 1.0) was focused on teaching religion and philosophy with the primary goal of preparing good citizens (Ernst and Young LLP, 2017). Education in the ancient and medieval times was championed by religious institutions-- mainly Christian monasteries and Islamic madrasas-- with the support of the kings. It targeted elites, mostly boys (ibid.:11).

However, according to Clark Kerr, the 'modern university' which began to emerge in the medieval period, comprised a "community of masters and students" with a unique personality and soul in form of "a central animating principle" (Kerr, 2001). This unique personality was identified by "a name and a central location, masters with a degree of autonomy, students, a system of lectures, and a procedure for examinations and degrees" in addition to "an administrative structure with its faculties".

The impact of Printing Press on the spread of University Education

The advent of printing press in the seventeenth century allowed publication of books on a large scale not witnessed before. It permitted a wider sharing of knowledge, and resulted in moving education system from one-to-one learning, to one-to-many mode of instruction. That in turn allowed the massification and spread of higher education throughout the world (Ernst

and Young, 2017). The number of universities began to multiply, rising from 10 universities between 1800 and 1809, to 131 universities between 1850 and 1859 (Ernst and Young, 2017). By 1990s, the number of university degrees awarded in the United States rose to1.05 million compared to 28,600 in early 1900s. Moreover, government influence began to increase from seventeenth century onwards, while the religious influence began to wane (Ernst and Young, 2017). And by 2003, United States had some 4000 institutions of higher education, of which 500 awarded doctoral degrees, 125 were classed as research intensive with 50 institutions receiving the highest concentration of research funds (Shattock, 2014). The trends that influenced the development of higher education and universities and their impacts between the sixteenths and eighteenth centuries are summarized in Table 1.

Meanwhile, the 'animating principle' that defined a university has been dynamic and changing from one era to the next, despite the views to the contrary. For example, the views about university such as once held and articulated by Cardinal Newman are being challenged. Newman argued that the binding principle of a university was cast as residing in the university's responsibility to act as "high protecting power of all knowledge and science, of fact and principle, of inquiry and discovery, of experiment and speculation," as well as curving out of "the territory of the intellect" by ensuring that "there is neither encroachment nor surrender on any side" (Newman, 1930).

Table 1. Impact of printing press on development of Higher Education in Europe

Period	Trends	Features
Before 17th century	• Scientism and rationalism • Schools conceived as scientific workplaces • Use of inductive and empirical methods	• Renaissance increased government influence on education while it diminished the religious influence • Establishment of universities such as Harvard, Yale, Columbia, and Princeton in the US • Introduction of new teaching methods
18th century	• Emergence of philosophical trends • Introduction of mother language in teaching • Inclusion of science curriculum • Improvement in teaching pedagogies	• European universities emphasis on STEM and development of cognitive skills • Numbers of universities rose from 10 between 1800-1809 to 131 between 1850 and 1859 • Higher education spread rapidly across the world
19th century	• Emphasis on citizen's welfare with the development of industrial revolution and increasing urbanization • State taking increasing responsibility of education	• Public educational systems established in France and Germany • Participation of women given importance in US and UK • Germany established universities that carried out research • Number of bachelor degrees awarded by the US universities rose from 28,681 in early 1900s to 1.05 million by 1990s.

Source: Ernst and Young LLP (2017)

Broadly understood, universities in Newman's view, were ivory towers that stood aloof outside the society, and were entirely absorbed in their core business, while resisting any temptation of being compromised by the society they were embedded in. And as echoed by Eric Ashby, similar ideals about the idea underpinning the function of the university were apparent in German's seventeenth century tradition of Wissenschaft. Namely, the academic vocation was seen as "a single-minded, almost fanatical, devotion to advancement of knowledge" while excluding the application of science and concept of education-for-life (Ashby, 1958). This also rhymes very well with Welhem Holmholtz's idea of the German university's quest for scientific knowledge at that time (Helmholtz, 1873):

Whoever, in pursuit of science, seeks after immediate practical utility, may generally rest assured that he will seek in vain. All that science can achieve is perfect knowledge and a perfect understanding of the action of natural and moral forces. Each individual student must be content to find his reward in rejoicing over new discoveries, as over new victories of mind over reluctant matter

And by the mid-twentieth century, Newman's and Helmholtz' ideals of what university and knowledge generation meant, had come to be at odd with a more utilitarian function of the university that is now taken as given. For example, Abraham Flexner in the United States context noted that "university is not outside, but inside the general social fabric of a given era;" and that it represents "an expression of the age, as well as influence operating upon both present and future" (Flexner, 1930).

Moreover, the Newman's model of university in the molds of Oxford and Cambridge of that era, gave preference to "liberal knowledge" over "useful knowledge" which he saw as nothing but a "deal of trash" (Kerr, 2001). And reading Newman correctly, one can infer that the "animating principle" for him, and which underpinned the idea of university, is that of an institution devoted purely to research and pursuit of knowledge for its own sake, as opposed to being an instrument of service to society as understood by Francis Bacon (Bacon,1937), or 'the arm of the government' that it later became as expounded by Kerr (2001). This extended function of the university fits with the view long espoused by Alfred North Whitehead and others (Whitehead, 1929):

The universities are schools of education and schools of research. But the primary reason for their existence is not to be found either in mere knowledge conveyed to the student or in mere opportunity for research afforded to the members of the faculty…The justification for a university is that it preserves connection between knowledge and the zest of life, by uniting the young and the old in an imaginative consideration of learning…The Universities have trained the pioneers of our civilization – the priests, the lawyers, the statesmen, the doctors, the men of science, and the men of letters. They have been home of those ideals which lead men to confront the confusion of the present times

And to substantiate the above view, Whitehead points out that as early as in 1316, the University of Cambridge in England had established a college with the sole purpose of "providing clerks for the King's service" (ibid:92).

Furthermore, Germany was the first to establish universities devoted exclusively to conducting scientific research (Ashby, 1958). The German model spread to British universities in mid nineteenth century, while the American universities borrowed from both the German and British models (Kerr, 2001) as recorded by Derek Bok (Bok, 1982):

From Germany came the idea of a university dedicated to research conducted by the

specialized professor with the help of student apprentices. From England came a strong emphasis on the teaching of undergraduates and a broad conception of education that embraced the moral and emotional as well as the intellectual development of the student

The result was a unique mix and match for the American university model as Clark Kerr had observed (Kerr, 2001):
Out of all these fragments, experiments, and conflicts a kind of unlikely consensus has been reached. Undergraduate life seeks to follow the British, who have done the best with it, and an historical line that goes back to Plato; the humanists often find their sympathies here. Graduate life and research follow the German, who once did best with them, an historical line that goes back to Pythagoras; the scientists lend their support to all this.

What's more, Clark Kerr contents that the 'central animating principle' that binds "community of masters and students" -- teaching and discovery of new knowledge- has been changing shape and content over the centuries, leading to emergence of what he described as "the multiversity" with the implications that the modern university has come to serve many purposes in the society beyond teaching and research (Kerr, 2001).

Most prominent development in the American university function was the signing of Morill Act in 1862 by President Abraham Lincoln that led to the birth of land-grant universities in all States with the mandate of teaching "such branches as of learning as are related to the agriculture and the mechanical arts, in such manner as the legislature of the States may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in several pursuits of professional life." (Bok, 1982).

Furthermore, as a consequence of the Morill Act, Charles Van Hise at Wisconsin University in Madison, declared that the borders of his university's campus was going to be the boundaries of the state. That 'Wisconsin's idea' was emulated by other land-grant universities, and the service-orientation, beside teaching and research, became the distinguishing mark of the American university model, as noted by Kerr (2001):
The land-grant university brought schools of agriculture and engineering, of home economics and business administration; opened the doors of universities to the children of farmers and workers, as well as middle and upper classes; introduced agriculture experiment station and service bureau.
And as demonstrated during the World War II, American universities came out to assist in war effort, especially when the academic scientists played an important role in the development of weapons for the military and splitting of the atom for war and peaceful applications. The result was that the American Government recognized the university-based talent, and provided generous funding of research at university campuses (see Bok, 1982; Bowen, 1982).

Tensions in multiversity

The emergence of multiversity as espoused by Clark Kerr (2001) in the United States was not without controversy. It generated contradictions and tensions within the academic fraternity– mainly between the liberal activists on the one hand, and traditionalist conservatives on the other. The activists thought that the American multiversity has become a 'hired-gun' of the vested interests which exercised political power over the American society by offering support ranging from developing weapons for use by the military in war in distance lands, to consultancy services for industrial corporations and agricultural extension for wealthy farmer groups. In so doing, the academe was seen to have compromised the neutrality of university on issues dividing the society (Bok, 1982).

On the other hand, the conservative academics saw too much involvement of professors in societal affairs such as setting up specialized

urban observatories, or establishing criminology research centres that solved social problems; as risking professors' commitment to research and scholarship, and hence leading to the lost of traditional detachment from societal concerns that may compromise their academic objectivity.

Notwithstanding the tensions generated by public service-orientation of American university, Howard Bowen has articulated that universities have continued to carry out their traditional function of teaching and knowledge generation through scientific and applied research, beside preservation and interpretation of culture, carrying out policy analysis, acting as sources of national scientific expertise when needed, hosting centres for philosophical and religious inquiry, engaging in diverse forms of public service through training and research, and contributing to national economic prosperity (Bowen, 1982).

Moreover, Bowen has highlighted further key areas in which the university can contribute to the betterment of society. These are: creating society of educated people by continuing to increase access to higher education for wider sectors of population, inculcating good values in the student as well as imparting specialist knowledge, tackling special problems facing youth in the modern society, and contributing to global understanding.

3. Trends affecting the functions of universities globally

This section reviews the trends that are affecting university systems globally, with a specific focus on the Anglo-Saxon (US, UK, and Australia), Humboldtian (Germany, Norway, and Finland), Napoleonic (France and Italy), and Japanese universities. In particular, the analysis will focus on trends in governance of university systems in these countries, diversification of funding through innovation and entrepreneurship, and integration of digital technologies to respond to changing student needs and globalization of higher education market.

International reforms in university governance

International trends driving the modernisation of higher education include changing role of the State in university governance, its ramifications on university's internal governance structure, and distribution of authority in the collegiate (Shattock, 2014). This modernisation push is driven by the recognition by governments and regional blocks such as EU of the important role universities play in knowledge economy, implications for funding, on how authority is shared within the university, and between university and external actors, including the State. Reforms in European and Japanese universities are driven by State legislation, but much less so in UK and Australia; while the state plays no role in regulating universities in United States.

The US and Anglo-Saxon reforms have tilted towards 'enterprise university' and marketisation of higher education system in line with new funding arrangements that give universities more autonomy. However, the US higher education system provides "the most diversified, individualized, and autonomous range of universities in any system", according to Michael Shattock. Although received with some resentment within the European university system, giving universities more autonomy and borrowing business practices was aimed at improving decision-making processes in universities, as summarized in Lisbon declaration that embodied the need to reform governance at EU Member States universities:

Universities must be autonomous and responsible in order to encourage innovation and assist change. This calls for a division of tasks between the Member States and the universities. The Member States should

establish frameworks (rules, policy, funding, and incentives). The universities should establish new governance systems based on strategic priorities and on the professional management of human resources and administrative procedures. They should also reduce the fragmentation of their services and entities and assume responsibility for their results.

In other words, more autonomy to universities is the answer to more entrepreneurial and innovative universities.

Reforms at Humboldtian Model Universities

University governance systems in Germany, Norway, Finland, and a great number of Northern European universities share much in common. They were founded on German Humboldtian model that made emphasis on research-based teaching and significant freedom to the professor (Kehm, 2014; Salmela-Mattila, 2014; Stensaker, 2014).

Germany

Germany operates a binary higher education system comprising universities providing academic education, and universities of applied sciences that provides professional education, in addition to differentiated non-university or vocational education sector (Kehm, 2014). As characterised and argued by Kehlm (ibid.:8), higher education governance regime in Germany "consisted of detailed State regulation, weak presidents and rectors, a strong professoriate, no external guidance and no competition.". German States regulate the universities within their borders, while the Federal Government provides a Framework Law that constraints the State laws governing universities to be compatible. The regulations governing universities cover recruitment of academic staff, funding, ownership and maintenance of buildings, approval of new study programmes, curricula, and degrees. All the authority relating to academic matters rests with the professoriate. The rector or president is regarded as "the first among equals."

However, in the face of dwindling public funding, German universities are under pressure to "do more and better with with less" (ibid.:19). Efforts started in 1990 to make German universities more competitive and included performance based funding, more autonomy to universities in academic and financial matters, introduction of boards that have external members in order to strengthen institutional leadership; and Excellence Initiative in 2005 whose aim was to increase the number of German universities in the 100 top ranked World Class universities through competitive institutional development funding, and experimenting with foundation status at selected universities (Kehm, 2014).

Norway

Before 2013, Norway had a binary higher education system similar to German's higher education setup in which some institutions were designated as universities and others as colleges; with a very a strong regulatory influence by the Ministry of Education; weak institutional leadership, and huge departmental powers; and no tuition fees (Stensaker, 2014). As described by Stensaker (2014), several attempts were made to encourage universities to reform but this resulted in modest impact on the old system. The reforms included introduction of new quality assurance agency to accredit and approve programmes, experimenting with new governance measures; rolling out output and performance-linked funding; and appointing rectors by a board as opposed to rectors elected by academics. The effects of the changes were described as "modest" as far as the traditional Norwegian higher education system was concerned (ibid.:38).

Finland

Finland, typical of Humboldtian higher education systems, has binary higher education system comprising universities and universities of applied sciences. According to Samela-Mattila (2014), reforms at Finish universities

were initiated by the Ministry of Education in 2010. Universities were requested to profile in order to highlight their areas of excellence that are practice-oriented, attain excellence in teaching and research, build university-society relationships, and provide service to society. As a result, universities were transformed into autonomous self-governing entities under public law; while others became private foundations governed by private law. What is more, universities were obliged to be accountable like businesses corporations that are able to allocate financial resources more efficiently based on areas of their strengths and strategic growth; and were to be assessed on their societal impacts as opposed to the traditional old performance indicators and evaluation.

For example, in Finish flagship universities such as University of Helsinki, a collegium composed of professors, research and teaching staff, and students' representatives decides the composition of university board, reviews university financial annual reports, and discusses matters of importance to the university. A board consisting of internal and external members is the highest decision-making body for the university. The board has power to decide on the strategy as well as on operational and financial matters of the university. University Chancellor has a public role of promoting and managing University's external relationships, including the promotion of sciences, arts, and humanities; while the rector, supported by a number of vice rectors, is in charge of financial and administrative affairs of the university. Central administration consisting of rector's office and university services is run by a director. Faculties are headed by deans while independent institutes are managed by directors.

In other universities such as University of Tampere, rector serves as rapporteur to the board, while academic units comprise the schools managed by directors, and a board of directors selected by the university board. Directors are responsible for developing the schools based on university's overall strategy.

The impact of reforms at Finish universities are beginning to work as summarized by Salmela-Mattila's paper (ibid.:61):
The reform was pushed through with a tight time…especially on the governance and administrative level… the new organisational arrangements are in place. In practice, management chains have become more straightforward, increasingly simple and possibly even more transparent. The administration whole seems to have evolved from a matrix structure, with sometimes very unevenly balanced actors, towards a line organisation with clearly defined responsibilities.

Governance reforms at the Napoleonic Model University Systems

The Napoleonic system of higher education that exists in France, Italy, Spain, Portugal, and many countries in Southern Europe, is characterised by "a central State control and a general agreement between the State administration (the Ministry of Education) and the academic estate (or 'the academic oligarchy')" (Moscati, 2014). Chatelain-Ponroy *et al*. (2014), and Moscati (2014) have respectively reviewed the recent attempts to reform French and Italian university systems from 1990 onwards. These reforms were inspired in part by the advent of the new public management (NPM), and by the need to harmonize the European higher education systems with Bologna process. Below is a summary of the governance reforms at French and Italian universities.

Reforms at French Universities

The development and governance of the French higher education system has been shaped by historical events that included suppression of

universities by the French Revolution in 1793, and their resurrection in a modified form in 1806 by Napoleon as discipline-based faculties. Furthermore, an Imperial University for the whole France that is composed of lycees and faculties and led from Paris was established (Chatelain-Ponroy *et al*., 2014).

As part of adopting New Public Management in French public administration (LOLF), higher education institutions were also requested to present a budget linking a set of objectives to indicators that measure achievements in the following year (ibid.:67). Universities are led by presidents who are elected amongst academics by the staff. Policy making bodies comprised of elected members representing academics and administrative staff, students, and outside stakeholders. Universities also enjoy academic freedom and autonomy. The president's term of office comprises four-year tenure, and renewable only once.

Overall, according to Chaterlain-Ponroy (2014), the governance of French universities takes place through three channels: Administrative channel headed by registrars, political channel led by presidents, and deliberative channels led by university councils. Elected heads such as presidents, deans, and departmental heads are not regarded as part of the administration, but only exercise political power as 'firsts among equals.' It is also noted that for historical reasons, French grandes ecoles that are involved in specialist and professional type education are more prestigious than universities in French higher education system. Moreover, as departure from Humboldtian model, the Napoleonic system did not consider research to be one of the missions of universities but that of national research organisations (or Centres National de la Recherche Scientificque, CNRS), although the collaboration between universities and national research centres (CNRS) is gaining currency as part of university mission in French universities (ibid.:71).

To date, three models of power-relations operate in French universities. These are: the technocratic models in which central administration has more power over academic leadership, and is characterised by weak presidents and vice presidents who tow the lines recommended by registrars; functional politicization model in which presidential team exercise political power to overrule and bypass registrars to exercise direct control over specific administrative units; and most prevalent of all, is the so-called 'dual-hierarchy' in which the president manages vice presidents, while the registrar exercises administrative authority (ibid.:74).

Reforms in Italian University System

Following a Napoleonic system of higher education, the State exercises central control through the Ministry of Education that has agreed some ground rules to be observe by both sides with the 'academic oligarchy' (Moscati, 2014). And according to Moscati (ibid.), the balance of power that has been in operation for long between the Ministry of Education and universities has protected the later from outside interference, while providing no incentive for change. The motivation for reform that began in 1980s was meant to align Italian higher education system with EU models, and implement the Bologna process, has, according to Moscati (2014), followed a 'stop-go' path in line with Margaret Archer's rule:

…the governing elite monitors educational development in relation to its own goals and to changing circumstances. It hesitates to introduce major changes until there is evidence that current polices are not working or not appropriate… (in general) the elites will hold back as long as possible because what is involved is a jump in the dark…thus leaps in the dark are resisted, until pushed by political supporters, or force of circumstances, and when they are taken they will be unadventurous, unless produced by a new group assuming power

(Archer, 1979)
As described by Roberto Moscati:

"…reforms are introduced by Italian governments without any sort of involvement of academic world, which is always taken by surprise. After the shock a long period of implementation follows featuring more individual disagreement with collective opposition. As a result, norms are introduced in a series of compromises in a ritualistic and cosmetic way and the changes are formally visible but substantively have little effect."
Moscati (2014)

Oddly enough, attempts to grant Italian universities autonomy over academic matters, led to uncontrolled, and somewhat less responsible expansion of higher education sector in 1990s. It did not take long before the central authority began to regain control over all academic matters in Italian universities. In other words, marketization of the Italian higher education sector through granting more autonomy to universities did not produce desirable results as it it did in other Western systems such as the US and UK, or Australia (Moscati, 2014).

Governance reforms at Japanese Universities

The founding of Japanese universities in the latter half of nineteen century followed Humboldtian model that links research and teaching closely, while adopting Napoleonic system of central control through a strong Ministry of Education (Shattock, 2014. Hence, the Japanese universities until 2004, operated as integral part of national government under the Ministry of Education, Culture, Sports, Science, and Technology (MEXT) (Oba, 2014). As noted by Jun Oba (ibid.:108), problems associated with the close integration of Japanese universities with government organisations included: internal conflict between state control and academic autonomy, widespread disaffection with disparities between national and private universities, and inefficiency in the management of public universities. Reforms were initiated to tackle the inefficiency and facilitate effectiveness of the Japanese university systems, and was driven by New Public Management thinking and implementation of neoliberal reforms in public service.

A National University Corporation Law was passed in 2003 that granted universities status of national university corporations (NUCs) with legal personality and autonomy, and gave strong powers to university presidents, in line with global trends (Christensen, 2010). Government supports NUCs with operational grant in addition to special grant allocated on competitive basis, while tuition fees form over 50% of revenues for universities. MEXT determines the level of tuition fees and allow universities to vary their fees at a rate that does not exceed 20% of MEXT determined fees. Operation grant is based on NUC's mid-term goals that extends over six-year period. A National University Evaluation Committee assesses the achievement of mid-term goals based on self-assessment reports submitted by the NUCs.

Furthermore, the highest authority is exercised by NUC's president and the board of directors. The president is the final decision maker of NUCs. He or she is selected by a special presidential committee and appointed by the Minister of Education. The terms of office are determined by the selection committee and legal provisions have been put in place to dismiss president if circumstances necessitate it. The Board of Directors supports the president. Its members are appointed by the president. The governing structure is composed of Administrative Council, Board of Directors, Education and Research Council, and President Selection Committee (with equal representation of members of Education and Research Council, and Administrative Council), and Auditors. At least one member

of the Board of Directors is external and mostly from business community, while at least 50% of Administrative Council are external members. The Administrative Council discusses matters of administrative nature, while the Education and Research Council is composed mainly of internal members and deliberates on academic and research matters. Under new law, NUCs have the discretion to decide over human resource management matters, including giving the president the appointing right. The new reform is not without its contradictions such as the difficulty of dismissing a president by the Minister of Education on the recommendation of a board of directors appointed by the President.

4. Innovation and Entrepreneurialism at University: The Third Mission

Increasingly, universities in advanced economies are viewed as key contributors to enhancing national economic competitiveness, especially the knowledge intensive sectors of the economy (Shattock, 2009). According to the European Commission, universities are strategically positioned at the crossroads of research, and education; and that 'innovation universities' hold the key to unlocking of knowledge economy. For example, in 2001, universities employed 34% of active researchers in the EU, while 80% of fundamental research in the EU Member States was carried out in universities. Moreover, the knowledge intensive sector of EU economy which employed mainly university graduates, was responsible for half of the new jobs created between 1997 and 2000.

In order to fulfil this 'third mission' (Williams, 2009) besides teaching and research, universities are under pressure to change the way they are organised and led; with a need for them to be more autonomous in their decision-making processes and capable of acting entrepreneurially in order to exploit opportunities in their economic environments in timely fashion (Shattock, 2009a).

Literature of university entrepreneurialism and innovation is wide and extensive (see Clark, 1998; Kwiek, 2009; Lambert, 2009; Marinez and Kitaev, 2009; Mora and Vieira, 2009; Rinne and Koivula, 2009; Shattock, 2009a; Shattock, 2009b, Shattock, 2009c; Shattock, 2009d; Shattock, 2009e; Temple, 2009; Williams, 2009; Mazzucato, 2011; Fagerberg, 2016; Juma, 2016; Akec, 2018a; Akec, 2018b).

The preceding subsections review pathways of transformation and other factors that drive innovation and entrepreneurialism in European settings and which may be emulated in African and other settings.

Pathways of Transformation

To be entrepreneurial or innovative, Burton Clark (1998) argued that a university must be willing to put in place institutional structures capable of expending energy and taking risk on activities in anticipation of positive outcomes which cannot be guaranteed at the outset. Clark (1988) also identified five cardinal characteristics or pathways of transformation that are common amongst entrepreneurial or innovative universities. These are: strengthened steering core composed of central management group and academic departments that are committed to change and can respond quickly to opportunities arising in their operating environments; expanded development periphery in form of new organisational units (outreach offices for knowledge transfer, intellectual property development, and industrial training, for example) within the university that are capable of reaching out across old university boundaries and connect with the outside organisations in order to establish collaborations that tackle real-world industrial problems; diversified funding bases in form of additional financing portfolios for bringing in a third streams income for discretionary purposes (beside traditional government support and mainstream research grants); stimulated academic heartland in form of active commitment by the academic

departments and research centres to modify their belief systems in line with entrepreneurial values; and integrated entrepreneurial culture in form of set of beliefs embedded in university wide structures, symbols, and organisational practices.

And while entrepreneurialism does not always take financial nature, finance is a key driver and indicator of entrepreneurial activity; and that a university which has enough resources to fund all its activities will see no incentive in being more innovative (Williams, 2009). Depending on how financing of higher education is structured (the incentive arrangements), it may stimulate entrepreneurialism or impedes it. .

The role of financial incentive and characters of institutional leaders

Williams (2009) observed several types of entrepreneurial behaviours in the case studies carried out on 28 universities in Russia and six European countries (Finland, Moldova, Poland, Spain, Sweden, and UK). These were: establishment of new private higher education institutions, government action stimulates new developments at public universities; public universities initiating institution-wide transformation, small ventures at departmental, faculty, or at centre levels; and mushrooming of freelance activities in teaching, and research. Moreover, the entrepreneurial character of the institutional leaders and managers is found to contribute to great extent to institutional entrepreneurialism (ibid:29).

Other driving factors of entrepreneurialism at universities

Shattock (2009b) notes that for technology transfer to take place from university to industry, there must be a 'pull factor' from society, and a 'push factor' from the government. That different kinds of innovation and entrepreneurial activity take place at different kinds of universities,ranging from comprehensive and research intensive universities, to regional universities, to specialist and research intensive universities, to private universities. Moreover, entrepreneurialism in teaching may be driven by one or more of the following factors: making regional impact, widening access function, commitment to professional domain, and linking teaching to research (Temple, 2009). And that change in curricula may be driven by one or a combination of knowing, acting, and being (ibid.:51).

Furthermore, Shattock (2009c) highlights the importance of aligning human resource management practices such as level of pay, academic promotion procedures, and system for motivation and recognition of staff performance, and so forth, with the institution's strategic mission in order to stimulate entrepreneurial behaviour among staff. What is more, flexibility in the face of changing environments and contexts, as opposed to following rigid traditions and organisational cultures, is seen as more conducive to creating more entrepreneurial behaviours.

Moreover, Mora and Viera (2009) highlight the role of governance in enhancing or inhibiting entrepreneurial behaviour in the university. They argue that the following components of governance influence entrepreneurship to varying degrees. State regulation, stakeholder guidance, academic self-governance, managerial self-governance, and competition for resources. Areas of contentions include: relationship with the State (over regulation or micromanagement by the State), university internal governance (traditional collegial governance that may delay decision making), and management tools (identifying the right tools for ensuring effective consultation). And in this respect, European Commission university modernisation program identifies the following areas of change: less regulation, more autonomy to universities, increased funding for innovation, and better university leadership. It also recommended that

universities (ibid.80):

- Take more responsibility for their financial sustainability in the long term by diversifying their funding sources
- Establish stronger, sustainable, and collaborative linkages with the business community, and society in general on commercialisation of research output
- Share knowledge with business community for the purpose of exploiting intellectual property generated by research.

Finally, Martinez and Kitaev (2009) have described how internationalization of higher education is driving university entrepreneurialism. Internationalization has been defined as "the process of integrating international, intercultural and/or global dimension into the goals, functions, (teaching, learning, and research) and delivery of higher education." Martinez and Kitave (ibid.:122), argue that "activities described under the headings like the impact of globalization on higher education, cross-border higher education and the global higher education market may lead to more entrepreneurialism through related international openness, exposure, visibility, competition, partnerships, ventures, and risk-taking." And that entrepreneurial universities can explore and exploit opportunities through international cooperation.

5. The Impact of Technological Advancement (Especially electronic/digital communication technologies)

At the turn of the last century, Clark Kerr (2001) opined:

Perhaps above all, higher education is going through its first great technological change in five centuries – the electronic revolution. Late confrontation with fundamental technological change is the main reason why universities are the major institutions in the western world that has changed so little over the past five centuries. Agriculture, transportation, industry, and the military have all been impelled forward by new technology. Now it is higher education's turn. It is too early to tell in detail how the electronic revolution will affect higher education, but it is likely to be dramatic.

Peter Drucker predicted the possibility of rise of distance learning as a substitute of campus learning (Drucker, 1998): "Long distance learning …may well make obsolete in 25 years [or by 2024] that unique American institution, the free American college." This was further amplified by Arthur Levine when he argued that higher education administration will be dominated not by management of campuses, but will be preoccupied with "management of the distribution of knowledge to individual destinations, however remote." Levine further likened the future organisation of the American higher education as a setup that will drive the prospective student into the "wilderness" (Levine, 2000).

The evolution of educational system came to be categorized into Education 1.0, Education 2.0, Education 3.0, and Education 4.0 (Ernst and Young LLP 2017) The historical periods and features are shown in Table 2.

Education 4.0 (Ernst and Young LLP 2017) will accompany Fourth Industrial Revolution (Kaku, 2011; Brynjolfsson and McAffee, 2016; Schwab, 2016) and will be characterised by:

- New disruptive technologies such as mobile internet, social media, cloud technology and big data, massive online open courses (MOOCs), the Internet of Things (IoT), 3D printing, robotics and artificial intelligence and machine learning, advanced materials, biotechnology and genomics
- Social and economic phenomena that include flexible work arrangements, rising geopolitical volatility, emerging young demographics and middle classes, rapid urbanization, climate change and transition to low-carbon economy, women rising aspiration and economic power, the demand

for personalized learning
- Student centric and competency based learning
- Flexible curricula and flexible completion time frame
- Globalization of higher education market
- Life long learning
- Skills for jobs yet unknown (Kaku, 2011).
- Increased student mobility

All this will put immense pressure on universities globally to get ready, or suffer immense consequences of increasingly competitive globalized high education market.

Table 2. Features of educational systems from ancient and middle ages to present day

Education System	Period	Main Features
Education 1.0	Ancient time to Middle Ages (14th Century)	• Personalized • Very close contacts between teacher and students • Informal with no standardized curricula • Limited scaled (confined to few students) • Teachers were mostly philosophers or religious leaders • Started in Greece, India, China, Israel, Rome • Private with aim of producing good citizens • Dominance of religious and philosophy education in Western Europe and focus on scientific thought in Rome • Imparting of basic skills in reading, writing, and mathematics • Focus on upper class males • Later more formal education system began to appear and university system began including in Italy, China, Japan, Korea, UK, and France • No assessment or credentials • No diversification • Focus on learning of Greek and Latin classics
Education 2.0	Mid-15th Century coinciding with the invention of printing press technology	• Printing press technology impacted literacy levels in France, England, and Germany • Emergence of one-to-many education • Number of books published increased between 16th and 18th century • Books provided the means of knowledge dissemination • Renaissance and Reformation, development of society

		• Inquiry and innovation encouraged • Proliferation of educational institutes and centres for discussion, scientific inquiry and experimentation • Growth of vocational education in India, Japan, South Korea, and Europe
Education 3.0	20th Century to present day	• Exponential increase in demand for higher education globally • Technology allowed the use of smart board to replace the chalkboard in higher education • Increase use of personal computer, laptops, smart phone by students • Use of learning management systems (LMS) and enterprise resource planning (ERP) and to improve the administrative functions • Use of electronic communication for improved interactions and collaboration between members of academic community
Education 4.0	The evolving/unfolding next generation of education for the 21st century	• Driven mainly by the rapid advancement in information and communication technologies • Technology disrupters include mobile internet, social media, cloud technology and big data, MOOCs, the Internet of Things (IoT), 3D printing, robotics and artificial intelligence and machine learning, advanced materials, biotechnology and genomics • Social and economic disrupters include flexible work arrangements, rising geopolitical volatility, emerging young demographics and middle classes, rapid urbanization, climate change and transition to low-carbon economy, women rising aspiration and economic power, the demand for personalized learning • Student centric and competency based learning • Flexible curricula and flexible completion time frame • Globalization of higher education market • Life long learning • Skills for jobs yet unknown • Increased student mobility

Source: Ernst and Young LLP (2017)

6. The Push for World Class Status

A world-class university is described as university with "highly ranked research output, a culture of excellence, great facilities, and a brand name which transcends national boarders" (Coete *et al*., 2015). It must also be ranked among top global universities in league tables that are published annually by non-profit academic ranking organisations. These ranking organisations include Times Higher Education World University Ranking (The WUR), Shanghai Jiao Tong Academic Ranking of World Universities (ARWU), QS World University Ranking, and US News and World Report global ranking (Shattock, 2010; Gadd, 2020). While 40 percent of Times Higher Education (THE) ranking is based on institutional reputation, Shanghai Jiao Tong league tables use statistical data to rank universities (Shattock, 2010).

International league tables fuel 'reputational competition' amongst universities globally based on their research performance (Shattock, 2010). However, the league tables are not necessarily without limitations and shortcomings as benchmarks for measuring institutional success. The ranking organisations have been criticised for some of indicators they use such as counting the number of Nobel prize-winning alumni as proxy of research excellence, favouring publications in English; that older and wealthier Northern American and European universities almost always top the list of the World rankings, while contributions to society and teaching are either ignored or undervalued (Gadd, 2020). Furthermore, some statistical analyses reveal that 71% of 100 top-ranked world universities come from English-speaking countries (Carnoy *et al*., 2013).

Nevertheless, the rankings have been influential in deciding who is eligible to receive scholarship grants based on the institution where they are based. They also influence the choice by scholars of where to work or study; therefore putting less reputable universities at disadvantage (Gadd, 2020).

Moreover, there are some expressed controversies seen as associated with when all universities aim to attain world class status. Most prominently, it is thought that such competition will eventually eliminate institutional diversity as everyone strives to look like Harvard or Oxford, a phenomenon described as institutional isomerism (Shattock, 2014). This was described as follows by Di Magio and Powel (1983):

Once disparate organisations in the same line of business are structured into an actual field (…by competition, the state, or the profession), powerful forces emerge that lead them to become more similar to one another… Organisations may try to change constantly; but after a certain point in the structuration of an organisational field, the aggregate effect of individual change is to lessen the extent of diversity within the field.
(Di Magio and Powel, 1983).

Nevertheless, league tables are influential in formation of institutional strategies (Shattock, 2020). Education Minister in Germany, for example, had suffered from the so-called 'Harvard here syndrome' when only very few German universities could participate in the annual top lists of academic ranking by Shanghai Jiao Tong Academic Ranking of World Universities (Kehm, 2014). This led to the birth of Excellence Initiative and change in funding structure of research in Germany with the aim of concentrating resources in fewer but competitive German universities. And in order to make universities more autonomous and more responsive to changing operating environment, Germany has been experimenting with giving selected universities foundation status.

Similarly, in Finland, University of Aalto

was formed as a merger of Helsinki School of Economics, the Helsinki University of Technology, and University of Arts and Design in order to pool resources and strive for world-class excellence (Salmela-Mattila, 2014).

An OECD report notes that global ranking tables are dominated by top research universities in industrialised countries, also known as Super RUs (Olsson and Cooke, 2013). This is a small percentage of all post-secondary institution and ranges from 3% in China, to 5% in US, to 25% in United Kingdom (Cloete *et al*., 2015). Table 3 shows the percentage of research intensive universities in three industrialised countries (US, UK, and China).

For research universities to flourish, national higher education systems are required to differentiate in their missions at post-secondary levels; and organize sensibly to align their programmes and priorities with appropriate missions. As outlined by Olsson and Cooke (2013):
Certain higher education institutions address the growing demand for access, both from national populations as well as from international students. Others, notably research universities, align academic research to national economic growth and social development, thereby linking up to the national and global knowledge economy.

In society where uniformity is preferred, in order to create equal society, vertical, as opposed to horizontal differentiation can be a challenge (Kehm, 2014). Finally, in order to attain world-class status, a research intensive university must be well led and governed, possesses a critical mass of talented staff and students, and have access to sufficient resources (Olsson and Cooke, 2013).

The mass higher education has been accompanied by a differentiation. According to Burton Clark (1983), a good example of differentiated higher education system is offered by the State of California comprising a number of private universities, and public universities with three tier system of 10 campuses of University of California with 220,000 students; State universities on 23 campuses with student population of 430,000; and an undefined number of open 2-year community colleges that enrolled 1.5 million students by 2009.

The Future of African University

Latecomer Status: The benefits and drawbacks. As explained in the introduction, African universities, like their counterparts in the developing countries, were latecomers to the global higher education scene compared to European or American universities whose histories date back to medieval era and seventeenth century, respectively (for the implications of longevity of university on its success chances, see Shattock, 2009). Although first African universities initially were conceived as extensions of the British and French university systems, Cloete and Maasen (2015) argues that African universities, in practice, fell short of Oxbridge's and grande école's models

Table 3. Percentage of resaerch intensive universities in three industrialized countries

Country	Number of Post Secondary Institutions	Number of Research Universities	Percentage of Research Universities
United States	4000+	220	5%
United Kingdom	100	25	25%
China	3000+	100	3%

Source: Extracted from Cloete *et al*. (2015)

that they were meant to imitate; and instead focused on training of administrators for colonial governments, and political elites of post-colonial era (Cloete and Maasen, 2015).

What is more, the expansion and development of African higher education sector, especially in the sub Saharan Africa region in the three decades that followed independence, was slowed down by the publication in 1986 of a hugely influential World Bank's report (Psacharopoulous *et al*., 1986). The report claimed that the returns to a dollar spent on primary education were twice the returns to a dollar spent on higher education. Furthermore, Cloete and Maassen (2015) noted that the World Bank went as far as asserting its position at a meeting of African vice chancellors in Harare in 1986 that higher education was a 'luxury' (Cloete and Maassen, 2015). Moving forward, the Bank pushed for educational policies in the sub Saharan Africa region that shifted public funding from what was a highly subsidized tertiary education sector to general education sector. As a result, public expenditure per tertiary student began to decline from a high USD 6,800 in 1980 to a very low average of USD 981 in some 33 low-income sub Saharan African countries (World Bank, 2009). That policy still receives the lion share of the criticism directed at the World Bank for playing such a 'damaging role' in the underdevelopment of higher sector in Sub Sahara Africa (Monbiot, 2003; Cloete and Maasen, 2015).

The Path Taken by BRICs

Looking back, it is possible to think that the post-independence governments of Sub Sahara African region may have missed the opportunity to give World Bank's higher educational financing policy recommendations due consideration and find sustainable financing solutions that could have allowed them to expand their countries' higher education systems. The World Bank's alternative financing policy options included considering families and students' contribution to the cost of higher education through tuition fees payment, student loan schemes, and award of selective scholarships to poorer students who may not afford to pay for university education (Psacharopoulous *et al*., 1986). Evidently, the partial implementation of the report without mitigation measures (reducing expenditure on higher education), has resulted in the expansion of primary school enrolment, underinvestment in African higher education sector, and the lagging behind of higher education sector in terms of student enrollment ratios, declining public expenditure per tertiary student, and fall in African universities share of global research publication output (Cloete *et al*., 2015; Cloete and Maasen, 2015). It leaves so many unanswered questions as to why higher education was allowed to stagnate for too long.

However, some efforts were exerted at Makerere University in Uganda to apply market-based solutions to finance the expansion of university education (Mamdani, 2007). These included creation of part-time and temporary staff, development of competitive and income-generating vocational courses by various schools, and admission of private self-paying students at Makerere, and other public universities. This, according to Mamdani, amounted to nothing more than "commercialisation of the university at the expense of quality and research" (Cloete and Maassen, 2015).

In contrast, starting in the early 1990s and for the next two decades that followed, the Governments in Asia, Eastern Europe, and Latin America, especially the BRIC countries--Brazil, Russia, India, and China—succeeded in expanding their higher education systems considerably by making more resources available to tertiary education through a mix of subsidies and charging of tuition fees (see Carnoy *et al*., 2013).

As noted in Carnoy *et al*. (2013), the

Governments of BRIC countries recognized higher education as a source of economic competiveness that, in addition, yields higher private returns to individuals. Based on that clear understanding and correct reading of the challenges of expanding higher education systems, BRICs responded robustly to the increased demand for tertiary education in their societies by soliciting contributions from the families towards the cost of higher education of their children, while encouraging the expansion of private higher education for those who could not get into public universities but can afford it.

And in a way, one many argue that BRICs succeeded through adapting some of the strategies and approaches proposed by the World Bank's report -- implementing cost sharing policies, while finding ways to support the under privileged sectors of the society. The result was the massive expansion and growth of the sector over the same period in which African higher education systems had stagnated (Carnoy *et al*., 2013). In Brazil, for example, enrollment per 100,000 of population rose from 1,074 students in 1990 to 3,421 students by 2010; in Russia enrollment increased from 1,900 students to 6,599 students; in India from 585 students to 1,173 students per 100,000 of population over the same period. The expansion of higher education in three BRIC countries: China, Brazil, and India is shown in Figure 1 in terms of enrollment per 100,000 of population from 1920 to 2010.

The graduate enrollment rates for three BRICS countries (Brazil, India, and China), and that of Sub Sahara Africa between 1970 and 2009 are shown in Figure 2. It is noted that while graduate enrollment for Brazil, India, China, rose from 10, 5, and 1 percent, respectively, in 1975 to 36, 14, and 24 per cent in 2009; the gross enrollment ratio in higher education rose for Sub Sahara Africa average from 1.6 in 1975 to 7.4 by 2009.

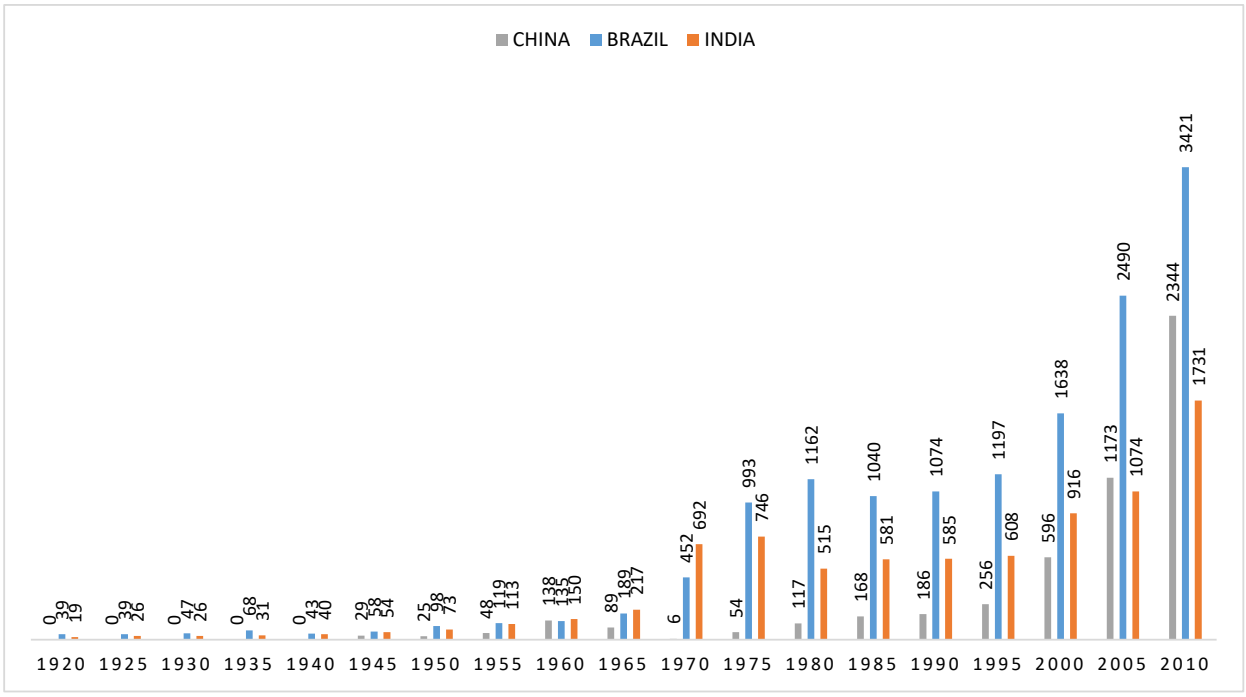

Figure 1. Enrolment in higher education per 100,000 of population (Source: Extracted from Carnoy *et al*., 2013)

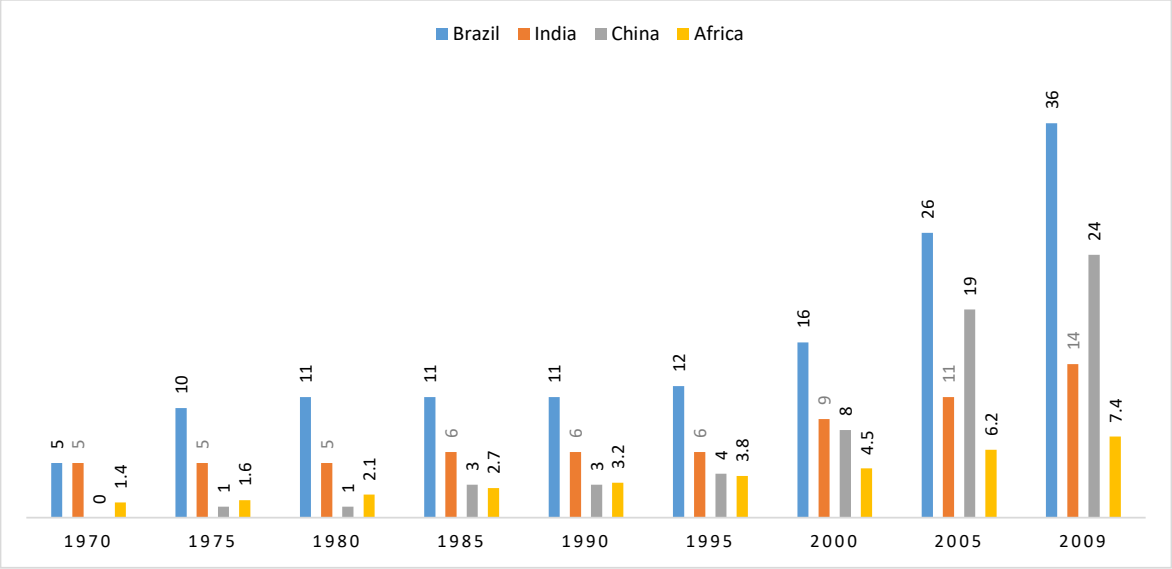

Figure 2. Gross Enrollment rates in higher education in three BRICs countries and Africa between 1970 and 2009 (Source: Carnoy *et al*., 2013 for BRICs, and World Bank data for Sub Saharan Africa)

Another feature of expansion of higher education in BRICs countries is differentiation, vocationalization, and inclusion/rationalization (Carnoy *et al*., 2013).

Differentiation

Differentiation allowed more high school graduates to enter universities by expanding second and third tier institutions to absorb en masse the new entrants. This allowed the quality of former elitist institutions to be preserved by continuing to educate fewer and most talented student.

In India, for example, institutions of tertiary education are grouped into three tiers (Ernst and Young LLP, 2017):

Tier 1 Institutions– Research focused, providing high quality research and innovation with critical national role in addressing intellectual imperative and educate fewer number of students

Tier 2 Institutions – Offering professional courses with prime aim of producing industry-ready graduates, with an important responsibility of addressing economic concerns. It is of lower cost and absorbs mass of new entrants.

Tier 3 Institutions – Foundation institutions offering diverse courses with purpose of producing well rounded graduates with skills needed by local industries, with responsibility of addressing social imperatives. It is open, wide spread, and non-selective non-university tertiary education.

Vocationalisation

Involves teaching of professional technical education in engineering and computer sciences (Carnoy *et al*., 2013). The returns to technical professional education have been increasing with globalization and demand for manufacture of high-value added goods.

Inclusion/Rationalization

Many countries including India, Brazil, and China strives to address inequality and bring on board socially and economically excluded groups through affirmative actions and tests,

quotas, and other schemes.

The divergence between sub Sahara Africa higher education and the rest of the World

Part of the reasons behind underdevelopment of African tertiary education is that while 'engine of development' role or 'the arm of the State and industry' function of the university has been recognized and put to good use in the US, Europe, and BRICs countries (Kerr, 2001; Carnoy, 2013), that function has not caught as much on the African Governments most of which were preoccupied with internal political power struggle, in addition to distortion caused by the policies promoted by the funding agencies such as the World Bank (Cloete and Maasen, 2015). Untangling itself from the distorting web of influence by the multilateral international agencies is one of the challenges Africa higher education policy must resolve if the sector can have any chance to expand.

In brief, the African university system is now faced with the twin challenge of expanding as well as catching up with the rest of the world. It is a situation that involves chasing 'a moving target' – it wants to be where 'the rest' are, whereas 'the rest' are already advancing ahead in order to remain relevant (Weigratz, 2009), and consequently suffer from Matthew Effect: 'those who have will have more, and those who have not, will lose even the little they have' (see Shattock, 2009).

In order to overcome this dual challenge, the African university system might decide to adopt the latest technologies and leapfrog into twenty-first century education 4.0 that will serve the Fourth Industrial Revolution (Abramovitz, 1986; Ohno, 2006; Akec, 2018b).

7. African University in the context of a changing global higher education systems

While acknowledging the challenges facing the African university as a latecomer to higher education sector, the African university system is not an island unto itself, but forms part of the global higher education system that must adapt its traditional roles, its internal organisation, its leadership, its governance structures, its intellectual cultures and values, its funding sources, and its operation and mode of service delivery in order to respond positively to new trends and demands put by the society on its intellectual services (Bok, 1982; Kerr, 2001; Castells, 2009).

As noted by Raina (Raina, 2015):
We seem to have taken the university as the primary site for the production of knowledge for the last two centuries without in any way appreciating that the habitus of science within the university is as different from anywhere else. The future of the university of teaching is uncertain today, not because it is threatened by extinction, but because the university itself is likely to undergo downsizing or process of major reform. These transformations are affected by a wide variety of factors that include the changing constellations of knowledge and the context of its production

The factors and trends driving change in higher education systems in Africa, include the ever increasing call on the universities to enhance national economic competitiveness through training and capability improvement in a globalized knowledge economy (Weigratz, 2009; Cloete *et al*., 2015; Akec, 2018a); to act as engines of national economic development, cultural renewal, military power, and social progress (Bowen, 1982; Castells, 2009; Akec, 2016); to catalyze innovation for national industrial development and value addition (Clark, 1998; Weigratz, 2009; Akec, 2018b); to respond to internationalization and globalization of higher education market (Martinez and Kitaev, 2009; Carnoy *et al*., 2013; Raina, 2015); to adapt to corporatization of university governance (Mamdani, 2007; Fazackerley and Chant, 2009; Shattock, 2014; Cloete *et al*.,

2015; Raina, 2015); to diversify their resource bases in the face of falling public financing of higher education operation (Clark, 1998; Mamdani, 2007; Shattock, 2009; Williams, 2009; Carnoy *et al*., 2013); to provide educational opportunities to broader sectors of population, including the low-income groups in the society through massification (Bowen, 1982; Carnoy *et al*., 2013); and to weather the impact of health pandemics by use of communication technologies (The Economist, 2020, 15th August). Last, but not least, to differentiate academically by supporting its flagship universities (such as universities of Botswana, Cape Town, Dar es Salaam, Edwardo Mondlane, Ghana, Makerere, Mauritius, Nairobi, and others) to become first-tier research-intensive universities in order to join the ranks of the world-class universities, able to attract significant research funding, while serving a limited number of students; or otherwise choose to position themselves as second-tier 'mass teaching universities' and colleges that absorb the vast proportion of the students enrolling in higher education in many countries (Shattock, 2009; Carnoy *et al*., 2013; Cloete *et al*., 2015); and still others remain as third tier institutions in order to provide hands on and vocational training that impart practical skills needed by the industry.

But most importantly, university systems globally and also in Africa, must respond to the unfolding Fourth Industrial Revolution that is being set in motion by the advances in digital technologies. According to one of its ardent advocates, Klaus Schwab, the Fourth Industrial Revolution is a technological revolution that will fundamentally change the way we live, how we work, and how we relate to one another. It will be characterised by 'fusing of different technologies and blurring of the lines between the physical, digital, and biological spheres' (Schwab, 2016). And that an effective response will call for a concerted action by all the stakeholders in the global community, including the public and private sectors, academia, and civil society. The technologies underpinning the Fourth Industrial Revolution include mobile devices with large data storage and processing capacity, big data for decision support, robotics and autonomous vehicles, artificial intelligence, the Internet of Things, nanotechnology, 3D printing, biotechnology, and quantum computing, among others.

Furthermore, the digital technologies that are responsible for unleashing the Fourth Industrial Revolution will also usher in Education 4.0 that is going to force universities to review their enrollment policies, their educational delivery mechanisms, and their assessment and credentialing methods in order to enable personalized and life-long learning for their clients (Drucker, 1998; Kerr, 2001; Carnoy *et al*., 2013; Ernest Young LLP, 2017).

And while the African university system shares similar challenges as those facing university systems globally, it faces some very specific bread-and-butter pressures. These include mobilizing sustainable funding for expanding operational and research capacity, reducing gender disparities in science-related fields, building staff capacities for teaching and research, increasing access to higher education, gaining recognition as 'the arms of the State' – namely, an indispensable partner in economic development, industrialisation, and social progress, serving its communities better, decolonizing its curricula, and effecting improvement in STEM education (Kerr, 2001; Mamdani, 2007; Cloete *et al*., 2015; Juma, 2016; Akec, 2018b; Tikly 2020).

One may also note that the challenges facing the African university as enumerated above are the same pressures that are facing universities globally—no university has enough of financial resources or enough of research funding to meet all its needs (Clark, 1998; Shattock, 2009). Hence, universities world over are

constantly striving for continuous improvement as they respond to declining public support, and changing global educational environments. That calls on African universities to be innovative and entrepreneurial in order to create third revenue streams besides government support and research grants (Clark, 1998)

Specific challenges that will drive change in African university

At the core of the challenges facing African universities in particular, and the higher education sector in general, is the need to establish credibility by demonstrating their real potential as development partners to national governments and communities they serve as the experience has shown elsewhere (see Shattock, 2010:7).

African universities can establish this credibility by responding in timely manner to regional agendas such as: African Union Agenda 2063, and Comprehensive African Agricultural Development Programme (CAADP) (Akec, 2018b). It can also respond to global agenda such as: UN Agenda for Sustainable Development Goals 2030, adapting to digital technologies revolution, responding to Fourth Industrial Revolution (Schwab, 2016), and transitioning to Education 4.0 (Bunting *et al*., 2015; Cloete and Maasen, 2015; Juma, 2016; Akec, 2018b; Tikly, 2020).

The regional forces that will also shape the African university in the next two decades are the expectations by governments (research and policy advice, and human resources development), providing relevant education to the rising student population (youth bulge will demand universal access to quality higher education and needs for decent jobs in post-university);

Furthermore, African universities are under pressures to respond to the competitive global knowledge-based economy and its implications for the national industries (the need to innovate and vocationalize). The advances in communication technologies (with implication of integration of ICT and digital technologies as enablers of Education 4.0) has changed the nature and needs of today's student (lifelong learning calls for flexible learning curricula and academic programmes).

The increasing threats of the pandemics (the new normal, wild-cards, or black swan events that impact methods of education delivery such the need of social distancing that followed Covid-19 pandemic) needs to be accommodated (Kerr, 2001). All these factors will combine to differentiate the winners from the losers in the race towards realisation of the 'next generation African university'. The pressure to respond and adapt to these multiple overlapping, and sometime conflicting challenge on African university is like nothing we have seen before. The role of governments in the transition will also be critical.

The role of leadership in managing change

Like their global counterparts, African universities need to be well-led and better managed, beside excelling in their core functions of teaching and research in order to succeed (Shattock, 2010). A successful institution, as expressed by Shattock, is one that can 'punch above its weight.' Namely, an institution managed and led in such a way as to perform 'better than its circumstances might suggest it could.' According to Shattock (2010):

Success does not occur as a result of a single critical decision but because the institution finds ways of getting a lot of relatively small decisions right over a long period, and these decisions reinforce one another, and because its machinery and its organisational culture encourages consistency of purpose, and imposes an unspoken coordination on decision making so as to concentrate rather than dissipate institutional energies.

Moreover, the goal to succeed must be inspired

by, for example, the ambition to attain a world-class status, or move to higher relative positions nationally. New kinds of leadership will be needed for African universities aspiring to join the ranks of the world-class universities. As noted by Olsson and Cooke (2013):

This role requires persons of exceptional talent whose responsibilities are multi-faceted, inter alia: defining a mission for the institution and its creative strategy for change in an evolving social context, responding to policy opportunities, protecting scholarship for quality research, encouraging bold experimentation in teaching and learning, forging alliances with stakeholders, spearheading fund-raising efforts and communicating the institution's activities to concerned partners. This leadership agenda is realised through efficient and effective management strategies which clearly demonstrate the institution's contribution to local and international development.

Furthermore, African universities will need to be autonomous and accountable like businesses, able to manage their resources efficiently and respond quickly to changing environment. This will have implication on how it is governed in term of distribution or concentration of authority. It should take note of the move in European countries to align with New Public Management that give more power and authority to university presidents.

Finally, it is worth adding that the development of new African university will be best led by foxes as opposed to hedgehogs in order to succeed ("hedgehog knows one big thing, and fox knows many small things" (Berlin, 1953)). According to Clark Kerr (2001):

Academic leaders of this new century, or at least of its early decades, may be able to identify no great single vision to guide them or great and compatible forces to dominate them; they may need to look in more directions, to be sensitive to many diverse opportunities and to many threats. They may be best be foxes or "entrepreneurs" … looking around every bush, avoiding every trap, eating everything that happens to come along that can't eat them. No great visions to lure them on, only the needs of survival for themselves and their institutions. They may have no clear picture of the world they are destined to inhabit; no total assurance about the future. This is not a fault. The situation is not suited to concentration on one or a very few great visions.

8. CONCLUSIONS AND RECOMMENDATIONS

African university is not an island unto itself, but situated in the global higher education environment. It is impacting the sector and is being impacted by it. Most of the factors that will drive African higher education are global. Others are regional and unique to the African continent. The paper has reviewed at depth the factors driving reforms in higher education in several developed countries, and outcomes of such reforms. And it is observed that these factors are changing and as a result universities have been changing in the way they are managed, teach, conduct research, and serve society.

Moreover, it could be seen that over the centuries, universities in the developed and in developing world have moved from being institutions serving the privileged in the society, to institutions providing mass higher education to wide sectors of society following the invention of printing press in the sixteenth century. The development of internet at the end of twentieth century opened up new opportunities for distance and life-long learning. Further development in communication technologies, increasing computing power, cloud computing, and large data, as well as the availability of Massive Online Open Courses (MOOCs), will further impact universities in ways not yet known or seen. The advent of machine learning and artificial intelligence will cause some jobs to disappear and create jobs whose qualifications are yet unknown.

African universities must learn from how universities in the advanced economies have evolved and continue to change in response to changing economic, cultural, social, and technological conditions. Equally important,

African universities must continue to respond effectively to national and regional agenda in order to stay relevant to African communities and societies they serve. An African university must generate technologies necessary for the improvement of agricultural productivity, value-addition, food and nutritional security, and industrialisation of African natural resource-rich economies. Cultivating entrepreneurship and innovation must be part of an African university mission and culture.

To succeed, African higher education institutions must massify and differentiate into three or more tiers in order to cater for different needs of the communities they serves, including meeting intellectual, economic, and social imperatives of the African society. Massification will only serve its purpose if Africa has fewer research intensive world-class universities, as well as second and third lower tier universities that can provide professional, technical, and vocational education that is capable of producing large number of industry-ready graduates in such areas, but not limited to, finance, management, economics, agriculture, engineering, and computer science.

Massification will not be possible without sustainable financing. Experience of BRICs has shown that returns to university education are highest for individuals. Hence, individuals are obliged to contribute to cost of higher education in their countries. Governments must design sustainable loan schemes in addition to scholarships for the underprivileged and marginalised members of the society, including increasing the number of women in engineering and sciences.

African universities must be innovative and entrepreneurial in order to bring in third streams income that can support research, academic, and extension programs. Innovations should include support of local and regional industries. Incentive systems and administrative structures must be designed in such a way as to promote and reward entrepreneurial culture throughout the organisations.

African universities must be well managed and well led in order to thrive. The university governance structures need to be reformed in line with New Public Management (NPM) in order to create more dynamic organisations that are agile and responsive to their environments. African universities should be managed as accountable and responsible businesses that are able to allocate their scarce resources efficiently. This will call for less government regulation, more university autonomy, as well as giving more executive powers to university presidents, vice chancellors, and rectors, with due consideration to how information is shared with the stakeholders (professoriate, administrative staff, students, government, and business community). Deans of schools must become manager-deans responsible for implementing the strategies designed by the university central administration. Academic leadership as a career must be made attractive, and rewarding in order to inspire the most talented African academics to consider university leadership as a worthwhile vacation, even as a life's calling.

The possibilities for a thriving future African university are limitless as far as they are led by entrepreneurial presidents, vice chancellors, and rectors. In other words, Academic leaders, as argued by Clark Kerr, must be entrepreneurs or 'foxes.'

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