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Higher Education as an Instrument of Economic Growth in Kenya

Abstract

The purpose of the present paper is to identify the main challenges facing Kenya's public higher education system and to propose plausible and, concrete steps policy makers and educational leaders can take to address those challenges to ensure the country's higher education system prepares the human capital, which is necessary for the construction of a knowledge economy. To that end, I use the conceptual frameworks of quality and education policy borrowing to argue that Kenya can and should draw useful policy lessons from the success stories of newly industrialized economies (Brazil, China, India, Korea, Singapore, and Taiwan) where higher education continues to play a fundamental catalytic role in the process of social and economic transformation. Even so, I am cognizant of the fact that there are important political, cultural, historical, economic, and even geographic differences between Kenya and these newly industrialized countries and that these differences impact education policy borrowing/transfer in varied ways. The documentary review method was used to collect data. The recommendations discussed in this paper provide important insight into how Kenya's policy planners and higher education leaders might reform the public higher education system to ensure that it creates the skilled domestic workforce necessary drive economic transformation.

Der vorliegende Artikel zielt auf die Identifizierung der wichtigsten Herausforderungen für Kenias öffentliches Hochschulsystem und auf die Unterbreitung plausibler Vorschläge und konkrete Schritte, die politische und pädagogische Entscheidungsträger ergreifen können, um diese Herausforderungen zu begegnen und sicherzustellen, dass das Hochschulsystem des Landes das Humankapital vorbereitet, das für den Aufbau einer wissensbasierten Wirtschaft erforderlich ist. Zu diesem Zweck verwende ich die konzeptuellen Rahmen ‚Qualität‘ und ‚Bildungstransfer‘ (education policy borrowing) um zu argumentieren, dass Kenia die Erfahrungen der Erfolgsgeschichten von Schwellenländern (Brasilien, China, Indien, Korea, Singapur und Taiwan) nutzen kann und sollte; in diesen Ländern spielt Hochschulbildung weiterhin eine grundlegende katalytische Rolle im sozialen und wirtschaftlichen Transformationsprozess. Dennoch ist mir die Tatsache bewusst, dass es wichtige politischen, kulturellen, historischen, wirtschaftlichen und auch geografische Unterschiede zwischen Kenia und diese neuen Industriestaaten und, dass diese Unterschiede sich auf vielfältigen Weisen auf Transfer auswirken. Die Dokumentarmethode wurde verwendet, um Daten zu sammeln. Die in der vorliegenden Arbeit diskutierten Empfehlungen liefern wichtige Einblicke darin, wie Kenias Politikplaner und Entscheidungsträger in der Hochschulbildung das öffentliche Hochschulsystem reformieren könnte, um den Aufbau der nötigen inländischer Arbeitskräfte als Antrieb der wirtschaftlichen Umgestaltung sicherzustellen.

Keywords

Kenya, higher education, economic growth, development, knowledge-economy, quality in higher education, education policy borrowing

HIGHER EDUCATION AS AN INSTRUMENT OF ECONOMIC GROWTH IN KENYA

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Introduction

In 2008, the government of Kenya unveiled a comprehensive and ambitious development plan aimed at transforming the country into a middle-income economy by 2030 (GoK, 2007) and political stakeholders are now trying to address some of the major challenges facing the country. But, judging by the current trajectory of growth, and the state of higher education in particular, it appears increasingly unlikely this target will be achieved. The literature indicates the newly-industrialized economies including Brazil, China, India, Korea, Singapore, and Taiwan have previously struggled with issues broadly similar to those facing Kenya. These challenges include high levels of illiteracy, low GDP, low levels of funding for academic research and development (R&D), and brain drain due to non-returning students especially in STEM areas (Johnson, 2002; Marshall, 1995; Mazzoleni, 2008; MoE, 2008; MoE, 2012; MoS&T, 2008; Zweig & Rosen, 2003). However, robust policies favorable for academic research and collaborative investments, by both governments and the private sector, in higher education and particularly in STEM areas created optimal conditions which played a central role in their remarkable, innovation-led economic growth (Bloom, Canning, & Chan, 2006; Johnson, 2002; Lin, 2009; Mazzoleni, 2008). These policy choices and the ensuing economic experiences provide important lessons for Kenya's development policy. Indeed, a growing body of literature suggests higher education is a critical driver of economic growth and competitiveness (Bloom, Canning, & Chan, 2006; Douglass, 2009; Johnson, 2002; Lin, 2009; Marshall, 1995; Mazzoleni, 2008; World Bank, 2002).

The purpose of the present paper is to identify the main challenges facing Kenya's public higher education system and to propose plausible and concrete steps policy makers and educational leaders can take to address those challenges to ensure the country's higher education system prepares the human capital, which is necessary for the construction of a knowledge economy. To that end, I use the conceptual frameworks of quality and education policy borrowing to argue that Kenya can and should draw useful policy lessons from the success stories of these newly industrialized economies where higher education continues to play a fundamental catalytic role in the process of social and economic transformation. Even so, I am cognizant of the fact that there are important political, cultural, historical, economic, and

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even geographic differences between Kenya and these newly industrialized countries and that these differences impact education policy borrowing/ transfer in varied ways.

Quality in Higher Education

Quality is a difficult concept to define, at least in higher education, because the term means different things to different stakeholders including students, tax payers, employers, government, and quality assurance agencies. Harvey and Green (1993) identify five “discrete” yet overlapping dimensions or conceptions of quality which I briefly revisit here. In the view of some, quality refers to the notion of a product or service being exceptional, distinctive, or special. But to define quality this way in a complex field such as education is problematic as there really are no clear criteria for conferring “special” status to a service or product. Other stakeholders view quality as a measure of perfection—a state (hypothetically) achieved when a system of education produces “flawless” graduates that meet a set of predetermined specifications on a consistent basis (Harvey & Green, 1993). But Harvey and Green (1993) point out that this approach is also insufficient as it may lead to simplistic, yet strict adherence to a set of standards which may be narrowly defined or focused to the exclusion of other more substantive issues.

Quality can also be interpreted as fitness for purpose and proponents of this stance see education’s main role most often as training individuals for employment and believe that quality is achieved if an education system produces graduates that are fit for their roles as workers in the existing society (Harvey & Green, 1993). This mission-focused approach, however, raises important questions regarding the usefulness or purpose of education and who determines that purpose. A fourth school of thought defines quality simply as value for money and proponents of this view judge the outcomes of participation in education based on the associated monetary costs (Harvey & Green, 1993). But to be sure, someone has to decide what is valuable and the point at which that “value for money” is achieved and how much it is worth.

Still, others see quality education as that which has transformative values embedded within it (Harvey & Green, 1993). This type of education leads to some form of qualitative change as individuals challenge predominant knowledge and values. In some cases, the change is in individual learners; in other cases, the goal of education is to change the society itself (Harvey & Green, 1993). Freire (1993), for instance, points out that existing society may be unjust, thus quality education is that which leads to transformation of both graduates and society. That is, if an education system can nurture and support graduates who can transform an unjust society (e.g., Nelson Mandela), then that education is of higher quality than one that simply trained apartheid-era black South Africans to be competent mine workers (M. Merrill, Personal Communication, August 20, 2012).

Evidently, the construct of quality in higher education is subjective and its meaning is contested as different stakeholders conceptualize it differently relative to their contexts. In addition, there are multiple important purposes of higher education. But for the purposes of this paper, I accept the definition or conception of quality education as fitness for purpose (Harvey & Green, 1993). Different countries at different points in their respective life cycles have different needs, and at this particular point in time, economic growth and development is a high enough priority for Kenya to warrant the country’s higher education system to prepare a well-educated, highly-trained workforce for industrialization, modernization, and global citizenship. Important process-related input variables for this competency-based approach include the provision of sufficient infrastructure, adequately trained academic personnel, curricula that are

responsive to the needs of the knowledge economy, and interactive pedagogy as opposed to didactics (Owlia & Aspinwall, 1996).

Education Policy Borrowing and Lending

The profound and transformative impacts of globalization continue to drive major changes in higher education globally both at the systems and institutional levels, and as a result, policy makers and educational leaders continually engage change efforts to ensure that curricula and training programs are responsive to the needs of the modern economy (Altbach & Knight, 2007; Eckel, Green, & Hill, 2001; Eckel, Hill, & Green, 1998). The Bologna process—Europe’s collective effort to create a higher education area and to make higher education more comparable and compatible and more competitive presents a somewhat successful example of change at a supranational level (Obasi & Olutayo, 2009; Van der Wende, 2009). Africa’s unsuccessful efforts at harmonization of higher education systems stem from 1981 when the *Arusha Convention on the Recognition of Qualifications in Higher Education in Africa* (the Arusha Convention) was ratified by a few countries (Obasi & Olutayo, 2009).

This convention was amended in 2003 and again in 2006 largely in response to the changing landscape of higher education, for instance the Bologna Process (Obasi & Olutayo, 2009). Regardless, African nations have been slow to ratify the treaty, an outcome frequently attributed in part to the differences in regional and national systems of education inherited from the different colonial legacies (Hoosen, Butcher, & Njenga, 2009; Obasi & Olutayo, 2009). *Tuning Africa*, introduced in 2011, is the latest effort that promotes integration and harmonization of systems of higher education based on learning outcomes by discipline (Shabani, 2013). Broadly, the focus of both the Arusha Convention and Tuning Africa efforts is to create an African Higher Education and Research Space that is globally competitive (Hoosen, Butcher, & Njenga, 2009; Obasi & Olutayo, 2009; Shabani, 2013). Even though the pace of change has been slow, these initiatives suggest policy makers and educational leaders are responsive and adapting to the changes taking place in the global higher education landscape.

Moreover, it is ever more discernible that globalization and the ensuing competition for the human capital continually push higher education systems towards policy convergence (Altbach & Knight, 2007) as countries increasingly “borrow” appealing education policies they perceive as successful and effective in preparing a well-educated and highly-trained labor force (Harpin & Troyna, 1995). Phillips and Ochs (2004) define education policy borrowing as the practice of “conscious adoption in one context of policy observed in another” (p. 774). It is important to mention here that increased economic integration brings with it increased labor and capital (remittances) mobility. As a result, beyond educational reasons, there are political and economic rationales that also drive policy borrowing (Steiner-Khamsi, 2012). Phillips and Ochs (2004) look at the different circumstances under which education policy borrowing/transfer occurs and provide a useful continuum that highlights four levels of duress involved. These levels range from imposed or required by conquering powers after a war as happened in many countries during colonialism to required by aid agencies such as the World Bank to economically necessary but not imposed by an outsider such as in countries freely and willingly implementing Bologna reforms in higher education to freely adopted for various reasons.

Relatedly multiple models of education policy borrowing/transfer have been developed yet given space limitations, the present paper will highlight briefly the one developed by Steiner-Khamsi (2003) based on Luhmann’s theory of self-referential systems. Luhmann’s

theory suggests that politicians and/or policy makers refer to external systems when all else fails to justify the need for policy reforms “often presented as a lesson learned from elsewhere” (Steiner-Khamsi, 2003, p. 2). Based on this theory, Steiner-Khamsi (2003) proposed a model consisting of three political discourses commonly used to drive education policy borrowing/transfer. The first, scandalization, involves drawing attention to the shortfalls or limitations of education policy at home and using those deficits to generate interest and validate the need for reform. The second is glorification and here potential lenders emphasize the success of their education policy with the hope of persuading potential borrowers, and the third, indifference, revolves around the practice of borrowing policy without due regard to important contextual differences between the lender and borrower (Steiner-Khamsi, 2003).

The decision-making process in education policy borrowing is certainly complex and fraught with several nuances. Nonetheless, Phillips and Ochs (2003; 2004) propose a circular four-stage model that attempts to describe the sequence of events that typically characterize the process of policy borrowing in education. The process begins with cross-national attraction or impulses that attract or compel policy makers to investigate policies of another country. Triggers for impulses include: internal dissatisfaction, systemic collapse, negative external evaluation, economic change/competition, and political change (Phillips & Ochs, 2003; 2004). Following impulses is the decision-making stage where policy makers formally initiate actions or processes intended to lead to the adoption of appealing or successful education policies. The next stage is implementation whereby the borrower attempts to adapt parts or whole policies of interest. Internalization is the final stage of this process and it involves the borrower attempting to synthesize borrowed policies with those at home (Phillips & Ochs, 2003; 2004). But the issue of context is central to successful and meaningful education policy borrowing/transfer (Ball, 2010; Phillips & Ochs, 2003; 2004) which is why Ball (2010) reminds us that tinkering and compromises are essential for borrowed policies to be effective in and responsive to the local context.

Methods

I used the documentary review method to collect data for this paper. Documentary review is a method of research that involves the analysis of texts and documents that contain data that is pertinent to the research problem (Bailey, 1994; Scott, 1990). Although both the documentary review and the meta-analysis approaches involve a comprehensive review of the literature on a particular topic, the two approaches differ in important ways. Meta-analysis is a statistical technique where researchers seek to summarize, analyze, and integrate or contrast results from several studies based on common measures such as effect sizes or confidence intervals (Glass, 1976; 1977). The goal of a meta-analysis is to attempt to establish the overall effect or statistical significance or to explain variations (Glass, 1976; 1977). In contrast, the purpose of documentary research is to analyze, synthesize, and interpret data, find patterns, and generalize results to address research questions (Bailey, 1994, Scott, 1990).

I retrieved all data from the internet using the computer search function provided by Google and Google Scholar using key search terms such as “challenges/problems facing Kenya’s higher education system,” “double intakes,” and “investments in R&D in Kenya.” I also searched the Kent State University Library educational databases including: Academic Search Complete, Academic Search Premier, Eric, Education Full Text, and Education Search Complete. My searches returned a total of 40 documents including ministerial reports, policy statements, statistical bulletins, UNESCO reports, published empirical articles, and opinion pieces of interest published between 2000 and 2012. The limitation of using Google search and

electronic databases means I was able to retrieve only documents and reports available in electronic format. I excluded pieces that made only a superficial reference to the problems facing Kenya's higher education system.

In the end, I selected these twenty one articles for final analysis owing to their depth and nuance: (Boit & Kipkoech, 2012; GoK, 2007; Gudo, Olel, & Oanda, 2011; Johnson & Hirt, 2011; Johnson, Hirt, & Hoba, 2011; MoE, 2008; MoES&T, 2004; MoS&T, 2008; MoE, 2012; Mutula, 2002; Ngome, 2003; Nyaigotti-Chacha, 2004; Oanda & Jowi, 2012; Odhiambo, 2011; Owuor, 2012; Saitoti, 2004; Sifuna, 2010; Wangenge-Ouma, 2008; 2012; Wasanga, 2009). I analyzed these published and unpublished documents qualitatively to identify the main challenges facing Kenya's higher education system. I defined main challenges as those discussed by a simple majority of the documents reviewed and based proposed solutions on model policies from newly industrialized countries (which also form part of my data). These countries include Brazil, China, Korea, and Taiwan.

Challenges facing Kenya's higher education system

The history of formal higher education in Kenya can be traced to the early 20th century when the British colonial powers established Makerere College in Uganda to replace the traditional non-formal forms of education that existed previously in East Africa. Rising demand for higher education led to the founding of the Royal Technical College in Nairobi in 1956 as a constituent campus of Makerere College. The Royal Technical College, re-named the University College in 1961, became the University of Nairobi in 1970—the first fully-fledged university in post-independence Kenya (Mutula, 2002; Nyaigotti-Chacha, 2004; Odhiambo, 2011; Sifuna, 2010). The intervening decades were characterized by continuous growth in demand for (and dramatic albeit unplanned expansion of) higher education (MoE, 2012; Oanda & Jowi, 2012; Odhiambo, 2011; Owuor, 2012; Sifuna, 2010). A search on the Commission for University Education's (CUE) website reveals Kenya currently has twenty two public universities with several constituent colleges and campuses and seventeen chartered privates also with a number of constituent colleges (CUE, 2013). In addition, Kenya has several technical, industrial, vocational, and entrepreneurship training institutions, hereafter referred to as non-university institutions (MoE, 2012).

Despite its rapid expansion, Kenya's public higher education system faces a number of serious challenges including: massification; overcrowding; ever-growing demand; erosion of the non-university subsector due to acquisitions and takeovers by public universities in search of space; insufficient/declining public funding; curricula that are not responsive to modern-day needs of the labor market; declining quality; lack of basic laboratory supplies & equipment; crumbling infrastructure; poorly equipped/stocked libraries; poor governance; and rigid management structures (Boit & Kipkoech, 2012; Gudo, Olel, & Oanda, 2011; Johnson & Hirt, 2011; Johnson, Hirt, & Hoba, 2011; MoE, 2012; Mutula, 2002; Ngome, 2003; Nyaigotti-Chacha, 2004; Oanda & Jowi, 2012; Odhiambo, 2011; Owuor, 2012; Saitoti, 2004; Sifuna, 2010; Teferra & Altbach, 2004; Wangenge-Ouma, 2008; 2012).

Massification seems to be the fundamental problem facing Kenya's public higher education system and a catalyst for the other problems. Massification simply refers to the transformation of previously elite systems of higher education to mass systems of higher education as participation in post-secondary education expands dramatically (Trow, 2000). Kenya's public universities have witnessed decades of record growth in enrollment from just 3, 443 students in 1970 to nearly 200,000 in 2010 (MoES&T, 2004; MoE, 2012; Nganga, 2010; Owuor, 2012). Although there have been efforts over the years to expand the public higher

education system, rapid and sustained double-digit growth in demand has consistently outpaced supply. The annual rate of growth in enrollment between 2005 and 2010, for instance, averaged nearly 40 percent (Nganga, 2010; Owuor, 2012).

A popular policy response the Ministry of Higher Education, Science & Technology (MoHES&T) has often employed to try to cope with mass demand for higher education is “double intake”, a political strategy wherein the government props up public universities to expand enrollment further to absorb as many students as possible that meet minimum admissions qualifications (Boit & Kipkoech, 2012; Gudo et al., 2011; Nyaigotti-Chacha, 2004; Odhiambo, 2011; Owuor, 2012; Wangenge-Ouma, 2008; 2012). Unfortunately, this expansion of enrollment comes at a time when public universities are receiving declining funding from the Ministry of Education, thus forcing them to explore alternative avenues for expanding their respective revenue bases (MoE, 2012). A common strategy all public universities in Kenya have implemented is the so-called “Parallel” or “Module II” degree programs which allow for institutions to admit students who elect to pay the full cost of attendance in addition to those receiving government subsidies.

In fact, recent studies have shown that self-sponsored students are the new majority in Kenya’s public universities (Odhiambo, 2011; Sifuna, 2010; Wangenge-Ouma, 2008; 2012). This tremendous expansion of undergraduate education when combined with declining funding translates to more and more students being admitted to institutions that were originally designed to accommodate far fewer students. So severe is the crisis of overcrowding that it is not uncommon to find students standing inside or outside of lecture halls or even perched on windows during lectures. The period between the end of one lecture and the beginning of another is particularly chaotic as students simultaneously attempt to fill and vacate lecture halls or simply jump in or out through windows to guarantee themselves seats (Boit & Kipkoech, 2012; Mutula, 2002; Odhiambo, 2011; Sifuna, 2010; Teferra & Altbach, 2004).

These factors point to the worrisome conclusion that Kenya’s public higher education institutions produce graduates who are ill-equipped to compete effectively in the modern global economy (Odhiambo, 2011). In fact, recent studies have found curricula throughout the public higher education system to be poorly aligned with the changing needs of the knowledge economy (GoK, 2007; MoE, 2012; Odhiambo, 2011). Affirming the important role higher education plays in economic growth and development, however, former U.S. Secretary of Labor Ray Marshall famously stated, “education is critical” and “it cannot be considered apart from overall economic strategies” (Marshall, 1995, p. 63). This assertion underscores the shift in the global economy to a phase of intense, knowledge-based competition in which quality higher education is a critically important driver for faster economic growth (Bloom, Canning, & Chan, 2006; Douglass, 2009; Lin, 2009; Marshall, 1995; Mazzoleni, 2008; World Bank, 2002). Despite that, Kenya’s policy responses have so far fallen short of the deep-seated reforms necessary to surmount the problems facing the country’s public higher education system.

For one, the government’s blue print—Vision 2030—at its core articulates the need to emphasize science and technology courses to help the country transform into “a newly industrializing, middle-income country providing a high quality life to all its citizens by the year 2030” (GoK, 2007, p. 1). Yet even this long-term vision fails to outline substantive measures to address pre-existing issues already affecting the system and to delineate a framework that lays out a clear path on how to get from “here” to “there” by 2030. What is clear, therefore, is that Kenya’s public higher education system as it exists today is broken and that fundamental reforms are urgently needed for the system to play a catalytic role in

transitioning Kenya from a subsistence economy towards a knowledge economy. To that end, political stakeholders must understand that massification is not merely about seeking more innovative ways to cram more students into already overstretched institutions; rather a serious response to massification would require sweeping reforms to the system. These reforms should begin with major capital investments to construct the requisite infrastructure to match expanded enrollment and curricula reforms with a major focus on both quality and the changing needs of the modern economy. Absent deep-seated reforms, Kenya risks being further marginalized within the global economy and the envisioned economic transformation (Vision 2030) is unlikely to be realized.

Policy lessons for Kenya

A look at the experiences of newly-industrialized countries reveals they have struggled with problems similar to Kenya's current challenges including lack of or crumbling infrastructure, low GDP, and low levels of funding for academic research (R&D) (Johnson, 2002; Mazzoleni, 2008; Zweig & Rosen, 2003). But as the literature indicates, the remarkable economic growth and tremendous success of Brazil, China, Korea, and Taiwan was underpinned and enhanced greatly by critical investments in a number of areas including: reforms focused at modernizing institutions of higher education; policies supportive of STEM fields; aggressive collaborative investments in academic research (R&D) by both governments and the private sector; and clear links between higher education and the economy at both conceptual and policy levels (Johnson, 2002; Marshall, 1995; Mazzoleni, 2008; Zweig & Rosen, 2003). Specifically, investments in higher education focused on rapid expansion of university systems, increased enrollment in general and specifically in STEM education, funding the development of public research laboratories, funding research activities collaboratively with the private sector, and creating incentives to encourage foreign-based scientists to return (Gardner, 2011; Johnson, 2002; Mazzoleni, 2008; Zweig & Rosen, 2003). This mix of initiatives resulted in the creation of a large, skilled talent pool that continues to drive research production, technological capabilities, and ultimately economic growth in the aforementioned countries.

There are important contextual differences between Kenya and these newly-industrialized countries, but broadly speaking, Kenya can use a similar model of investing aggressively in higher education and in R&D to drive future economic growth. Kenya stands to benefit from the experiences of these countries in that it can not only emulate their models, but also improve on their designs (avoid policy mistakes) to meet its development needs. In fact, a recent report by the Ministry of Science & Technology (MoS&T) notes the important role of government investment in the creation of necessary infrastructure in South Korea, Malaysia, Taiwan, Brazil, and Chile (MoS&T, 2008). Subsequently the government has created a broad policy framework—the National Science, Technology, and Innovation Policy and Strategy—to guide the growth of R&D. Although this is an important first step, relevant government departments (i.e., Science & Technology and Education) have yet to follow through with aggressive investments identified as necessary to foster the growth of R&D.

Public expenditure in R&D—measured as a percentage of Gross Domestic Product—is essential for economic growth as the associated products are routinely exploited for commercial purposes. Academic research often leads to the generation of new knowledge, especially in key areas of competition, and the creation of life-changing innovations (Douglass, 2009; Urama, Ozor, Kane, & Hassan, 2010). In order to create the knowledge and skills for the new economy, both the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the African Union recommend that countries invest at least one percent of GDP in R&D (Urama,

Ozor, Kane, & Hassan, 2010). Yet a recent study indicates Kenya's public investment in R&D remains below one percent of GDP (Urana, Ozor, Kane, & Hassan, 2010). One way Kenya can raise public investment in R&D and create a competitive and attractive R&D base that would support research at a high level is through capital investment in a recurrent budget.

This capital would be used to support the construction of research laboratories and research centers, to purchase equipment and supplies, and to support research activities (Johnson, 2002; Mazzoleni, 2008, Zweig & Rosen, 2003). Refining the existing R&D policy framework (MoS&T, 2008) to ensure it is in fact supportive and effective represents an important starting point. A few practical enhancements policy makers could embed within the policy framework to encourage foreign-based talent in STEM areas to return and bring back new knowledge include partial remission of relocation expenses, grants for equipment and research, tax credits to encourage industry to invest in R&D, and opportunities for networking and professional development (Johnson, 2002; Mazzoleni, 2008; Zweig & Rosen, 2003). This model has proved very useful for China, Taiwan, and South Korea. Favorable R&D-focused policies sparked off a wave of returning expatriates, including scientists and engineers, who brought back new scientific knowledge, vast international experiences, and networks for collaborative international research and thus enhanced the national competitiveness of their respective nations (Johnson, 2002; Mazzoleni, 2008; Schiermeier, 2012; Zweig & Rosen, 2003). In South Korea, supportive R&D policies and incentives ignited tremendous growth of the semiconductor industry whereas Taiwan's Silicon Valley-type Industrial Park is a hub for innovation and entrepreneurship in Microchip technology (Johnson, 2002; Mazzoleni, 2008).

In addition to supportive policies, the Kenyan Ministry of Education should explore other ways of growing a competitive workforce. A popular strategy used by newly-industrialized economies is that of sending young scholars abroad to bring back new knowledge and skills in fields such as science, medicine, engineering, technology, education, law, diplomacy, business, and social services. Russia and Brazil developed study abroad programs of sending students to leading universities in the United Kingdom and the United States. These countries define leading universities as those that appear in the top 300 of the major rankings agencies—the *Times Higher Education World University Rankings*, *The Academic Rankings of World Universities*, and the *QS World University Rankings* (Gardner, 2011; Schiermeier, 2012). Brazil's Science Without Borders program sends students in engineering, health sciences, life sciences, and technology fields to top universities including Harvard University, Massachusetts Institute of Technology, Stanford University, and the University of Cambridge (Gardner, 2011). Scholarships are awarded jointly through the Ministry of Science and Technology and the Ministry of Education and recipients are selected based on performance in an exam administered by the Ministry of Education. Similarly, Russia's study abroad program aims to promote social and economic innovation. The program is funded through the Strategic Initiatives Agency and is designed to send young scholars in all fields of science, technology, medicine, social sciences, and business to top schools abroad annually. Prospective recipients are required to apply to schools on their own and gain acceptance before the Strategic Initiatives Agency provides grants (Schiermeier, 2012). Both countries require scholars to return and work in their home countries for a period of time after completion of their studies while non-returners are required to pay back their stipends (Schiermeier, 2012; Zweig & Rosen, 2003). China, South Korea, and Taiwan also used study abroad models focused mainly on STEM areas (Johnson, 2002; Schiermeier, 2012; Zweig & Rosen, 2003).

Partnerships between universities, industry, and government or the so-called "triple helix" have proved useful to enhancing economic growth and competitiveness both in

postindustrial economies of the West and in newly-industrialized economies of the East (Douglass, 2009; Edmondson, et al., 2012; Etzkowitz & Zhou, 2009; King, 2009; Lin, 2009). Compelling empirical evidence of the vast potential and immense benefits of these collaborations is visible and widespread ranging from the ground-breaking discoveries in biotechnology and biomedical engineering to communications equipment to nanotechnology and software development (Douglass, 2009; Edmondson, et al., 2012; Etzkowitz & Zhou, 2009; King, 2009, Lin, 2009). In the United States, the federal government and industry invest billions of dollars in cutting-edge research programs at leading research universities spread out across the country including in California (e.g., Silicon Valley), Massachusetts (e.g., Kendall Square), and in Texas (e.g., Austin Area) (Douglass, 2009; King, 2009). Similar kinds of research-focused collaborations are visible across Europe (see e.g., Edmondson et al., 2012) and in parts of Asia (China, Taiwan, Singapore) (Etzkowitz & Zhou, 2009; Lin, 2009). In Taiwan, for instance, university-industry-government collaborations led to the creation of innovative technologies that played a major role in transitioning that country's agrarian economy of the 1950's to the modern knowledge-based economy where economic activity is driven by explosive growth in demand for and sales of electronics worldwide (Johnson, 2002; Lin, 2009).

The outcomes of these collaborations typically are beneficial in different ways to all parties involved. Benefits to industry include access to highly trained students, first class faculty, and state-of-the-art research facilities. Industry is also able to appropriate the prestige associated with collaborating institutions to promote its brand and to enhance market share (Etzkowitz & Zhou, 2009, Santoro & Chakrabarti, 1999). Collaborating higher education institutions benefit from the continuous inflow of research dollars while the government and society benefit from the knowledge and products created, such as new drugs and technological advances that improve quality of life (Douglass, 2009; Edmondson, et al., 2012; Santoro & Chakrabarti, 1999). Evidently, supportive policies and substantial capital investments are at the core of R&D-based economic growth (Douglass, 2009; Edmondson, et al., 2012; Etzkowitz & Zhou, 2009; King, 2009; Lin, 2009). For Kenya to achieve this kind of growth, policy makers must move with speed to create policies that scale up and promote university-industry-government collaborations based on areas of common research interests.

Moreover, initiatives focused on STEM education are needed throughout the education system to spark and sustain students' interest in these fields. Although Vision 2030 identifies science and technology as a vehicle for faster growth (GoK, 2007; MoE, 2012), a look at high school STEM education enrollment data from 2009 reveals a very disconcerting trend; students tend to avoid optional STEM fields. Math, for instance, which is a compulsory subject, had a total enrollment of 181, 980, where Physics, which is optional, had a total enrollment of only 39, 792 (Wasanga, 2009). Furthermore, the poor performance in STEM education in qualifying examinations (for entry into higher education) is both unmistakable and deeply troubling. In 2009, for example, mean scores (%) for boys and girls in Math were 18.67 and 13.42 while in Chemistry mean scores were 31.76 and 27.72. In other words, the average score for girls, in Math for instance, after you add all the scores (%) and divide by the number of girls who took the test would be a paltry 13.42 percent (Wasanga, 2009).

Even more worrying is the fact that this trend of avoiding STEM fields continues through college. Though anecdotal, statistics from the University of Nairobi class of 2013 offer a glimpse into the magnitude of the problem. Whereas 1, 229 students graduated with Master's degrees in Business Administration, 65 students graduated with Bachelor of Science degrees in Biochemistry, and only three graduated with Master's degrees in Civil Engineering (Okoth, 2013). What is discernible from these numbers is that there is a systematic departure from

STEM fields throughout the education system. As a consequence, the current superficial emphasis on science and technology will not amount to much in terms of increasing the production of a highly-skilled STEM workforce or realizing STEM-based economic growth and transformation. Rather, the Ministry of Education ought to invest in programs to train excellent math and science teachers before recruiting these teachers, build the necessary infrastructure in schools, supply those schools with the necessary resources, and incentivize teachers to work hard towards producing high school graduates adequately prepared and motivated to pursue STEM education at the highest level.

Institutional diversification is important for any system of higher education as different types of institutions provide different types of training (Reichert, 2009), thus providing alternatives for students and ultimately expanding opportunities for access to higher education. This is one area where Kenya can learn from the United States where community colleges are both a vital part of the higher education system and an essential engine for economic growth and competitiveness as they train a large section of the workforce to meet the emerging needs of the US economy (Jacobs & Dougherty, 2006; Kane & Rouse, 1999). As Kane and Rouse (1999) point out, community colleges often respond more quickly to market changes and serve different kinds of student populations ranging from those seeking terminal vocational degrees, to those already in the workforce and simply needing to upgrade or expand their skill set, to those taking remedial courses in preparation for the pursuit of four-year degrees.

Even though Kenya also has some diversity of types of higher education institutions, this diversity is threatened as public universities systematically acquire mid-level colleges and convert them to constituent colleges or satellite campuses to cater to ever rising demand for higher education and to generate new revenues (Gudo, Olel, & Oanda, 2011; MoE, 2012; Oanda & Jowi, 2012). These acquisitions, lack of resources, and a host of other challenges have weakened the non-university subsector resulting in a public higher education system that is burgeoning at the top but lacking a strong network of mid-level institutions to offer meaningful vocational, industrial, and technological training to students whose terminal education would otherwise be high school. Urgent action is needed, however, to prepare Kenya's higher education system for an imminent explosion in demand when the first batch of students enrolled under the free, universal, primary education program introduced in 2003 (Saitoti, 2004; Sawamura & Sifuna, 2008) graduates from high school in 2015. Free primary education does not only mean there is going to be an even greater number of students seeking access to higher education, but also that there are going to be different types of students seeking different types of higher education and a robust, tiered system where different institutions cater to different types of students will be needed to meet increased demand.

Kenya currently has a total of 1,600 non-university institutions, half of which are public and housed under various government ministries and the other half are privates owned by religious organizations, communities, and civil societies (MoE, 2012). Despite the large number of institutions, the non-university subsector plays a diminutive role in the country's higher education as it traditionally serves less than 10 percent of the total student population (GoK, 2007; MoES&T, 2004; MoE, 2012). If Kenya is to realize Vision 2030, non-university institutions must play a more vibrant role in the process of economic growth and development. As a matter of fact, a strong non-university subsector will provide a valuable alternative for students from lower socioeconomic backgrounds and particularly those from rural areas, because they are commonly less expensive to students than four-year colleges. Thus, the Ministry of Education should take a series of measures to revitalize this subsector and to ensure that students have the necessary supports to learn technical knowledge and skills for

industrial and agricultural output. These steps should include creating a development and advancement program with the ultimate goal of raising capital, from both public and private sources, to facilitate the building of essential infrastructure and purchase of necessary equipment and supplies—such as books, computers, and access to databases in all disciplines—and improving administrative efficiency. The latter goal can be achieved through the elimination of unnecessary bureaucracy such as having all public non-university institutions under the Ministry of Education instead of being spread out across different government departments (MoE, 2012).

Curricula development at the non-university subsector is another important area in serious need of policy attention. A recent report produced by the Ministry of Education observes that curricula and training programs at non-university institutions are irrelevant and do not reflect the needs of the new economy and that these institutions rely on part-time, often inadequately trained, instructors (MoE, 2012). To align curricula offerings at these institutions with the needs of the modern economy, the Ministry of Education needs a broad-based approach involving all types of stakeholders such as faculty, employers, students, alumni, community representatives, and curriculum developers, to ensure the process is comprehensive and adequately addresses the deficits in curricula. No doubt, the shortage of qualified faculty adds to the problem of quality of education and training at non-university institutions (MoE, 2012) and to address this problem, the Ministry of Education needs to: (a) create programs to re-train faculty to increase their levels of competency, skills, and productivity, (b) incentivize faculty to take advantage of the proposed re-training and to stay at non-university institutions once they have been re-trained, and (c) explore recruiting foreign-trained instructors to teach fields in which locally trained instructors lack experience.

Public universities face challenges similar to those of non-university institutions (Boit & Kipkoech, 2012; MoE, 2012, Ngome, 2003) and the Ministry of Education needs to make capital investments for infrastructure a top priority so that universities may serve their teaching and research roles effectively. A report by Altbach, Reisberg, and Rumbley (2009) points out that overcrowding and shortages of quality faculty are emerging problems worldwide as national systems of higher education struggle with growing enrollment. Still, shortage of quality faculty is not new to Kenya's public universities as the problem has persisted despite record growth in enrollment over the years (Sifuna, 2010). The ensuing high student-faculty ratios have a deleterious domino effect as they affect the quality of training students receive which in turn directly affects the quality of the labor force. The situation is especially dire in STEM fields, which often require hands-on instruction (Sifuna, 2010) and this raises important questions regarding whether or not the Kenyan higher education system is producing enough highly-skilled graduates to promote STEM-based economic growth.

The process of curriculum design and development at the university level is left to individual universities (MoE, 2012). Accordingly, faculty committees (school boards and/or unit boards) ought to systematically and comprehensively review curricula based on feedback from various stakeholders including students, recent graduates, industry/employers, faculty, the community, and the government, to ensure training programs are responsive to the needs of an increasingly global labor market (Wolf, 2007). Input from all stakeholders is critical to ensure the reform process is data-driven and that decisions are data-informed (Hill, 2007; Wolf, 2007). Some important elements of a meaningful curriculum design and review process include careful planning, formulation of pragmatic learning outcomes for all courses and programs, development of appropriate and effective frameworks for assessing learning relative to articulated outcomes, and the use of results to inform course and program improvements

(Allan, 1996; Hill, 2007; Kuh & Ewell, 2010; Middle States Commission on Higher Education, 2007; Wolf, 2007). Allan (1996) defines learning outcomes as what students should know and be able to do upon completion of a course or program. For that reason, thoughtful reflection is required to ensure that each learning outcome is clearly described and operationalized (Allan, 1996) and that conceptual links between higher education and the labor market, in terms of the knowledge, skills, and competencies, are clear.

A related area that also needs urgent policy attention is the creation of a standard credit system (MoE, 2012). Teferra and Altbach (2004) remind us that credits are the “common currency” of higher education as they provide a simple, broadly defined tool for tracking the academic progress of students and for facilitating student mobility within higher education systems. A credit-based system of higher education in the U.S., for example, facilitates seamless transfer for students from one university to another, from a community college to a university, or even from a university to a community college (Trow, 2000). In addition, the accumulation of credits allows students greater flexibility in switching majors or fields. Across the Atlantic, Europe has recently created the European Credit Transfer and Accumulation System (ECTS) that allows students to accumulate credits that are transferable across different institutions within collaborating countries (European Commission, 2013; Trow, 2000).

However, this is a grey area in Kenya’s higher education system and institutions use internal credit systems for lack of a standard framework for credit transfer (MoE, 2012). There is, therefore, a serious need for a framework for the recognition and transfer of credits to facilitate within-country lateral and vertical mobility for students in the higher education system (MoE, 2012). Furthermore, a standard credit system would likely make higher education more accessible—as credits will not be “lost” when students make within-country lateral or vertical transfers or even simply switch majors—and more affordable for low-income students who are more likely to enter the higher education system through non-university institutions with the intent to transfer to four-year colleges. For students needing to complete their undergraduate degrees abroad or for those planning to pursue graduate work abroad, a standard credit system would provide a more accurate way to determine credit equivalencies in target foreign institutions, thus facilitating credit transfers and opening multiple, flexible pathways for obtaining degrees (European Commission, 2013; Teferra & Altbach, 2004; Trow, 2000). There is no need to “reinvent the wheel” by designing an entirely new credit system. Instead, CUE, which is the body that regulates public and private universities and conducts accreditation for programs and universities in Kenya (CUE, 2013), could use the framework already provided by the Arusha Convention (Obasi & Olutayo, 2009) as the baseline to create a system-wide credit framework.

Reforms will not be complete without restructuring the governance of public higher education institutions in order to improve administrative efficiency, transparency, and accountability to the wide range of stakeholders involved. The definition of the concept of *accountability* particularly in higher education is contested, as different stakeholders use different variables or inputs and approaches to assess this construct (Leveille, 2005). For our purposes, accountability refers to the practice of evidence-based leadership where higher education leaders are called upon to produce evidence of achievements at the conclusion of their contract terms (Leveille, 2005). To overcome problems of poor governance and rigid management structures, the CUE should learn from the U.S. model of higher education administration which embraces flatter management structures, decentralized decision-making, and institutional autonomy (OECD, 2003; Trow, 2000). Autonomy does not mean public institutions operate

independent of oversight; rather the CUE should create a robust framework for substantive oversight that pairs autonomy with both accountability and transparency (Dill, 2001).

Individual performance contracts, first introduced in Kenya in 1989 and reintroduced in 2003, represent one strategy used by the government to try to improve administrative efficiency and accountability in the delivery of public services (Kobia & Mohammed, 2006; Obong'o, 2009). A performance contract is a management tool that stipulates deliverables or measureable outcomes (Kobia & Mohammed, 2006; Obong'o, 2009). Contracting parties, representatives of the state and leaders of state agencies, freely negotiate and agree upon a broad range of goals which are to be achieved over a specific contracting period and these goals form the basis of a performance review at the conclusion of a contract term (Kobia & Mohammed, 2006; Obong'o, 2009). Thus far, however, performance contracts have produced mixed results, an outcome attributed in part to unclear goals and lack of political goodwill necessary to drive both the process and culture of results-based contracting (Kobia & Mohammed, 2006; Obong'o, 2009).

Accordingly, the CUE should be more proactive in promoting a culture of accountability in higher education leadership. This can be achieved by the creation of a broad policy framework that would require public universities to collect and publish pertinent data regarding performance relative to various indicators of accountability such as student learning outcomes assessments, student satisfaction, graduation rates, faculty productivity and research output, quality of faculty, mission focus, and the level of student success in the labor market following graduation (Alexander, 2000; Lederman, 2013). The Commission could also explore a performance funding model, wherein a portion of each institution's allocation is tied to outputs or achievement of mutually agreed upon indicators of efficiency and effectiveness (Alexander, 2000; Dill, 2001; Leveille, 2005).

Conclusion

There are as many different ways of conceptualizing quality as there are different types of stakeholders in higher education. But at this particular point in its life cycle, Kenya's higher education system urgently needs to educate, train, and develop an information-age workforce in order to achieve economic transformation in the next several years (GoK, 2007). For that reason, this paper defined *quality higher education* as that which would produce a well-educated and highly-skilled workforce able to compete in a modern knowledge-based economy. The development trajectories and economic experiences of some of the newly-industrialized nations indicate that higher education plays a critical catalytic role in the construction of a knowledge economy and its subsequent growth (Johnson, 2002; Marshall, 1995; Mazzoleni, 2008; World Bank, 2002; Zweig & Rosen, 2003). Accordingly, these countries offer powerful and useful lessons for Kenya's development policy as the nation seeks to transform its economy in the years ahead.

But, of course, the importance of context in education policy borrowing/transfer cannot be emphasized enough (Ball, 2010; Philips & Ochs, 2003; 2004). The local politics has a strong influence on the areas of emphasis and points of departure relative to policy borrowing and implementation. As a result, one would expect strong state intervention in the planning and execution of education policy in countries with authoritarian structures or where planning is highly centralized, whereas the process of decision-making and implementation would be much more contested in established and emerging democracies. Regardless, the recommendations discussed in this paper provide important insight into how Kenya's policy planners and higher

education leaders might reform the public higher education system to ensure that it creates the skilled domestic workforce necessary drive economic transformation.

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