



Towards a Model for Entrepreneurial University Ecosystem in the Evolving Higher Education Landscape in Kenya

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To cite this article:

Salome Kanini Kaberia, Victor Mwendwa Muithya, Stephen Makau Muathe. (2024). Towards a Model for Entrepreneurial University Ecosystem in the Evolving Higher Education Landscape in Kenya. *Higher Education Research*, 9(1), 1-17.

<https://doi.org/10.11648/j.her.20240901.11>

Received: October 17, 2023; **Accepted:** November 14, 2023; **Published:** January 18, 2024

Abstract: As the intensive search for answers to varied global challenges such as structural economic shifts and recessions persist, government and corporate leaders throughout the world are increasingly looking to "their" universities to offer solutions that promote regional development and boost national competitiveness. The enactment of an entrepreneurial institutions of higher learning can play a significant role in knowledge-based economies, where knowledge is an influential component of output to advance the economy. The entrepreneurial institution of higher education is one of the key forces that propel social systems, and hence entrepreneurship can be viewed as both a process and an outcome for this force. How these institutions interpret and respond to this call will define the University of the Future. But has their impact been felt so far? These universities are themselves struggling to remain relevant and operational due to economic challenges; more so in developing economies like Kenya where they previously relied on government funding and tuition fees only. This study seeks to investigate the opportunities and challenges for Kenyan universities in transforming themselves to become entrepreneurial universities. This goal is two-fold in that it denotes how colleges are approaching this new epoch of self-reliance, as well as reflects the principles of the entrepreneurial society, of which the university is a part. By offering a thorough analysis of numerous case studies from across the globe, the research deepens our knowledge towards creation of an entrepreneurial institution of higher education ecosystem, and thus offers strategies for Kenyan and other African universities to become an integral part in re-writing the pragmatic role of institutions of higher learning in the economic advancement of their respective countries. Universities are called upon to improve their programs, delivery of the content, the output quality (entrepreneurial students) and meaningful interaction with stakeholders. Entrepreneurial universities will be born and sustained through entrepreneurial degree programmes, creation of corporate alliances, development of entrepreneurial cultures and ecosystems, and development of initiatives and programmes for the commercialization of scientific research, among other strategies.

Keywords: Commercialization of Research, Entrepreneurial University, University Ecosystem, Opportunities, Challenges, Kenya

1. Introduction

Universities all over the world have sought to position and establish themselves in response to the new expectations of them. Universities today are no longer thought of as ivory towers, but rather as significant forces for social and economic transformation [26]. Scholars and researchers must thus characterize this transformation, and renew their

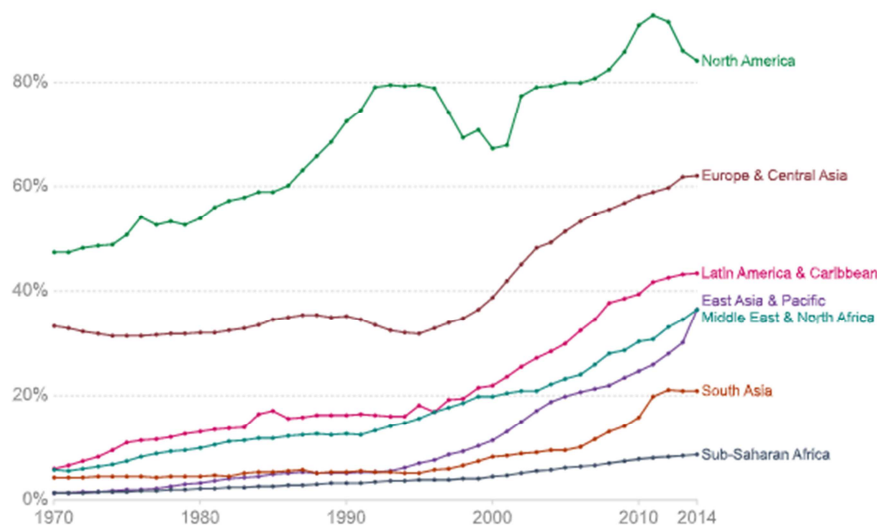
identities.

By emphasizing the ways that academics participate in or disengage from entrepreneurial activities and, consequently, from the developing entrepreneurial ecosystem, numerous studies have attempted to add to the bulk of literature on entrepreneurial university environments. The number of further education colleges worldwide has increased to almost 18,000 as of 2021 (with 2 million students). [2, 35]

In China, there were close to 3000 universities, and by

2020, the overall enrollment rate had risen from less than 10% in the late 1990s to more than 45%. By 2020, there were

about 370 universities in Korea [2].



Source: (Al-Youbi, Zahed, & Atalar, 2021)

Figure 1. Gross enrolment percentage in university education.

African institutions of tertiary learning are still stuck in a severe crisis. This problem is diverse, multidimensional, and presents a wide range of mysteries and difficulties. Some of the challenges result from the wide variations in Africa's higher education; from nation to nation and university to university, making it risky to make broad generalizations without exaggerating one side or the other [11].

The pattern in Kenya's universities in terms of growing numbers and student enrolment levels is no different. During higher education's democratization in the mid-1990s, there was an unprecedented demand for it, which led to the initial increase. In the middle of the 1990s, there were only four public universities and one private university. Today, there are 63 institutions of higher education; of these, 33 are public and 30 private; with about 70% of public institutions being founded in the academic year 2012–2013 [54]. The number of learners registered has increased dramatically from 10,000 in 1990 to about 550,000 in the present. Of these, 86 percent are enrolled in public universities, especially the top five [54].

The university system's growth necessitated a significant increase in finance. Basically, everything the institution has to implement requires funds, including hiring excellent faculty staff and scholars, providing scholarships to appeal to better and more talented students, raising faculty remuneration to keep them from accepting positions at rival universities, and enhancing the university's facilities and services to improve the quality of life within the campus. Apart from tuition fees, no institution in Kenya has established a strong market-based income generation strategy to fund the majority of its activities [54].

Ironically, the same universities that are struggling with self-reliance are now the focus for solutions on global and regional economic challenges. They must thus not only transform themselves into entrepreneurial institutions towards self-reliance, but also enhance an entrepreneurial

ecosystem so that they produce citizens who can identify a commercial opportunity and competently commercialize it profitably, while at the same time churning out functional ideas towards sustainability and development of the entrepreneurial ventures around them [8].

Universities' projected profits from research funding, consultancies, industry partnerships, and sales of goods, among other things, have not materialized because they lack the capacity to access these resources [54]. He further opines that, while institutions of higher learning in the developed economies gain income from these alternate sources, those within Kenya, similar to universities in most African (developing) nations, do not have the economic capacity to sustain such advances.

Meeting these expectations calls for a paradigm shift in the content delivered; lessons on identifying opportunities, converting an idea into a business, managing resources, and starting a venture. Additional areas to be considered include management, marketing, information systems, and finance [31].

1.1. Statement of the Problem

The issues of funding, accessibility, and relevance have remained the main challenges facing Kenya's institutions of higher education post the year 2000. How their other problems are remedied depends on financing shortages, but policymakers are still unsure on how to expand alternative funding sources beyond the general public [1]. At the same time, these universities find themselves hard-pressed to find and present pragmatic solutions to the cyclic global economic recessions and other developmental challenges.

The Kenyan Universities have a debt of 60.2 Billion (President Ruto Speech on 3 May 2023). This indicates that universities are in dire financial times. Kenyan Universities

have been receiving block funding and this has led to financial challenges amongst other problems. In the Year 2022/23 Universities were allocated Ksh 54 Billion. The new financial allocation for the Financial Year 2023/24 will see universities receive Kshs. 84.6 Billion (President Ruto Speech on 3 May 2023). This new model focuses on an increase in financial support to universities, but is it sustainable?

The higher education sector has endured a financial crisis of unparalleled dimensions over the past three years, raising concerns about its long-term viability. The situation is so bad that institutions are unable to pay for basic running costs like paying wages, electricity, and required contributions like income tax and pension funds [54], President Ruto Speech on 3rd May 2023). Munene [54], opines that a temporary fix demands for an immediate cash influx, but this is by no means sustainable; more so considering that governments alike are faced by budgetary constraints. The long-term solution, therefore, calls for a multifaceted overhaul of higher education funding and strategic income generation at the institutional and national levels.

Many studies and statistics have underlined the connection between entrepreneurship and economic expansion, and it is clear why: entrepreneurship stands founded on undertakings that transform ideas to business prospects. Entrepreneurship encourages transformation as well as innovation, which enhances productivity and competitiveness of the economy. While there have been small steps towards becoming entrepreneurial universities, these institutions have faced never-before-seen difficulties as a result of this transformation [44].

Additionally, the concept, factors, and traits of the entrepreneurial university are not clearly understood [32, 83], [36]. Given that the components of the entrepreneurial colleges are not clearly defined might be summed up as the main problems identified by the contextual and conceptual analysis conducted for earlier studies in this area [44]. This study thus seeks to explore how universities in Kenya can tap into entrepreneurship to innovate and champion positive change for themselves as well as for the business environments within which they operate.

Without a doubt, entrepreneurship has revolutionized the commercial sector and spread to every corner of the world. The rapid expansion of entrepreneurial goings-on in the United States during the past 10 years is one instance that exemplifies this assertion [31]. Each year, hundreds of thousands of small enterprises are established. With this rapid development, universities must therefore update and keep refreshing the entrepreneurial education they offer, while also transforming themselves to benefit from this explosive expansion of entrepreneurship.

Millions of new job opportunities have been created, 94% of which can be attributed to 15% of the fastest-growing new businesses, or "gazelles"; less than one third of these gazelles were high technology companies [42]. Approximately 16% of American companies have been operating for more than a year. According to Reynolds et al. (1999), smaller enterprises

create 67% of all new inventions. Market economies are dynamic, ever-evolving systems that place more emphasis on the present than on the past [41].

1.2. Objective of the Study

In line with the research topic namely towards a model for entrepreneurial university ecosystem in the evolving higher education landscape in Kenya, this research thus pursues:

- 1) To establish the Trends in Higher Education landscape in Kenya.
- 2) To analyze what an Entrepreneurial University is.
- 3) To analyze Entrepreneurial University and Commercialization of Research.
- 4) To evaluate the opportunities and challenges of an entrepreneurial university in Kenya.

2. Literature Review

Theoretical and empirical reviews are presented by the researchers in this section, in line with the study's goal, namely to explore the opportunities and challenges for Kenyan universities in transforming themselves to become entrepreneurial universities.

2.1. Theoretical Framework

This section presents theoretical review underpinning development of entrepreneurial university in Kenya as informed by earlier studies reviewed, this study is anchored on three theories, namely the agency theory, resource dependency theory and Triple Helix model. Each of these theories helps management to make overall strategic decisions.

2.1.1. Agency Theory

The interplay between business owners and their agents can sometimes cause issues, which agency theory seeks to clarify and address. The agency hypothesis asserts that the interests of a principal and an agent are not necessarily congruent. The principal's (in this case governments or the churches in the case of religious affiliated universities) depend on an agent (university administration) to carry out certain tasks or make choices on their behalf and believed to be for the common good. When agency theory is applied to public higher education, it is implied that conflicts of interest may occur since the institutions' aims may not be in line with that of the state, which are to provide its citizens with affordable, high-quality education [6].

The agency conflict that occurs between the government and the communal institutions of advanced learning starts to fade as a result of declining reliance on state appropriations. Funded by the state budget, institutions offer educational opportunities to the residents of the relevant state (Bennett, 2018). The two methodologies that have emerged in agency theory are positivist agency theory and principal-agent research [5].

Furthermore, they contend that principal-agent research has suggested that agent monitoring and risk-sharing are two

potential agency complications [5]. The two problems are linked because it becomes more difficult for the principle to monitor agent behaviour due to information asymmetries brought on by a divergence in the risk-sharing area. The change in risk-sharing, be it real or perceived, makes it challenging for the principal and agent to enter into a flawless contract. Positive agency theory focuses on the essential control mechanisms that keep agents from acting egoistically [18].

Systems of managerial incentives will also be ineffective since principals may find it challenging to comprehend the appropriate incentives needed to produce respectable contributions. As human beings often choose a workable solution over an ideal one [78], it's possible that they (principals; governments in the case of public universities) would not devote sufficient resources towards figuring out the kind of incentives the agents would desire. Therefore, given limited rationality, it is unclear what kind of enforcement mechanisms and contributions are required to reduce / eliminate the agency conflict among institutions of higher education.

However, contemporary studies have questioned if agency conflicts (the emphasis on the division of management from ownership, as well as owners' inability to effectively enforce their property rights) are really the only considerations in the agency theory. Unique principal-agent relationships outlined by Mills [48], as well as by Mitchell and Meacham [49], add to the body of research available on this theory and highlight the numerous extra issues brought on by the division of ownership and management.

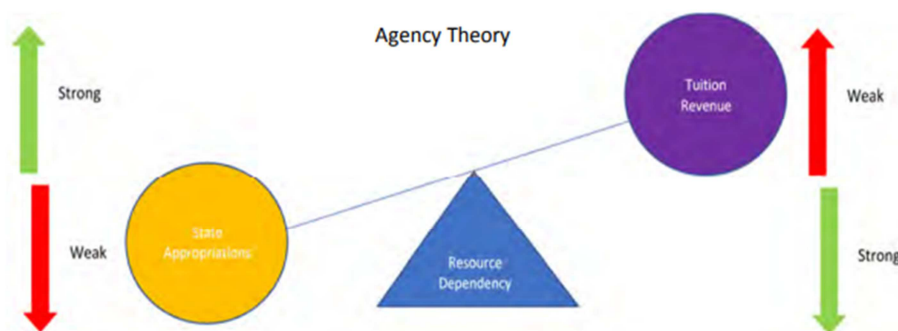
Honest ineptitude is a key problem that academicians have

neglected to thoroughly investigate [25]. Could this be the case in some Kenyan universities? Are the nominated managers empowered and skilled enough to govern these mega-institutions? Scholarly research must develop at the same rate that the contemporary landscape does [5]. Since honest incompetence must also be taken into account, researchers can no longer presume criminality through negligent ownership and governmental oversight [25]. Although a credible hypothesis, honest incompetence lacks explanatory power.

2.1.2. Resource Dependency Theory

The theory of resource dependency explains the behavioral effects of relying on a limited number of resources on organizational processes. State appropriations and student tuition are the two major funding sources for public higher learning systems. The distribution of these revenue streams may have an effect on the principal/agent relationship that exists between the government and its numerous higher learning institutions. An institution's capacity to obtain and preserve these resources determines its potential to succeed and survive as an organization [38, 64].

Bennett and Law [7] contend that the competing concepts of resource dependency theory and agency theory for public tertiary education institutions may have an impact on the university management's strategy agenda for providing accessible, high-quality education. Recruitment, tuition costs, resource distribution, and cost-cutting are some significant issues that might be impacted. Below is an illustration of the conflict of the two theories.



Source: Bennett and Law, 2021.

Figure 2. Agency theory conflict in public higher education.

The hypothetical framework put forth in the study might explain the challenges public higher institutions' systems (in Kenya) encounter when functioning as the state's agent while also increasing their reliance on tuition income as a result of declining state allocations.

2.1.3. Theory of Entrepreneurial Transformation Paths

Clark [13], describes processes of transformation that occurred over a fifteen-year period (the span in which he thought institutional change could occur), in five European institutions based on field research conducted over a two-year period. He identified five characteristics as

"organizational pathways of transformation" which he highlighted and used to frame the case-study descriptions. These pathways are comprised of a strengthened steering core, an enlarged developmental perimeter, a diversified financial foundation, a stimulated academic core, and an entrepreneurial culture.

When considered collectively, these components support universities in overcoming the global mismatch between environmental demands and university capacity to respond. Universities have been under increasing pressure to become more innovative and entrepreneurial. The case studies are thus based on concepts that are created in an attempt to

balance these changes with conventional academic values [13].

The term "entrepreneurial," which to critics implied at best a slavish adherence of market principles and at worst a submission to commercialism [72] was a particular target of criticism. Clark replied, "Entrepreneurial character in universities does not stifle the collegial spirit; it does not make universities hand maidens of industry; and it does not commercialize universities and turn them into all-purpose shopping malls." This was stated in his 2000 speech to the IMHE/OECD General Conference [14].

For the ten-year period 1994–2004, data studies for universities with a strong academic concentration, such as Lund, Tampere, and the Technical University of Valencia, reveal a shift towards Clark's entrepreneurial model and the presence of his five organizational aspects of transformation.

In revisiting the model's success, Clark [15] observed that when faced with the same external factors, some universities adapt significantly, others very marginally, and yet others hardly at all. Obviously, the demands of the present do not lead to change. The responses, gathered from different universities, are what really count.

2.1.4. Theory of Strategic Actions

According to organizational theorists, an action is "strategic" when players deliberately use their social positions to their advantage in order to gain power, particularly by influencing other actors [40]. Institutions like universities are intricate, both inside and outside. The magnitude and level of complexity of the numerous knowledge and skill sets that their staff members possess determines their internal complexity [68].

The level of instability and unpredictability in the university surroundings is what causes their external complexity [68]. In order to successfully deal with this complexity, organizations that function in high-complexity situations need particularly adaptable structures and tactics.

Frølich, Stensaker, and Huisman [28], sought to establish what strategies are currently being used in modern universities. Among questions they posed to better explore the strategic planning universities are: Is there a strong emphasis on the creation and implementation of strategic plans in top-down, top-down strategic action? Or perhaps a better way to define strategic activity is as a bottom-up, natural progression of events where emergent tactics play a critical role?

A fully developed third mission for universities will result from its cross-cutting inclusion in their plans, perhaps in the shape of their social responsibility (defined in a broad sense) and socioeconomic participation [16]. This strategy might assuage the concerns of some university stakeholders who are reluctant to see their resources and results commercialized. Developing, coordinating, or strengthening the organizations devoted to providing logistical assistance to academics should be one of universities' strategic priorities.

Educational entrepreneurs have a unique traditional instrument at their disposal, unlike actors elsewhere. It is

known as the "charter," and it is almost a singular normative license that schools have to confirm and transmit official information. Because academic actors can specify exchange connections with several parties in academic terms, using a vocabulary of accounting that is specific to schools, the institution's charter is a valuable instrument for adopting tactical action [40].

2.1.5. Resource Based View

The resources-based view holds that each organization has distinct tangible, intangible, and human resources that are a result of its prior experiences and decisions [4, 30, 85]. Each university thus has its own unique set of assets. Through organizational routines, these resources are gathered and integrated to carry out specified tasks that, in turn, indicate the institution's capabilities [68].

It is these unique capabilities that help the institution to develop and sustain a competitive edge over their competitors [63]. Resources need to be valuable, hard to duplicate, hard to replace, and hard to transfer to another company in the market in order to provide a true competitive edge [68].

2.1.6. Schumpeter Theory of Innovation

All types of entrepreneurship are built on innovations, which call for modifying how resources are used and creating new skills [79]. All personnel at all organizational levels contribute to the development of these abilities through their actions and conduct [45]. It is thus the duty of every player within the university to take action towards innovation in form new ways (of content delivery), new products (relevant research), and new markets (the entrepreneurial ecosystem within which the institution operates).

It has been suggested that knowledge transmission and innovation is the main aspect of the third mission through which countries such as Spain have made significant progress in transforming universities to entrepreneurial universities in recent decades [29].

2.1.7. The Triple Helix Model

Henry Etzkowitz and Loet Leydesdorff developed the Triple Helix concept in the 1990s, which contends that interaction between innovations from academia, business, and government is essential for economic growth in a knowledge-based economy. The University, through its students, provides innovative solutions for the industries which contribute to the government hence economic growth [21, 46].

Three fundamental components make up the triple helix model [22], which is a new function for universities throughout the development of innovations; the emergence of partnerships between the triple helices and the notion that each player takes on roles other than their own in addition to their usual ones. Research on the level of collaboration between university–industry–government in Indian established varied levels of relation between the three actors towards knowledge base economy [69].

Further, empirical research by Liu and Huang [47], on the

capability of university as a basic ground for the Triple Helix model in China found out that universities need to have capabilities that make them relevant in the model, commercialization of university projects is key to relevant collaboration and universities play a key role in national and regional development.

2.2. Empirical Review

Universities around the world are adopting an increasingly entrepreneurial mindset by providing more than just academic programmes and viewing themselves as significant players in the innovation and economic and social development ecosystems. Higher institutions of learning in Africa and particularly in Kenya, too, have started the journey towards becoming entrepreneurial universities. The pace and style, however, varies with each institution.

2.2.1. Trends in Higher Education Landscape in Kenya

When Kenya gained its independence in 1963, it joined the majority of other African nations in having historically free higher education, with government funds covering both tuition and costs of upkeep. This was a result of the state regime's intention to develop vastly skilled personnel to take the place of the retiring colonial officials. As development needs increased, many factors changed and governments had to review the allotments [53].

The Bayh-Dole Act was enacted in the United States (USA) in the year 1980 [33]. Since then, there has been enhanced activities such as the commercialization of scientific work, together with transferal of institutional technology, intellectual licensing and patenting, and the creation of start-

ups / spin-offs. These have all been actively observed in the USA as well as in nations in Europe, Asia, Australia, Canada, and Israel.

Many African nations encountered financial difficulties in the 1980s as a result of weak economic growth, fast population expansion, and structural adjustment projects. As a result, universities had to compete fiercely with other industries for the little government funding. The Kenyan government introduced a framework for cost-sharing and cost-sharing in institutions of tertiary learning, largely owing to the sector's poor performance in promoting access and equity and a reduction in the money allocated to institutions [56].

As a result of Kenya's educational systems reform (introduction of 8-4-4 system), four additional universities were founded in the years from late 1980s to early 1990s, and the number of undergraduates enrolled increased by two-fold through a double intake [3]. At this tertiary level, the learner to teacher ratio increased very marginally, from 7.1 in 1980 hitting 8.1 in 1990, according to UNESCO [81, 86].

50% of all universities' total income came from student fees. Government capitation came in second, contributing 39%, followed by other sources of income (7%), and research grants (only 5%). In public institutions, the government contributed 48% of the income, followed by student fees (42%), research grants (42%), and miscellaneous incomes (5% each).

Research funds made up only 2% of the income at private colleges, while other sources of income provided 17%. Table 60 compares the income at communal and private establishments of tertiary education.

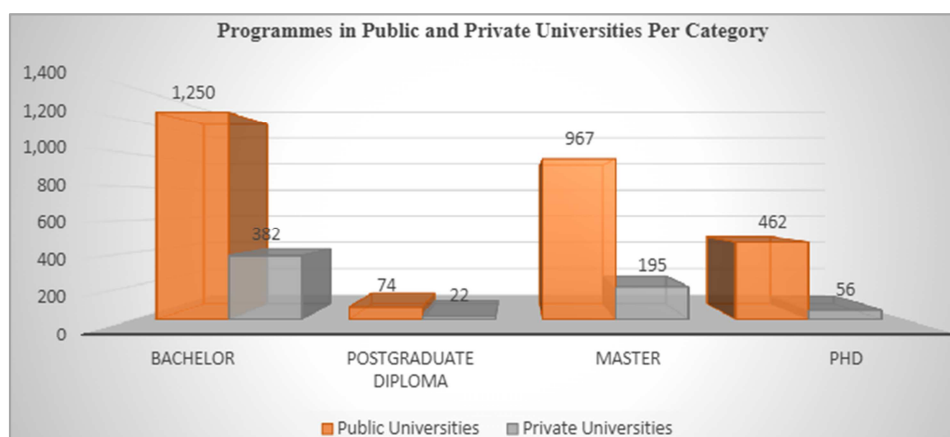
Income and Income Streams (Ksh. Millions) 2010-2014 Academic Years				
University Category	Government Capitation	Student Fees	Research Grants	Other Incomes
Public Universities	48%	42%	5%	5%
Private Universities	0%	81%	2%	17%
Total	39%	50%	5%	7%

Source: Commission for University Education, 2016

Figure 3. University incomes.

Despite the above incomes, Ksh 354.91 billion was spent by the university sector during the period under consideration (2010-2014). In comparison to private institutions, public universities spent the most money, totaling Ksh. 281.49 billion. Evidently, the expenditure was unsustainable. The university sector soon had a Ksh. 8,992.34 million operating deficit, with the larger portion of the deficit, Ksh 7,122.78 Million, being at private universities, while public further education colleges had a shortfall of Ksh 1,860.56 million (CUE, 2016). The trend was worrying and called for drastic measures.

According to Kenya's Commission for University Education, the four levels of university curricula in Kenyan universities are bachelor's, post-graduate diploma, master's, and doctorate. 48% of the programmes stood at the bachelor's level (1627), 34% existed at the master's level (1622), and 15% stayed at the doctoral level (518) as of the year the report was published [53]. Only 3% of the programmes were at the post-graduate diploma level. The majority of the programmes were offered by public institutions, accounting for 81% (2752) of the total 3,408 programmes, while private universities had 19% (655).



Source: Commission for University Education, 2016

Figure 4. University programmes.

The biggest percentage of programmes across all universities was in the humanities and arts cluster (14%). It was followed by courses in life and physical science at 10.7%, business, administration, and teacher preparation at 11.1%, and agriculture, forestry, and fisheries at 10.7% each. Manufacturing, Law, Architecture, and Veterinary were the clusters with the lowest representation, on the other hand, as per Commission for University Education in [53].

These findings, however, were not unique to Kenyan universities. According to a 2014 World Bank report, the educational systems in Japan and Britain had recently reduced funding for and the quantity of courses in the humanities and arts, in favor of applied topics that more directly address these countries' development requirements.

Most people now have the opportunity to obtain higher education owing to Kenya's rapidly growing university system. In Kenya, the quantity of university students enrolled has been constantly growing. In 2015, there were 539,749 students enrolled overall, up from 440,840 in 2014. This indicated a 22% increase. Although a country's population's level of education is a positive sign, there are some drawbacks, such as the fact that many graduates lack the skills necessary for the job market or whose credentials don't meet those requirements. This calls for ongoing programme reviews to make sure they are in line with both present and future market demands [53].

Globally Competitive Quality Education, Training, and Research for Sustainable Development are goals of the Kenya Vision 2030. The college curricula should be explicitly matched with the nation's development demands in order to accomplish the aforementioned objectives. All interested parties must investigate creative financing strategies to sustain the universities while also contributing to the national goals. Research is one of the primary objectives of higher education. It is crucial to emphasize the value of research in order to generate fresh concepts and discoveries that stimulate economic growth.

There are many disparities in the Kenyan advanced learning system. Kenya's five public universities feature among the top 100 African universities in terms of size and

innovation, yet the same Kenyan universities are in a terrible financial state. Quality seems to have suffered as a result of quantitative increase [87]. There is a glaring conflict between the need for better quality and significance through relevant programs as well as efficient learning approaches, and the social desire for greater expansion.

According to the World Development Report, the need for higher-level cognitive abilities, socio-behavioral abilities, and skill sets linked to better adaptability is growing, while the need for low skill profiles was dropping [88]. With the increasing demand for jobs while the employment market is not growing at the same rate, this trend has persisted to-date. Universities must thus position themselves to fill this gap. The World Economic Forum evaluation of the growing need for skills among African nations, asserts that many firms in Sub-Saharan Africa see a shortage of skilled workers as a major obstacle [89].

The advanced learning initiatives of the education plan, which are centred on boosting quality and relevance, addressing governance and accountability, and extending access and equity, relate what students learn to labour market demands [87]. The national education policy includes the formation of the Open University of Kenya (OUK), improving university students' retention, wellbeing, and productivity, and increasing access to STEM programmes among its top priorities.

The specific objectives of the plan, according to the national strategy, are to: increase access to STEM programmes to 60% of the student population; give academic staff opportunities to earn PhDs and the necessary pedagogical skills; establish the OUK (30% of degree programmes offered through universities); and raise the gross enrollment ratio in university education from 7% to 15%.

The World Bank policy report offers a range of options for developing and implementing a sustainable higher education financing strategy in Kenya, as well as ways to enhance the value and standard of current higher education institutions and programmes, in order to achieve the twin objectives of quantitative expansion and quality improvement [87]. The government of Kenya's stated policy priorities serve as the

foundation for this policy report. These include resource mobilization, resource allocation, quality and relevance (the relevance of university output to the labour market), system expansion, shape and size (which organizational structure would enable a fair and financially viable system expansion), and technology exploitation.

According to Munene [54], who studied the financial status of Kenyan universities, the current financial crisis is the result of the interaction of two forces: micro-level institutional governance malfeasance and system-wide macro-level policy reforms. The former comprises system development, unequal enrollment growth, quality enhancement methods, the demise of the market model, and reduced state assistance, whereas the latter also includes poor institutional financial governance mechanisms.

At 11.7 percent, Kenya's higher education enrollment percentage is much lower than that of the upper-middle-income economies it seeks to emulate. However, it is much higher than the 9.3% regional average. Kenya intends to match the standards of Southeast Asian "newly industrializing countries" including Taiwan, Hong Kong SAR, Singapore, and Republic of Korea, all of which have enrollment rates above 70%, according to Vision 2030 [87].

Economic status also significantly affects access, with the richest households participating at a rate that is triple greater than that of the second-richest earnings cluster [87]. The geographic disparities are much greater; the majority of Kenya's counties without universities are located in metropolitan areas, making up nearly half of the country.

While the state has fast-tracked the production of postgraduate study graduates who stand eligible for hiring as university faculty staff, numerous Kenyan universities still lack the necessary number of qualified staff members, according to the World Bank report [87]. As would be predicted, this lowers the standard of instruction offered in these institutions.

Student-teacher ratios have worsened over time, approaching 70:1 at certain public colleges, as a direct result of the expanding disparity between student enrollment and the supply of qualified staff. This is not made any easier by industrial actions that often

reduce the student learning time. Against this background, it is no wonder that lack of innovation capacity, frail work ethics, and an under-educated labor force were cited among the most difficult aspects of conducting business in Kenya, according to the 2017–18 Global Competitiveness Index.

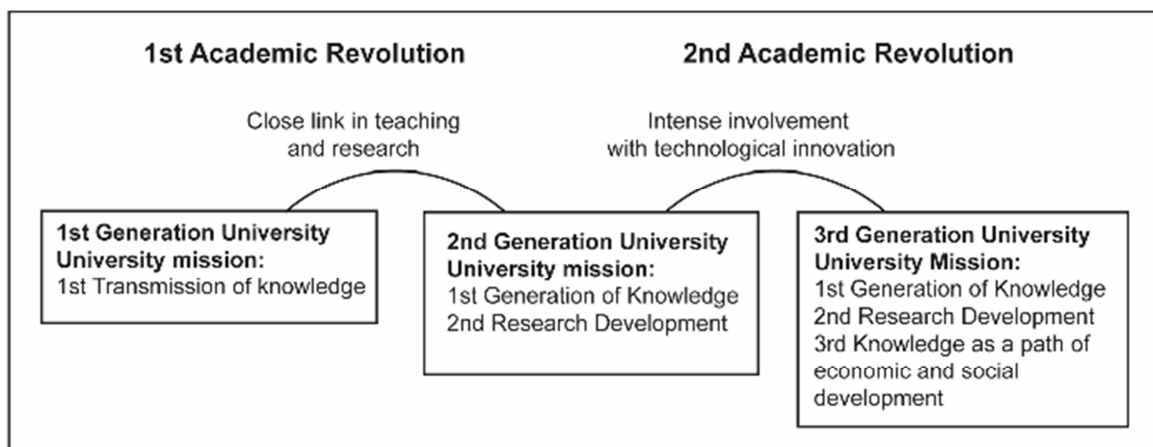
Universities in Kenya must be judged on their performance in relation to their environmental relevance. An indirect way to gauge how Kenya's universities contribute to the country's innovation system and to the growth of the regions they serve is through metrics of technology transfer. Kenya, whose output is almost as high as South Africa's, performs better than comparator countries on the continent in terms of the number of patents awarded relative to GDP [87].

The main difficulties the Kenyan government faces in the higher education sector include figuring out a financially feasible way to expand access in a fair way, improving the caliber and applicability of the programmes provided, and supporting university-based research and technology transfer. While becoming entrepreneurial universities is the promising answer, it is imperative that the Kenyan universities become part of the much-sought solution; they must fast revolutionize themselves.

The World Bank has advised the Kenyan government to look into the possibility of using allocation techniques that are not only beneficial in fostering innovation among higher education institutions but also in promoting an efficient use of public resources [87]. This programme will be essential to the accomplishment of Kenyan government's goals to consolidate and further improve its tertiary education system, together with the universities' drive to produce employable, self-employable, and market-relevant skilled output.

2.2.2. Entrepreneurial University

The first generation of institutions of higher learning were focused on disseminating knowledge previously acquired from philosophy [39]. The Second Academic Revolution kicked off after the First Academic Revolution; universities of this generation started using research activities to acquire, transmit, and integrate knowledge [70].



Source: Klein and Mafra Pereira (2021)

Figure 5. Trajectory of university's mission.

Research was fast becoming more interdisciplinary then, and hence used trustworthy methodologies, allowing researchers to contribute to knowledge development [20]. The second academic revolution ushered in the third generation of institutions of higher learning, whose mission then included knowledge transfer and economic and social growth (Laredo, 2007).

This third goal became a component of universities' study into the economic and social environments outside of academia (Laredo, 2007), having an impact on the term "Entrepreneurial Universities", as opined by Etzkowitz, [19]. In such a situation, the institution of higher learning acts as a catalyst for innovation, creativity, and economic advancement [65]. The below diagram illustrates the two academic revolutions and their corresponding traits, as well as the three generations of universities and their separate missions.

The term "Entrepreneurial University" first arose in the third generation and refers to the institution's dynamism in the pursuit of novel sources of funding and relationships between the institution and the non-academic world [19, 20, 70].

The third mission of universities, often known as engagement, has gained attention in the advanced education space, as observed by European Commission [36]. Various scholars and experts have suggested that the third mission of academic institutions is relationships between the university

and the non-academic world, including business, government, and the general public (Schoen et al. 2007).

According to researchers, it involves collaboration between institutions of higher learning and their larger communities (local, regional/state, country, and the world) for the flow of resources and knowledge that benefits both parties [16]. Additionally, the economy and society gain from it [50].

Varied research demonstrates that entrepreneurial university research is gaining momentum and featuring a number of useful special themes [17, 55, 75, 76]. However, the research's findings in this area continue to be ambiguous and unreliable [44]. The aforementioned special issues serve as representations of various nations, and demonstrate how entrepreneurial universities are a global phenomenon that would be eagerly adopted by higher education institutions across the world.

A strengthened guidance nucleus, expanded peripheral development, a diversified financing base, a stimulated academic centre, and an integrated entrepreneurial culture were the five components that Clark [13], a scholar looking for the components of the entrepreneurial university, identified from his longitudinal study with five European universities in the middle of the 1990s. The study is acknowledged as a turning point in the field's literature, claim [24].



Source: OECD, (2012)

Figure 6. A guiding framework for entrepreneurial universities.

In addition, scholars have thoroughly reviewed the literature on the growth of these universities and suggested four areas for additional research [12]. Examples of indications of the effectiveness of the Entrepreneurial University include a taxonomy of definitions, its influencing

factors, the effects of entrepreneurial concerns, and the influence of entrepreneurial issues on university activity. Additionally, they discuss the idea of integrated learning processes for university innovation.

However, with this shift in universities' self-perception

from a setting for research and education to a facilitator and enabler for the growth of ideas and the application of discoveries, serious discussions on the management and actual effectiveness of study programmes, technology transfer offices, and other university-affiliated initiatives have started [27].

Research shows that the entrepreneurial university cannot be defined in a way that applies to everyone; rather, it is distinguished by a valuable diversity of approaches that are innovative, creative, and still useful [60]. In the literature reviewed, there are numerous definitions of the entrepreneurial university that likewise fail to come to a consensus. There is therefore no standard description of an entrepreneurial institution.

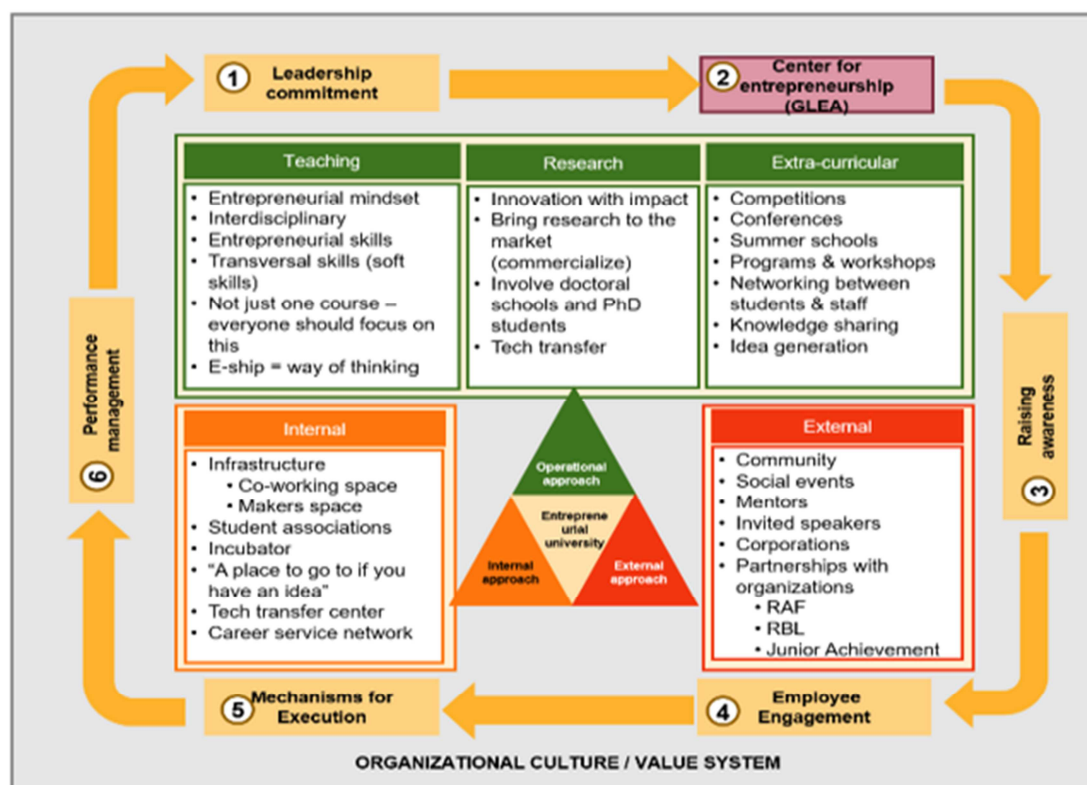
This study will thus focus more on some characteristics of an entrepreneurial institution as a means to describe the desired outcome. The below framework, guided by OECD [60], considers the various tenets that are central to the realization of an entrepreneurial university.

Since there are many features of an entrepreneurial university that are well recognized, this framework has been created around seven themes [60]. As a result, many of the definitions now in use can be supported by this guiding framework. Results obtained from this model framework serve as insights into how well change towards entrepreneurial universities is progressing in a university, provide a foundation for planning sessions, and facilitate creation of strategic plans. Results may also serve as a benchmark against which future progress can be monitored and evaluated.

There are other ways to enhance entrepreneurship as well as an entrepreneurial training in colleges [60]. Based on thorough study, they offer a brilliant ideal of an entrepreneurial institution of higher learning. Such a model incorporates everyone involved and is a more intricate system of politics, education, and financing [60]. The development of a successful programme takes time since the programme directors must manage the self-interests of numerous stakeholders in order to advance such a complex organism. Even if each academic department only makes local efforts, they must have a sense of ownership over the greater university-wide programme.

The radiant approach, however, presents certain academic challenges [31]. Finding rationale for entrepreneurship programmes in non-business subjects in terms of the curriculum and faculty availability is difficult. Grecu and Deneş, [31], thus propose a tripartite approach encompassing an external, an internal and an operational approach. The approach emphasizes the significance of each one of the triple factors, recognizing the necessity of providing the necessary infrastructure and providing a place where students may gather, interact, and stimulate innovation.

The external approach distinguishes both the community's role in developing an entrepreneurial environment and the institution's interdependent interaction with the local economy and community. Research, informal and formal teaching as well as learning are the three components that are broken down into the third method in the model, referred to as the operational one [31]. This model is illustrated below.



Source: Grecu and Deneş, (2017)

Figure 7. Model of the entrepreneurial university.

The model lays out the steps to take in order to establish an entrepreneurial attitude across the board and achieve the idealized vision of an entrepreneurial institution. The leadership's commitment (university administrators) is where it all starts. The next stage is to establish a structure to coordinate and monitor the implementation of the essential reforms to turn the university into an entrepreneurial one.

In addition to important legislators, it should address students, alumni, teachers, support personnel, the broader community, and the business environment. It is a continual activity that must be ingrained in the institution's culture to raise understanding of the significance of entrepreneurship for the future of the institution and the economy.

2.2.3. Entrepreneurial University and Commercialization of Research

Since the Bayh-Dole Act was passed in the United States (USA) in 1980, these activities have all been actively observed in the USA as well as in countries in Europe, Asia, Australia, Canada, and Israel [33]. Academic entrepreneurship differs from traditional forms by respecting scientific rules, standards, and principles [77]. Often, the academia produces for the institution and grants it intellectual property. This has led to continued evolution and development of this kind of entrepreneurship.

Today, over and above delivering research parks and technology transfer offices (TTOs), entrepreneurship has continued to offer new perspectives that seek to benefit the university ecosystem on a larger social and economic scale by fostering entrepreneurial mindsets towards development. Universities with a focus on entrepreneurship today provide entrepreneurship centres, accelerators, student business idea competitions, networks of industry connections, and alumni; all involving students, alumni, and entrepreneurs [65, 77].

2.2.4. Opportunities and Challenges of an Entrepreneurial University in Kenya

Achieving the status of an entrepreneurial institution is a process that requires thought leadership and intentional strategies. Like anything good, therefore, it does not come without challenges. Getting past administrative obstacles is essential for entrepreneurial development of a university [60]. Universities with fewer barriers or hierarchies are better able to engage in entrepreneurial activities and make decisions faster.

While it might be challenging to involve the staff in this process, it becomes crucial that each person recognizes the immediate and longstanding benefits of a pledge to entrepreneurship curriculum. OECD [60] strongly recommends that the plan must be well-known throughout the organization and recognized as a top priority by both employees and students in order to perform well. Internal communication initiatives should be used to spread and support the commitment [57, 58]. The method of implementation refers to providing all parties with the tools they need to carry out the strategy as we advance towards a university-wide entrepreneurial approach [31].

For it to be successful, the process must carry along all stakeholders [43]. One of the most important tasks that universities play in their communities is supporting and promoting local, regional, and social development. The universities that play a major part in the community and are connected to their surroundings will perform well in assessments towards becoming entrepreneurial universities [60]. Providing resources to people beyond the institution, taking part in regional clusters, promoting nearby social and artistic events, presenting prospects for native start-ups or recognized businesses, and actively participating in deciding the strategic course of local development are a few examples of how external stakeholders can be included.

The organizational structures and methods used by universities may limit their ability to engage in the kinds of entrepreneurial activities that serve their strategic goals [60]. The institution must put in place particular frameworks that support the growth of entrepreneurship in all areas of activity. For universities to give entrepreneurial learning and to be entrepreneurial in their approach, structures are essential.

Sustainability of the entrepreneurial activities is critical for continued self-sustenance of the institution. The credibility and influence of university entrepreneurial activities will increase if they can be sustained over the long term. Students and all staff are important internal stakeholders who support the entrepreneurial goal. Collaborating across faculties, departments, and other organizational structures will enable the institution as a whole to break down old barriers and silos and create linkages and synergies. Systems should be in place at universities for utilizing internal knowledge and resources to get high scores.

A major challenge for an entrepreneurial higher institution of learning would be the limitation of space; previously enrolment was pegged on classroom and / or hostel capacity. In the journey towards entrepreneurial universities, delivery of content must also be revolutionized to accommodate more people and a wider scope. The guiding framework by OECD [60], advocates for varying the ways to teach entrepreneurial skills that may be implemented across an entire university [59].

Skills are not just taught through standard lectures in institutions that value entrepreneurial learning; a variety of other strategies are used to achieve the necessary learning objectives. These include incorporating short and targeted courses for entrepreneurs within the community, investing in and selling research findings to relevant organizations for implementation through consultancies etc. Students can develop and operate their own businesses, participate in competitions and get awards, serve as entrepreneurs' ambassadors, and run clubs in addition to using mentors, living laboratories, cross-disciplinary learning, etc.

3. Research Methodology

Due to the exploratory character of this work, data were gathered and analyzed using a desktop review from online databases, the Internet, and government sources [10, 52]. This method, which uses secondary data, is less common

than field research but is nonetheless quite successful. It was shown to be extremely helpful after Covid-19 inhibited physical activity.

The Covid-19 epidemic had a significant impact on research approaches and methodologies, as it put the traditional ways of conducting research to the test. Examples of the covid-related measures included border shutting, solitary confinement rules, necessary PCR (Polymerase Chain Reaction) tests, curfews, as well as social distancing requirements that restricted mobility and rendered face to face interviews undoable.

Secondary analysis can significantly advance knowledge and give guidance for future research [61]. These authors further opine that researchers who had performed the original research also gain extra information via the usage of secondary data; insights that they utilize to validate furtherance of their original studies.

Secondary data can be acquired from a wide range of sources, ranging from census data, information collected by government organizations, records maintained by groups, and data that was initially collected for other sorts of studies [34]. For this study, journal articles and academic papers on the challenges facing universities and how to overcome them were also reviewed.

The study provides a scoping review in this research area, which is a thorough literature evaluation that provides comprehensive research answers. Scoping reviews, which are a modern method of reviewing literature, concentrate on examining the literature to determine its volume and potential reach in a certain field [84]. Rather than providing a detailed solution, they provide a comprehensive overview.

While systematic reviews' primary objective is to summarize obtainable evidence (hypothesis testers), scoping reviews have the primary objective of offering a general view (hypothesis creators). Systematic reviews also consider a narrow range of study types, while scoping reviews may contain both primary and secondary research, depending on the objectives of each scoping review.

4. Findings

For a number of reasons, the landscape of higher education is shifting. Higher education institutions have faced external difficulties such as intense rivalry and a decline in student enrollment. Increased assessment and accountability procedures, declining state funding, and lower endowments all have an impact on public higher education institutions [64]. The issue is that the majority of African countries' higher education systems do R&D at the greatest rates, which emphasizes the necessity for entrepreneurial institutions.

Whereas, most of the studies indicated scarcity of funding, it is noted that funding sources for entrepreneurial plans within universities in Ethiopia were found to be more limited as compared to those in Ghana and Kenya, while South African universities had relatively better sources of funding in their entrepreneurial activities [11].

Authors contend that there is a global movement underway

to transform universities into entrepreneurial institutions that actively participate in the creation of new businesses in their communities in addition to playing the traditional roles of producing and disseminating scientific knowledge [23]. Universities become a more significant component of the national innovation system as a result of their closer and more frequent interactions with enterprises and the government [62].

The introduction of entrepreneurial degree programmes, the creation of corporate alliances, the growth of entrepreneurial cultures and ecosystems, and the advancement of initiatives and programmes for the commercialization of scientific research are examples of strategies [83]. One major milestone towards entrepreneurial universities, as proposed by UNCTAD, is the success of institutions of advanced learning in commercializing research outcomes and conducting enterprise-relevant research.

In the Kenyan context, an immediate influx of funds is required to ease the financial train the Kenyan university sector is currently experiencing. However, a long-term strategy demands a multifaceted, innovative reconsidering of financial techniques to fund tertiary education [54]. This necessitates a carefully thought-out and structured state support programme for both public and private universities, transparency in institutional financial decision-making, the separation of ownership and management at private universities, budget decisions based on realistic enrollment trends, and the employment of financial managers rather than academics—as is the case at the moment—to direct financial decisions.

Moreover, the 2022 presidential working party on education reform in Kenya established that Kenyan universities relied heavily on government allocation, thus over-relying on government to finance its operations and thus students with a variety of specializations might benefit from entrepreneurship education by closing the gap between classroom philosophies and notions and real-world experiences. Numerous universities that strive to teach students in an entrepreneurial classroom characterized by variety employ the tactic of bringing students from non-business areas closer to the business school.

A different method of entrepreneurship education at the university involves providing lessons about entrepreneurship from within a particular discipline, which sends a message pertinent to the field itself [31]. This way, entrepreneurship would readily provide a reform and transformation agenda for state sponsored universities in Kenya and beyond. But such successes are few and far between, yet it is an eye-opener that an entrepreneurial culture in the university sector in Kenya could not only make universities more resilient and sustainable but can also improve the academic well-being of both faculty and students.

4.1. Recommendations

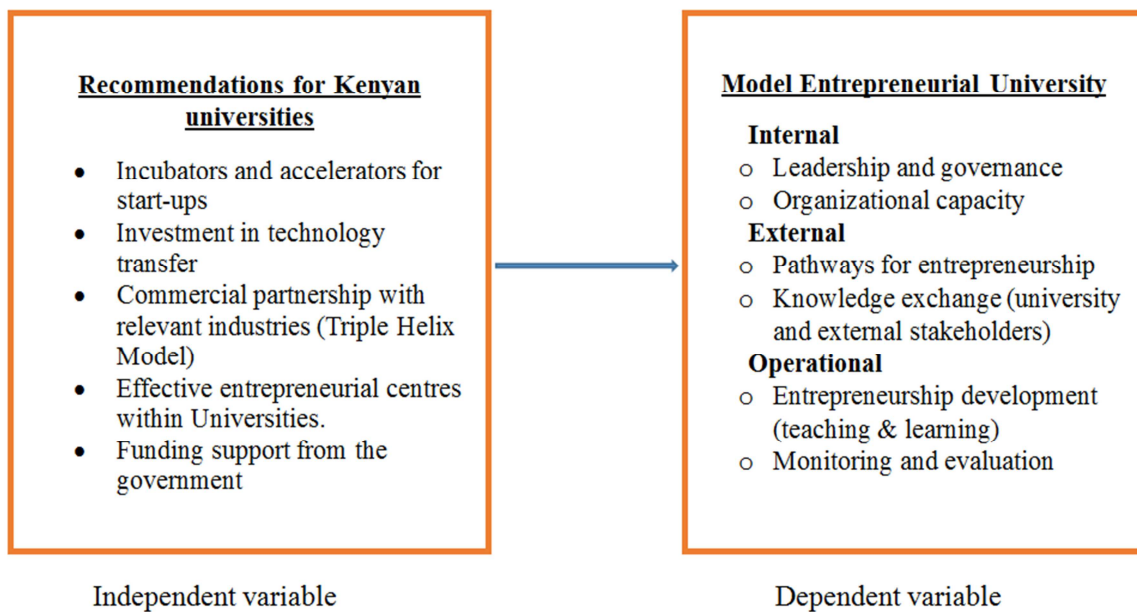
In summary, the researchers recommend varied and multi-pronged efforts by Kenyan Universities towards their sustainability. Setting up incubators and accelerators for

start-ups and commercializing them would help Kenyan universities to not only become relevant to the entrepreneurial eco-system, but the collaboration would also inform research on emerging issues, thus making it more pragmatic for the ecosystem. Investment in technology transfer would then help the universities to attract tech-savvy students who would use their creativity to advance themselves, the universities and the business environment at large.

Official commercial partnership with relevant industries in furtherance of the Triple Helix Model Provides a huge step in the right direction for any university seeking to become an entrepreneurial university. Establishment of effective

entrepreneurial centres offering entrepreneurial education within the universities will further create an environment conducive for collaboration and mutual advancement.

Lastly, funding support from the government, like in the just released new financial model by the KENYA KWANZA Administration, will help boost the Kenyan universities towards becoming the entrepreneurial universities they desire to become. The investment must, however, be utilized with an entrepreneurial mind to yield income, rather than just spend without considering the return on investment. The below diagram presents a model enlisting the proposed actions as the independent variable, while the model entrepreneurial university is the dependent variable.



Source: Researchers', 2023

Figure 8. Proposed actions towards entrepreneurial universities.

4.2. Conclusion

Entrepreneurial universities stand to provide solutions to the problem facing African governments by imparting skills required by job markets and, in this case, Africa's universities must set themselves up to be entrepreneurial by nature. However, much needs to be done on the context of institutions of higher learning. An arising issue is how to transform the institutional environment through fostering an entrepreneurial organizational culture at higher education institutions, which will increase their focus on future policy initiatives that will involve human capital.

An increasing number of new studies on entrepreneurship ecosystem show the measures embarked on by institutions of higher education as well as governments, towards economic sustenance through entrepreneurial support. There is need for additional research to validate the efficacy of financial measures undertaken by the African Universities and more so in the Kenyan context. Nevertheless, although much has been said on measures to improve the operationalization of the

institutions on regular basis, for the long-term viability of these institutions, it is necessary to better understand the various grant processes that are likely to be used.

5. Policy Implications

The study established that there is urgency for African countries to establish entrepreneurial universities. This is because, owing to the continent's rising need for higher education, there is a chance to build and create new academic institutions that are entrepreneurial from the start. Therefore, a temporary fix to the financial crises of universities in Kenya calls for an immediate cash influx, but a long-term plan calls for a multifaceted overhaul of advanced education funding at the countrywide and institutional levels.

Towards this end for the conventional university to navigate towards entrepreneurial university, the institutions need to concentrate on important areas including entrepreneurship development in learning and teaching, inclusive management and governance, organizational capability, people and incentives, and pathways for entrepreneurs. Moreover, there is

need to integrate academic and research units of HEIs based on erasing the edges of traditional disciplines and on creating start-ups as a means to promote economic development. Moreover, there is a need to establish close ties with the business community and society, the introduction of business incubators at the institutions, and the regular improvement of the universities' information structure.

In addition, a focus on entrepreneurial universities as internationalized institutions, relationships between universities and businesses and the outside world for knowledge exchange, and measuring the impact of entrepreneurial universities are additional essential areas that would require strengthening the culture of entrepreneurial universities. Although most Kenya universities especially the leading universities in the county have clear management structures, there are obstacles relating to a lack of autonomy in engaging in entrepreneurial activities, and the leadership's level of commitment to putting entrepreneurial initiatives into action is tepid.

The Government, through the Presidential working party, proposed a measure of structuring university financing in Kenya based on scholarship, loan or both to the students, given the financial limitation in the government, this model though highly welcomed it might not cure the university financial crisis. To avert a scarcity of funding entrepreneurial activities in Kenyan universities, it is necessary for the universities to pursue an ecosystem funding model that would draw support from multiple sources and not depending solely on government. Hence its necessary for higher education governance structures to be established to enable entrepreneurial universities to increase their funding through the triple helix model which can draw funding from alumni donations, local private funding and from external sources.

Moreover, with the reduced financing the university management of universities in Kenya should have strong commitment towards implementation of entrepreneurial strategy through the higher education programme of Universities by inculcating the necessary entrepreneurial culture among the staff and sensitizes the academic staff on pursuing relevant applied research for industry that generates revenue for the university, be on the front in the development of intellectual property and mentor students in the incubation centers to raise the quantity of spin-off enterprises.

For entrepreneurship to be embraced at university level, there must be intentional strategies such as positive attitude of the institution's community towards role models, entrepreneurship, and academic reward systems, support structures to create new startup businesses, organizational and governance structures, entrepreneurship teaching methodologies and entrepreneurship education to introduce it at the preceding education levels namely primary and secondary schools. Entrepreneurship education must thus be embedded at both formal and informal education. Using integrated and online tools, an effective and region-relevant entrepreneurial curriculum must be enforced across all academic fields and courses.

Towards stability and sustainability of the curriculum,

government and stakeholders must train teachers on entrepreneurial education, encourage the private sector to sponsor entrepreneurial education and skill building, promote stakeholder networks and create a strong coordination mechanism with well-defined mandates.

6. Limitations and Future Research

This study was a desktop review and thus it used secondary data. Although secondary data is widely available and may be simple to acquire, making it useful for sectors that need quick findings, it is recognized to have several flaws [37, 51]. The disadvantage of secondary data, as observed by scholars, is that it is obtained by a third party, therefore the researcher may not have complete control over the technique [9]. Owing to this limitation, additional confirmation of the results using primary data collection may be necessary.

Future research would help identify country and institution specific strategies that would fast transform the Kenya universities towards relevance in terms of research, the students they churn out, and build capacity for their own sustainability. Nonetheless, this research offers insights into the response strategies towards entrepreneurial institutions of higher education in Kenya, to align the universities to the global need for higher institutions of learning to present pragmatic solutions to the cyclic global economic recessions and other developmental challenges, there is need for in-depth research that will lead to an almost scientific measure of institutional progression towards becoming an entrepreneurial university.

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Conflicts of Interest

The authors declare no conflicts of interest.

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