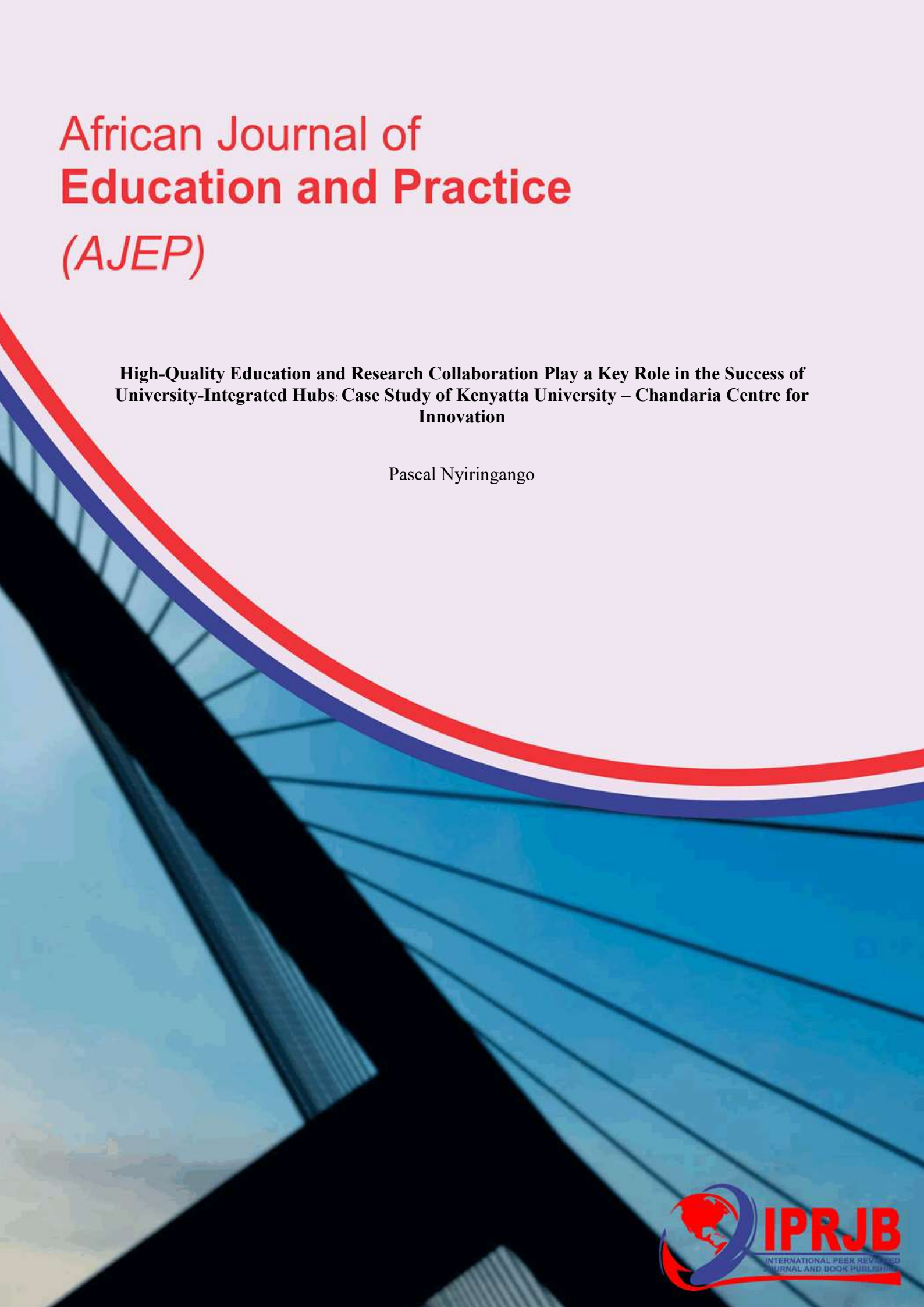
African Journal of
Education and Practice
(AJEP)

High-Quality Education and Research Collaboration Play a Key Role in the Success of University-Integrated Hubs: Case Study of Kenyatta University – Chandaria Centre for Innovation

Pascal Nyiringango



IPRJB
INTERNATIONAL PEER REVIEWED JOURNAL AND BOOK PUBLISHING

African Journal of Education and Practice
ISSN 2519-0296 (Online)
Vol.10, Issue 1, No.4, pp 46 - 55, 2024

www.iprjb.org

High-Quality Education and Research Collaboration Play a Key Role in the Success of University-Integrated Hubs: Case Study of Kenyatta University – Chandaria Centre for Innovation

Pascal Nyiringango

Article History

Received 21st January 2024

Received in Revised Form 2nd February 2024

Accepted 9th February 2024

How to cite in APA format:

Nyiringango, P. (2024). High-Quality Education and Research Collaboration Play a Key Role in the Success of University-Integrated Hubs: Case Study of Kenyatta University – Chandaria Centre for Innovation. *African Journal of Education and Practice*, *10*(1), 46–55. https://doi.org/10.47604/ajep.2304

Abstract

Purpose: This study was carried out to investigate the role played by High-quality education and research collaboration in the success of university-integrated hubs.

Methodology: The study used Kenyatta University –Chandaria Centre for Innovation as the case study. The study employed a qualitative method and was descriptive by design. To cover all the variables, the study employed a theoretical framework that combined; Social Network Theory, Resource-Based View (RBV) Theory, and Institutional Theory. The theoretical framework allowed the researcher to investigate the role of social networks, resources, and institutional arrangements of the university in the success of university-integrated hubs.

Findings: The study findings showed that indeed there has been collaboration between researcher and also between the university and the private sector. These social networks together with resources and institutional arrangements at the university have greatly contributed to the success of the ihub. Despite the success however, there are still challenges which include; poor funding for research, high internet costs, lack of national policy on intellectual property, internal weaknesses included; poor state funding, lack of national policy on intellectual property, expensive internet services, non-commercialization of innovations and many others.

Unique Contribution to Theory, Practice and Policy: For University embedded ihubs to achieve their intended goal, the study give several suggestions such as increased research funding, fast tracking national policy on intellectual property, access to financial assistance and many others.

Keywords: *Education, Research, Innovation, Knowledge Transfer, Integrated Hubs, Ecosystem*

INTRODUCTION

High-quality education and research collaboration play a key role in the success of university-integrated hubs. These hubs are ecosystems that foster innovation, entrepreneurship and social impact by connecting academia, industry and government. High-quality education equips students with the skills, knowledge and mindset to become agents of change in their fields and communities. Research collaboration enables the generation and dissemination of new knowledge, insights and solutions that address local and global challenges. By combining high-quality education and research collaboration, university-integrated hubs can create a positive feedback loop that enhances the quality and impact of both activities, as well as the reputation and attractiveness of the hub itself.

Since the middle of the 1990s, more research has been put into understanding innovation networks and clusters. Economic Sociology, Strategic Management, Industrial Economics (particularly industrial economics and the "new" economic geography), and other academic disciplines have all been the subject of ongoing theoretical/conceptual, methodological, or (mainly) empirical research. Providing in-depth analyses of the *spatial dimensions* and *mechanism*s (primarily at the national or regional level) underlying the clustering and networking phenomena in important high-tech sectors, particularly in the biotechnology, ITC, nanotechnologies, new materials, and space and defense industries, has been a major challenge shared by these research efforts.

The growing belief expressed since the late 1990s by numerous governments and international organizations (notably the OECD and the EU) that national competitiveness in a global economy lies paradoxically, as Porter puts it, in "local things" has accompanied and encouraged academic interest in innovation clusters and networks analysis. In line with this conviction, most governments in industrialized, emerging, and developing nations have implemented active cluster strategies, but with varying degrees of success. In addition to these policies, national or regional governments as well as international organizations have supported and funded a substantial number of academic studies to inform their decisions and activities in support of innovative industries, regional development, and competitiveness (Porter, 1998).

University develops and diffuses new knowledge in society and is widely recognized to impact the knowledge society and knowledge economy (Etzkowitz et al, 2007). The “key to economic growth is innovation and the key to innovation is properly encouraged human talent” (Florida, 2014). (Florida, 2014). The potential of universities to foster an environment of enhanced innovation and establish a system of science-based economic development is being focused on throughout the world, but the main pillar is high-quality education and a well-structured system to support the incubator program, which is seeding and breeding university space for startups and patents ready for market. The quest to achieve Education for All (EFA) is fundamentally about assuring that children, youth, and adults gain the knowledge and skills they need to better their lives and play a role in building more peaceful and equitable societies (Unesco, 2004).

Investing in the caliber of compulsory education is crucial as developing nations experience social and economic development. This will encourage the indigenous population's creativity, especially among the 90% of the workforce that does not already engage in creative activities.

In order to start the creative process leading to inventions, it must be clear and guided. *Although the innovation process is aided by quality education and relevant curriculum, the question of whether this is also true of an atmosphere that is conducive to invention is yet open*. The process of learning, teaching, and research stimulates the idea of innovations primarily in the incubator space; it aids in accelerating quick failures and trials for experiments before commercialization, which is assumed by industry subject to pre-existing frameworks that restrict the budget between the two actors. "Creative problem-solving is the art of innovation, and some of the world's most innovative companies are systematic in following this approach (Soni, 2020).

Why did I decide on the University of Kenyatta? According to the Global Innovation Index, Kenya is one of Africa's top four innovative nations, with South Africa coming in first. This is due to South Africa's higher correlation between knowledge and growth, which is attributable to the country's greater investment in education and education remains very consistent and relevant to labor market needs. On the continent, Africa's top four innovative nations, including Kenya, are also characterized by their modern infrastructure and continued investment in education, consistent education policy.

The Global Innovation Index (GII) measures innovation in a relatively holistic way by scoring and ranking over 140 countries (Milken Institute, 2022). It contains input and output sub-indices as well as an innovation efficiency ratio which is used to generate an overall index. It's observed that many middle-income countries fit between positions 40 and 100. Kenya ranked position 88 in the GII ranking of 2022 and 3rd in Sub-Saharan Africa (KeNIA, 2022).

In conclusion, a core field of research is being done to determine the extent to which the quality of education contributes to the success of integrated university hubs by establishing a location where an ecosystem begets creativity. The paper establishes the terms pertaining to the various structures around innovation systems before we can meaningfully discuss innovation ecosystems, Of course, these can be viewed from a variety of angles. For instance, a "set of institutions whose interactions determine the innovative performance... of national firms" and a "set of distinct institutions which jointly and individually contribute to the development and diffusion of new technologies, and which provides the framework within which governments form and implement policies to influence the innovation process" are some definitions of a Kenya National Innovation eco-system and its contribution to improving university embedded hubs.

Theoretical Frameworks

University based hubs are a combination of social networks, resources and institutions. For a meaning investigation, the study and had to employ a theoretical framework that explores all those variables. This study was therefore guided by a combination of three theories which included; Social Network Theory, Resource-Based View (RBV) Theory, and Institutional Theory.

Social Network Theory

Social Network Theory focuses on the role of social relationships in transmitting information, channeling personal or media influence, and enabling attitudinal or behavioral change (Lui et al, 2017). Across all social networks, performance depends on the degree to which Reciprocity, Exchange, and Similarity are accounted for (Kilduff & Tsai, 2003). The theory explores the relationships and connections between individuals or organizations within a network. In the

context of university-integrated hubs, this theory helps to analyze how collaborations and knowledge exchange occur among universities, research institutions, and other stakeholders. The study this theory investigate the structure of networks, the strength of connections, and the flow of information and resources, all of which played a crucial role in the success of these hubs. High-quality research is often interdisciplinary, involving multiple fields of study and expertise. University-integrated hubs provide an environment where researchers from various disciplines can collaborate on complex problems, leading to breakthrough innovations. The proximity of academic institutions and businesses fosters collaborative research projects that may not have been possible otherwise (Kairit Tammets et al, 2021). Research cooperation is viewed as a unique type of collaboration carried out for the goal of research, where research is implicitly recognized as scientific investigation. Technology transfer is indirectly impacted by the scope and nature of university research partnerships through the effectiveness of the results (Indonesia Participants, 2011). Research collaboration helps institutions access expertise, resources, funds, new skills, prestige, productivity, fun, and pleasure. Scientists in small science systems do not collaborate only because they lack economic resources, but because research collaboration also demand availability of research material which can be found in the wider scientific world (Bozeman & Lee, 2005).

Resource-Based View (RBV) Theory

The Resource-Based View Theory focuses on the strategic management of resources within an organization. Resource-Based Theory (RBT) suggests that company's profits depend on its internal factors such as resources and capabilities. The diversity of these resources enables a firm to be more skilled to perform particular activities and create competitive advantage. Furthermore, the complexities of trading resources across firms may create persistence in differences in resources (Utami & Alamanos, 2023). Armando & Salazar further argued that value is the central concept, and that value emerges from the interaction of internal resources within the firm (Armando & Salazar , 2017). This suggests that in studying university-integrated hubs, the study had to examine the unique resources, capabilities, and expertise that universities bring to the hub. In particular the study analysed how these resources are leveraged for high-quality education and research collaborations. Through this theory the study was able to identify the competitive advantage that universities offer and how this contributes to the overall success of the hub. Universities typically have state-of-the-art laboratories, libraries, and research facilities that are essential for conducting cutting-edge research. These resources are available to businesses within the hub, reducing the barriers to entry for startups and encouraging research and development (Hansse and Solvoll, 2015). To overcome intra-firm knowledge asymmetries, firms must be integrated into a process of open innovation that draws on the regional knowledge capabilities and systematic innovation strengths of successful regional and local clusters. Support infrastructures are part of the regional knowledge capabilities that facilitate the commercial exploitation of public research. The assistance offered by HEIs to access support infrastructures like science parks, On-campus incubators, or Incubators in the region is related to patent publishing and third-stream activity to promote the creative process. The assistance may be supplied by the HEI itself, in conjunction with a partner, both, or neither (Minguillo & Thelwall , 2015). Long-Term Vision for Universities have a vested interest in the long-term success of their regions. By actively participating in university-integrated hubs, they contribute to the economic and social development of their communities, ensuring sustainable growth and prosperity. In Germany, the characteristics of the various economic sectors are more closely linked to academic ties

than the conditions fostered by intermediary organizations (Schwartz & Hornych, 2010). It is anticipated that science parks will serve as a catalyst for university spill over into local innovation networks (Fukugawa, 2013).

Institutional Theory

Institutional theory examines the processes and mechanisms by which structures, schemas, rules, and routines become established as authoritative guidelines for social behavior. It asks how such systems come into existence, how they diffuse, and what role they play in supplying stability and meaning to social behavior. It also considers how such arrangements deteriorate and collapse, and how their remnants shape successor structures (Scott, 2005). In this study, the theory was used to investigate how the regulatory environment, cultural norms, and institutional pressures shape the strategies and practices of university-integrated hubs. This theory helped to explain the role of institutional factors in promoting collaboration and high-quality education within these hubs.

With the above famework the study was able to investigate university-integrated hubs analyzing the role of social networks in particular the dynamics of collaboration, the strategic use of resources, and the influence of institutional factors on their success.

METHODOLOGY

The research method employed by this study was qualitative because the topic under investigation was very subjective. Secondly the topic is not about frequency but addressing the questions of ‘how’ and ‘why’. Additionally, the researcher is seeking to find out views of experts using qualitative methods which include focus group discussions and Key informative interviews.

Research Design

Brink and Wood (1998:100) state that the purpose of a research design is to provide a plan for answering the research question and “is a blueprint for action”. A qualitative, descriptive research design was chosen for this study in order to avoid biases.

Target Population

A population is the entire set of cases in which a study is interested. It is the full set of individual or of objects having some common characteristics. The target population is “the entire aggregation of respondents that meet the designated set of criteria” (Burns & Grove 1997:236). The target population in this study constituted management of ihubs and young innovators.

Sampling Method

Sample is a subset of population. An element is the most fundamental unit from which data is collected. In Social research subjects are usually views. In this study the sampling method of the study are purposive, because the researcher was seeking to collect data from people with knowledge on the subject.

Data Collection Tools

Data as defined by Merriam-Webster dictionary is factual information (such as measurements or statistics) used as a basis for reasoning, discussion, or calculation. In this study, the researcher used Primary and secondary data with personal observations. Primary data is an original and unique data, which was directly collected by the researcher from a source through

interviews. As opposed to secondary data which is easily accessible but are not pure as they have undergone through many statistical treatments. Sources of secondary data are government publications, websites, books, journal articles, internal records (Ajayi, 2007). The study used key informative interviews so that respondents could give as many views as possible

Data Collection Processes

Data collection is "a systemic way of gathering information, which is relevant to the research purpose or questions" (Burns & Grove 1997:383). Data collection started after verifying the questions reliability. The researcher arranged meetings with respondents at their most convenient time. The researcher had their phone contacts and made sure the respondent two hours before meeting time to avoid costly disappointments. The data was electronically recorded on a smart phone and then later it was transcribed.

Data Analysis

Data analysis is the process of cleaning, changing, and processing raw data and extracting actionable, relevant information that helps businesses make informed decisions (Kelley, 2023). After data collection, the study analyzed the data using Narrative analysis. Narrative analysis is a type of qualitative data analysis that focuses on interpreting the core narratives from a study group and personal stories.

Ethical Consideration

The respondents were informed of intended study and willingly participated. The researcher treated the exercise with utmost confidentiality. The information collected in this study was utilized solely for this goal, and the researcher respected confidentiality, privacy, and cultural norms. Only those participants who consented to the study were interviewed.

FINDINGS

Interviews conducted (data to compile and analyze). Chandalia Center for entrepreneurship based at Kenyatta University -Center director, and commercialization offer.

Factors contributing are:

i. The ICT curriculum is better re-aligned to the innovation aspect, which is how MPESA was created by ICT/IT students and their top-ranked innovators and creative students, but the curriculum revision plays a very large role. He made an emphasis on maker space which provide office space for innovators, labs for building prototypes and testing.
ii. He reaffirmed what the CEO had mentioned about the need for infrastructure, reasonably priced internet, qualified researchers, and instruction that is supported by real-world strategies that can result in lab testing and validation.
iii. However, he came up with a clarification that a significant amount of research comes from engineering (ICT/IT), and potential for venture creation due to the modules offered like rapid prototyping which helps them to observe trends of opportunities available for commercialization. He continued by saying, however, that much research done is not for entrepreneurship purposes, the majority cannot be patented due to poor knowledge of making claims of IPR as well and patent lawyers become very expansive for the younger innovators.

iv. Engineering is an Innovation domain and the oldest department at Kenyatta University (KU)
v. The majority of innovation index reports highlight Kenya's top five universities, namely Nairobi University, Kenyatta University (KU), Jomo Kenyatta University (JKUTT), Moi University, and Egerton University, whose academic programs significantly contribute to or feed Kenya's innovation ecosystem.

Results of Interviews from CEO - Association of Innovations Actors in Kenya,

According to Chez, the CEO of ASEC, Factors contributing to the success of the innovation ecosystem in Kenya are:

i. Synergy between the private sector and scientists doing research.
ii. Infrastructure and affordable internet
iii. The IHub concept was for the first time developed in Kenya.
iv. Easy access to mobile telephone handsets based on affordability contributes a lot to why Kenya is part of the big four countries in Africa ranked as the best innovation index.

Interview with the Younger Innovators from the Chandalia Center for Innovations

The majority of respondents emphasized the importance of having access to physical facilities that can be used to make prototypes and conduct testing as a major barrier to product development in an academic setting. One of the innovators who has had the most success in launching new businesses claimed that he moved to Germany as a result of an exchange program between Kenyatta University and Germany, which helped with the development of prototypes and the validation of better technology. This development was made possible thanks to research collaboration, which appears to be a pillar for university-based hubs.

Challenges and Suggested Possible Solutions

Currently, there is no national innovation and commercialization policy and strategy. A draft National Science, Technology, and Innovation Policy (2021) emphasized technology transfer and commercialization of R&D outputs, but not all aspects of innovation, start-ups and innovation hubs were covered (Kimemia, 2022).

Currently, there is no dedicated fund for innovation and commercialization. The STI Act 2013 provides that at least 2% of the GDP should be allocated to R&D, and the funding level is currently at around 0.8%. However, the prevailing funding practice focuses more on funding research than funding technology transfer and commercialization of research outputs (Kimemia, 2022).

Currently, there is inadequate coordination of universities, research institutes, and government agencies responsible for technology transfer and commercialization. The STI Act (2013) has provided for the establishment of three agencies (NACOSTI, NRF and KeNIA) to spearhead science, technology, and innovation in Kenya (Kimemia, 2022).

Kenya hasn’t operationalized a national Intellectual Property policy, despite being the regional leader in innovation. Several past attempts have been made to develop an IP policy but has remained at draft level (Kimemia, 2022). As a result of concerted efforts

and a combination of support structures from the innovation ecosystem, startups that emerge from country level every year ranging from 20-900+every year (Kimemia, 2022).

Conclusion

The study was conducted investigate the role played by High-quality education and research collaboration in the success of university-integrated hubs using Kenyatta University – Chandaria Centre for Innovation as the case study. The study employed a combination of three theories namely Social Network Theory, Resource-Based View (RBV) Theory, and Institutional Theory. The study findings proved that indeed social networks play a vital in the collaboration between researchers and this has high research output. The study further showed university resources have greatly contributed to the generations of innovations. Overall therefore high quality education and collaboration have significantly contributed to the success of Chandaria Centre for Innovation.

Recommendations

- The government and all other stakeholders should fast track the formulation of national policy on intellectual property.
- The government should also fulfill commitment of dedicating 2% of the GDP to research and development. This funding should be extended to include commercialization.
- The government and the financial sector should devise means of providing financial assistance to young innovators and entrepreneurs without collateral.
- The Kenyatta University administration should ease the bureaucratic process of acquiring seed funding.
- The university administration should introduce courses that encourage innovation and entrepreneurship early enough. The ICT curriculum is better re-aligned to the innovation aspect, which is how MPESA was created by ICT/IT students and their top-ranked innovators and creative students.
- The university should also increase space especially office space for innovators, labs for building prototypes and testing.
- The university also needs to improve infrastructure especially reasonably priced internet.
- The university should also look out for qualified researchers, and instruction should be supported by real-world strategies that can result in lab testing and validation.

REFERENCES

Acs, Z. A. (2023). The knowledge spillover theory of entrepreneurship. . *Springer link.*

Anatan. (2015). Conceptual issues in university to industry knowledge transfer Studies. *Procedia-Social and Behavioral Sciences,*, 711-717.

Armando & Salazar . (2017). *The Resource-Based View and the Concept of Value The Role of Emergence in Value Creation.* México: Universidad de Guadalajara.

Bozeman & Lee. (2005). The Impact of Research Collaboration on Scientific Productivity. *Social Studies of Science* , 673-702.

Cummings & Teng. (2003). Transferring R&D knowledge: the key factors affecting knowledge transfer success. *Journal of Engineering and Technology Management*, 39-68.

De Vasconcelos et el. (2018). Unpacking the innovation ecosystem construct: Evolution, gaps and trends. . *Technological forecasting and social change,*, 30-48.

Etzkowitz et al. (2007). University-Industry-Government Interaction: the Triple Helix Model for Innovation. *Asia Pacific Tech*, 13-24.

Florida. (2014). The Flight of the Creative Class: The New Global Competition for Talent. *The foeigner affiars JSTOR*, 11-20.

Fukugawa, N. (2013). Heterogeneity among science parks with incubators as intermediaries ofresearch collaborations between startups and universities in Japan. *International Journal of Technology Transfer and Commercialisation,*, 231-262.

Indonesia Participants. (2011). *WIPO Regional Forum on University Industry Collaboration to Promote Technology Transfer.* Hanoi.

Hansse and Solvoll. (2015). The importance of university facilities for student satisfaction at a Norwegian University. *Facilities, Vol. 33 No. 13/14,*, 744-759.

Kairit Tammets et al. (2021). *Accelerating Digital Innovation in Schools through Regional Innovation Hubs and a Whole-School Mentoring Model.* Tallinn : Tallinn University.

KeNIA. (2022). *Kenya innovation outlool report* . Nairobi: KeNIA.

Kilduff & Tsai. (2003). *Social Networks and Organizations.* SAGE.

Kimemia, D. (2022). *Country report: Kenya county governments' websites analysis report.*

Lui et al. (2017). Social Network Theory. *Wiley Online Library*, https://doi.org/10.1002/9781118783764.wbieme0092.

Milken Institute. (2022). *Global Opportunity Index: Focus on Emerging Southeast Asia.* Milken : Milken Institute .

Minguillo & Thelwall . (2015). "Which are the best innovation support infrastructures for universities? Evidence from R&D output and commercial activities," Scientometrics, . *Springer;Akadémiai Kiadó, vol. 102(1),* , 1057-1081.

Mok & Yuda. (2021). Managing the COVID-19 pandemic crisis and changing welfare regimes. *Journal of Asian Public Policy*, 1-12.

Phillips et el. (2016). Innovation ecosystems: A critical examination. *Technovation*, 1-6.

Porter, M. (1998). *The Competitive Advantage of Nations.* Macmillan Business.

Schwartz & Hornych. (2010). Schwartz, M., & Hornych, C. (2010). Cooperation patterns of incubator firms and the impact ofincubator specialization: Empirical evidence from Germany. *Technovation*, 485-495.

Scott, R. (2005). Social Theory (general). In G. R. (ed), *Encyclopedia of Social Theory.* SAGE Publications, Inc.

Soni. (2020). *Design your thinking: The mindsets, toolsets and skills sets for creative problem solving* . Penguin Random house of India : New Delhi.

Unesco. (2004). *Inclusive Education.* Jakarta: UNESCO.

Yamada, R. (2015). *Impact of Higher Education Policy on Private Universities in Japan: Analysis of governance and educational reform through survey responses.* Tokyo: MEXT.