



(RESEARCH ARTICLE)



## Innovation Hub as a Catalyst for Research(er)-Led Innovation Outputs

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### Abstract

Despite the benefits of having an innovation hub in a university and the calls by the stakeholders in the Technical University of Mombasa (TUM) Strategic Plan 2018-2022, there is no conducive physical space within the university that supports multidisciplinary TUM researchers to converge among themselves or with external stakeholders, to continuously brainstorm and co-create innovative solutions. As a response to these calls, this study explores innovation hubs and centres in top universities, with the aim to draw lessons and inspiration of setting up one at TUM. This study adopts exploratory research design. By being part of a broader research study, empirical data will not be collected and analysed at this stage. With the insights from the review, the study proposes the repurposing of an existing building space within TUM into a physical innovation hub. We envision that the innovation hub will contribute to the following lasting benefits for TUM: enhance TUM's contribution to a better society; increase TUM's reputation; enhance the quality of TUM's research; as well as generate income for TUM.

**Keywords:** Innovation Hub; Innovation Centre; Innovation Lab; TUM; Review

## 1. Introduction

### 1.1. Background Information

Innovation hubs provide a physical conducive space that allow a wide range of stakeholders to meet and co-create solutions (Chirchiatti, 2017; Friederici, 2017; WITS, 2022). The hubs encourage interaction, co-creation, collaboration, and team formation and facilitates chance encounters. A hub is about connecting people as well as nurturing ideas (Chirchiatti, 2017). Most hubs include meeting rooms; co-working areas; lounge/ hang-out areas; and events/ meet-ups areas. Such a space allows research ideas and promising start-ups to get discovered (Chirchiatti, 2017).

The top ranked universities by Webometrics globally, in Africa and in Kenya, all have a number of innovation hubs (Cybermetrics Lab - CSIC, 2024). The innovation hubs have helped the said universities:

- To contribute to a better society;
- To raise the quality of their research;
- To raise their reputation and visibility
- To generate income through innovative outputs (products, processes, services, policies, or ideas)

The Technical University of Mombasa (TUM) is an ISO 90001-2015 certified public institution established in accordance with the Universities Act 2012 and TUM Charter 2013. Since its inception, TUM has been guided by the 2014-2018 Strategic Plan, the 2018-2022 Strategic Plan and now the 2022-2027 Strategic Plan.

Derived from the Universities Act 2012, TUM is specifically mandated to:

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- Provide quality university education and training that meets international standards
- Stimulate intellectual participation of students and staff
- Provide a foundation for professional development
- Carry out research and innovation activities
- Participate in discovery, preservation and application of knowledge
- Engage in production of goods and services, linkages and partnerships with industry
- Contribute to community service and transfer of technology for development

### 1.2. Statement of the Problem

Research has demonstrated the benefits derived from a university having an innovation hub, lab or centre (Bertha Centre, 2022; C4DLab, 2022; Chirchiatti, 2017; Harvard i-lab, 2022; WITS, 2022). The innovation hub: enhances the university's contribution to a better society; increases the university's reputation; enhances the quality of the university's research; as well as generates income for the university. All the current top ranked universities by Webometrics globally, in Africa and in Kenya, have at least an innovation hub, centre or lab (Cybermetrics Lab - CSIC, 2024).

In a bid to deliver on its mandate, TUM's Strategic Plan 2018-2022 (TUM, 2018) identified a number of its strengths, weaknesses, opportunities and threats. From the engagements with stakeholders, different calls were made. Some of them were:

- Increased activities to improve TUM's visibility
- Enhanced linkage between TUM and industry players
- Increased engagement in research and consultancy services
- Sustained networking and collaboration to promote TUM

There is therefore a legitimate need for a conducive dedicated space where staff and graduate students from the different schools and institutes within TUM can meet to collaboratively brainstorm and co-create innovative solutions among themselves or with partners from external stakeholders.

This study is a response to the four specific calls by the stakeholders in TUM Strategic Plan 2018-2022 (TUM, 2018). By extension, it is also in line with TUM's vision and mission; the BIG Four agenda and Kenya's Vision 2030.

### 1.3. General Objective of the Study

The goal of this study is to explore innovation hubs and centres in top universities. We aim to draw lessons and inspiration from the hubs and centres with the specific objective of setting up one at the Technical University of Mombasa.

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## 2. Methodology

This paper adopts an exploratory research design. Exploration and analysis is conducted on select innovation hubs and centres domiciled at top universities as per the Webometrics rankings. The goal is to draw lessons and make recommendations towards the setting up of an innovation hub at the Technical University of Mombasa. Being part of a broader research study, empirical data will not be collected and analysed at this stage.

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## 3. Results

In the latest university rankings by Webometrics, as of January 2024, Harvard University and Stanford University were ranked position one and two respectively. In Africa, University of Cape Town and University of the Witwatersrand (WITS) were ranked position one and two respectively. Back home in Kenya, University of Nairobi and Jomo Kenyatta University of Agriculture and Technology (JKUAT) were ranked position one and two respectively. Technical University of Mombasa was ranked position 32 in Kenya and 9,665 globally (Cybermetrics Lab - CSIC, 2024).

The rest of this section paints a picture of some innovation hubs and centres across the above listed top universities.

### **3.1. Harvard University – Harvard Innovation Labs (Harvard i-lab)**

The Harvard i-lab provides physical and virtual space where students, faculty and alumni from all the 13 schools in Harvard university can meet to collaborate, turn their ideas into reality, and to connect with external partners (Harvard i-lab, 2022). It provides a conducive space for innovation and entrepreneurship support in a multidisciplinary setup.

Harvard i-lab has achieved the benefits that an innovation hub offers (creating a better society; raising the reputation of Harvard university and generating income). For example, over the last decade, the Harvard i-lab hosted over 4,700 founders from all 13 Harvard schools. The founders went on to raise over 4 billion dollars in capital. Since they were from more than 150 countries, created truly global change. Harvard i-lab prides itself to be transforming dozens of industries and creating meaningful impact that spans the private, public, and non-profit sectors.

Harvard i-lab is just one among the many physical co-working spaces within Harvard university, that house research and innovation centres, groups and institutes.

### **3.2. Stanford University – Stanford d.school**

The Stanford d.school prides itself as a community and a physical place that encourages exploration and experimentation at Stanford University. It strives to inspire creative thinking by bringing together external partners, faculty and students from all its schools, institutes, centres and research groups (Stanford d.school, 2022).

Stanford d.school is just one among the many physical co-working spaces within Stanford university, that house research and innovation centres, groups and institutes.

Students and faculty yearn to create real impact in the society. Therefore Stanford d.school programmes challenge the students and faculty to combat the actual challenges affecting the society rather than the textbook examples.

The Stanford d.school has achieved the benefits that an innovation hub offers (creating a better society; raising the reputation of Stanford university and generating income). Among the notable innovations that have sprung from Stanford d.school is d.light, a solar home systems company that has gone to improve the lives of over 125 million people across 70 countries (d.light, 2022).

### **3.3. University of Cape Town (UCT) – Bertha Centre for Social Innovation and Entrepreneurship**

The Bertha Centre is housed at the Graduate School of Business in the University of Cape Town. It has become a leading, globally recognised multidisciplinary academic space that advances social innovation as well as entrepreneurship (Bertha Centre, 2022). The centre is open to UCT students, faculty and external partners.

Bertha Centre lists the following as its core work:

- **Educating for Impact:** It is dedicated to teaching for impact, and believes that by growing and supporting a cohort of game-changing next generation leaders on the African continent, it is catalysing change.
- **Researching for Action:** In researching for action, its focus is to build an evidence base, demonstrating African-centred social innovation as well as entrepreneurship through dissemination of actionable research insights.
- **Catalysing for Change:** it strives to catalyse for change through pioneering, exploring, testing and scaling innovative initiatives with its various partners.
- **Convening for Results:** it brings together and engages stakeholders through discourse.
- **Advocating for justice:** It seeks to promote social justice through empathic advocacy and presenting evidence to policymakers on social impact.

### **3.4. University of the Witwatersrand – Tshimologong Digital Innovation Precinct**

It is a physical innovation and incubation hub fully owned by the Wits University. It is an incubator aimed at commercialising the research outputs of Wits university faculty and students (Tshimologong, 2022).

The hub offers venue hire and rental spaces, a co-working space, software development, animation development, masterclasses and short courses as well as community innovation events. It has so far incubated 159 start-ups and 231 entrepreneurs.

### 3.5. University of Nairobi – Computing for Development Lab (C4DLab)

C4DLab is an innovation hub based at the University of Nairobi. It offers an attractive and conducive physical space where multidisciplinary researchers can collaboratively co-create solutions (C4DLab, 2022). It provides start-up incubation and acceleration services, research and development, as well as curates innovation events in the form of workshops, seminars, bootcamps and innovation weeks.

C4DLab has attracted research funding from various stakeholders including: Google, Microsoft, CISCO, IBM, UN-Habitat, UNICEF, Oracle, Barclays Bank, GIZ, Embassy of Finland, Intel, Uber and Shell Foundation

C4DLab is open to the staff, students, alumni and external stakeholders of the University of Nairobi.

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## 4. Discussions: Lessons from Innovation Hubs and Centres

### 4.1. Framework for the Research Process to Innovation Outputs

According to WITS (2022), the inputs to an innovation process within the university setup will include:

- Students – undergraduate and postgraduate;
- Academic / Research staff – assuming that all Academic staff are expected to be “research active”.
- Non-Academic/ Professional staff – those tasked with running the university’s systems and operations.
- External stakeholders – including commerce and industry, government, external communities, etc.

Innovation can arise out of engagement between all of these communities. Hence, we can consider the following examples of innovation activities applicable to a university:

- Research-led innovation
- Researcher-led innovation
- Student-led innovation.

In arriving at the definition of “research-led” and “researcher-led” innovation, WITS (2022) relate “innovation” to new ideas coming out of “research”. “Research” is both a process and a result, both a verb and a noun. The verb “research” refers to a methodology that answers a question (the “research question”) by drawing on existing knowledge to synthesise new knowledge. The noun “research” is this new knowledge. In some contexts, this new knowledge can also be labelled as an “invention”.

The way to go about finding an answer – the verb “research” – draws on a long tradition of academic practice. The solution to the problem – the noun “research” – can be used in a variety of different ways. WITS (2022) clusters these outputs within two groups:

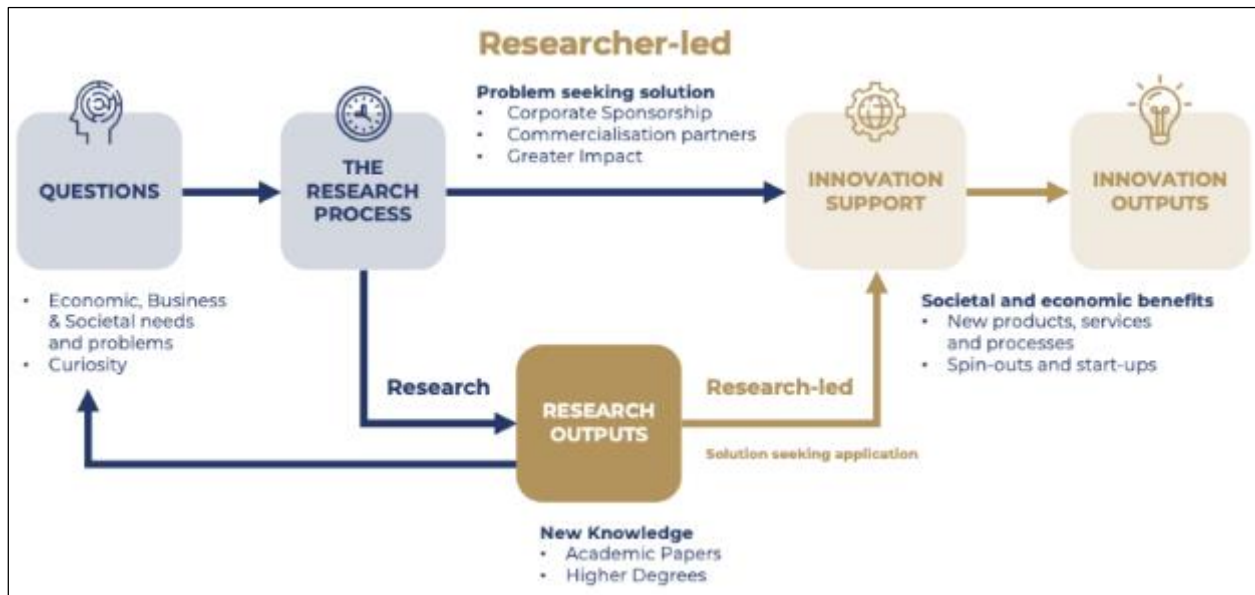
**New Knowledge:** the solution is shared via academic publications, theses, dissertations, books, patents, and other forms of knowledge and in the intellectual development of people who gain new insights.

**“Innovation”:** the new knowledge is embodied in new products, services, processes; policies; organisational practice, professional practice etc and delivered to society using mechanisms such as companies (for-profit, non-profit or state-owned, start-ups, spin-offs) or other types of organisations.

Starting from “research” we can distinguish between “research-led innovation” and “researcher-led innovation”. Consider the process depicted in the flow chart on Figure 1

Research questions can either arise from a researcher’s curiosity and experience or can originate from the desire to address problems and needs in society. Such problems and needs might be identified by researchers themselves or may be brought to the researcher by others.

Research outputs can be in the form of academic publications and/or higher degrees, and can lead to valuable outcomes in society, such as skilled graduates, new knowledge in a discipline, etc.



**Figure 1** Framework for the Research Process to Innovation Outputs (WITS (2022))

A researcher, or others, may use the outputs to consult and to inform further research. Where there is the possibility of innovation, a researcher can choose to further develop the ideas into products, services, processes or other outputs which can be made available to society to use. In Figure 1 this is referred to as “research-led” innovation.

Existing companies or other stakeholders may support research by providing funding or other resources. They may choose to use research outputs as well as possibly collaborate during all steps in the process. This often requires contracts or other formal arrangements. In Figure 1 this is referred to as “researcher-led” innovation.

#### 4.2. Proposed Innovation Hub in TUM





**Figure 2** Architectural illustration of the imagined innovation hub

We propose repurposing a large classroom to serve as a physical innovation hub in TUM. It will involve redesigning the interior of the room, reinforcing it with security grills as well as furnishing it. This will be to make the hub attractive and conducive for both TUM faculty and students as well as top executives from external stakeholders. Figure 2 shows an architectural illustration of the imagined innovation hub.

For the purpose of this study, we envision that the proposed innovation hub at the Technical University of Mombasa will serve as a catalyst for both research- and researcher- led innovations.

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## 5. Conclusion and Future Directions

From the innovation hubs and centres reviewed, it is clear that there are benefits to the universities that host them. The benefits include: contribution to a better society; increase in the quality of the research; increase in the reputation and visibility of the universities; and generation of income through innovative outputs (products, processes, services, policies or ideas).

We envision that the innovation hub will have the following lasting benefits:

- Contribute to building a better society: By finding innovative solutions to local and global challenges TUM academics and students will play a role in building a better Mombasa, Kenya and a better world.
- Raise the quality of TUM's research: The users of the innovation hub will increase their research metrics, including international reputation, quality of publications, access to funding, etc.
- Raising TUM's reputation: The innovation hub will enhance TUM's reputation as a leading participant in the knowledge economy. TUM will also become more attractive to students and sponsors who value innovation.
- Generating income: innovation outputs from the hub such as products and start-ups could result in substantial financial benefits to the individual, their research group or School, and the University.

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## Compliance with ethical standards

### *Disclosure of conflict of interest*

No conflict of interest to be disclosed.

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