

# Pathways to Entrepreneurial Culture in Universities: Applying Intrapreneurship Theory to Practice at Kyambogo University

ZAIDI KITAGAANA

*Kyambogo University, Kyambogo*

*kitagaana@yahoo.co.uk*

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## Abstract

The main purpose of this paper was to analyse the in which entrepreneurial culture can be infused in universities. The study adopted the intrapreneurship theory. Universities are being required to operate more entrepreneurially, commercialising the outcomes of their research and spinning out new knowledge-based enterprises. Against this background, the study explored the culture of entrepreneurialism at Kyambogo University, in the Faculty of Engineering. The study attempted to answer the question of how the entrepreneurial culture among academic staff in universities can enhance entrepreneurship. The study adopted a descriptive case study design. Data was collected through one-on-one interview, document analysis and site visit and analysed thematically. The findings show that the existing entrepreneurial elements, such as the promotion of a close relationship with the business community and the promotion of teaching of entrepreneurship, are loosely coupled with one another, and that there is an infant entrepreneurial culture at the faculty. Additionally, the study uncovered a number of impediments to the deepening of an entrepreneurial culture, including bureaucratic procedures, limited incentives, and limited financial and technical support for innovative ideas. It was concluded that: Kyambogo University policies are not fully activated to steer entrepreneurship; infrastructural units at the university lack the bargaining strength to negotiate official licensing contracts with industry; and less attention has been given to deepening analysis of how entrepreneurship is mainstreamed in the university. The study recommended that university management should ensure that entrepreneurial activities are fully integrated into all programmes and actions of the university. The main contribution of this paper is that the findings may help universities to design policies that can stimulate entrepreneurial activities.

**Keywords:** *Entrepreneurial culture; Entrepreneurship; Entrepreneurial university; Intrapreneurship.*

## Introduction

In this study, I set out to analyse how the entrepreneurial culture among academic staff manifests at Kyambogo University (KyU). The earliest medieval universities were envisioned as teaching-only institutions, places for interaction between the scholars and students (Clark, 1983). However, the beginning of the 19th century, mainly through the influence of the Humboldtian university model, saw the emergence of research as a second function of the university (Nybom, 2003, p.144). Later, the enactment of the Morrill Act in 1862 in the USA broadened the mission of the university to embrace entrepreneurship (Duderstadt, 1999).

Entrepreneurship is acting upon opportunities and ideas and transforming them into value for others (Kourilsky, 2003). It is characterised by three main dimensions: innovativeness (creativity and experimentation); proactiveness; and then risk-taking (Yemini, 2014). Research on the entrepreneurial university has seen a significant increase in the past three decades but with less emphasis on the involvement of lecturers as the source of resources (Rothaermel et al., 2007). The growing literature is largely scattered and consensus as to what an entrepreneurial university entails is yet to emerge (Audretsch, 2014). Part of

the confusion can be attributed to the lack of agreement on the meaning of the word ‘entrepreneurship’. According to Gibb et al. (2012), about one hundred definitions of entrepreneurship are currently in use. The difference in studies is, therefore, a reflection of this difference in conceptualising the word ‘entrepreneurship’ and its variants (entrepreneurial, entrepreneurialism).

According to Clark (1998), an entrepreneurial university, on its own, seeks to innovate in how it goes about business. It seeks to work out a substantial shift in organisational character so as to arrive at a more promising posture for the future. Entrepreneurial universities seek to become “stand-up” universities that are significant actors on their own terms. Ropke (1998) defines an entrepreneurial university to mean three things: the university itself as an organisation; the members of the university – lecturers, students and employees – who are turning themselves somehow into entrepreneurs; and the interaction of the university with the environment, the “structural coupling” between university and region, following an entrepreneurial pattern. Kirby (2002a) argues that at the heart of any entrepreneurial culture, entrepreneurial universities have the ability to innovate, recognise and create opportunities, work in teams, take risks and respond to challenges. Etzkowitz’s (2003) definition is slightly different, which is that just as the university trains individual students and sends them out into the world, the entrepreneurial university is a natural incubator, providing support structures for teachers and students to initiate new ventures. Jacob et al. (2003) look at an entrepreneurial university in terms of commercialisation of knowledge to further education courses, consultancy services, extension activities) and commoditisation (patents, licensing or student-owned start-ups).

In the coevolving, reciprocal relationship, Etzkowitz (2008) puts universities at the forefront of knowledge production. This is in contrast to the traditional models of innovation, which puts business organisations at the epicentre of technological innovation (Etzkowitz, 2013). Etzkowitz (2008) argues that universities have the upper hand in leading innovation as a result of their students. Specifically, the students who flow through the system have the potential to bring in fresh ideas on a continuous basis, giving the university the comparative advantage to innovate in a more diversified and sustainable manner.

Although the entrepreneurial culture in universities has become a popular topic, less attention has been given to a deep analysis of how it integrates in the Ugandan universities. Moreover, there are few appropriate frameworks for the conceptualisation of the transformation of universities. According to the current study, the entrepreneurial university is characterised by closer university-business partnerships, by greater lecturer responsibility for accessing external sources of funding, and by a managerial ethos in institutional governance, leadership and planning.

With regard to the entrepreneurial culture in universities, an emphasis is being put on infusing and incorporating such a culture in the mission statements, development plans and evaluation reports (Kyambogo, 2016; National Development Plan III, 2020). For instance, objective nine of Kyambogo University’s strategic plan 2012/13 – 2022/23 intends to build the capacity for entrepreneurship. This has not been achieved despite the approval of some key policies for the realisation of entrepreneurship by the University Council in 2014/15. It is anticipated that this study may contribute to a deeper understanding of the entrepreneurial culture in universities. The findings and recommendations of this study could also feed into the future strategic directions of universities in the quest to become more entrepreneurial.

## Objective of the Study

The study specifically sought to find out ways of infusing an entrepreneurial culture among academic staff at Kyambogo University’s Faculty of Engineering.

## Theoretical Review

This paper used the intrapreneurship theory to explore the changes required to take place if universities are to create a culture that supports enterprise creation and spin-offs. Intrapreneurship theory (Pinchot, 1985) suggests that if established organisations are to re-discover their entrepreneurial drive, there is a need for: commitment by senior management to entrepreneurship; a corporate model for entrepreneurship; the development of an intrapreneurial culture; the identification of intrapreneurial talent; and the monetary and non-monetary rewarding of intrapreneurs. According to this view, the entrepreneurial universities usually establish mechanisms such as a Technology Transfer Office (TTO). The tasks of a TTO include

taking the initiative to establish contact between research groups and suitable firms for their research field and facilitating contracts, patenting and licensing.

Hybrid organisations, such as cooperative research centres, strategic alliances and incubator facilities, have been created at the interface of academia and industry to stimulate innovation. A possible outcome of entrepreneurial activities at the universities is the establishment of spin-off companies that are based on new technology or available technology in new combinations derived from the university (Etzkowitz, 2003). The theory suggests that it is necessary to have clear and fair policies and procedures, and to communicate them positively. In addition, there is need to address the barriers that prevent entrepreneurship within the organisation and to create an environment that is supportive of and conducive to its development. In order to effect this, the theory proposes the formulation of a high-level strategy that demonstrates the university's intent, making it clear that the university encourages this form of behaviour, provides the university's staff with the knowledge and support to start their own businesses, and creates an environment that reduces the risk involved.

## Review of Literature

### Entrepreneurial culture in universities

An analysis of the entrepreneurial culture in universities takes into consideration an interplay among the variables at different levels. It considers the organisational level, described in the systems of innovation literature (Edquist, 2005); and the institutional level, which explains the differences among faculties and departments operating within the same university (Di Gregorio & Shane, 2003). At the organisational level, universities need infrastructure that can be used to transfer new technology to the industrial sector (Zhang et al., 2018). At the institutional level, universities need to find a way of regulating and managing a whole new set of activities, including increased funding, dissemination and internal capacity building (Sharifi et al., 2010).

Guimon, in a study conducted for the World Bank (2013), reviewed ways of promoting an entrepreneurial culture in universities. He looked at the three university missions of teaching, research and entrepreneurial university. His findings are that existing collaboration between university and industry in terms of commercialisation tends to be more informal owing to historically based cultural and institutional barriers. Relatedly, Kaweesi et al.'s (2019) study about the nature of academic research at Uganda's premier university, Makerere, also found that "research at Makerere University is partially motivated by the desire to produce new products with commercial value so as to satisfy the corporate market and promote innovation". Whereas the above studies indicate that universities, both in the Global North and Global South, endeavour to entrench an entrepreneurial culture, they do not propose an appropriate approach to promoting entrepreneurship.

A similar study conducted by Kaymaz et al. (2011) in Turkey investigated factors hindering entrepreneurship. The main finding of the study was that the academics perceive negative factors in the entrepreneurship process. The current study considered the university viewpoint. Relatedly, Cai et al. (2017), in a study carried out in China, explored why some university technology transfer organisations prevailed while others declined in their pursuance of entrepreneurship. Some limitations were observed. First, the definitions of entrepreneurial university in this study were vague. Second, while many forms of entrepreneurial university were discussed, few examined them from the perspective of their historical development. Third, none of them had systematically examined the organisational characteristics of entrepreneurial university (Zhang et al., 2018). This study tended to explore specific forms of entrepreneurial university, calling for the need to fill this research gap.

In order for a university to survive and thrive, the key factor for success is to understand that different forms of interaction are required in different ecosystems. Audretsch (2014) argues that "as an economy evolves from being driven by physical capital to knowledge, and then again to being driven by entrepreneurship, the role of the university has also evolved over time." In order to underscore this difference and make his point, Audretsch refers to a seminal paper by Etzkowitz (1983), who introduced the notion of both "entrepreneurial scientist" and "entrepreneurial university" which claims:

The entrepreneurial university integrates economic development into the university as an academic function along with teaching and research. It is this 'capitalization of knowledge' that is the heart of a new mission for the university, linking universities to users of knowledge more tightly and establishing the university as an economic actor in its own right. (Etzkowitz, 1983, p.201)

On the other hand, in an entrepreneurial society, Audretsch (2014) argues, the role of the university is broader than just being an "entrepreneurial university". The key task of universities today is to create an overall entrepreneurial thinking and entrepreneurial capital in order to contribute to a dynamic economy and to an entrepreneurial society. In other words, modern universities need to facilitate innovation and entrepreneurial-driven economic growth through new organisational models, new curricula and new research programmes that are conducive to entrepreneurial activities in the society. The point is the development of innovation, intrapreneur and entrepreneur skills among students and academic staff, encouraging entrepreneurial culture and developing inter-relationships among groups of entrepreneurs, innovators, venture capitalists, business incubators, and policy actors (Guerrero et al., 2017).

Entrepreneurial universities have an unwavering will to put knowledge to use and they do so in three principal ways. First, through the transfer of technological innovation to already established entities and through the creation of new ventures. The capitalisation of knowledge (both coming into and leaving the institution) implies a strong coupling of the university with external actors. As such, interdependence is the second feature of an entrepreneurial university (Etzkowitz, 2008). Third is independence, which echoes the much-needed autonomy entrepreneurial universities require to innovate and experiment. However, independence should not be confused with isolation from the outside world, for that would turn the university into an ivory tower. Rather, it is about having the autonomy to make discretionary decisions and to interact with the other key actors (industry and government) in a comparable basis while at the same time systematically responding to their demands (Etzkowitz, 2008). The balancing act of independence and interdependence will give the entrepreneurial university a touch of a hybrid organisation: partly responsive, partly protective.

The different features of an entrepreneurial university identified by Etzkowitz (2013) can be summarised in terms of an entrepreneurial university being a responsive institution with a reasonable amount of autonomy that sets its own direction and contributes to socio-economic development by capitalising on the knowledge created through internal and external collaboration (Etzkowitz, 2013). Clark approaches entrepreneurialism from its internal set-up. He focuses on how the internal units should be aligned to support one another. On the other hand, Etzkowitz approaches entrepreneurialism from a wider perspective of the triple helix model of innovation where the university is only one actor.

## Methodology

The strategic goals were aligned with the epistemological stance of qualitative research, described as interpretivist. Interpretive researchers often address the process of interaction among individuals. Researchers recognise that their own background shapes their interpretation and they position themselves in the research to acknowledge how their interpretation flows from their own personal, cultural and historical experiences. My intention was to make sense of the meaning others make of the world.

This was a qualitative study. The rationale for this approach in this study is that it is ideal for exploring and understanding the lived experiences of study participants. It provides rich descriptions of social constructs. My main goal was to rely as much as possible on the participants' views of the situation being studied. The questions asked were broad and general so that the participants could construct the meaning of a situation. In this study, I employed a descriptive single case study design. It focuses on people's experiences, perceptions of reality and the meaning of those two aspects (Langdridge, 2007). The goal of the research was to understand the participants' realities, based on the similarities of the individual perceptions, and to form a systematic view of the concept of entrepreneurship. This research design facilitates a deep investigation of a real-life situation in its natural context (Creswell, 2014). Additionally, the case study focuses on contemporary events. This means that the product of the research is a rich, 'thick' description of the events under study (Creswell et al., 2007).



I used semi-structured interviews as a method of collecting data. The study had 10 interviewees, including five heads of departments, one dean and four lecturers. The selection of the participants was based on their experience as far as entrepreneurial activities are concerned. The 10 interviewees formed an appropriate sample since the interview data reached a saturation point after the tenth interviewee, where similar themes were repeated throughout the interview data. Interviews were recorded, transcribed and analysed throughout the interview process and the transcripts were analysed using Clarke and Braun's (2006) thematic analysis. Field notes were also used to mark down possible notable aspects and perceptions evoked by the interviews. The interview guide afforded me an opportunity to give participants freedom to express their opinions. The interviews were audio recorded. Written data sources included published and unpublished documents. The data for this study were also generated through documentary checks. This helped me to complement the face-to-face semi-structured interviews.

## Quality Control

According to Lincoln and Guba (1985), it is essential to ensure trustworthiness of the findings in terms of trueness, applicability, consistency and neutrality. Accordingly, the trustworthiness of this study was evaluated in terms of Sherton's (2004) observations. Regarding credibility, I ensured that the findings are in tandem with reality (Merriam, 1988). Here, I paid attention to selecting interviewees that had the required information regarding the entrepreneurial culture in universities. In designing the interview guide, I first reviewed the existing literature in the line of my research. This is a key criterion for evaluating qualitative inquiry.

Additionally, I used two methods to collect data. These included interview and document review. This helped me to get various dimensions of the research problem (Gibbs, 2007). I triangulated different data sources of information by examining evidence from the sources and used it to build a coherent justification for themes (Cresswell, 2014). Regarding transferability, I tried to verify whether or not the findings applied to other situations (Merriam, 1997). For this study, I used a small sample of participants in a specific environment and, therefore, the research findings can be generalised to other universities with caution by drawing inferences to other contexts of a similar nature (Lincoln & Guba, 1988).

With regard to dependability, that is, whether the findings of the study are consistent across repeated inquiries in different circumstances with different investigators, I was guided by Gibbs (2007, p.97), where the transcripts were checked to ensure that they did not contain obvious mistakes made during transcription. I ensured that there was no shift in the meaning of the codes during the process of coding. I had to constantly compare data with the codes and I wrote memos about the codes and their definitions. I recorded and transcribed verbatim all the interviews and checked all the interview transcripts to capture all the contexts and responses of the participants.

Concerning confirmability, which requires taking measures to guarantee that the findings of one's study result from the experiences and ideas of one's participants rather than one's own characteristics and preferences, I used an external editor who reviewed the entire project by looking at the accuracy of transcription, the relationship between the research question, and the data as well as the level of data analysis from the raw data through interpretation.

## Findings

The findings I present in this section resulted from the semi-structured interviews I conducted with 10 participants, all from the Kyambogo University Faculty of Engineering. The interviews were conducted between May and October 2022. Besides this, the findings are based on document analysis. Regarding the issue of entrepreneurial culture in universities, participant P04 said:

Entrepreneurial culture and commercialisation of research inventions is still low at the faculty but the university has already established some organisational infrastructure, for instance the Technology Development Centre and the KyU Business Incubation Centre to support the development, transfer and commercialisation of technology. The university is developing an Intellectual Property Management (IPM) policy, whose objective is to stimulate and support innovative thinking among students and staff and to enable ownership and efficient management of intellectual assets and innovations produced at the university. Furthermore, spin-off companies started by members of the academic staff based on

their research activities and results are helping in the TT [technology transfer] and making the faculty more entrepreneurial. (Interview, P04)

Asked if there is any statutory instrument that brings university and industry closer, P02 said:

This is minimal. Largely, we decide by ourselves what to do. However, the creation of an innovation fund in the Department of Science, Technology and Innovation has allocated some funds to support scientists to actualise their inventions and translate these R&D outputs into commercialised outcomes in form of products. (Interview, P02)

Another participant, P08, regretted the lack of ethics among academic staff and researchers, some of whom do not declare their inventions formally. In the words of this participant:

There is a poor university policy on research and community outreach where teaching is given priority at the expense of research and innovation. The classes are too big for scientists and the teaching load well above the NCHE recommendations. There is low motivation of staff and this partly explains why some staff do their TT informally. More to that, the university has limited facilities. The laboratories and workshops do not have the required tools where staff and students could innovate. This means that some of the university innovations remain on paper. (Interview, P08)

Participant P01 acknowledged that his department undertakes interdisciplinary research with other departments. He lamented thus:

The mandate of the university mission is largely to teach as opposed to entrepreneurship. University policy is narrow and there is need to change many things in the running of the university. TT at KyU is constrained by the appointments and promotions policy for the academic staff which is unbalanced in favour of teaching. For instance, the university awards each member of its academic staff a maximum of 2 points and 3 points per cent for his or her innovations and contributions to the external communities, respectively. Contrastingly, the university awards each member of the academic staff a maximum of 25 points for his or her publications. We need to restructure the mandate of the university from focus on teaching to entrepreneurship. The role of the lecturer has to change and focus on contract research for profit and they should begin working on start-ups. (Interview, P01)

Participant P01 advocated a structural change in management, research, teaching and community outreach. There is need for an open-door policy on interdisciplinary research. Members of the academic staff have heavy workloads and, as a result, they cannot find adequate time to engage in technology transfer activities. The university's policy on the appointment and promotion of the academic staff states that the minimum workload for a teaching member of the academic staff is 10 hours per week (later increased to 15). There have been limited attempts at vocationalising university education, changing the policy on skills acquisition and the provision of space where university researchers and students can work with the informal sector in areas of fabrication.

Asked about the major barrier to entrepreneurship, P07 said:

Lack of appropriate leadership at the university departments to initiate, guide and support activities are the main barrier to entrepreneurial activities which are often viewed by lecturers as peripheral activity conducted at the sole initiative of a few faculty members. This is attributed to the absence of a clear national policy on entrepreneurship. Such a policy would make obvious the connections between every sector by clearly detailing the responsibilities of each type of officers, stakeholders and actors, this would in turn make the role of the university faculty clear. (Interview, P07)

A review of the Uganda National Council for Science and Technology (UNCST) policy document reveals that the council does not have the mandate to allow universities to interface with the productive sector even if it is a government institution created with a vision to improve the development of science and technology.

Participant P09 explained thus when asked about the priority of BIC – whether it is entrepreneurship or advancement of knowledge:

BIC is commercial but it has the other side of negotiation. The goal of BIC is not merely performing a decent negotiation; the goal is to make innovation happen and apply the outcome of research in the society. Our role is to start with researchers and scientists and try to find money and management. For instance, when we are doing a spin-out, we build a team of people that becomes the new company.

Supporting spin-off companies can be beneficial for the university. Many are licensing some IP from us. Licensing to those companies does not only result in licensing fees but in most cases also leads to further cooperation agreements. However, entrepreneurship sometimes contradicts patenting/licensing and contract research agreements because IP given to start-up cannot be used in other forms of TT. If we attract research collaborations with a patent and we are granting the sponsor all rights to it that often makes it mutually exclusive of being used for economic development. (Interview, P09)

Although the BIC' s central mission is to make TT feasible and generate income, the lack of a fair compensation policy for the research investment may increasingly lead to underestimating the knowledge generated by the university. Regarding the participation of researchers in the TT process, they are generally well received since the researchers who request protection of their inventions want them to go to the market because it is also a profitable activity for them.

According to two university participants, P03 and P05, the newly created innovation centre is the main mechanism of entrepreneurship activities at Kyambogo University:

We have an Innovation and Entrepreneurship Centre of Excellence (IECE) based in the School of Management and Entrepreneurship (SOME). It is a strategic intervention put forward by the University to address the rampant problem of unemployment among graduates. We are trying to overhaul our curriculum across the entire university. This centre of excellence puts emphasis on practical entrepreneurship and building entrepreneurial mindset and culture among staff and students. The centre aims at supporting job and wealth creation. (Interview, P03 and P05)

P10 elaborated further:

Specifically, the IECE' s aims are threefold: (a) providing knowledge and skills, to students and staff to come out with innovative ideas that can be supported to become viable commercial ventures for job and wealth creation; (b) working with other stakeholders in the entrepreneurship ecosystem, including private sector, government financiers, venture capitalists to support business start-ups; (c) co-ordinate all the memoranda of understanding with different organisations and institutions to support practical entrepreneurship training. (Interview, P10)

Provision of knowledge and skills is indeed the vision of Kyambogo University and it is an advocate for linkages involving cooperative research and development activities among academics, industry and other research institutions. These kinds of linkages can play an instrumental role in accelerating the transfer of new technologies from an idea to the market. Responses from the participants indicate that the major barrier to the development of an entrepreneurial university relates to a university' s institutional capacity. The universities in developing countries do not have the structures and personnel to engage productively with industry. This lack of capacity includes limited human resources and poor infrastructures. The participants acknowledged that the university needs more PhD graduates in order to engage profitably in entrepreneurial activities. The absence of expertise affects not only academic professionals but also the staff who are unable to deal with all aspects of entrepreneurship.

Entrepreneurship is about innovation, taking risks when initiating new practices whose output and outcome is not known clearly. To be entrepreneurial, individual members of the university ought to come together in their basic departments and units with the aim to cause change and transformation. The departments can devise new structures and processes which, in turn, would lead to a positive output and hence outcome, which would impact the entire institution. The challenge is that the university workers have been resistant to change. They appear to live in the past and think less about the future. They are contented with what they have and appear not to aspire towards more. Most of the agreements reached between the university and the outside communities are informal – complicating the formation of a strong bond between the two entities.

Document review (KyU, 2016) revealed that the university has improved its managerial capacity. The challenge has, however, been that state resources are dwindling. There is a need to grow the academic and managerial units further, which would enable linkages to be established with outside organisations, including professional offices, graduate programmes, fundraising and convocation affairs. More effort has been infused into interdisciplinary research for group academic work. There is improved capacity building in research activities, including training in grants writing, as well as setting up outward-reaching research centres with a non-disciplinary definition of problems. Research centres in the university mediate between

academic departments and the outside world. The challenge with government funding is that education is competing against so many equally important needs. This is the main reason why the grants and contracts from industrial firms, local government support, royalty income from intellectual property, earned income from campus services as well as students' fees are critical now. This financial diversification allows the university to make significant moves without waiting for government funding.

Development partners have been handy in providing financial resources for research and other academic and infrastructural development. The Swedish International Cooperation Agency (SIDA) has undertaken to train staff at master's degree and doctorate levels. The Millennium Science Initiative, Kyambogo University receives a substantial amount of funding from these agencies. The African Development Bank (AfDB) has provided substantial amounts of money to construct laboratories and workshops for the faculties of Engineering and then Science (KyU, 2016). Another challenge to entrepreneurship is the lack of appropriate leadership in the university departments to initiate, guide and support activities. Entrepreneurial activities are often viewed by lecturers as peripheral activities conducted at the sole initiative of a few faculty members. This is attributed to the absence of initiative due to the lack of a clear national entrepreneurial policy. Such a policy would make obvious the connections between every sector by clearly detailing the responsibilities of each type of officer, stakeholder and actor; this would, in turn, make the role of the university faculty clear.

To further complicate the above scenario, Uganda National Council for Science and Technology (UNCST) does not have the mandate to allow universities to interface with the productive sector even if it is a government institution created with a vision to improve the development of science and technology. The university engages guest speakers to provide entrepreneurial advice but there are no resources specifically dedicated to supporting entrepreneurial activities by the university. A wide range of other resources and incentives are being employed at a low frequency. Moreover, support for exchanges with the private sector, recognition awards for industry-related research, monetary bonuses, and promotion based on industry-related research and entrepreneurial activities are almost non-existent. The bottom line is that access to special funds and access to seed grants for commercialisation of outputs are employed at a small scale.

Relatedly, the university has faculty members who espouse the ivory tower approach. They are not willing to collaborate with the productive sector and fail to see how industry can contribute in any useful way to the development of the university community. Engagement with industry is seen by some as conflicting with the existing norms. They feel that research commercialisation is not part of their job as academic researchers. The majority of lecturers are more interested in transferring acquired knowledge to students than in teaching them the wider potential of knowledge.

## Discussion

In this section, the findings that emerged from the study are discussed. Generally, research findings point to ways of infusing entrepreneurial culture at Kyambogo University's Faculty of Engineering such as being creative, undertaking risks and being proactive (Yemini, 2014). To supplement the above findings, Dalmarco et al. (2018) propose a framework consisting of five discrete dimensions, namely: entrepreneurial perspective; external links; access to university resources; innovation arrangement; and scientific research. Entrepreneurial perspective includes entrepreneurial lectures in all departments to improve awareness among students about how to identify new markets or technology opportunities. Students who want to start up their own ventures and develop their own business plans see entrepreneurial classes as positive (Rasmussen et al., 2014). This agrees with the observation of P07, who lauds the Innovation and Entrepreneurship Centre of Excellence (IECE) for working with the other stakeholders in the entrepreneurship ecosystem to support business start-ups. External links mean that academics participate in national and international applied research domains.

It was discovered that entrepreneurship education is being intergrated into all postgraduate academic programmes at the Faculty of Engineering at Kyambogo University. This is intended to make students more entrepreneurial, and enable them to market their inventions. This awareness helps them to excel in technology transfer, especially in terms of contract-funded projects as well as in the development



of an entrepreneurial culture, which has a positive relationship with patenting and technology licensing. As such, the number of contract-funded projects is considered a good predictor of overall performance between departments in the technology transfer process.

Although entrepreneurship education is moving into different departments, there is a challenge of how to design relevant forms of teaching entrepreneurship. In their research, Warhuus and Basaiawmoit (2014) found a difference in centralisation vis-à-vis decentralisation of the programme in addition to a connection between the numbers of credits offered for the programme in different faculties. In terms of centralisation, one department delivers the programme to different disciplines, either as a stand-alone course or through collaborative efforts in which business departments deliver modules or lectures in the courses. However, examples of courses developed as joint efforts between different departments are also present, for example, at Aalborg University in Denmark (McDonald et al., 2018). A balance is required, which could be the reason some faculties still apply a more traditional approach to entrepreneurship education and teaching about entrepreneurship (Aadland & Aaboen, 2018), but still with the objective of creating entrepreneurial individuals. This, however, disagrees with the findings of Kirby (2006) and Zhang et al. (2018), who considered universities as the least entrepreneurial institutions because of their hierarchical structure and their inadequacy of business know-how.

This study has found that commercialisation of research results is a primary rationale for academics' involvement with industry in some departments. The claim is that the role of academics is gradually shifting from basic to applied research. Rather than concentrating on basic research, academics are seen to be increasingly eager to bridge the worlds of science and technology entrepreneurially by commercialising technologies emerging from their research. This is in line with the findings of Clark (1998) and Etzkowitz (2003), that serving society is becoming a coherent domain of the universities, thus interlinking the three missions of teaching, research and community service. Similarly, Kaweesi et al. (2019) found that research at Makerere University is partially inspired by the need to come up with new products with commercial value so as to satisfy the corporate market, promote innovation and create intellectual property.

However, other studies reveal that working with industry does not necessarily mean commercialisation in the sense of university-developed technologies being converted into commercial applications. In most of the applied projects, academics contribute to projects that were already ongoing within firms, as opposed to providing ideas and technologies for new products (Fadeyi et al., 2019). Therefore, involvement in applied projects with industry does not automatically lead to lower or higher research productivity, but significantly informed by academics' underlying motivation to seek collaboration. Analogies can be drawn with Shinn and Lamy's (2006) study, which found that some academic entrepreneurs perfectly combined commerce and science while others focused on commerce at the expense of science. Previously, research demonstrated that highly productive researchers use consulting engagements and advisory board appointments to work with industry in an attempt to gather new ideas for research, learn about new industry applications, as well as access data and materials (Murray, 2002).

The university policy of incorporating the teaching of entrepreneurship education into the curricula of all faculties has influenced entrepreneurship (Aadland & Aaboen, 2018; Gabrielsson, 2019; Genza et al., 2018). The early teaching of entrepreneurship education focused on small business development and was mostly found in universities' schools of management and entrepreneurship. However, entrepreneurship education is now a cross-cutting initiative established in all faculties, including engineering. The target has also changed to a more holistic view in the entrepreneurial mindset of undergraduate and graduate students. This now creates a broader sense about start-ups and spin-offs. As of now, the students' role has been transformed from just recipients of knowledge to self-driven individuals.

Several arguments contradict the assumptions regarding conflict of interest between academic pursuit of freedom of creative research and focused strategic research aimed at commercial objectives. According to PACEC/CBR (2009), initial concerns about whether the emphasis on the third-stream mission would affect the traditional teaching and research roles have proven to be unfounded because many synergies between knowledge exchange, teaching and research have been realised. For academics, science and commerce go hand in hand (Haeussler & Colyvas, 2011) and many of them report a positive impact of

their interactions not only on their research (Hughes, 2011) but also on their teaching activities (Abreu et al., 2009).

An important debate concerning the primary objective of TTOs is whether TTOs should primarily maximise their revenues or prioritise the social benefit when licensing their inventions. Since TTOs are responsible for commercialising the university research results, a social mission should clearly be prioritised, especially when the transferred invention is publicly funded. This result leads to important policy and management implications. It, indeed, suggests that university licensing might not always be in line with the interests of the public; it might not maximise social welfare. For instance, technologies may be mature, and still be exclusively licensed. This is in agreement with the findings of Genza et al. (2018) and Siegel et al. (2007). The university policy of incorporating the teaching of entrepreneurship education into the curricula of all faculties has influenced an entrepreneurship culture at the university.

It has been unearthed in this paper that funding from government is on the decline, prompting universities to explore alternative sources to accumulate some discretionary funds in the form of competitive research grants and contracts (Clark, 1998; KyU, 2016). Perhaps the most significant discretionary funds come from students' fees. It is clear that the primary drivers of entrepreneurial change are the academic staff found in the academic departments and some of the newly established interdisciplinary units. Such academics often determine the pace of change and innovation in research and teaching within their departments and faculties. Furthermore, change is sequentially accelerated as academic units embrace similar organisational practices. New academic programmes that meet specific demands have been established. In the same dimension, the collegial dimension in decision-making ensures that conflicts in the system are checked. In Clark's analysis, science and technology departments usually become entrepreneurial first (Clark, 1998).

Having put in place a complete incubation process, Kyambogo University is now raising awareness of the opportunities for new venture creation amongst its staff and students. The university has Entrepreneurship on its bachelor's and master's programmes in the School of Management and Entrepreneurship. Additionally, non-accredited extra-curricular courses are offered. This complements short courses intended for academics and the employees of technology companies who wish to commercialise their research and/or start their own business. In doing this, the university is attempting to create a completely integrated incubation process in which its incubator become the entrepreneurial schools of tomorrow. In order to continue this process, the university has bid for funding from the government under the Higher Education Science and Technology (HEST) project. This has enabled the university to create enterprise laboratories for its students that will co-ordinate and integrate the academic and practitioner approaches to entrepreneurship across the university. All these activities are integral components of the university's strategic plan and are endorsed by the Vice Chancellor, and this line is supported by the University Council.

Kyambogo University is embarking on a programme of training more students to earn advanced degrees at PhD level. However, the absence of a national policy on entrepreneurship is affecting entrepreneurial activities. This stems from the society's lack of understanding of entrepreneurship in universities. There is need for a legislative framework and a national innovation system that link higher education and the community.

## Conclusions

Though Kyambogo University has taken strides to improve entrepreneurial activities, more still remains to be done. Making the university entrepreneurial is not easy. For entrepreneurship to succeed in higher institutions of learning, there must be a significant level of networking, teamwork and mentorship resulting in a cross-fertilisation of ideas. Adjustments have to be made to the university stakeholders' mindset. A culture of enterprise that encourages and enables academics and students to commercialise their inventions is required. Entrepreneurial behaviour should be recognized as an integral part of the University mission.

## Recommendations

It was found that management at Kyambogo University does not reward lecturers for their effort in making the university entrepreneurial. The researcher, therefore, recommends that management at the university should reward their lecturers through a combination of results-based and fixed rewards. Policies and frameworks that encourage entrepreneurship need to be implemented. Priority in the interventions to revitalise the university has to be given to the development of lecturers; improving management and leadership; the redevelopment of the curriculum; the enhancement of physical facilities and infrastructure; improving the Centre of Excellence in Science and Technology; the development and strengthening of graduate programmes; improving research and strengthening innovation capacities.

I further found that government support for entrepreneurship activities at the university is still inadequate. In this regard, I recommend that the Government of Uganda should shape entrepreneurship in universities by developing policies that lead to the establishment of science parks in the vicinity of universities and by spurring university research spin-offs and start-ups with university connections. The government should establish and support student programmes and even the joint supervision of PhD students, who may undertake part of their research within firms.

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