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Strategies for Turning Ideas into Business at Universities

Dr. Natasha Ramkissoon-Babwah [1*] Mr. Arnold Babwah [2]
1. Department of Management Studies The University of The West Indies St. Augustine Campus, Trinidad and Tobago
2. The Arthur Lok Jack Graduate School of Business The University of The West Indies St. Augustine Campus, Trinidad and Tobago
* E-mail of the corresponding author: natasha.ramkissoon-babwah@sta.uwi.edu

Abstract
Universities are well known for undertaking research projects in various sectors and making technological breakthroughs but few universities have focused on actually turning ideas into businesses. More and more universities are beginning to realize that it is no longer adequate to simply produce graduates and doctoral theses. They must play a greater role in generating wealth for their country and contributing to society by ensuring that promising inventions and other creative ideas do not get lost but be developed into marketable products and services. As a result, there is currently a growing trend whereby universities are taking steps to become more entrepreneurial by encouraging students and staff to generate creative ideas and commercialize their ideas.
This paper examines the programmes of Universities at the International Level that have been promoting entrepreneurship development and recommends intervention areas to increase the capacity of a University to derive the benefits from an active business commercialization process. The key recommendations include the development of an entrepreneurial vision for the University, cultivating partnerships with private and public sector organizations and creating linkages that will promote mentorship and funding opportunities.
Keywords: Entrepreneurial University, Business Commercialization, Innovation, Triple Helix Model

1. Introduction- Universities and Enterprise Development

Universities are well known for undertaking research projects in various sectors and making technological breakthroughs but few universities have focused on actually turning ideas into businesses. *The Vice Chancellor of Coventry University Madeleine Atkins (2013), in discussing the* Entrepreneurial University Leaders Programme *has stated that universities can face the challenges of the future with vision and entrepreneurship will bring great benefit to society.* More and more universities are beginning to realize that it is no longer adequate to simply produce graduates and doctoral theses. They must play a greater role in generating wealth for their country and contributing to society by ensuring that promising inventions and other creative ideas do not get lost but be developed into marketable products and services. As a result, there is currently a growing trend whereby universities are taking steps to become more entrepreneurial by encouraging students and staff to generate creative ideas and commercialize their ideas. The research of Shaffer (2010) suggests that there is promising evidence of new investment, new companies, and new jobs being created through Universities. He further stated that many universities are going through a learning experience, as they test out what seems to work best. The characteristics shared by the most active institutions in the field can be identified such as the leadership to make economic revitalization a priority, the culture to mesh that objective with their academic mission, the legal flexibility to mix and match assets and brainpower with the private sector, and the resources to make it all work.
The increasing importance of Universities in contributing to economic development has also been recognized by Gibb and Hanson (2011) who argues that Universities are increasingly being urged to take centre stage in regional development strategies in the UK and indeed elsewhere in Europe. They further suggest that a growing number of Universities are beginning to recognise the long-term importance and benefits of strategically engaging in stimulating enterprise in their student populations. They note the growth in the number of Deputy Vice Chancellors and Pro-Vice-Chancellors (DVCs/PVCs) for enterprise or entrepreneurship and there is explicit articulation of enterprise as a core and fundamental pillar upon which a University will succeed. Finally with the growing importance of knowledge-based industry, policy makers in the private and public sectors have realized the importance of universities in regional economic development (Chakrabarti & Lester, 2002). The roles of Massachusetts Institute of Technology in growth of the industries in greater Boston area and Stanford University in the Silicon Valley area are quite well known. One can observe similar experience of other universities in the US and Europe including the UK. Finally Fairweather (1990) has also argued that the dominant view in the literature is that universities' key role in economic development is via the commercialisation of scientific research either by patent licensing or, more commonly, by spinning out knowledge-based enterprises.

2. Success Stories of Entrepreneurial Universities

Some of the world's life changing inventions emerged from universities such as the popular sports drink, Gatorade which was developed at the University Of Florida, Insulin which is a well-known drug for treating Type 1 and Type 2 diabetes that was developed at the University of Toronto, Plexiglass was invented at the Mc Gill University, the Pap Smear test for women emerged from Cornell University, the pioneering work for Ultrasound was undertaken at the University Of Vienna, the Electric Computer was invented at the University of Pennsylvania, the Heart-Lung Machine which is used in open heart surgery was invented at the University of Minnesota.

Universities and their inventors in the USA earned more than $1.8-billion from commercializing their academic research in the 2011 fiscal year, collecting royalties from new breeds of wheat, from a new drug for the treatment of HIV, and from longstanding arrangements over enduring products like Gatorade. The one hundred and fifty-seven (157) universities that responded to the annual survey of the Association of University Technology Managers completed 5,398 licenses and filed for 12,090 new patents. They also created 617 start-up companies (Goldie Blumenstyk 2012). The University of Florida's (UF) David Day states that licensing inventions to start-ups also makes sense for institutions like his, which still collects revenue from the trademark it holds on the Gatorade sports drink and related products. The University of Florida, which formed 12 start-up companies in 2011, is also investing in facilities and programs to help incubate new companies and foster innovation (Goldie Blumenstyk 2012).

3. Programmes for Turning Ideas To Business at Universities - Process and Challenges

Most universities that have started pursuing entrepreneurial activity are still in their embryonic stage of development and aim at achieving some level of success by teaching entrepreneurship as a course in the classroom and hosting business plan competitions. According to Crain Detroit Business (2013), business plan and elevator pitch competitions are practically a growth industry in Michigan in the current economic climate , for example, Start Garden in Grand Rapids, PITCH at Western Michigan University, the GreenLight Business Model Competition at Michigan State University and the state's Pure Michigan Social Entrepreneurship Challenge, to name but a few . However, it is rare that a viable business comes out of these competitions. Many competitions lack high-quality coaching, insufficient cash prizes and tend to go for quantity over quality when it comes to entrants. A study undertaken by TechnoServe in Africa and Central America in 2009 on the impact of business plan competitions found that Central American entrepreneurs expressed a desire for support after the competition. They reported that after the competition, they encountered a number of unexpected challenges, such as entering new markets, negotiating with large customers and raising capital from alternative sources. They believed that even limited support from business experts would have been extremely helpful in overcoming these challenges.

The Minnesota Science and Technology Authority (2013) stated that entrepreneurship support is often a new activity for universities and they face challenges in designing and delivering appropriate entrepreneurship education and business start-up services for graduate entrepreneurship. However, some universities such as the Central Michigan University in the USA, Brunel University in the United Kingdom, National University of Singapore and the Technical University Of Denmark have developed a comprehensive strategy to turn ideas generated at their university into marketable products and businesses.

4. The Business Development Programme at Central Michigan University

The Central Michigan University flagship business development programme is its **New Venture Competition (NVC)** which supports the creation of new ventures, business development, and experiential learning. The **New Venture Competition** is for new ventures or ventures that are in an early stage of launch. It is designed to create an opportunity for students who have business start-up ideas to get them going, through connections to resources including the potential of earning start-up capital. The competition creates opportunities for students who have business start-up ideas, and enriches the economic environment of Michigan and the careers of those students who compete. The NVC 2013 awarded over $65,000 in cash and in-kind prizes for start-up capital.

The Central Michigan University has further strengthened its commitment to business development by creating a structure that provides four (4) major connected support services to help turn ideas into profit as follows:

(1) Business Acceleration: The objective of the Business Acceleration service is to give business start-ups a kick start by assisting with the assessment of the feasibility of ideas, preparation of business plan, access financing, secure intellectual property, marketing and mentorship. The university has developed a roster of regional experts who help with business plans, finances, intellectual property rights and training.

(2) Funding: The University connects these emerging businesses with funding sources such as banks, venture capitalists, angel investors and government programmes.

(3) Incubator Space: The incubator is a vital part of the business acceleration process for start-ups in science, biotechnology and other advanced technologies. The incubator provides the physical space, essential business services, and business development support which emerging businesses need to move quickly from fragile start-ups to resilient, commercially successful enterprises. The emerging entrepreneurs have to pay a friendly lease rate for use of the incubator and have access to office space, shared administrative services, conference and meeting areas, copiers, faxes, scanners, high speed wireless internet and state-of-the-art-wet labs. The wet lab brings scientists and early-stage start-ups together, encouraging interaction, facilitating partnerships, and supporting the connectedness of their work.

(4) Technology Park: The technology park comprises more than 120 hectares fully developed real estate and is the obvious next step for successful start-ups which have outgrown the incubator. It is suitable for high-tech businesses that can benefit from each other and from access to the university's facilities and research. The technology park is occupied by healthcare providers, financial institutions, technology innovators, restaurants, hotels, and more. It's designated by the Michigan Economic Development Corporation as one of Michigan's eleven SmartZones—locations where technology based firms, entrepreneurs and researchers locate in close proximity to each other and to resources that can help them succeed. SmartZones create techonlogy clusters among universities, industry, researchers, government, and growing technology-based businesses.

5. The Business Development Programme at National University of Singapore

The National University of Singapore (NUS) is the country's flagship university and is well-known for its research strengths in engineering, life sciences and biomedicine, social sciences and natural sciences. In line with its goal to inject an innovative and enterprising dimension to the University's core research and educational activities, the NUS Entrepreneurship Centre (NEC) was established by the university. NEC's vision is to be a dynamic NUS community with a pervasive entrepreneurial and innovative culture and global reputation for entrepreneurial educational leadership. The mission of the NUS Entrepreneurship Centre (NEC) is to promote and support entrepreneurial learning among the NUS community, nurture start-ups by NUS professors, students and alumni, and conduct research to advance knowledge of the policy and practice of technology venturing in Singapore and beyond.

NEC offers a wide range of services to nurture start-ups by NUS professors, researchers, students and alumni. Among them is the NUS Enterprise Incubator, a place with physical facilities to give aspiring entrepreneurs the infrastructure they need to bring ground-breaking ideas to the next level. Incubatee companies enjoy access to support services which include training workshops, introductions to venture capitalists and angel investors, linkages to business networking contacts and other corporate shared services. Through the active mentoring programme, they also regularly meet with the centre's team of experienced local and international mentors to benefit from their assistance with global marketing, fund raising, business advice and international expansion.

6. The Business Development Programme at Brunel University United Kingdom

At Brunel, Enterprise and innovation, as well as entrepreneurial projects, are embedded in curricula across the University. Leading entrepreneurs participate in course delivery and students work with Brunel's commercialisation experts to develop, patent and market their ideas and products. The ambition and effectiveness of the University's curricular promotion of enterprise is epitomised by an annual showcase in Brunel which is attended by over two hundred (200) commercial companies and over two hundred and fifty (250) Engineering, Design and Sports Science students exhibit products of outstanding quality, many having been patented with the support of the University's commercialisation department, while many others are receiving commercial backing for full development. In 2010 a formal network of graduate entrepreneurs was established to act as mentors for current students. Also in 2010, the University appointed its first Entrepreneur In Residence to extend the support and encouragement of student entrepreneurs.

The efforts of Brunel University has led to widespread entrepreneurial activity from successful commercialisation projects and high-value contracts with major companies including GlaxoSmithKline and Tesco in addition to the funding of eighty-seven (87) Knowledge Transfer Partnerships, twenty-seven (27) Council for Advancement and Support of Education (CASE) awards and seventeen (17) major grants from the Technology Strategy Board totalling £6.6m. The University has also established ground-breaking industrial collaborations, such as the Brunel Innovation Centre (BIC) based at TWI Limited laboratories in Cambridge. Scientists from both organisations work together and Brunel provides co-funding with TWI for PhD students, and staff, with the Board made up of staff from both institutions.

Many alumni have gone on to create successful, and multi-million pound businesses, including some such as Peter Ward (WAYNE network) who regularly returns to lecture at the University. The University offers regional

enterprise leadership through a leading role in the Place West London business show case and the recently established Gateway Asia project which supports SMEs to establish business with India and China. The University undertakes close collaborations with West London Business (Chamber of Commerce), and is playing a leading role in the development of a Local Enterprise Partnership in West London.

7. Recommendations For Business Development Programmes At Universities – Turning Ideas To Business

Turning ideas into business at universities requires an approach much beyond the classroom and business plan competitions. Industries related to agriculture, biosciences, manufacturing, electronics and energy rely on innovation and advances in science and technology and strong entrepreneurial support including funding in order to compete globally. In a best case scenario staff and students must have access to state-of-the-art research facilities where they can innovate and make advances in science and technology and there must also be support systems to commercialize the products emanating from the laboratories and other research facilities. In most cases universities have limited resources and therefore have to fill the gaps by partnering with various public and private organisations which possess one or more of the resources required.

An entrepreneurial university is characterised by strong leadership that develops entrepreneurial capacities for all students and staff across its campus. In modern times it has never been more vital for a university, business and institutional leaders to confront the challenges posed and work together to harness our intellectual capital for the benefit of the economy and society in general. The triple helix model is also a useful concept in developing an entrepreneurial university that can contribute to successful business development. The work of Etzkowitz (2003) conceptualizes this model by suggesting that a triple helix regime typically begins as university, industry and government enter into a reciprocal relationship with each other in which each attempts to enhance the performance of the other. Most such initiatives take place at the regional level where specific contexts of industrial clusters, academic development and presence or lack or governing authority influence the development of the triple helix. He further contends that a triple helix embedded in a flourishing civil society encourages the emergence of diverse sources of innovation. Creating an organization or network, representing different interests, to build support for a regional focus is a key element in such strategy. Individuals, typically from the triple helix spheres, come together to brainstorm ideas, formulate initiatives and seek out resources to promote regional development initiatives. Examples include the Pittsburgh High-tech Council and the Niteroi Technopole in Brazil.

Other intriguing suggestions to create Universities that can contribute to regional development have been postulated by Walshok (2003) who states that Research universities have an increasingly significant role to play in regional economic development if they do three things:

1. Embrace a wider and deeper understanding of the unique character and multiplicity of factors affecting economic development in a knowledge society
2. See their role in society as mobilizing and making accessible campus wide academic resources—from the sciences to the humanities—relevant to the knowledge problems confronting advanced economies
3. Invest politically and financially in the development of institutional mechanisms whose central role is to facilitate, broker, and develop knowledge across the internal boundaries of academic disciplines and across the boundaries currently separating the highly valuable traditional research and teaching programs from the concerns and challenges confronting practitioners and decision makers in the larger society

Based on the foregoing, it is suggested that an entrepreneurial university is one which has created an enabling environment to foster continually the generation and development of innovative ideas and to commercialize the products and services derived from these ideas. The question therefore is: What is the best approach for universities to become more entrepreneurial? Strong institutional leadership is needed for transforming the university's culture to one that has the capacity and motivation to facilitate student and graduate enterprise development. The university must first review its vision and mission statements to ensure that they are aligned to achieving this goal of being an entrepreneurial university. The next step should be to develop a research plan for identifying best practices in this field and also for undertaking a situational study of the university to determine the relevant gaps and weaknesses. The entrepreneurial model to be developed will vary from university to university depending on the university's short-term, medium-term and long-term goals and the resources available to the university. Universities with very limited resources could still make gradual progress using the low hanging fruit strategy.

One major characteristic of entrepreneurial universities is the strong entrepreneurial culture within the university which lead to widespread entrepreneurial activity from idea generation to inventions and commercialization. In universities where this culture exists, the academic programmes are designed to incorporate an inspiring entrepreneurial course in which industry experts including successful entrepreneurs make a substantial contribution by way of presentations, success stories and company visits. Students and graduates must also have easy access to research facilities to undertake experiments and develop innovative products. For this activity,

support and mentorship will be required from experienced scientists including alumni. In many cases universities may not have modern research laboratories and should therefore seek alliances with external organisations which possess such facilities and especially organisations or other universities with complementary strengths and shared visions. For example, Brunel University had formed a ground breaking industrial collaboration to facilitate student research at state-of-the-art laboratories owned by TWI Limited, a global non-profit technology engineering and R&D consultancy with a membership of over 600 large industrial companies. In addition to the physical facilities, support is also provided by TWI's experienced scientists. Student exchange with other universities is also a good strategy.

A key ingredient of the enabling environment is having a well-structured Business Acceleration Programme to evaluate new discoveries and inventions and in cases where they are found to be feasible facilitate the commercialization process. Similar to the Central Michigan University, the Business Acceleration Programme must be designed in such a way as to give potential business start-ups a kick start by evaluating their ideas, preparation of business plan, access financing, secure intellectual property, marketing and mentorship. For this activity the university needs to develop a network or a roster of experts with these skills.

8. Conclusion

The critical success factors for establishing an entrepreneurial university are committed institutional leadership, aligning the mission statement of the university with this vision, creating a strong enabling environment to spawn innovative ideas, discoveries and inventions and to develop their commercial potential and forming collaborative alliances with public and private sector organisations. These relationships can be strengthened where there is an opportunity to derive benefits from complementary strengths and shared vision and develop a roster of dedicated resource personnel including alumni to facilitate business acceleration programmes and provide mentorship services to aspiring entrepreneurs.

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