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Abstract: Although research on entrepreneurial universities started over 30 years ago, the findings are mainly sampled in developed countries in U.S. and Europe. Limited research provides empirical evidence on entrepreneurial universities' practices in developing countries, particularly how they depart from the traditional model, break silos, and adapt organisational university structures to implement entrepreneurial developments. This paper examines how a Sino-British university in China has successfully adapted its organisational structures and founded an Entrepreneur College over the past five years. By undertaking an in-depth case study on this revelatory university, the research findings uncover the significant role of a newly formed university unit entitled the Entrepreneurship and Enterprise Hub (EEH), which facilitates innovative entrepreneurial degree and non-degree education for interdisciplinary students and cultivates an industry-oriented entrepreneurial ecosystem which channels enterprise infrastructure, resources, and networks for the mutual benefit of students, faculties, industries and the local economy. This developmental paper aims to contribute to entrepreneurial university literature and provides practical implications for other academic institutions that wish to develop progressive entrepreneurial education opportunities and implement organisational structural changes.

Keywords: entrepreneurial university, entrepreneurial education, organisational innovation, entrepreneurial ecosystem, case study

Track: Entrepreneurship (developmental paper)

1. Introduction

As a result of the recent pandemic, the financial crisis, and a growing competitive global economic environment, policymakers and academics alike are more interested than ever in the potential role that colleges and universities may play in economic and social growth. How universities operate, collaborate, make decisions, identify benefits, or transform their roles to contribute to economic and social welfare has become a booming research area (Cunningham and Link, 2015). While it is widely acknowledged that higher education institutions contribute to the development of human capital, knowledge capital, and entrepreneurship capital in the literature on innovation ecosystems (Castellacci and Natera, 2013; Zahra and Wright, 2011) and entrepreneurship ecosystems (Isenberg, 2010; Mason and Brown 2014), Audretsch (2014) contends that universities have a leadership role in advancing the entrepreneurial society. Universities can only reach their full economic and social potential by assuming this leadership position, expressed via the development of entrepreneurial ideas, actions, institutions, and capital.

However, it has also been noted that universities' inherent characteristics as big, impersonal, hierarchical institutions might hinder the development of the entrepreneurial university and implement changes to carry on entrepreneurial activities. According to Kirby (2006), universities are founded on rules, processes, and restrictions, demand permission at several levels, and may not have any systematic coordination of entrepreneurial operations (Woollard et al., 2007). How to break silos and adapt the university's organisational structure to implement entrepreneurial changes is still unclear. The extant literature has primarily focused on the practices of entrepreneurial universities in the U.S and Europe, while research on entrepreneurial universities and their structural changes in developing countries is still in its infancy, lacking analytical and conceptual frameworks (Forlano, De Bernardi & Yahiaoui, 2021).

In response to this challenge, this developmental paper aims to make the following contributions to the growing entrepreneurial university and ecosystem literature through an in-depth case study (Siggelkow 2007; Eisenhardt, 1989) on a revelatory Entrepreneur College established in 2018 in the Taicang High-Tech Development Zone in China; an international joint venture university founded by Xi'an Jiaotong University in China and the University of Liverpool in the United Kingdom. Our research findings reveal a new management paradigm focusing on the Entrepreneurship and Enterprise Hub (EEH) which is not structured as a traditional university department or professional service; instead, it is a university platform that is a hub for the systematic coordination of university-wide entrepreneurial activity, contributing to a developing regional entrepreneurial ecosystem across schools, institutions, industry partners, and local government. Our findings offer an empirically grounded model of how the Entrepreneurship and Enterprise Hub fosters seamless collaboration between academic staff, students, industry partners, local government, and the wider community, towards a modern, entrepreneurial, and sustainable society.

2. Literature Review

The growing requirement to develop, transmit, and commercialise viable research discoveries has gradually prompted universities to reconsider and alter their function within the local, national, and worldwide settings to which they belong (Goethner and Wyrwich, 2019). Etzkowitz (1983) was the first to explore this shift in higher education, coining the term "entrepreneurial university" to define universities as institutions that have become critical for regional economic growth. Many and varied studies have since highlighted that the entrepreneurial university is a model that prioritises a set of activities based on a combination of academic and business imperatives by broadening both the inputs to academic knowledge and its application in an economic and societal context (Trencher et al., 2014; Foss and Gibson, 2015). According to research cited by Salamzadeh et al. (2016), the entrepreneurial university is a worldwide phenomenon with the same developmental trajectory. For instance, Dill (1999) and Ropke and Xia (1998) refer to an entrepreneurial university as an "entrepreneur organisation." Jacob et al. (2003) define an entrepreneurial university as one that has "developed a comprehensive internal system for the commercialisation and commodification of its knowledge," whereas Kirby (2006) describes an entrepreneurial university as a natural incubator that fulfils its mission of teaching, research, and entrepreneurial activities. According to Günther and Wagner (2008), the entrepreneurial university is comprised of direct and indirect processes that connect academic institutions with enterprises. For example, technology transfer facilities such as technology transfer offices (TTOs), incubators, and university-based research parks are established to patent and license novel technologies and establish new start-up businesses.

Nonetheless, several studies define an entrepreneurial university as any creative activity beyond conventional teaching and research missions. In contrast, others contend that the entrepreneurial university relies on the initiative and risk-taking of individuals and groups to achieve maximum political and financial gains in the marketplace (Middlehurst, 1993; Clark, 1998a; Huyghe and Knockaert, 2014) to represent a means of earning economic benefits, protect academic freedom and engage in further research. Thus, we argue that the entrepreneurial university is based on the initiative and risk-taking of individuals and groups to achieve maximum political and financial gains in the marketplace (Berkowitz and Feldman 2008). In addition, these efforts are based on research and a new management paradigm for the operation of entrepreneurial activities (Unger and Polt, 2017). Particularly in the United States, colleges have increased their entrepreneurial efforts in several sectors, such as patenting and licensing, constructing research parks, fostering academic spin-offs, and investing in start-ups (Mowery et al., 2004; Siegel, 2006; Mariani et al., 2018). Along with the commercialisation of knowledge (Naidoo and Jamieson, 2005), the entrepreneurial university was developed to identify the contribution of universities to economic and social growth (O'Carroll et al., 2006) as well as the interconnections between universities and society at large (Molas-Gallart et al., 2002).

Despite the fact that several researchers have addressed concerns relating to entrepreneurial colleges throughout the years, there is still no consensus on this subject

(Secundo et al., 2020). Doubts also pervade about "one-size-fits-all" approaches to establishing, managing, and applying for entrepreneurial colleges in various nations (Kitagawa et al., 2016; Secundo et al., 2018). In addition, there has been an absence of critical reflection on how universities have implemented reforms and integrated entrepreneurial teaching, or those that have taken the lead in establishing entrepreneurial ecosystems into their core operations. Given the fact that the literature on university-industry collaboration has primarily sampled universities in developed countries, with few studies focusing on emerging countries (Wang et al., 2016), Forliano et al. (2021) call for research to establish an empirical research base for entrepreneurial universities in developing countries. The imperative for universities to transition from their old models to new more "entrepreneurial" ones is also projected to be more pressing in developing nations. The transition to knowledge-based economies - rather than ones based on low wages and natural resource advantages - necessitates a significant increase in indigenous capability when it comes to the ability of local enterprises to create and commercialise new knowledge, rather than relying primarily on knowledge imported from advanced countries. However, many of the local private firms that arose during earlier stages of industrialisation are still laggards rather than leaders in terms of R&D and innovation. As a result and compared to their more technologically developed counterparts in advanced countries, local companies in developing countries frequently lack expertise and skill in commercialising information acquired by local institutions (Wong et al., 2007). Our research aims to address this gap by undertaking an in-depth case study on the organisational and structural innovation of a Chinese international university, namely XJTLU Entrepreneur College, co-founded by Xi'an Jiaotong University in China and the University of Liverpool in the United Kingdom, and analysing how it successfully established the first Entrepreneur College in China.

3. Method

Case study is useful to gain in-depth understanding of a subject, event, or phenomenon of interest in its natural, real-world setting. Case study also condones multidimensional examinations of complex subjects in context of their setting. A case study is an approach for qualitative empirical research that permits an in-depth examination of a contemporary event in its actual environment (Pettigrew, 1973; Stake, 1995; Yin, 2003). Case study research is ideally suited for answering how and why questions or explaining a phenomenon and its actual context of occurrence, particularly when exploratory approaches are required to comprehend how a phenomenon manifests. Typically, exploratory case studies are used to comprehend organisational dynamics or social processes. This method contrasts statistical and empirical research approaches that are primarily used for confirmatory purposes, where researchers already know how a phenomenon occurs and have a solid understanding of why it *how* occurs (i.e., hypothetical deduction is possible) and can quantitatively measure all the variables of interest. Typically, this research approach is used to answer *who*, *what*, *where*, *how many*, and *how much* questions. In this regard, a case study design is an appropriate method, as it accommodates situations in which multiple variables of interest are

embedded in the context of investigation and it (ii) relies on multiple sources of evidence, with data requiring convergence through a process of triangulation (Yin, 2003).

Our case study approach can perhaps be characterized as "revelatory" (Yin, 1994) as it recognizes the paucity of in-depth case studies on entrepreneurial universities in developing countries, and because our strategy was to carry out exploration and in-depth data analysis on a revelatory entrepreneurial university from different stakeholders' views. Based on the recommendations of methodologists (e.g., Patton 1990), we sought to identify an organisation that could potentially be a unique and exemplary source of insights and enlightenment on this topic. The XJTLU Entrepreneur College (Taicang) appears uniquely suited to our study's objectives as its case has the "rare or unique" qualities that make it a logical candidate for "theoretical sampling" (Eisenhardt, 2021; Eisenhardt, 1989). We conducted semi-structured interviews with key stakeholders, such as university staff, faculties, students and industry partners involved in the case. Interviews helped researchers obtain firsthand accounts, perspectives, and experiences related to the research topic. We also analysed a wide range of documents and archives, including university newsletter, reports, policy documents, official records, emails, diaries, and other archival materials. These documents provided historical context, insights into decision-making processes, and evidence of actions and events relevant to the case. In addition, the authors engaged in direct observation of the case university, as practitioners as well as the observers. Observational data were collected through field notes, video recordings, or audio recordings, capturing real-time behaviors, interactions, and dynamics.

4. Case Overview

Xi'an Jiao Tong-Liverpool University (XJTLU) is China's most prominent educational joint venture, opening in 2006. Located within Suzhou Industrial Park (SIP), it has grown exponentially in the intervening fifteen years, reaching over 23,000 registered students and 100-degree programmes. In September 2022, XJTLU launched a second campus in Taicang, a satellite city of Suzhou, in Jiangsu province, where the recently established Entrepreneur College is situated. The planning and operation of "XJTLU Entrepreneur College (Taicang)" is built upon the educational philosophy of Syntegrative Education (Malik, 2019, Perrin, 2022) to equip future leaders for the challenges of disruptive technology, rapid innovation and shifting market demands. The mission of XJTLU Entrepreneur College (Taicang) is to become a cradle of elites for new industries and a model for the University of the Future. The operational focus is on seamless collaboration between academic staff, students, industry, government, and the wider community, with long-term aims of fostering the development of a future-facing, entrepreneurial, and sustainable society.

5. Main Findings

To date, the Entrepreneur College (Taicang) has attracted over 1000 registered students, more than 60 industrial collaborations and successfully launched seven undergraduate and two post-graduate degree programmes. One of the disruptive approaches that XJTLU Entrepreneur College (Taicang) took was to establish a non-traditional hybrid academic-professional unit known as the Entrepreneurship and Enterprise Hub (EEH) to break down traditional institutional silos of disciplines, academics and professional services. EEH is an emergent multi-disciplinary, trans-institutional platform seeking to

connect resources, stakeholders, schools, industries, and societies. Taught EEH provision forms an integral and Syntegrative scaffolding for all undergraduate technology awards offered by the Entrepreneur College (Taicang) through a specialised minor in contemporary entrepreneurialism. EEH has also embedded an innovative, entrepreneurial, and enterprising culture on campus, and has leveraged unique competitive advantages to help develop future leaders. It develops industry schools

jointly with well-known domestic and international partners in specialised fields. Such partnerships are instigated based on predicted future demand and industry alignment across technological trends such as AI, robotics, industry 4.0, big data, healthcare, entertainment, material sciences, smart manufacturing, and biochemistry. There are five strategic goals for EEH, namely 1) fostering the Syntegrative entrepreneurship education model; 2) becoming a recognised international brand and platform for business development; 3) establishing scalable new forms and modes of incubation which focus on early-stage escalation of student outputs; 4) executive education and professional development for leadership in industry 4.0, 5.0 and beyond; 5) developing emergent Syntegrative entrepreneurship research themes.

The organisational structure (Figure 1) is that of both a platform and a hub to link seven technology schools together. These seven different schools are the School of AI and Advanced Computing, School of Chips, School of Cultural Technology, School of Intelligent Finance and Business, School of Intelligent Manufacturing Ecosystem, School of Internet of Things and School of Robotics.

Entrepreneurship & Enterprise Hub (EEH) provides a number of key values (Figure 2), including:

(1) The transferal, syntegration, and cultivation of the necessary student capabilities within entrepreneurship (ENT) modules. A culture of strategic thinking, interpersonal skills, creative problem-solving and project-based learning in context of cutting-edge technologies, real world projects and across concepts such as entrepreneurship, intrapreneurship and technopreneurship.

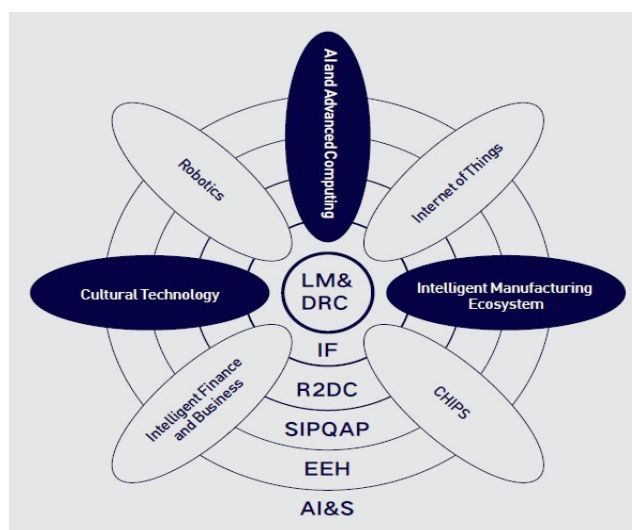


Figure 1. Organisational structure and positioning of EEH¹

(2) Connectivity with schools, industry, university, and government. EEH provides a conduit between XJTLU schools and university-led partnerships that link internal and

external collaborations with international institutions and companies. EEH also alliances with industrial partners and societal entities more widely to develop innovative student employment opportunities. In addition to partnership with local government, EEH also aligns research projects with governmental development priorities in order to develop future-facing graduates with the required agency and capabilities.

(3) Diversity of participation. Students, staff, alumni and industry are key stakeholders in the development and success of EEH. As a hybrid platform of both staff and student entrepreneurs, technologists and business owners it seeks to inspire successful innovation - not through being a community of practice where there are specific routes to membership (Lave & Wenger, 1991) perhaps more typical of entrepreneurial education - but through fostering something closer to a nurturing affinity space (Gee, 2004; Gee & Hayes, 2012) of entrepreneurialism, where contributions are welcome from all, and can be developed irrespective of age, ability, gender or ethnicity, where learning emerges through shared pursuit and common goals, acts of construction and the potential for creative success (Gee, 2005; Papert & Harel, 1991) in lieu of more traditional didactic methods.

(4) Society. Employability, sustainability-led impact, inclusive learning, social and cultural enterprise are key impetuses for EEH, and also values it intends to imbue its graduates, start-ups and spin-out businesses with. It seeks multi-generational impact through alignment with government policy on entrepreneurialism, its developing themes of executive education and wider ecosystem approaches to value-creation as hallmarks of EEH provision.

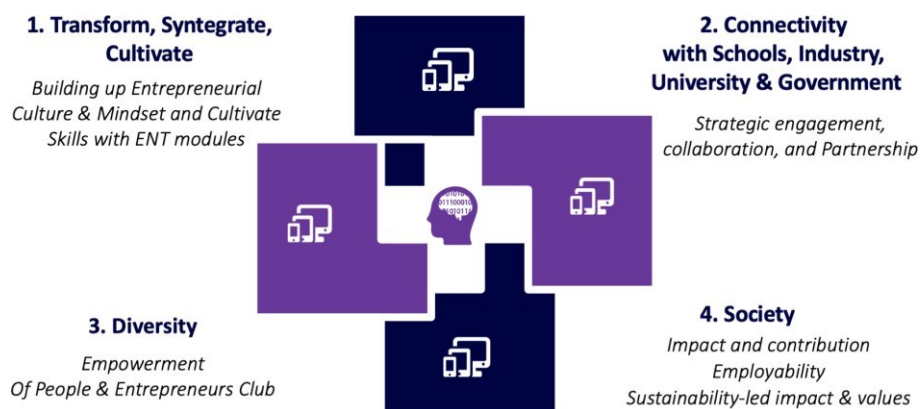


Figure 2. Key values of EEH

5) Leading Entrepreneurial Degree Programme Innovation:

The MSc Entrepreneurship and Innovation (MSc E&I) programme is designed to stimulate students to acquire an entrepreneurial mindset. The programme offers a broad range of pathways (Figure 3) to meet diverse students' interests and needs. As part of curriculum development innovation, the programme offer specialisation in a number of

pathways. Including Business, Circular Economy, Creative Technology, Enterprise Governance, Innovation and Succession, FinTech, Smart Cities and Technology Transfer Management, pathways are developed jointly with departments, schools, academies, and industry partners such as School of Intelligent Finance and Business, Academy of Film and Creative Technology, HeXie academy, International Business School Suzhou, Department of Urban Planning and Design, and XJTLU-JITRI academy of Industrial Technology. As somewhat of a revolution for progressive enterprise curriculum development, the MSc E&I programme enables students to learn how to identify new innovative or entrepreneurial opportunities, assess their potential, identify possible investors and clients, and bring ideas to the market. They learn how to develop managerial and leadership skills, including managing multi-disciplinary teams in innovative contexts. The programme also provides students with the ability to manage innovative ventures in one of many possible forms, such as their own start-ups, or as part of corporate intrapreneurship and consultancy placements. Students are provided with the infrastructure, resources and guidance to establish new products and ventures whilst following an academic trajectory built around business development. This combination of theory and practice, typified by the industry-oriented Masters' degrees of the Entrepreneur College (Taicang), offers students a unique educational experience with the potential to develop future-facing skillsets honed in real-life contexts.

6. Discussions

Whether a university is public or private, the following five qualities must be considered if it desires to build an entrepreneurial model (Etzkowitz, 1983, 2003; Guerrero et al., 2016; OECD, 2012). First, the presence of interconnections with governments, industries, and societies; second, the existence of different revenue streams, which make the university partially or completely independent from public funding; third, students' and faculties' involvement in some entrepreneurial activities, such as entrepreneurial education or technology transfer activities; and fourth, the creation of academic start-ups or spin-offs, supported by the implementation of ad hoc strategies, and lastly, the modification of the university organisational and structure to accommodate these changes and operation of entrepreneurial activities.

Literature had analysed the interaction between entrepreneurial activity, education, and research, identifying crucial limitations. Specifically, Sam and van der Sijde (2014) stated that engaging in entrepreneurial activities does not turn a university into an entrepreneurial institution. This only occurs when entrepreneurial efforts provide value to education and research, and vice versa. According to Günther and Wagner (2008), the entrepreneurial university is a complex institution with direct and indirect dynamics. The former refers to the transfer of information from research to industry, while the latter refers to the backing of entrepreneurial activities via entrepreneurship education. However, extant literature often individually addresses one or both of these connecting processes. Our research findings show reciprocal connections and routes, which address this literature gap. Our paper offers university managers and policymakers a mechanism for developing entrepreneurial universities and considering their technological,

managerial, and organisational implications. Answering questions is essential for contemporary policy and intellectual discussions (Benneworth et al., 2016).

7. Conclusions and Future Research

In conclusion, the case of XJTLU Entrepreneur College (Taicang) illustrates an attempt by a Chinese university from a small, newly industrialized economy to transform itself so it can contribute more effectively to the dynamic shift of the country toward a regional knowledge-based economic hub. The approach required structural changes to the university's organisation, and the establishment of a new hybrid department unit called the Entrepreneurship and Enterprise Hub (EEH) - that was neither an academic unit, nor a professional service in its entirety - but a university-wide platform for the systematic coordination of technology entrepreneurship and entrepreneurial education, preparing businesses, regional ecosystems and society more widely for the challenges of industry 5.0 and beyond. Since the pursuit of technology commercialisation as a university objective requires extensive organisational change that is likely to encounter considerable resistance, a completely new type of hybrid unit to lead university-level entrepreneurial activities appears necessary to break-down institutional subject and service silos. From there development of a modern, sustainable entrepreneurial university may become possible. In the future, data triangulation and multi-stakeholder data analysis will be carried out. For example, we will analyze transcripts from interviews with local government officers, students, faculties, and companies, to generate a more insightful and converging chain of evidence.

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