



Analysis of Knowledge Exchange Between Higher Education Institutions & Businesses for Establishing Entrepreneurial Universities in Quetta, Balochistan

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Abstract

The term “Entrepreneurial University” has prominent attention in the western world after the “Triple Helix Model” presented by Leydesdorff and Etzkowitz where it shaped the research outcomes in the form of patents, marketable brands, products and services that paved the way for traditional universities to transform into entrepreneurial university and the higher education institutions became self-sufficient in monetary terms and contribute to the economic growth of the nations. Though there are remarkable acceptance for this concept and many western higher education institutions, developed Asian countries and their universities benefited from transforming their research into valued monetary research while less developed countries still struggling in this direction to transform their higher education institutions as “Entrepreneurial University”. The current paper presents the concept of entrepreneurial university in the less developed world, i.e. Pakistan and especially the case of Balochistan province. The research is qualitative in nature using thematic analysis through a semi-structured interview method and questionnaires to corroborate the responses. Six main themes emerged from data that include i. perception of entrepreneurial university ii. human development to technology development iii. entrepreneurial skills for academia iv. SOPs to transform research into innovation. v. regionally developed brands. vi. collaboration & communication with the private sector. The research also contributed the efforts done by higher education commission of Pakistan, and the progress of imitative of “office of research and innovation center university of Balochistan”.

Key Words: Entrepreneurial University, Triple Helix Model, Higher Education Institutions (HEIs), Research and Innovation.

Introduction

The term “entrepreneurial university” has a widespread impact on research outcomes as in the modern era; higher education institutions are transforming into the supportive role of economic agent that not only becoming self-sufficient for their financial needs but also playing a vital role for the country to be developed. This goal is achieved by transforming academic research into brands and products that are marketed for financial compensation with the directive of government as caretaker and with the financial support of private businesses that requires invention or innovation in technology, patents and services to maximize profit margins. As this concept is presented in detail by [Leydesdorff & Etzkowitz \(1996\)](#) in their “Triple Helix Model” in which higher education institutions are recognized the main stakeholder in the model for generating research-based technology, patents and products rather purely dependent on traditional publications and they rationalize that this would enable higher education institutions, i.e. universities to become self-sufficient in terms of revenue-generating for their functional needs rather dependent of government exchequer. The second stakeholder is a private business which directly benefited from the research outcomes of the higher education institutions research outcomes in the form of brands, products, technology, services or any other related marketable commodity that would maximize their

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profit margin. The third main stakeholder is a government which supports such outcomes, and this would definitely have the positive impact on country economic growth in may terms like job creations, technological advancement, less dependency of universities on government budgeting, hike in exports and decline in imports as well as an economic activity within the region.

Background of the Study

The advancement in the field of science and technology has provided the new dimensions to the society. Evaluation of the technology not only connected the entire world but also provided the services, brands, patents and resources to the society with new opportunities for economic growth to governments and organizations. The paradigm shifted benefited the higher education provided institutions, i.e. universities, to be entirely depended on government support to an autonomous entity referred to as “entrepreneurial university”. The term entrepreneurial is briefly defined as the creation of organizations by entrepreneurs in the sense that establishing the organization and creating business ventures are the criteria that differentiate entrepreneurs with non-entrepreneurs [Gartner \(1988\)](#); thus the entrepreneurial university is defined by different scholars in following terms. The most important earliest definition is by [Etzkowitz \(1983\)](#) that defines an entrepreneurial university is a university that is considering the new source of funds in terms of patents, research under by contracts and entry into the partnership with a private enterprise. Entrepreneurial university is also defined by [\(Chrisman, Hynes, & Fraser, 1995\)](#) that the entrepreneurial university involves the creation of new business ventures by University academia and students. [Dill \(1995\)](#) elaborate on an entrepreneurial university technology transfer with private businesses as formal efforts to capitalize upon university research by bringing university research outcomes for financial outcomes and projects. Formal efforts are defined in terms of as organizational units with explicit responsibility for promoting technology transfer. [Clark \(1998\)](#) summarize as an entrepreneurial university innovates its own ways to step forward for businesses. a substantial shift in the form of organizational character to develop a more promising posture for the future business connections. Entrepreneurial universities become “stand-up” universities that are significant actors defined by their own terms Clark (1998).

Triple Helix Model

Triple Helix Model presented Etzkowitz and Leydesdorff (1998) as it is the pioneer model to drive a higher education institution, i.e. a traditional university for its transformation as an entrepreneurial university. As this model identified three main stakeholders as the university itself, private business as fund and resource allocator and government as mediator and controller. The model is further elaborated by [Etzkowitz \(2007\)](#) as “triple helix is a metaphor for university, industry, and government interacting closely while each maintains its independent identity. The triple helix message is that universities, firms and governments assume some of the capabilities of the other, even as each maintains its primary role and distinct identity”. This elaboration clearly mentions the role of each stakeholder while maintaining its core responsibility for the establishment and an entrepreneurial university for the benefit of each element.

Role of Technology Transfer Offices (TTOs)

While assessing the performance of TTOs (Technology Transfer Offices) activity, it is identified [Siegel, Waldman & Link \(2003\)](#) that these offices characterized by constant returns to scale and some environmental and institutional factors may explain the variation in performance in some context and productivity of the TTO may depend upon organizational practices. As being a part of entrepreneur university, it is important to analyse the motives behind the research academics for sharing their research with businesses, and a study conducted for physical and engineering sciences [Perkmann & Spicer \(2010\)](#) revealed that most research scientists engage with industry for further their research as it is believed that they share their research for commercialization and profit gain for higher education institutions and themselves. The study also finds out that there are differences in channels of engagement from patenting and spinoff’s motivated by commercialization and joint research, contract research and academic consulting by research related motives for research scientists.

Role of Incubation Centers

While discussing Entrepreneurial university, the role of incubation centers cannot be underestimated as the study suggests by Stal, Andreassi & Fujino (2016) that there is no priority for private businesses to get monetary advantage from innovations created from academic research results, despite the presence of incubators the private businesses are highly interested in the incubators' preference for projects that have a high potential for interaction with the university. Despite traditional incubation center and their processed [Kreusel, Roth & Brem \(2018\)](#) has identified two other types of incubation centers that greatly affects the output of the incubation centers namely "company builders" and "accelerators". The company builders are the type of creating new ventures, spin-offs, start-ups and joint venters with private businesses and "accelerators" are best known for its character sticks of booming, strengthening and enforcing new as well as existing portfolios of businesses.

Entrepreneurial University & Developing Countries

No doubt, the elements and criteria for an entrepreneurial university varies between developed and developing countries. For finding out differences and elements for developing countries, research conducted by [Farsi, Manipour, & Salamzadeh, 2012](#)), following four main elements were found out for an entrepreneurial university development of these were i. resources either soft that includes human resource, entrepreneur background resources and hard that includes various financial support. Secondly, ii. Capabilities of the university in which rank and background are important factors and iii. the mission of the university to become an entrepreneurial higher education institution and iv. the impending factors that include political behaviour and resistance of all stakeholders were discussed. While analyzing triple helix for developing countries [Williams & Woodson \(2012\)](#) have analyzed South Asia, Brazil and African countries for Less Economically Developed Countries (LEDCs) and argued that innovation and technology developed by scientific academia theoretically and practically might contribute to the innovation policies in the less economically developed countries. Their study has analyzed two distinct patterns in mentioned less economic developed countries are for as the whole society as a site for innovation and secondly, innovation through appropriation.

Entrepreneurial university in the Context of Balochistan

This research study has explored few dimensions of the existing situation within universities for knowledge-sharing processes among universities and businesses to build alliances and collaborations to become entrepreneurial universities in Quetta city as well as the analysis of current practices that contribute to building this collaboration of universities with businesses and industries to introduce entrepreneurship among students and faculty. The research has further analysed some aspects of universities in the sense of their capability of becoming entrepreneurial universities operating within Quetta Balochistan. Through research, technology and innovation sharing with local and national level businesses. The study may have contributed to lay down a foundation for universities to work on such areas for development of faculty and students.

Research Objectives

1. To explore the level of linkages built between universities and various businesses for becoming entrepreneurial universities in Quetta.
2. To explore the knowledge exchange process and issues between higher education institutions and businesses in Quetta city.

Research Questions

1. Are public sector universities performing as entrepreneurial universities in Quetta?
2. Do public sector universities have the potential to become entrepreneurial universities?
3. How the linkages of Universities with businesses in Quetta can enhance the operation of entrepreneurial universities?

Research Design

The research is of a qualitative nature. A “Semi-Structured Interviews” approach [Barriball and While \(1994\)](#) is preferred as this approach provides the flexibility to collect data through a semi-structured interview. Semi-Structure approach would assist the researcher in analysing a range of current factors contributing to entrepreneurial universities and be able to detect elements and processes that innovate such dimensions for universities for entrepreneurship through “Thematic Analysis”. “Thematic analysis is a method for identifying, analyzing and reporting patterns (themes) within data” ([Braun & Clarke, 2006, p. 79](#)). This method “aims to explore the understanding of an issue or the signification of an idea” ([Attride & Stirling, 2001, p. 387](#)). It enables the researcher to interpret and understand the respondents’ perspectives based on a situation by subjective analysis. The subjective element would be introduced to attribute, leading to purposeful recommendations based on conclusions. However, some of the objective analyses could also be included in this research by highlighting certain policy documents and carrying out discussions about it. Further, semi-structured interview in qualitative methods [McIntosh & Morse \(2015\)](#) enables a researcher to deeply examine the contents of the data of qualitative nature mainly interview. Semi-Structure Interviews enable a researcher to go beyond the quantitative methods and statistical data analysis for understanding the most.

Data Collection and Sampling

All universities in Quetta city and businesses are the population in this research study for which purposive sampling “non-probability sampling” method carried out. The purposive sampling technique is from non-probability sampling is highly effective when a cultural domain of society is investigated with knowledgeable experience and opinion ([Tongco, 2007](#)). An array of possibilities is observed through purposive sampling ([Devers & Frankel, 2000](#)) through semi-structured interviews in order to assess the issue. In thematic analysis research purposive sample from a larger population is selected for two main stakeholders first research and innovation departments of the local university and external businesses operating in the vicinity of Quetta by considering the accessibility and their relevance with the subject ([Guarte & Barrios, 2006](#)). This sampling assists researcher to focus on specific characteristics of the population that are of interest with the best response to research questions. The sample selected is not although a true representative of the population; hence it is not considered as a weakness, but a choice as this technique is used to capture a wide range of perspectives on a selected topic. The sample would reflect a wide variety of attributes, behaviours experiences and incidents which will optimize the insights about the phenomenon by looking at it with wide spectrum.

Considering the scope of this research study, 12 respondents (8 higher management rank ORIC officers and officials from business incubation centres, and 4 from businesses in the vicinity of Quetta city) have been selected in purposive sampling and interviewed for semi-structured interviews for their insights on the research purpose and data are collected accordingly via video recording and short notes. Moreover, policy documents and secondary sources would support the evidence collected from higher education.

Research Analysis Tools

The data would be of qualitative nature, and there is no such previous study available regarding establishing an entrepreneurial university within the region, particularly Quetta. The applied method would be “Thematic Analysis”. Thematic analysis [Braun, Clark \(2006\)](#) has its own potential for drawing patterns and themes from data as described and elaborated by [Braun & Clark \(2006\)](#) six steps have applied as i. familiarization with data, ii. Coding, iii. generating initial themes, iv and reviving themes, v. defining and naming themes and writing up. Though having some pitfalls especially when the data is collected from a young age and collecting data from masses, in current research where the sample size is limited due to speciality of the respondents and highly experienced and purposive sampling are included in the research the thematic analysis would be the best yield the output in the form of the theme to be further elevated.

As six steps of thematic analysis [Braun & Clark \(2006\)](#) have been applied in psychology, marketing, management and social research the data is recorded in the form of audio through the “semi-structured interview” as to draw results and conclusions from the study. Thematic analysis [Boyatzis \(1998\)](#) has better outcomes in case

of a semi-structure interview. It is further identified as the appropriate method to inference the qualitative data [Despres & Chauvel \(2000\)](#) while extracting knowledge from a knowledgeable pool of the experts.

The data is transcribed in written form, and after initial familiarisation, coding is done. In the next step, initial themes are generated which have relevance with the topic and have importance. In the fourth step, themes are reviewed further from the dataset and illustrated and named for the research outcome, and these themes are presented in the next section of the research thesis.

Trustworthiness of the Data

In the case of a qualitative study, the trustworthiness of the data and research outcomes is measured through the model of [Lincoln & Guba \(1981\)](#) model of trustworthiness which has a valid application on qualitative studies. There are four criteria in the model of trustworthiness of [Lincoln, Guba \(1981\)](#) defined as credibility, transferability, dependability, and conformability aspects of the qualitative research. All four aspects of the data are validated for its trustworthiness and briefly described below, and the process is also applied to measure thematic analysis research of [Armendariz \(2019\)](#).

Credibility

In the research process, the credibility of the data has the importance to bring the experience and conception of the related answer through an interview to gain most of it and to receive exploratory responses Lincoln & Guba, (1981). The credibility of the data is obtained by completely describing the respondent with the aim and goals of the research. Further, they were encouraged to add their experiences, thoughts, and expectorations by asking their most related comments of the topic.

Transferability

As the purposive sampling technique is selected, it is expected that respondents' experiences are highly related to the topic, and they were expected to transform their valuable experience and concept of the entrepreneurial university with having a different mindset then general population for topic concern (Guba, 1981).

Dependability

The third step for data trustworthiness is dependability which means the constancy of the data and having stability while interpreted to research outcomes. It provides all track of the process, including sampling size, sampling selection and interpretation of the data. Meanwhile, the researcher, while interviewing, may change the course of the interview questions to get the maximum response of the respondent.

Conformability

As a researcher, it is mandatory to reduce the biasness, and for this purpose, the samples were selected that have the key positions for creating an environment of the entrepreneurial university and are closely related to the regulatory body in this case, i.e., Higher Education Commission to confront the research outcomes. Further, the business owners have enough experience in their filed to respond for the need for products, tools, experience workers, and services to build the concept of the entrepreneurial university with the higher education institutions.

Results and Discussion

As the semi-structured data is obtained and thematic analysis is applied ([Braun & Clarke, 2006, p. 79](#)), the data is initially familiarized for its relative contents, and any irrelevant content is excluded which is the first phase of thematic analysis. On the second phase, initial codes are generated with relevance to the topic, and on the third phase, initial themes are noted with the concern for relevance with conciseness. The fourth phase of the thematic analysis the initial themes are reviewed again and again for drawing outputs from the data and leading towards drawing the main themes which are the sixth and the final step of thematic analysis. Exhibit 4.1 shows the

sequential process of all these steps which are taken to draw the main themes of the research for output. The first fifteen initial themes are also listed in Exhibit 4.4 through which final themes are generated.

As the qualitative research conducted through the purposive sampling technique where experienced higher management of the offices that are relevant with the research topic and relevant higher management authorities of research and innovation offices are interviewed for expert opinion to draw a conclusion and the concept of “entrepreneurial university” may further be researched, analyzed, elevated and applied for establishing this concept within regional universities of Pakistan and especially in the case of Balochistan.

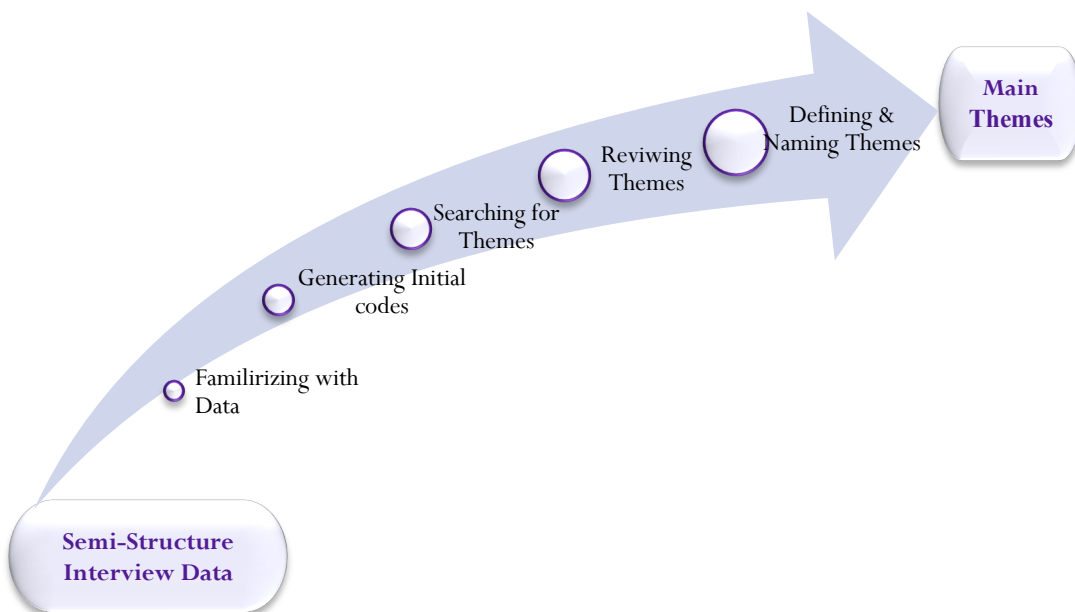


Exhibit 1. Six-Step Thematic Analysis Process

Further, private businesses are also researched and analyzed for their perception of developing brands, allocating funds, identify potential brands/sectors and their willingness to participate in brands and innovation on a regional level with the support of budget allocation and acceptance of generated brans and services. The following six themes Table 4.1 are generated through thematic analysis Braun & Clark (2006), and each theme is further discussed with details and outcomes from data:

Table 1. Main Themes

S. No	Main Themes
1	Perception of Entrepreneurial University
2	Human Development to Technology Development
3	Entrepreneurial Skills for Academia
4	SOPs to Transform Research into Innovation
5	Regionally Developed Brands
6	Collaboration & Communication with Private Sector

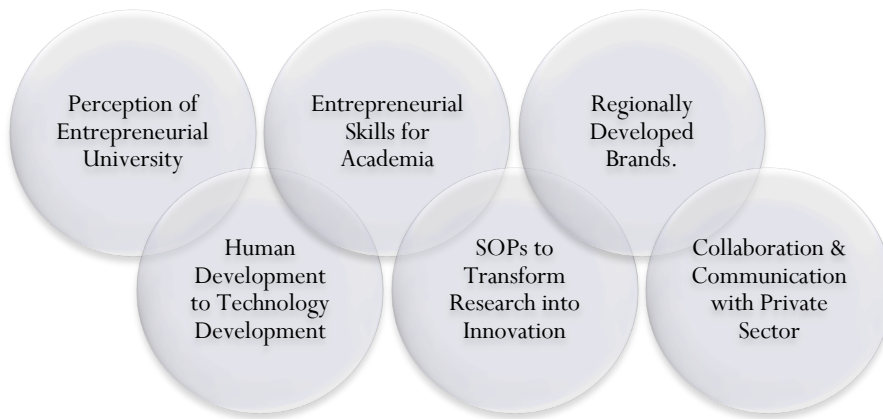


Exhibit 1.2. Shows the Relationship of each main theme with another as Drawn from the Semi-Structured Interview.

Table 2. Shows the Relationship of each main theme with codes and initial themes as drawn from the Semi-Structured Interview.

Main Themes	Initial / Review Themes	Codes	
Perception of Entrepreneurial University	Lack of awareness of Entrepreneurial University	Low Response to Projects	Low Response to Innovate
	Sense of entrepreneurial university among academia and students	Resource Shortage	Unawareness
	Entrepreneurship enrollment female students of Balochistan	Difference between Environment	Hurdles for Female Ent
Human Development to Technology Development	Business skills in academia of Pakistan universities	Guiding Examples	Need for Entrepreneurial Course
	Less attention & importance to ORIC activities by universities	Collaboration with Dev Sect	Workshops & Seminars
	Low level of education in business	Ent Course in Science Discipline	Local Brands Promo
Entrepreneurial Skills for Academia	Mindset transformation of academia towards brands and products	Marketing of Brands & Patents	OIRC Independent Operates
	Trust gains of university academia and private business owner	Un-Skilled Labour	Guiding SOPs for Research
	Lack of SOPs to transform research into brands and products	Stakeholders Communication	Need Local Developed Machinery
SOPs to Transform Research into Innovation	Marketing department involvement in brands and products	The need for Incubation Centers	Academia Incentive

Main Themes	Initial / Review Themes	Codes	
Regionally Developed Brands	Research focusses on human development to technology development to drive entrepreneurship	Low Level of Edu in Business	Brainstorming & Idea Generation
	Developing brands culturally and regionally accepted brands	Value Addition & Innovation	Promote Patent Culture
	Resource available	Diff in Academia & Bus Mindset	Start-ups for Graduates
Collaboration & Communication with Private Sector	OIRC Perform indigenously	Initiate Start-ups then SOPs	Social & Civic Issues
	Political stability in term of not changing SOPs in a short span of time	HEC Participation	PhDs Led Start-ups
		Direct Investment in Brands	Complicated Policies
		Local Brands through Exhibition	Support of Government
		Publication Driven	New Concept in Research

Perception of Entrepreneurial University

The first main theme that is emerged from data is the “Perception of Entrepreneurial University”. The supporting codes are illustrated in **Exhibit 1.4** that are a new concept in research, low response to projects, promote patent culture, the need of incubation centers, start-ups for graduate, guiding examples, HEC participation and workshops and seminar for the graduate level students and academia will enhance the concept of the entrepreneurial university among the students, academia and businessman of the Quetta vicinity. The codes emerged from the data, and initial themes were constructed that are lack of awareness of the entrepreneurial university, sense of entrepreneurial university among academia and students and the entrepreneurship enrollment of students of Balochistan. Finally, the main theme constructed on these codes, initial themes that is the perception of the entrepreneurial university.

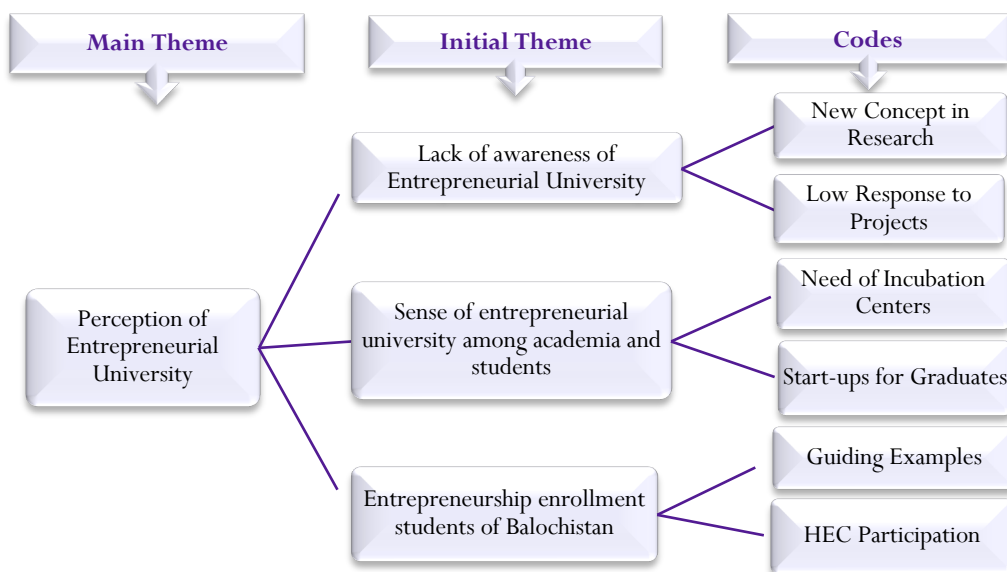


Exhibit 1.3. Development of the Main Theme from Codes and Initial Themes.

As the term entrepreneurial university though has a lucrative and attractive appeal for all stakeholders, i.e. university, businesses and government, its emergence in the developing countries generally (Eun, Lee, & Wu, 2006) and backward provinces like Balochistan particularly difficult to ingest where public sector universities are completely dependent on government funding. Though the government has taken progressive steps in the form of ORIC (Office of Research & Innovation Center), NIC (National Incubation Center, TISC (Technology Innovation Scientific Center) and recently CAC (Council of Advisory Committee) which is established by the imitative of Higher Education Commission of Pakistan for once in a month gathering with private business to formulate marketable brands and innovations, the “true essence of an entrepreneurial university is still missing among academia whose focus is only to publish papers”, response added by one aware and experienced director of ORIC.

The perception of the entrepreneurial university within the academia of regionally operating on the public and private sector is still not clear, and this ambiguity causes the low output from research in the form of brands and products. It is identified that we have adequate highly educated academia in the field of research, but their research now should be directed towards the brands and marketable products as commented by manager university-industry linkage that “We are enough PhDs and we have invested a lot on it, and now funding organizations like Higher Education Commission and Government of Pakistan and Government of Balochistan has to divert fund towards university and industry linkages and focus on bringing technology revaluation within the society”. The perception of the entrepreneurial university and the directions to invest for technology-driven society is also strengthened by research as studied and suggested by Liu & Huang (2018) that entrepreneurial university should have the position of micor-foundational perspective with having four basic traits of the resource base, motivation and objectives, resource allocation and coordination mechanisms and regional outcome.

Human Development to Technology Development

The main theme developed on these codes and initial themes is “Human development to technology development” which is further discussed in detail in next paras.

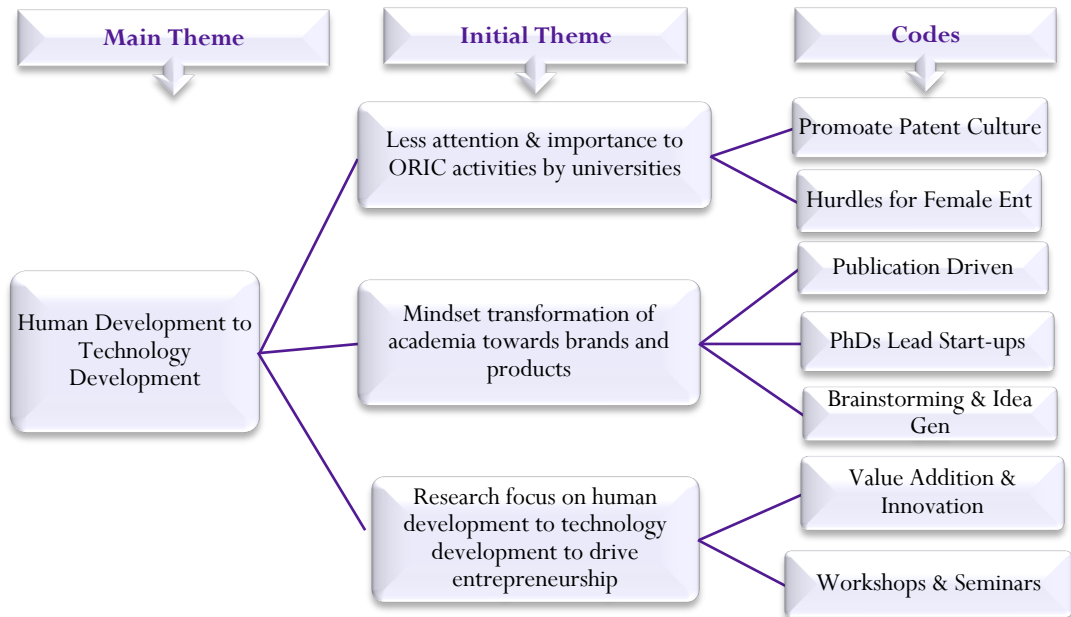


Exhibit 1.4. Development of the Main Theme from Codes and Initial Themes.

It is well said by the interviewee that “it is high time that we should transfer our research from human development to technology development, and it is the aim of higher education commission of Pakistan in the form of ORIC and other related activities”. He also added that academia having higher education from abroad and local universities may develop a sense of entrepreneurship among the students.

The Second theme emerged as the “Human Development to Technology Development” as the Manager University-Industry Relationship mentioned that “Research studies are purely applied funded by telecommunication and accessories firm “Huawei” in China, and 246 PhDs are working only of invention and innovation through research”. The transformation from human perspective to technology perspective within the higher education institutions needs only ORIC or TTO setups are incubations centers, and nurseries are also important the director ORIC s suggested that “ As in the initial stage and good invention or innovation needs the up to the date equipment’s and lab services which are still lacking on Balochistan level. Other ORIC centers of the city may have progressed in this sense as they established, but SBKWU is still in its initial phase especially in the case of ORIC.”

Entrepreneurial Skills for Academia

The next main theme is the “Entrepreneurial skills for academia” and the supporting codes this main theme are academia incentive, an entrepreneurial course in science and other related disciplines, need for the entrepreneurial course for graduates, and a low response to innovation from academia and business sector in general. Further, initial themes are constructed on these codes and emerged initial themes are business skills in academia of Pakistan universities and trust gain of university academia and private business owner.

The main theme “entrepreneurial skills for academia” is further discussed in detail in coming paras and main theme, initial theme and codes obtained from data are illustrated in Exhibit. 1.5.



Exhibit 1.5. Development of the Main Theme from Codes and Initial Themes.

The third theme describes the need for skills of entrepreneurship in academia, and as e seeking entrepreneurial skills in academia of Pakistan higher education institutions it is pointed out that “Every society has its own flavour of innovation and entrepreneurship” and emphasized by Dir ORIC BUIETMS that “To use the local resources, local intellect and develop our local products, processes. Instead of importing brands & products”. This statement provides another dimension of the entrepreneurial taste, socio-cultural factors and entrepreneurial activity within the society as mentioned earlier ([Thornton, Ribeiro-Soriano, & Urbano, 2011](#)).

To cover this gap, “HEC is doing a lot, but the problem is with the institution as the university administration do not realize the importance of ORICs” expert opinion of the ORIC Director BUIETMS mentioned the “non-participative behaviour of the academia and administration”. To cover such mindset “Future plan of the ORIC is to change the mindset of academia and students that do not do research for the sake of publication but for patents and products”, he concluded. This mindset transformation may be covered by evoking entrepreneurial abilities

and commercialization of research perspective in university academia to the academic scientist as mentioned (Jain, George, & Maltarich, 2009) with the linkage of academia scientist as “it is observed that scientists invoke rationales for involvement that are congruent with their academic role identity”.

SOPs to Transform Research into Innovation

The theme “SOPs (standard operational procedure) to transform research into innovation” is indicates the rules and regulations for changing the mindset of all stakeholders to develop brands and marketable services to take steps towards the “Entrepreneurial University”.

Initial codes that are highlighted from data are initiated starts-ups then SOPs, Guiding SOPs for research, direct investment in brands, to avoid complicated policies, ORIC indigenous operation and support of the government as stakeholders to promote an entrepreneurial culture within the higher education institutions of Pakistan. Initial themes are developed as lack of SOPs to transform research into brands and products, political stability in term of not changing SOPs, in a short span of time and autonomous function of the ORIC to take the initiative for developing brands and marketable products.

The main theme is further discussed in detail in coming paras, and its relationship with codes is illustrated in Exhibit. 1.6.

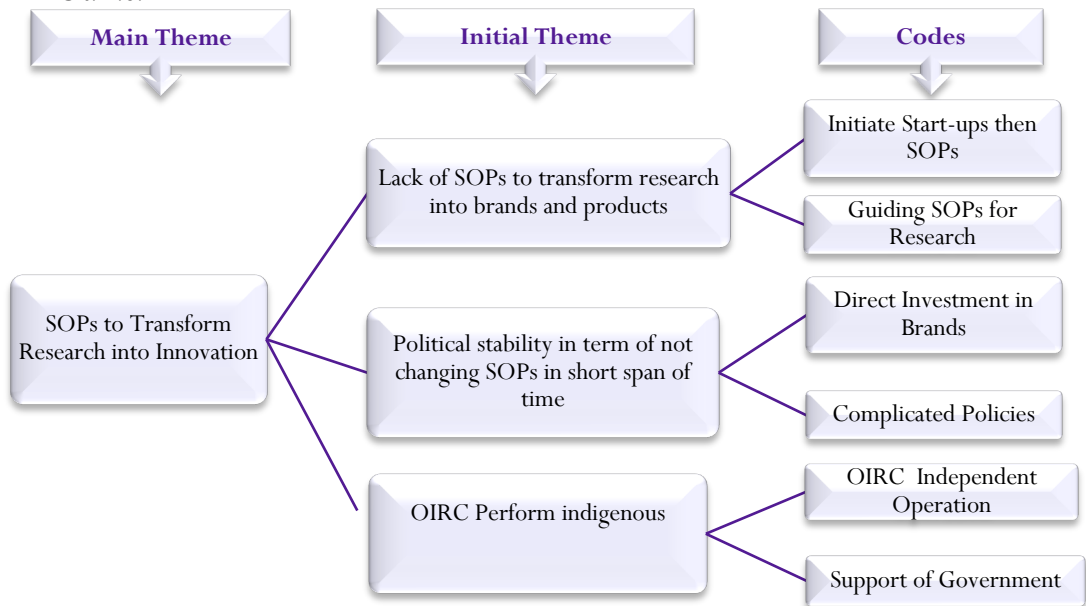


Exhibit. 1.6. Development of the Main Theme from Codes and Initial Themes.

Majority of the management while interviewing mentioned that there must be leading standard operational procedures (SOPs) to be formulated for guidance and directions that would emphasize on converting research into brands and patents, but these are lacking and apart from this “there is no SOP yet developed for academia to transfer their research from papers to brands & products”, director ORIC UOB mentioned the directive documents for scientists and researchers The fourth theme of the research data clearly indicates that there must be directives and SOPs to transform research into inventions and innovation rather in services or products for higher education institutions as well as for research supervisors and associates.

Though there are enough fund and resources allocated by the Higher Education Commission of Pakistan to patronize the skills of highly qualified academia towards innovation. “Incentive is being offered to scholars and academia and Technology Development Fund around 14 million for scholars of PhD and Master of Science level for marketable brands and patents”. Clarified the support of HEC Pakistan by the higher management of ORICs. Another aspect of the promoting brands and patents via private business is likely “marketing your research and

patents as an important aspect and marketing departments are also plays a vital role but they are involved more in their course or theory than practical or field experience”. A bold step has been taken of HEC as Council of Advisory Committee is established to A corporate advisory council established and “Corporate Advisory Council (CAC) can involve government and private businesses. We can listen to them; we discuss their problems and pass these problems to our scientists”. CAC meeting is scheduled to be arranged monthly or fortnightly, a positive response added by university-industry linkage manager of BUIETMS.

Regionally Developed Brands & Products

Exhibit 1.8 illustrates the relationship of the main theme “Regionally developed brands and products” with the initial themes and data-driven codes. The concept is further discussed in detail in coming lines as locally developed brands, and products have their own strength and weaknesses as compare with high developed technology-driven brands and products.

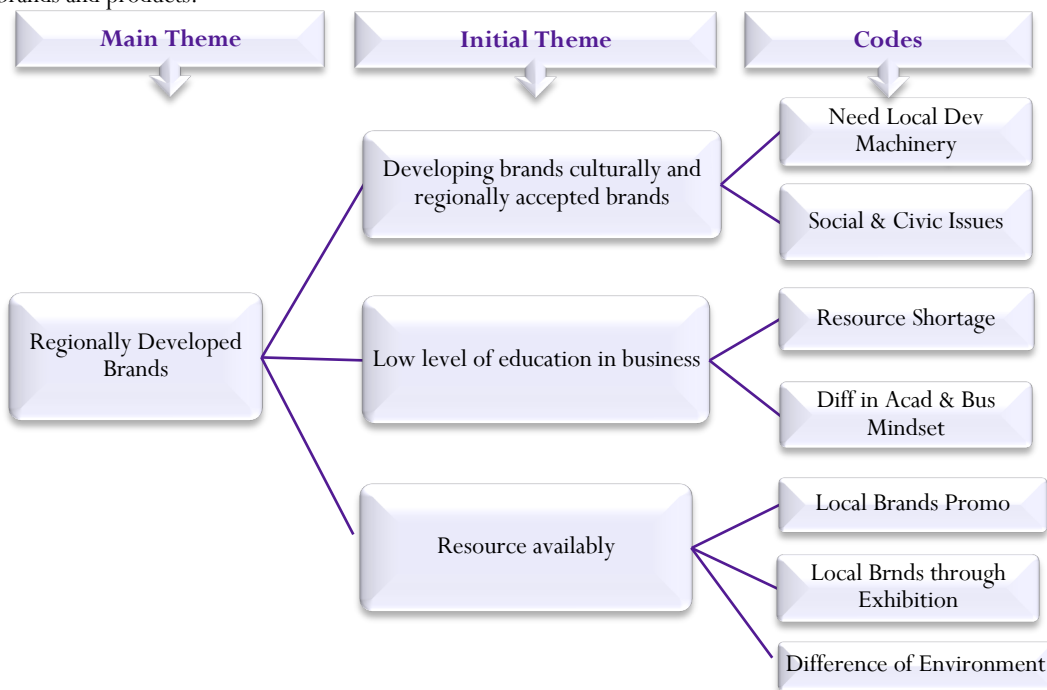


Exhibit. 1.7. Development of the Main Theme from Codes and Initial Themes.

The fifth main theme indicates the importance of local brands and their promotion with marketing and social aspects within the region to be less dependent on imports, as discussing the other social factors that support or hinders the process of industrial workflow and having objectives for academia to develop suitable brands/patents for them is “Political stability is also an important factor for investing as for last 15 years foreign investment is reduced, and local businesses shifted to neighbour countries. The literature also shows an indirect positive effect of political stability and economic growth as Feng (1997) mentioned results indicate that democracy has a positive indirect effect upon growth through its impacts on the probabilities of both regimes change and constitutional government change.

The second important thing is resources like “electricity and gas available for R&D” and most noticeably “communication, transport and telecommunication are also important”. Manager university-industry linkage pointed out the need for related resources for promoting entrepreneurial culture within the university.

Collaboration & Communication with Private Businesses.

The theme “Collaboration and communication with private business” with its initial themes and codes are illustrated in Exhibit 1.9. This main theme clearly indicates the communication of all stakeholders that are a higher education institution, private business and government as stakeholders. The data codes are unawareness, stakeholder’s communication, collaboration with the development sector, low-level education in business, marketing of brands and patents, and the problems of unskilled labour has its priorities. The initial themes have emerged as marketing department involvement in brands and products and exchange ideas and communication with private business holders. The main theme is further discussed in detail in coming paras.

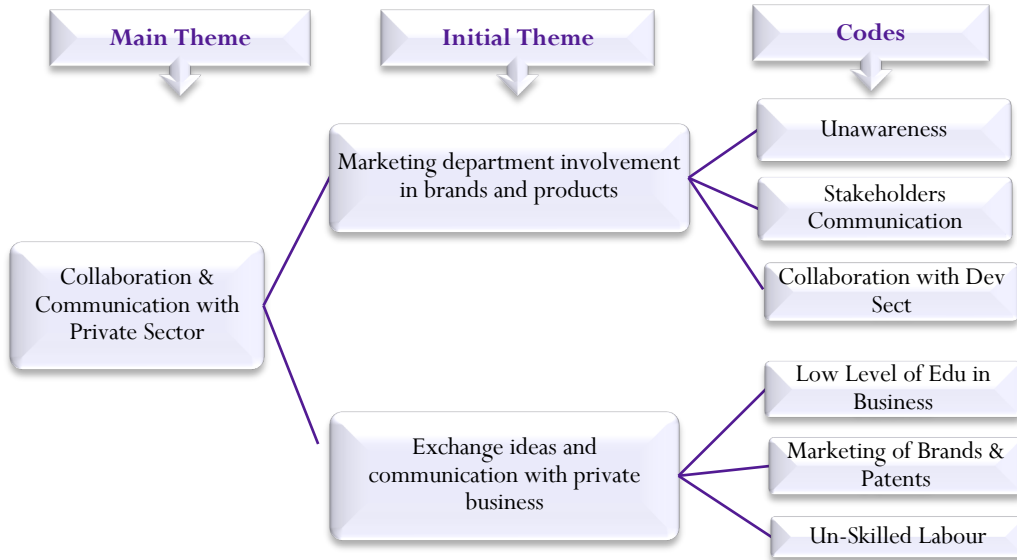


Exhibit 1.8. Development of the Main Theme from Codes and Initial Themes.

“What is the mindset of the private businesses?” is also important to analyze, and the response is worthy to interpret as firm owners’ views regarding R&D is highly positive. They not only ensured their support but also indicate the areas where sophisticated research and its outcome may show dramatic change not only for the business ROI but also for academia and society in general. As our society is also depending on agriculture, it is mentioned that “DAP (Diammonium Phosphate) fertilizer damaging soil and reducing the corps yield, Calcium cyst is formed in earth deep 4 feet after 10 years use of Diammonium phosphate (DAP) fertilizer”. Fertilizer industry needs reevaluation, and as an agriculture society, we cannot produce hybrid seeds “, and no Pakistani seed brand is being used”.

In marble industry, nearly all equipment, dyes, and polishing materials are imported from China, and if the local market prepares such on-demand items the private business owner will definitely communicate and invest in such opportunity for the growth and stability of their busies as stated by one leading marble sector businessman having more then twenty years of experience that “All polishing equipment’s and machines blades/granites are imported from China”. And “60% marble is destroyed due to blasting method and non-availability of slicing, segments marble technology and lack of skilled workers. Only very few have slicing technology” he further added to the grim situation of marble industry of Balochistan.

Table 3. Initiative & Progress of ORIC UOB

S. No	Project	Status
1	Innovation Summit	Office of Research & Innovation Center of Balochistan University has arranged four innovation successful innovation summits in the

S. No	Project	Status
		University of Balochistan started in 2016 till 2019. In the summit, students were encouraged to bring innovative ideas regarding brands, products and services.
2	Smart Helmet	<p>OIRC has developed “smart helmet” which is equipped with hi-tech sensors that enable the mining sector to reduce the human loss in catastrophic situations. The smart helmet project worth 14million rupees and will help to reduce the accidental loss in coal mining and related mining sectors.</p> <p>ORIC of the University of Balochistan with the collaboration of United Nations Development Program (UNDP) has initiated a pilot project that enables the Planning and Development Department of Balochistan Government to provide administrative assistance in forms of employment productivity, departmental fund loss in projects, officers and official training for task handling and inter-department collaboration and communication. Till date, two phases have been planned started in May 2019 to May 2020 & June 2020 to June 2021.</p>
3	Government Innovation Laboratory	
4	DIGI Skills	<p>ORIC Balochistan has successfully provided a course for around 200 students as freelancer project launched by Government of Pakistan to compete and prepare the students the get financial gain in a today competitive market.</p> <p>Initially, a smaller number of students and freelancers from Balochistan has shown interest in the courses offered by DIGI Skills Pakistan.</p>
5	Smart Water Filtration Kit	<p>ORIC Balochistan University has successfully developed a smart water filtration kit for Public & Health Department Balochistan. The smart has the capacity of measuring four qualitative values of water and the quantity of water. Government Balochistan is planning to fix the smart water filtration kit on all Balochistan water filtration plants to provide clean water to the masses.</p>
6	Smart Dust Bin	<p>ORIC Balochistan has initialized the idea and preparation of smart dust bin which has connectivity with the WIFI and main server of the municipal office. In case the dust bin is filled the garbage, collection vehicle will be informed through the message, and garbage will be collected only from filled dust bins with efficiency.</p>
7	Official Website Municipal Corporation Quetta	<p>ORIC has developed the official website of Municipal Corporation Quetta with details of employee tracks, records, projects and services provided by Municipal Corporation Quetta.</p>
8	Seventeen Sustainable Development Goals 2030 of the United Nations	<p>ORIC Balochistan has signed mutual interest with UNDP for the seventeen development goals of 2030 especially reforms in social and socio-economic sector of Balochistan. ORIC will be a helping hand initially for four sectors and will collaborate with the Government of Balochistan for sustainable growth in the social sector.</p>
9	Center of Excellence for Result base Management	<p>ORIC University of Balochistan has initiated a project center of excellence for result base management for government and public service delivery.</p>

Source: Originated by the author with the permission of ORIC Data.

Conclusion & Recommendations

As per interviews data and management expert opinions of the higher education institutions, the topic of the entrepreneurial university and this term application on local operating universities especially public sectors institutes, there are different aspects which would be kept in mind while transforming these institutions into “Entrepreneurial University”.

It is mandatory for Higher Education Commission of Pakistan and higher education institutions of Pakistan, i.e. universities to change the mindset of the academia and research fellows to convert their research from paper publication to innovation, inventions, products and brands. This step may require formulating standard operational procedures (SOPs) to be regulated and implemented within the universities for having “entrepreneurial universities” within the region. On the other hand, establishing an entrepreneurial university requires an eco-system within that all three stakeholders are fully aware of their responsibility and opportunity for growth and return. This will, directly and indirectly, boost the country economy and all stakeholders, i.e. university, business and government, will gain. This eco-system is dependent upon all major actors’ involvement, ability to identify opportunity in the shape of product innovation, SOPs to be followed, timeframe, mutual understanding and flawless communication. The most important dimension which this paper revealed that every society has its own strength and weaknesses in terms of marketable brands. Pakistan generally and Balochistan particularly may be focused for marine sciences, marble industry, agriculture & seed production, small & medium enterprise development, mining sector, waste management, cattle farming & breeding, vaccination & herbal medicines development instead of capturing higher-tech brands.

The research also suggests entrepreneurial subject may be added in graduation/university level as mentioned earlier and this concept will enable all the students of higher education institutions to present their research work with marketable opportunities, and this will ultimately change any traditional university to an entrepreneurial university for all disciplines research outcomes. The need for incubation centers cannot be neglected while forwarding towards an entrepreneurial university. The centers may be established in each university, or at least a central incubation centre should be developed with all latest equipment’s and labs, where researchers can transform their research into brands and products.

Another important element for establishing an entrepreneurial university is to attract the businessman for investment and ensuring his investment for return over investment. Any marketable product or brand may ensure that it will pay off. Only patenting and registering the invention or innovation without investment, return on investment (ROI), marketable and saleable opportunities will only be as valued for entrepreneurial university and a simple research paper. Eventually, the concept of “entrepreneurial university” has to be a significant component of higher management of ORICs and BICs management while the academia should be brainstormed, educated, evaluated, guided and communicated to transfer the concept of “entrepreneurial university”. Its scope in the future of higher education institutions, role in the economic growth, self-sufficiency and freedom from government funding would significantly be accepted features for universities in Pakistan.

References

- Armendariz, C. N. (2017). Thematic analysis of the Excel Pre-Collegiate Program as an avenue of successful postsecondary enrollment for Latina/o students, A. *2000-2019-CSU Theses and Dissertations*.
- Attride & Stirling, J. (2001). Thematic networks: an analytic tool for qualitative research. *Qualitative research, 1*(3), 385-405.
- Barriball, K. L., & While, A. (1994). Collecting data using a semi-structured interview: a discussion paper. *Journal of Advanced Nursing-Institutional Subscription, 19*(2), 328-335.
- Boyatzis, R. E. (1998). Transforming qualitative information: Thematic analysis and code development. *sage*.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology, 3*(2), 77-101.
- Chrisman, J. J., Hynes, T., & Fraser, S. (1995). Faculty entrepreneurship and economic development: The case of the University of Calgary. *Journal of business venturing, 10*(4), 267-281.
- Clark, B. R. (1998). The entrepreneurial university: Demand and response. *Tertiary Education and management, 4*(1), 5-16.
- Clark, B. R. (1998). Creating entrepreneurial universities: Organizational pathways of transformation. Issues in higher education. Elsevier Science Regional Sales, 665 Avenue of the Americas, New York, NY 10010 (paperback: ISBN-0-08-0433545; hardcover: ISBN-0-08-0433421, \$27)..
- Despres, C., & Chauvel, D. (2000). A thematic analysis of the thinking in knowledge management. Knowledge Horizons: The Present and the Promise of Knowledge Management. *Butterworth-Heinemann*
- Devers, K., & Frankel, R. (2000). Study design in qualitative research—2: Sampling and data collection strategies. *Education for health, 13*(2), 263-271.
- Dill, D. D. (1995). University-industry entrepreneurship: the organization and management of American university technology transfer units. *Higher education, 29*(4), 369-384.
- Etzkowitz, H. (1983). Entrepreneurial scientists and entrepreneurial universities in American academic science. *Minerva, 21*(2-3), 198-233.
- Etzkowitz, H. (2007, May). University-industry-government: The triple helix model of innovation. In Proceedings of 51-st EOQ Congress). *Prague: European Organization of Quality*. http://triplehelix.stanford.edu/Etzkowitz_pubs.
- Eun, J. H., Lee, K., & Wu, G. (2006). Explaining the “University-run enterprises” in China: A theoretical framework for university–industry relationship in developing countries and its application to China. *Research Policy, 35*(9), 1329-1346.
- Farsi, J. Y., Imanipour, N., & Salamzadeh, A. (2012). Entrepreneurial university conceptualization: case of developing countries. *Global Business and Management Research: An International Journal, 4*(2), 193-204.
- Gartner, W. B. (1988). “Who is an entrepreneur?” is the wrong question. *American journal of small business, 12*(4), 11-32.
- Guarte, J. M., & Barrios, E. B. (2006). Estimation under purposive sampling. *Communications in Statistics-Simulation and Computation, 35*(2), 277-284.
- Jain, S., George, G., & Maltarich, M. (2009). Academics or entrepreneurs? Investigating role identity modification of university scientists involved in commercialization activity. *Research policy, 38*(6), 922-935.
- Kreusel, N., Roth, N., & Brem, A. (2018). European business venturing in times of digitisation-an analysis of for-profit business incubators in a triple helix context. *International Journal of Technology Management, 76*(1-2), 104-136.
- Leydesdorff, L., & Etzkowitz, H. (1996). Emergence of a Triple Helix of university—industry—government relations. *Science and public policy, 23*(5), 279-286.
- Lincoln, Y. S., & Guba, E. G. (1986). But is it rigorous? Trustworthiness and authenticity in naturalistic evaluation. *New directions for program evaluation, 1986*(30), 73-84.

- Liu, Y., & Huang, Q. (2018). University capability as a micro-foundation for the Triple Helix model: *The case of China. Technovation, 76*, 40-50.
- McIntosh, M. J., & Morse, J. M. (2015). Situating and constructing diversity in semi-structured interviews. *Global qualitative nursing research, 2*, 2333393615597674.
- Perkmann, M., & Spicer, A. (2010). What are business models? Developing a theory of performative representations. *Emerald Group Publishing Limited*.
- Siegel, D. S., Waldman, D. A., Atwater, L. E., & Link, A. N. (2003). Commercial knowledge transfers from universities to firms: improving the effectiveness of university–industry collaboration. *The Journal of High Technology Management Research, 14*(1), 111-133.
- Stal, E., Andreassi, T., & Fujino, A. (2016). The role of university incubators in stimulating academic entrepreneurship. *RAI Revista de Administração e Inovação, 13*(2), 89-98.
- Thornton, P. H., Ribeiro-Soriano, D., & Urbano, D. (2011). Socio-cultural factors and entrepreneurial activity: An overview. *International small business journal, 29*(2), 105-118.
- Tongco, M. D. C. (2007). Purposive sampling as a tool for informant selection. *Ethnobotany Research and applications, 5*, 147-158.
- Williams, L. D., & Woodson, T. S. (2012). The future of innovation studies in less economically developed countries. *Minerva, 50*(2), 221-237.