A methodology proposal to develop a research project for innovation system

Dr. Jonas Gomes da Silva

Abstract

Around the world many students or professionals interested in innovation system field dream to have a master, doctor or post doctorate experience in a top university. However, it is noted that are difficulties to identify a top university and propose a good research for a potential supervisor. So, the aim is to propose a methodology to help readers to write a research project concerning innovation system in order to submit into top universities selection process. In order to do so, a basic conceptual methodology with 8 steps and guidance will be presented by using a real case entitled as "The Best UK Universities Management Practices to Foster Local Entrepreneurship and Innovation", a basic post doctorate project that the author submmited and was approved in 2018 by the Directors of The Manchester Institute of Innovation Research at Alliance Manchester Business School in the University of Manchester. It was concluded that there is no a universal standard to write a research project concerning to innovation system field or even other field, each university or fund/grand foundation develops its own model. So the conceptual methodology doesn't want to replace other methodologies, but only guide those candidates that wish to write a proposal and follow the orientations given in this article.

A methodology proposal to develop a research project for innovation system

Dr. Jonas Gomes da Silva (jgsilva@ufam.edu.br)

Eureka Laboratory

Department of Industrial Engineering - Faculty of Technology

Federal University of Amazon (UFAM)

Manaus – Amazon – Brazil

Abstract

Around the world many students or professionals interested in innovation system field dream to have a master, doctor or post doctorate experience in a top university. However, it is noted that are difficulties to identify a top university and propose a good research for a potential supervisor. So, the aim is to propose a methodology to help readers to write a research project concerning innovation system in order to submit into top universities selection process. In order to do so, a basic conceptual methodology with 8 steps and guidance will be presented by using a real case entitled as "The Best UK Universities Management Practices to Foster Local Entrepreneurship and Innovation", a basic post doctorate project that the author submmited and was approved in 2018 by the Directors of The Manchester Institute of Innovation Research at Alliance Manchester Business School in the University of Manchester. It was concluded that there is no a universal standard to write a research project concerning to innovation system field or even other field, each university or fund/grand foundation develops its own model. So the conceptual methodology doesn't want to replace other methodologies, but only guide those candidates that wish to write a proposal and follow the orientations given in this article.

Keywords: Research project; Innovation System; University;

1. Introduction

In a knowledge society, professionals with a quality post-secondary education are more employable, earn higher wages, and cope better with economic crisis. In this sense, higher education contributes both individuals and society, since a solid post-secondary education is a prerequisite for a country's ability to innovate and for its healthy long-term growth (adapted from WORLD BANK, 2018). Here Higher Education means Education institutions that support students beyond the secondary school level, specifically colleges, universities, graduate schools, and professional schools, often supporting applied and pure research (adapted from IEG, 2017 page 164).

Nowadays, nations must innovate and produce new technologies and/or services to speed up their competitiveness and adapt technologies to face local challenges. As a result, the role of universities in supporting and producing these outcomes is critical through the: provision of services to develop job-relevant skills aligned with demand in the economy; promotion of skills to complement the development

of competitive advantage; focus on research, learning, innovation, production and adaptation of technologies into local development; and dissemination of best management practices to society (adapted from DARVAS et. Al., 2017, page xiii).

Around the world there are thousand universities, the correct total number of such institutions is not well known, but according to Statista (2018), a germany online portal of statistics, in June of 2018, there were around 21,709 universities in 25 countries and the ten countries with the highest number of universities were: India (3944; 18.17%), USA (3257; 15%), China (2208;10.17%), Indonesia (2110; 9.72%), Brazil (1394; 6.42%), Russia Federation (1172; 5.4%), Japan (980; 4.5%), Mexico (916; 4.2%), France (620; 2.86%) and Iran (607; 2.8%). And according to the 2019 edition of Education at a Glance (OCDE, 2019 page 231 to 235): a) the number of foreign students engaged in tertiary education programmes wordwide has expanded massively in past few decades, rising from 2 million in 1998 to 5.3 million in 2017. In OCDE area, there were 3.7 million international of foreign students in 2017, 6% more than 2016; b) students become more mobile as they reach more advanced levels of education. International students account for only 3% of total enrollment in short-cycle tertiary programmes and 4% of total enrolment in bachelor`s programmes, but they represent 22% of enrollment in doctoral programmes; c) international enrolment is much higher doctoral level in the OCDE area (Figure 1), particularly in France, Luxembourg, the Netherlands New Zeland, Switzerland and United Kingdom, where 40% or more tertiary students come from abroad.
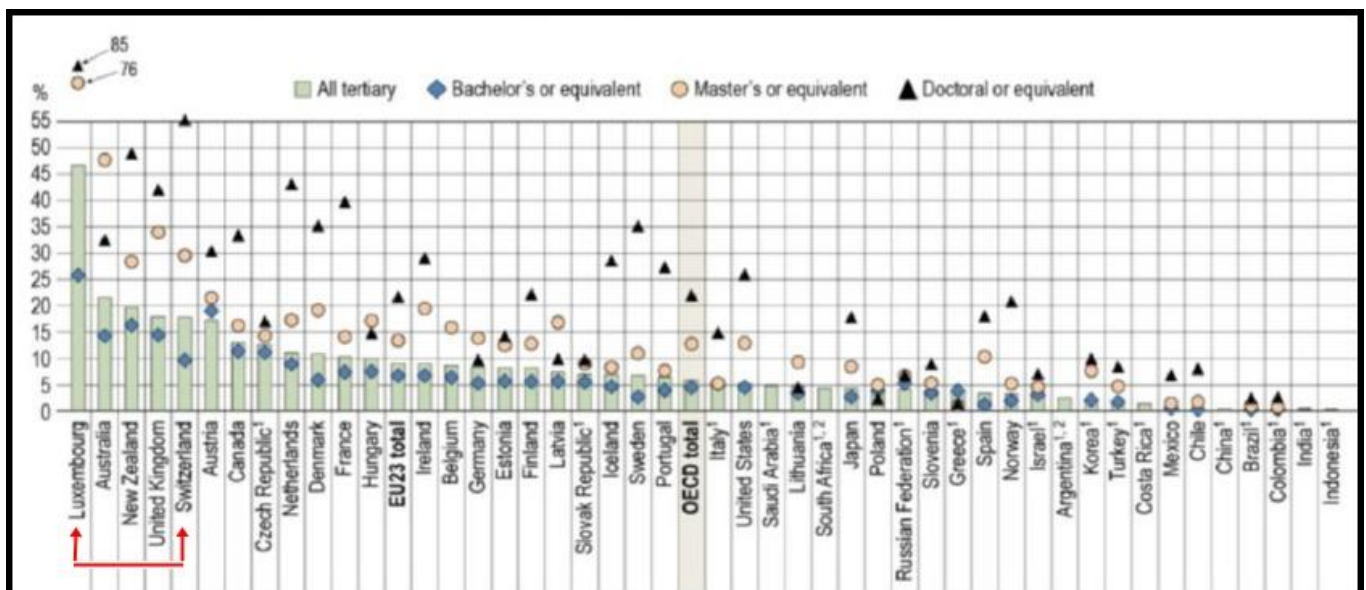

Figure 1 – International student enrollment as a percentage of total enrolment in tertiary level in 2016
Source: OECD (2019), Figure B6.3 (Year of Reference 2016).

The numbers shown above points out that thousands of people around the world are trying to update their knowledge, skills and networking through universities experiences. And when a student, researcher or other professional wish to study abroad to advance (master, doctor or post doctorate) the knowledge on innovation system issues, he face difficulties to develop a good research project in order to send to potential professors of top universities.

Basically, a research project is a detailed proposal that the candidate wish to undertake. Some universities departments require the candidate to submit a research project/proposal for master, doctor or post doctorate

process. Sometimes the universities have their own models, but independent of the model, it is important to prepare one even if it isn´t a formal requirement of the course. So the main question of this research is "How to build a good research project about innovation system in order to send to top universities selection process?"

So the main aim of this paper is to propose a methodology with basic orientations to help readers to write a research project concerning innovation system in order to submit into top universities selection process.

2. Conceptual Methodology for an effective research project

The research is descriptive with action research method and qualitative approach. Basically, the conceptual methodology is built from the experience of the author during The Manchester University selection process for the Academic Research Visit. Basically, the conceptual methodology has 8 steps as is described on Figure 2 bellow:

2. 1 Step 1: Theme

The theme is the essence of your research. It should be easy to memorize and call the attention or the curiosity of the potential supervisor.

It is recommended to select a theme that the candidate is very interested to investigate, something unique written in at most two lines.

Before decide for the theme, try to make a brainstorming and write five proposals and ask for advices from professors or tutors that have experience in the field. They`ll be able to give opinion on the importance of the theme for the academy and other stakeholders of the society. In short, the candidate should review some classes taken, consider a topic that enjoy to read and talk, think about your field that admires or aspire to be, and try to research current events in order to find topics that are calling a lot of attention and need further investigation.
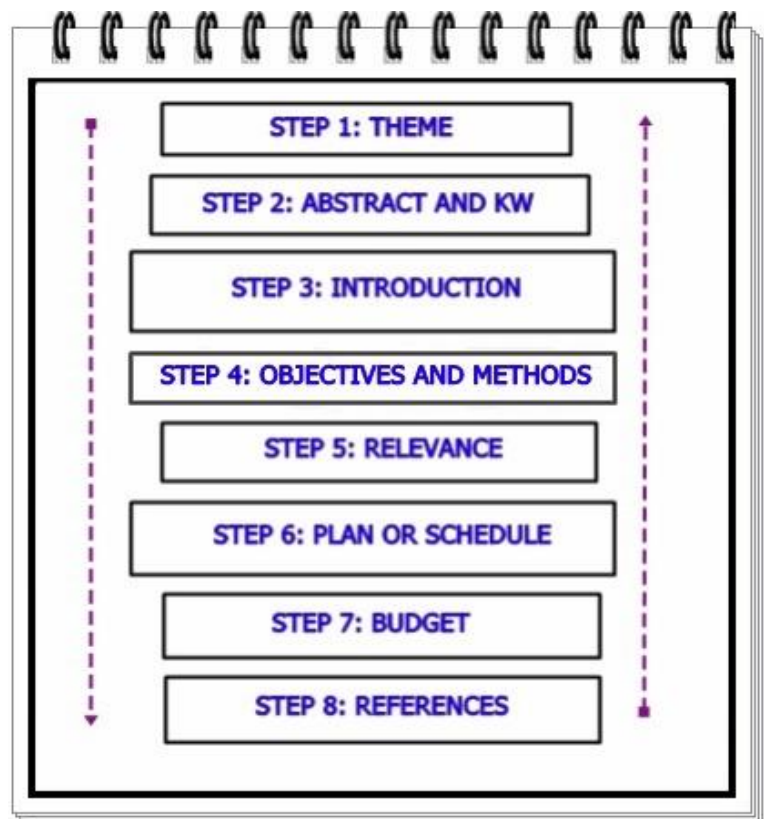

Figure 2 – Methodology to write a Research project

Source: Own Author

2.2 The step 2: Abstract (or Resume) and Key Words

An abstract or resume is a short version of your project. Since the candidate will submit the project for university selection process, it is recommended to check the university norms, but normally this part has

100 to 250 words and is important to write about the main aim of the research, the methodology to collect and analyze the data and the expected results.

The abstract is important because help the potential supervisor or reviewer to: a) decide to read; b) understand the essence of the proposal; c) remember key findings about the subject. The candidate can write the abstract and refine it as the research progresses over time.

The amount of keywords depends of journals, normally it is required 4 to 8 keywords or short phrases. The candidate can choose them by considering using Google Scholar or another scientific search engine.

2.3 The step 3: Introduction

The introduction is the chance to show to the potential supervisor or reviewer that your proposal is valuable. If the candidate wants to write about innovation system and submit into a top university abroad, then some tips are: (a) write the main topics of the introduction; (b) these topics could follow a broad view of the theme and then narrow down; (c); state the research problem; (d) explain the reason why that country and university was selected, if possible try to insert information from university official documents such as strategic planning, professors articles, books, etc; (e) and summarize relevant literature about the theme or topic; (d) use facts, statistics from international and reliable sources.

In this methodology, the literature review was put in this section, since the candidate is just writing a proposal plan to be read for potential supervisors or reviewers selected by University contacted.

2.4 The step 4: The main objectives and methods

It is recommended the maximum of three objectives. The objectives of the proposal plan should be clear, brief, meaningful and interesting. They provide the directions that the candidate desire to go and should reflect a logical sequence that realistically permit to investigate the problem proposed.
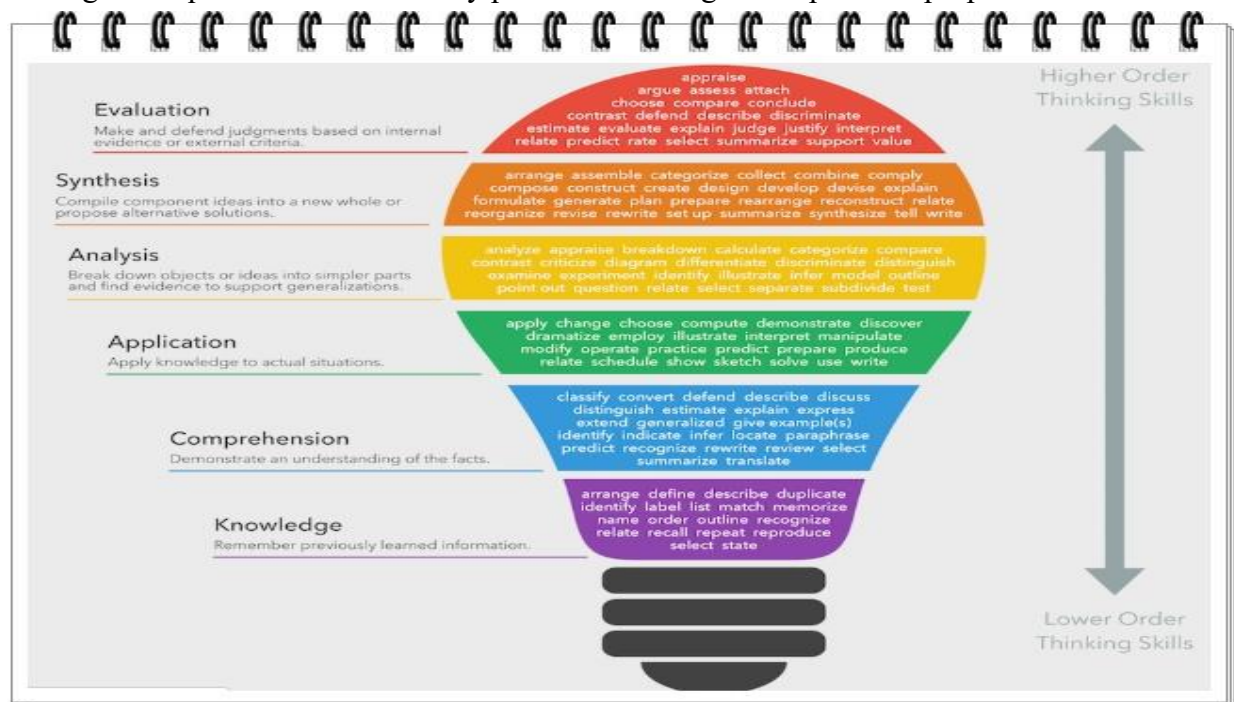

Figure 3 – Bloom`s Taxonomy Verbs

Source: Fractus Learning < https://www.fractuslearning.com/blooms-taxonomy-verbs-free-chart/>

It is recommended to use action verbs such as to investigate, to identify, to study, to compare, to determine, etc. Since innovation system is also focused on educational, training and learning processes, a basic source to consult are Bloom et al. (1956) and Anderson et al. (2001). Basically, Bloom et al. (1956) developed a taxonomy to promote higher forms of thinking in education that was reviewed by Anderson et al. (2001), in the first case is possible to identify the main verbs used when writing objectives for Knowledge, Comprehension, Application, Analysis, Synthesis and Evaluation, as shown in Figure 3.

Concerning with the methods, the proposal should make clear on how the results will be attained. Basically, the candidate can write about the type of the research and how will collect and investigate the data. The primary and secondary sources that will be used as well as the main methods to carry out the research. There are several methods used in qualitative and quantitative approaches, such as surveys with sampling method, interviews, focus group, case study, observation, experiment, content analysis, thematic analysis, etc.

It is important to focus on the objectives and/or main research question and when the proposed project be approved, it is recommended during writing process to cite relevant sources to compare different methodologies used to study the problem.

2.5 The step 5: Relevance

The relevance of the proposal shows how significant is to the academy and other stakeholders. So look into the problem and try to visualize for example the value of the study not only for the academic point of view, but to the industry, entrepreneurs, research institutes, government, etc.

2.6 The step 6: Plan or Schedule

The plan or schedule shows the main activities that will be carry out during the period of the research. If the plan is for master project the period is two years, for doctor project is 3 or 4 years depending on the University aimed, for post doctorate project, the period is one year. If the candidate doesn't know when exactly will start the research, the time horizon can be written as Month1, Month 2…. Month N. Otherwise, it is possible to write the month as January until December for the year aimed. It is very important to be realistic about the activities, how long each will be taken, as well as the resources that will be necessary. As much activity put it means that more resource and attention will be demanded.

It is recommended to leave time for editing and correcting, one tip is to use the PDCA method to write the research project: activities to Plan (individually, with the professor or team), to Do, to Check and Act (to register good results or make a corrective or new activities, etc).

2.7 The step 7: Budget

The Budget focused on how much will cost to realize the research project. Normally, a candidate write a research project for a fund/grant agency or a foundation in order to get a scholarship, but due high competition, it is very hard to be approved. So, the candidate should be prepared for a situation that demands the calculation of many resources that will be demanded without the scholarship.

A good budget shows to the potential professor or reviewer that candidate have thought about your research in detail. Some tips are: a) look at the plan or schedule; b) identify each cost item, including the cost that

you will need before going to abroad; c) in a spreadsheet put each cost with the respective month; d) use the value of the coin of the destiny country; e) try to talk with researchers that are living or lived in that country in order to identify the approximate cost of some itens.

With the budget the candidate also can study the types of grant provided by that country and/or university, the rules and value. This is important since the candidate could try to submit a proposal before or after arrive abroad. Also, with the research project and budget, the candidate can search for local or national government support, as well as a company support through Research and Development grant.

2.8 The step 8: References

Each nation has a national norm to write correctly a research project and also References. The candidate can should try to identify the norms of the aimed country in order to put the references according with them. However, if is not possible to do so, use your country`s norms and latter adjust them when arrive in the university aimed.

3. How to identify Top Universities

There are several organizations that rank the universities around the world. Some of them are:

3.1 QS Top Universities

The QS Top Universities (Figure 4) is a medium-sized company with over 250 staff working around the world <https://www.topuniversities.com/>. They have a diverse on line database that permit the user to access not only the ranking, but events, free test preparation, guidance on choosing the university, scholarships, etc.
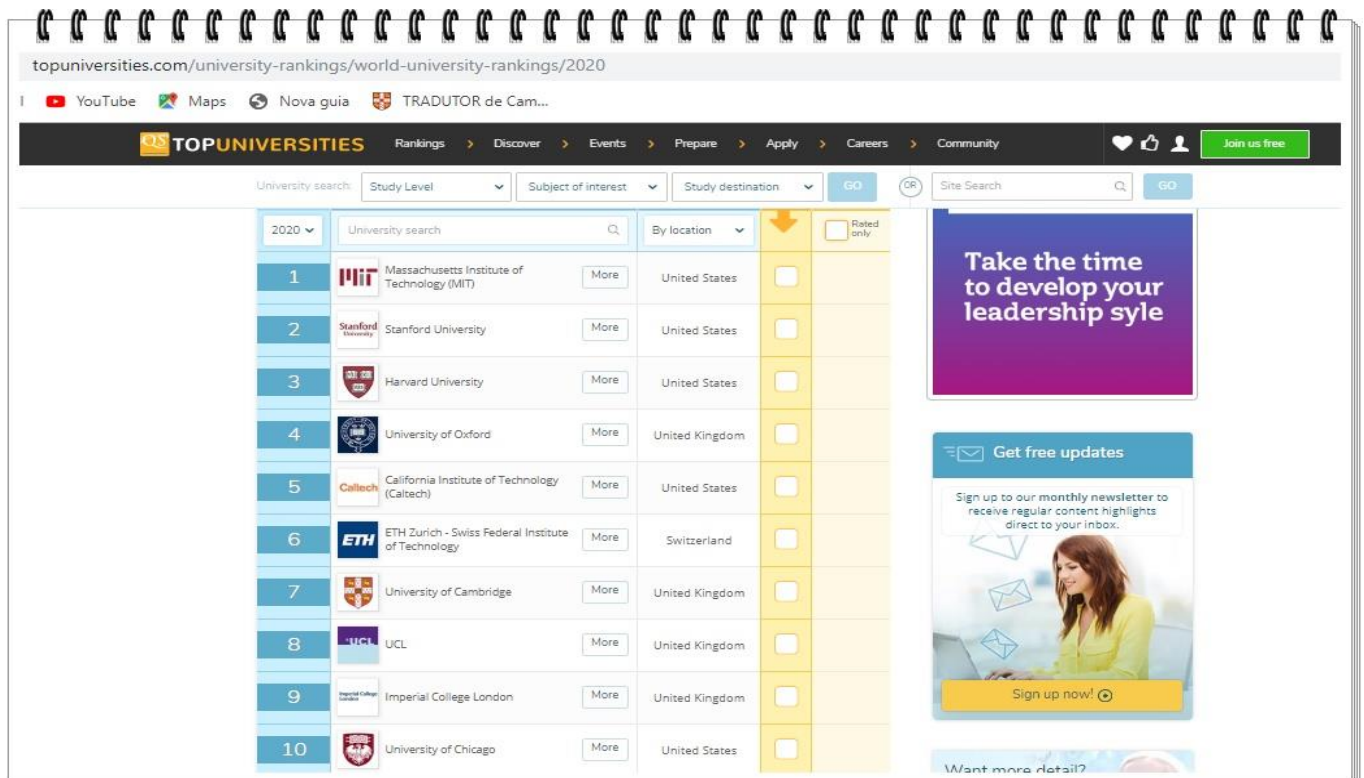

Figure 4: QS Top Universities site

3.2 The Time Higher University Ranking

The Time Higher University Ranking (Figure 5) is an American organization < https://www.timeshighereducation.com/> that is a leading provider of higher education data for world research institutions. In partnership with Elsevier every year they rank universities by using 13 performance indicators, also they organize events and provide useful information to students on where to study, advices, subjects and how to find a University.

Figure 5 – The Times Higher Education site

3.3 The Reuters Most Innovative Universities

The Reuters (Figure 6) also produce a rank with the 100 most innovative universities <https://www.reuters.com/innovative-universities-2018/methodology>. According with them, all these universities produce original research, create useful technology and stimulate the global economy.

Figure 6 – Reuters site

4. An example of a Research project for Post Doctorate

In order to show the application of the conceptual methodology, this section present main parts of a Post Doctorate research project submitted and approved in 2018 by the Directors of Manchester Institute of Innovation Research.

4.1 Theme

Best UK Universities Management Practices to Foster Local Entrepreneurship and Innovation.

4.2 Resume or Abstract

We're facing global economy recovery and countries able to build up, in long term, dynamic local innovation systems, probably will have more chance to overcome the challenges, creating more jobs and prosperity. In such scenario, universities play an important role, since their scientific, technological and entrepreneur innovation abilities contribute for regional or local innovation systems. Although several innovation system approaches have been developed, few researches were urdertaken to develop models that contribute for universities to achieve world class innovation performance level, taking into consideration the best common management practices identified from an international perspective. Thus, the main aim of this research is to investigate the best UK Universities common management practices used to foster local entrepreneurship and innovation, in order to propose a model to help other universities to achieve them in a long term. In order to do so, innovation systems approaches, models, awards and interview with experts will be used to develop a cross-sectional survey for the data collection and analysis process. The UK Top Universities will be selected through recognized international assessment and The University of Manchester will be the basis of the research. Through interview with experts, researchers, top managers, Deans, NGO leaders and application of a self assessment questionnaire and a cross sectional analysis process, the best common management practices will be identified and used as base to propose a conceptual model with valuable guidance on how to use it to foster local entrepreneurship and innovation.

Key words: Innovation System; University; Best Management Practices: Entrepreneurship

4.3 Introduction

4.3.1 Global Economy and Innovation System

According to the World Economic Outlook Report (a report published twice a year, presenting International Monetary Fund staff economists' analyses of global economic developments) released on april, 2018:

a) world growth strengthened in 2017 to 3.8 percent, with a notable rebound in global trade. It was driven by an investment recovery in advanced economies, continued strong growth in emerging Asia, a notable upswing in emerging Europe, and signs of recovery in several commodity exporters;

b) prospects remain favorable in emerging Asia and Europe, but are challenging in Latin America, the Middle East and sub-Saharan Africa, where — despite some recovery — the medium term outlook for commodity exporters remains generally subdued, with a need for further economic diversification and adjustment to lower commodity prices. More than one-quarter of emerging market and developing

economies are projected to grow by less than advanced economies in per capita terms over the next five years, and hence fall further behind in terms of living standards.

Such scenarios may show that we are facing a global economy recovery and countries able to build up, in a long term, dynamic local innovation systems, probably will have more chance to overcome the challenges, creating more jobs and prosperity.

The concept of "innovation" refers to the search for, development, adaptation, imitation and adoption of technologies that are new to a specific context (DOSI, 1988). An innovation system is therefore a network of organizations within an economic system that are directly involved in the creation, diffusion and use of scientific and technological knowledge, as well as the organizations responsible for the coordination and support of these processes.

According with Skillern (2008) Social entrepreneurship is an innovative, social value- creating activity that can occur within or across the nonprofit, government, or business sectors, primarily to create social value, rather than personal or shareholder wealth.

According with SEO (2006), the concept of Innovation System (IS) is based upon the interactive model of innovation, the key feature of the concept is that an economy's ability to generate innovations does not only depend on how individual actors perform, but rather on how they interact as parts of a system.

 4.3.2 Innovation System Approaches

Several types of innovation system approaches have been developed over the time, either focusing on territories as their point of departure or specific technologies/sectors. Among them, are: a) National System of Innovation (NSI); b) Regional Innovation System (RIS); c) Technological Systems Approaches (TSA); d) Socio Technical System Approach; e) Local Innovation System**.**

Althouth several researches have been made on above approaches (Freeman, 1987; Hughes 1983, 1987, 1990; Mayntz and Hughes, 1988; LaPorte, 1991; Summerton,1994; Coutard, 1999; Carlsson, B. and R. Stankiewicz, 1991; Lundvall,   1992;   Nelson, 1993; Nelson and Rosenberg, 1993; Wong, 1995; Edquist, 1997; Cooke, 1992, 1998, 2001; Asheim   & Isaksen, 2001; OECD, 2002; Geels, 2004; Lester, 2005; Hekkert, Suurs et al, 2007; Reamer, Reynolds and Mills, 2008; Oster, S. M. 2012, etc), few were urdertaken toward **University System Innovation Approach** and there is a special need to understand on how Top Universities are working together with local organizations, in order foster their entrepreneurship and innovation.

4.3.3 Why UK and The University of Manchester?

UK selection was made by using National System Innovation (NSI) approaches. NSI is the most mentioned approach, not only in academic field, but among governmental policy makers. For instance, in the last ten years, well recognized international organizations have developed and improved models to evaluate countries by using NIS or Global Innovation perspectives (Tables 1, 2 and 3), and in all cases, UK appears among 20 best countries in terms of Innovation Performance.

The last result (Table 3) is interesting because this year the Global Innovation Index (GII) ranks the innovation performance of 130 countries around the world with the theme "Energizing the World with innovation". According with the organizers, the GII 2018 analyses the energy innovation landscape of the next decade and identifies possible breakthroughs in fields such as energy production, storage, distribution,

and consumption. It also looks at how breakthrough innovation occurs at the grassroots level and describes how small-scale renewable systems are on the rise.

Table 1 – The most innovative countries (2009)

Country	Score	Rank	Region
Singapore	2.50	1	SEAO
South Korea	2.26	2	SEAO
Switzerland	2.23	3	EUR
Iceland	2.17	4	EUR
Ireland	1.88	5	EUR
Hong Kong	1.88	6	SEAO
Finland	1.87	7	EUR
USA	1.80	8	NAC
Japan	1.79	9	SEAO
Sweden	1.64	10	EUR
….			
United Kingdom	**1.42**	**15**	**EUR**
…			
Brazil	- 0.59	72	LCN

Source: BCG, National Association of Manufacturers, and The Manufacturing Institute, innovation indexes, 2008.

Table 2 – The Most Innovative Countries (2014)

Country	Score	Rank	Region
South Korea	92.10	1	SEAO
Sweden	90.80	2	EUR
USA	90.69	3	NAC
Japan	90.41	4	SEAO
Germany	88.23	5	EUR
Denmark	86.97	6	EUR
Singapore	86.07	7	SEAO
Switzerland	86.02	8	EUR
Finland	85.86	9	EUR
Taiwan	83.52	10	SEAO
….	...	...	...
United Kingdom	**80.01**	**16**	**EUR**
….	...	...	...
Brazil	54.41	45	LCN

Source: Bloomberg, IMF, World Bank, OECD, U.S. Patent and Trademark Office,WIPO (2014)

Table 3 – The Most Innovative Countries (2018)

Country	Score(0-100)	Rank	Region
Switzerland	68.40	1	EUR
Netherlands	63.32	2	EUR
Sweden	63.08	3	EUR
United Kingdom	**60.13**	**4**	**EUR**
Singapore	59.83	5	SEAO
USA	59.81	6	NAC
Finland	59.63	7	EUR
Denmark	58.39	8	EUR
Germany	58.03	9	EUR
Ireland	57.19	10	EUR
…..	….	...	….
Brazil	33.44	64	LCN

Source: The Global Innovation Index 2018

According with GII 2018 report (p. 19), the U.K moved to 4th place this year gaining three positions in Innovation Input Sub-Index and keeps its 6th spot in Innovation Output Sub-Index. The pillar where the U.K. improves its rank is Business sophistication (12th), especially due to the gains in Knowledge absorption (24th). At the sub-pillar level, other significant increases are in Knowledge diffusion (16th), Investment (8th), and Creative goods and services (2nd). Despite these important gains, the U.K. loses between two and five positions in Institutions (14th), Human capital and research (8th), and Infrastructure (7th). Items such as ease of getting credit, expenditure on education, and ICT services imports and exports lose the most positions. The U.K. maintains its 1st spot in quality of scientific publications, government's online service, and e-participation; it loses its 1st spot in ICT and business model creation. Thanks to its historic universities and the quality of its scientific publications, the U.K. is still the 5th world economy in quality of innovation.

When we compare the factors developed by the three (Table 1, 2 and 3) methodologies, it was found that (Table 4):

R&D tax credit and funding, regulation, education, infrastructure quality, business surrounding; IP generation, publication & knowledge transfer and high tech exports are the common factors founding among them, reason by which it is believed that Universities can play important roles to develop such factors in partnership with Government, Industries, Business sectors, especially in the "knowledge-based" economies of modern industrial and industrializing states as sources of trained "knowledge workers" and ideas flowing from both basic and more applied research activities (David and Bhaven, 2006).

Table 4 – Comparative factors from methodologies used to build the tables 1, 2 and 3

Factors score used	Methodology (Table 1)	Methodology (Table 2)	Methodology (Table 3)
Input – R&D tax credit	**X**	**X**	**X**
Input – Taxation level	X	-	-
Input – Gov. R&D fund	**X**	**X**	**X**
Input – Education policy	X	-	-
Input – Trade policy	X	-	X
Input – Regulation	**X**	**X**	**X**
Input - IP policy	X	-	-
Input – Immigration policy	X	-	-
Input – Infrastructure policy	X	-	-
Input – State of education	**X**	**X**	**X**
Input – value add by manufacturing	-	X	-
Input – Work force quality	X	-	X
Input – Infrastructure quality	**X**	**X**	**X**
Input – Business surrounding	**X**	**X**	**X**
Input – Political environment	-	X	X
Input – Tertiary education	-	X	X
Input – Ecological Sustainability	-	X	X
Input – Investment	-	X	X
Output – R&D investments	X		
Output – IP generation	**X**	**X**	**X**
Output – Publication & knowledge transfer	**X**	**X**	**X**
Output–Innovation/Patent Trade	X	X	-
Output – High tech export	**X**	**X**	**X**
Output – Labor productivity	X	-	X
Output – Market capitalization	X	-	-
Output – Employment growth	X	-	-
Output – Investment	X	-	-
Output – Knowledge creation	-	-	X
Output – Knowledge impact	-	-	X
Output – Business migration	X	-	-
Output – Economic growth	X	-	-
Output – Creative goods/services	-	X	X
Output – On line creative	-	X	X
Total	24	16	20

Source: Author

Finally, the reasons by which The University of Manchester was chosen are presented below:

The University has a long term strategic plan with the vision to be one of the leading universities in the world by 2020. In order to so, the vision has three core goals (world class research, outstanding learning and student experience, and social responsibility) guided by three main principles and values (Knowledge, Wisdom and Humanity) that inspired the proponent of this project;

This year the University was ranked 29st in the world according to the QS World University Ranking and it was ranked 34st by the Shangai Jiao Tong Academic Ranking of World Universities, an improvement of 4 positions when compared with 2011 (38st), the year that the strategic planning was launched;

The University put priority (strategy 5 – an international institution) on research collaborations, international business engagement, diversified student population, student experience and transnational education as the ways to enhance its international reputation. So, there is interest from Amazon Federal University managers to construct and promote long term partnership with The Manchester University;

The University strengthens cooperation with both the public and private sectors of the local communities;

The University has the Innovation, Management and Policy (IMP) division, one of the largest research groups for innovation management and policy. One of its groups includes the <u>Manchester Institute of Innovation Research (MIOIR)</u>, which is believed to be the best basis to develop the research.

4.4 Main objectives and Methods

The main objectives are:

a) To investigate the best common management practices adopted by UK top universities concerning with their strategies to foster local communities entrepreneurship and innovation;

b) To propose a model to help other universities to improve their local communities entrepreneurship and innovation;

c) To contribute for new partnerships among industry, academia, government local entrepreneurs.

To reach the above objectives, innovation systems approaches, models, awards and interview with experts will be used to develop a cross-sectional survey for the data collection and analysis process. The UK Top Universities will be selected through recognized international assessment and The University of Manchester will be the basis of the research. Through interview with experts, researchers, top managers, Deans, NGO leaders, application of a self assessment questionnaire and a cross sectional analysis process, the best common management practices will be identified and used as base to propose a conceptual model with valuable guidance to foster local entrepreneurship and innovation.

4.5 Relevance

a) It will serve as benchmark for universities Deans interested in continuously improve their management process toward world class innovation level of excellence;

b) It will provide academic discussion and reflection on how universities are innovating their processes in a more collective and entrepreneurship way;

c) Also, it will provide several suggestions for future researchers on topics found as needing further investigations;

d) It will serve as a bridge to approximate UK and Brazil organizations such as Universities, Governmental Agencies, Industries interested in realizing international experience exchange and partnerships on innovation;

e) Local entrepreneurs will improve their understanding about how work better with universities in order to foster their innovation process, products and services;

f) It is hoped to encourage university students to pursue their own entrepreneurial business initiatives.

4.6 Part of the Plan or Schedule

The PDCA methodology will be used to implement the proposed plan showed by Table 5 (it is shown part of the plan).

The main actions and methods will be discussed with the supervisor during the update meetings.

Table 5 – Part of research plan

Action	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
To update the Research Plan with the supervisor	X		X		X		X		X		X	
To study Alliance Manchester Business School and Innovation Management and Policy Division programs and projects toward local innovation and entrepreneurship	X	X										
To review the literature in order to identify and analyze models that evaluate University Best Strategic Management Practices to Foster Local Entrepreneurship and Innovation	X	X										
To select UK top innovative Universities by using national and international ranking criteria			X	X								
To develop a survey to evaluate University management practices to foster local entrepreneurship and innovation.			X									
To development and update a Web Page to open the project for Students, Scientific, Government and Business communities, as well as to collect data and share results.				X	X	X	X	X	X	X	X	X
To realize the Pilot Test with a sample of the selected Universities.				X								
To improve the survey and Web Page				X	X							
To collect data through web page, interviews and visits into Universities, Governmental and Business leaders that deals with local entrepreneurship and innovation.						X	X					
To analyze data and discuss with participants.							X	X				
To construct the model and a manual to guide managers on how to achieve best universities practices.									X			
To improve the model through participants contributions.									X	X		
To create a Database containing main information of people contacted during the project;							X	X	X	X	X	X
To support the IMP Entrepreneurship Programs or give orientation to Master and Doctor Students.	X	X	X	X	X	X	X	X	X	X	X	X

Source: Author

4.7 The Budget

The budget is show on Figure 7.

4.8 The references

The references will be show together with the references of this paper.

ACADEMIC RESEARCH VISITOR AT THE MANCHESTER INSTITUTE OF INNOVATION RESEARCH																
ALLIANCE MANCHESTER BUSINESS SCHOOL – UNIVERSITY OF MANCHESTER – UNITED KINGDOM																
ACADEMIC AREA: BEST UK UNIVERSITIES MANAGEMENT PRACTICES TO FOSTER LOCAL ENTREPRENEURSHIP & INNOVATION																
Duration: 12 months – July/15/19 to July 15/2020																
1 POUND =	5,2	Reais	March, 22th	STIMATED BUDGET IN POUNDS STERLING – VERSION 3 – APRIL 2d, 2019												
TOTAL COST	£31.525,0	Jonas Investment	£15.651,4	Partner 1 Investiment	SOLINOX – Fábio Magalhães –	Partner 2 Investiment		Partner 3 Investiment		Partner 4 Investiment		Partner 5 Investiment		Partner 6 Investiment	
ISTO TOTAL EM RE	R$ 163.930	Investimento Jonas	R$ 81.387	Investimento do	R$ 25.000	Investimento do	R$ 0	Investimento do	R$ 0	Investimento do	R$ 0	Investimento do	R$ 0	Investimento do	R$ 0
COST ITEM	Jonas investment	Partners investment	Previous-trip	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
Passport Update process (tax and	£78,3	£0,0	£78,3	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0
VISA costs	£392,3	£0,0	£392,3	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0
Round Trip	£0,0	£865,4	£865,4	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0
Equipments (Notebook, camera,	£480,8	£576,9	£480,8	£576,9	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0
Consumer material for research (paper, ink,	£0,0	£576,9	£0,0	£96,2	£0,0	£96,2	£0,0	£96,2	£0,0	£96,2	£0,0	£96,2	£0,0	£96,2	£0,0
Clothes	£600,0	£0,0	£0,0	£300,0	£0,0	£0,0	£0,0	£0,0	£300,0	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0
House renting	£0,0	£7.800,0	£0,0	£1.200,0	£600,0	£600,0	£600,0	£600,0	£600,0	£600,0	£600,0	£600,0	£600,0	£600,0	£600,0
House materials	£1.500,0	£0,0	£0,0	£1.000,0	£0,0	£0,0	£0,0	£0,0	£500,0	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0
Bench fee (annum) paid to University	£0,0	£5.000,0	£0,0	£5.000,0	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0	£0,0
Property Tax	£2.160,0	£0,0	£0,0	£180,0	£180,0	£180,0	£180,0	£180,0	£180,0	£180,0	£180,0	£180,0	£180,0	£180,0	£180,0
Food	£4.800,0	£0,0	£0,0	£400,0	£400,0	£400,0	£400,0	£400,0	£400,0	£400,0	£400,0	£400,0	£400,0	£400,0	£400,0
Health Insurance	£2.400,0	£0,0	£0,0	£200,0	£200,0	£200,0	£200,0	£200,0	£200,0	£200,0	£200,0	£200,0	£200,0	£200,0	£200,0
Gas and light	£960,0	£0,0	£0,0	£80,0	£80,0	£80,0	£80,0	£80,0	£80,0	£80,0	£80,0	£80,0	£80,0	£80,0	£80,0
Water service	£360,0	£0,0	£0,0	£30,0	£30,0	£30,0	£30,0	£30,0	£30,0	£30,0	£30,0	£30,0	£30,0	£30,0	£30,0

Figure 7 – Part of the Budget

Source: Author

5. Conclusion

The aim of this article is to propose a methodology to help readers to write a research project concerning innovation system in order to submit into top universities selection process. In order to do so, a conceptual methodology with 8 steps was presented by using real case of success, focused on a post doctorate project called "The Best UK Universities Management Practices to Foster Local Entrepreneurship and Innovation", which was submitted and approved in 2018 by the Directors of The Manchester Institute of Innovation Research at Alliance Manchester Business School in the University of Manchester.

After this experience it was concluded that there is no a universal standard to write a research project concerning to innovation system field or even other field, each university or fund/grand foundation develops its own model. So the conceptual methodology doesn't want to replace other methodologies, but only to serve as a guide to those candidates that wish to write a proposal and follow the orientations given in this article.

Further research should be done to compare the research methodologies used by the top universities in order to find common topics and propose valuable guidance for the readers.

6. Acknowledgement

7. References

[1] Altbach, Philip G. 2013. "Advancing the National and Global Knowledge Economy: The Role of Research Universities in Developing Countries." Studies in Higher Education 38 (3): 316–330.

[2] Anderson, L.W., Krathwohl, D.R., Airasian, P.W., Cruikshank, K.A., Mayer, R.E., Pintrich, P.R., Raths, J., Wittrock, M.C. (2001). *A Taxonomy for Learning, Teaching, and Assessing: A revision of Bloom's Taxonomy of Educational Objectives*. New York: Pearson, Allyn & Bacon.

[3] Asheim, B. & Isaksen, A. (1996), Location, Agglomeration and Innovation: Towards Regional Innovation Systems in Norway , STEP Report R-13, Oslo.

[4] Asheim, B. & Isaksen, A. (2001), Regional Innovation Systems: the Integration of Local Sticky and Global Ubiquitous Knowledge, Journal of Technology Transfer.

[5] Bloom, B.S. (Ed.). Engelhart, M.D., Furst, E.J., Hill, W.H., Krathwohl, D.R. (1956). *Taxonomy of Educational Objectives, Handbook I: The Cognitive Domain*. New York: David McKay Co Inc.

[6] Bloom, D. E., D. Canning, K. J. Chan, and D. L. Luca. 2014. "Higher Education and Economic Growth in Africa." International Journal of African Higher Education 1 (1): 22-57.

[7] Bloomberg, International Monetary Fund, World Bank, Organisation for Economic Co-operation and Development, United Nations Educational, Scientific and Cultural Organization, U.S. Patent and Trademark Office, World Bank, World Intellectual Property Organization: Most Innovative in the World 2014: Countries, January 7, 2014. Accessed on March 1st http://www.bloomberg.com/visual-data/best-andworst/most-innovative-in-the-world-2014-countries.

[8] Boston Consulting Group, The Manufacturing Institute, National Association of Manufacturers. The Innovation Imperative in Manufacturing, 1999:Boston, USA.

[9] Carlsson, B., Stankiewicz, R., 1991. On the nature, function and composition of technological systems. Journal of Evolutionary Economics 1, 93–118.

[10] Carlsson, B. and Stankiewicz, R. (1995): "On the nature, function and composition of technological systems". In: Carlsson, B. (ed.):Technological Systems and Economic Performance: The Case of Factory Automation. Kluwer Academic Publishers. Dordrecht, pp. 21-56.

[11] Cooke, P. (1992), "Regional innovation systems: competitive regulation in the new Europe", Geoforum 23, pp. 365-382.

[12] Cooke, P. and Morgan, K. (1998) The Associational Economy: Firms, Regions and Innovation, Oxford

University Press, Oxford.

[13] Cooke, P. (2002), Knowledge Economies: Clusters, Learning and Co-operative Advantage, London, Routledge.

[14] Cornell University, INSEAD, and WIPO (2015): The Global Innovation Index 2015: Effective Innovation Policies for Development, Ithaca, Geneva.

[15] Cornell University, INSEAD, and WIPO (2018): The Global Innovation Index 2018: Energizing the World with Innovation. Ithaca, Fontainebleau, and Geneva.

[16] Darvas, Peter, Shang Gao, Yijun Shen, and Bilal Bawany. 2017. Sharing Higher Education's Promise beyond the Few in Sub-Saharan Africa. Directions in Development. Washington, DC: World Bank. doi:10.1596/978-1-4648-1050-3. License: Creative Commons Attribution CC BY 3.0 IGO

[17] David C. M., Bhaven N. S., 2006. Universities in National. The Oxford Handbook of Innovation. DOI: 10.1093/oxfordhb/9780199286805.003.0008.

[18] De Brito Cruz, C. and L. de Mello (2006), Boosting Innovation Performance in Brazil. OECD Economics Department Working Paper No. 532

[19] Edquist, C. and Johnson, B. (1997), Institutions and Organizations in Systems of Innovation. In: Edquist, C. (ed): Systems of Innovation: Technologies, Institutions and Organizations. Pinter Publishers. London, pp. 41-63.

[20] George, E., and N. Augustine. 2009. "Higher Education and Economic Development in Africa: The Case of Cameroon." Educational Research and Reviews 4 (5): 231.

[21] Hughes, T. P. (1983): Networks of Power: Electrification in Western Society, 1880-1930. The Johns Hopkins University Press. Baltimore.

[22] Forbes, 2012. The Most Entrepreneurial Colleges, accessed 2014 August 15th, on http://www.forbes.com/sites/michaelnoer/2012/08/01/t

he-most-entrepreneurial-colleges/

[23] Freeman, C. (1995),The National System of Innovation in Historical Perspective, Cambridge Journal of Economics, 19, 5-24

[24] Geels, F.W., Understanding System Innovations: a critical literature review and a conceptual synthesis, in System Innovation and the Transition to Sustainability. Theory, Evidence and Policy, B. Elzen, F. Geels, and K. Green, Editors. 2004, Edward Elgar: Cheltenham, Northampton. p. 19-47.

[25] Geels, F.W., From sectoral systems of innovation to socio-technical systems: Insights about dynamics and change from sociology and institutional theory. Research Policy, 2004. 33(6-7): p. 897-920.

[26] Hekkert, M., R. Suurs, S. Negro, S. Kuhlmann, and R. Smits, Functions of innovation systems: A new approach for analysing technological change. Technological forecasting and Social Change, 2007.74(4): p. 413-432.

[27] Independent Evaluation Group (IEG). 2017. *Higher Education for Development: An Evaluation of the World Bank Group`s (English)*. World Bank Education Overview. Washington, D.C.: World Bank Group. International Monetary Fund. 2018. World Economic Outlook: Cyclical Upswing, Structural Change. Washington, DC, April.

[28] La Porte, T.R. (Ed.), 1991. Social Responses to Large Technical Systems: Control or Anticipation. Kluwer academic Publishers, Dordrecht, NL.

[29] Lester, R. K., 2005. Universities, Innovation, and the Competitiveness of Local Economies – A summary report from the Local Innovation Systems Project–Phase I. Industrial Performance Center, MIT. Lundvall, B.-Å. (1992): Introduction. In: Lundvall, B. Å. (ed.): National Systems of Innovation toward a Theory of Innovation and Interactive Learning. Pinter Publishers. London, pp. 1-19.

[30] Mayntz, R., Hughes, T.P. (Eds.), 1988. The Development of Large Technical Systems. Campus Verlag, Frankfurt.

[31] Nelson, R. R. (1992): "National Innovation Systems: A Retrospective on a Study". Industrial and Corporate Change, no. 2, pp.347-374.

[32] OECD (2019). Education at Glance 2019: OECD Indicators, OECD Publishing, Paris.

[33] OECD (2002). Benchmarking Science-Ind. Relationships. Paris.

[34] OECD (2013) ,Singapore: innovation profile, in OECD,Innovation in Southeast Asia, OECD Publishing.

[35] Reamer, A., Reynolds, E. B., and Mills, K. G (2008). Clusters and Competitiveness: A New Federal Role for Stimulating Regional Economics. Blueprint for American Prosperity, Metropolitan Policy Program, Brookings, USA.

[36] Seo J. H. "Region Innovation System and Industrial Cluster: Its concept, Policy Issues and Implementation Strategies" presented on National Workshop on Sub-National Innovation Systems and Technology Capacity Bulding Policies to Enhance Competitiveness of SMEs, 27-30 October 2006, Beijing, China.

[37] Oster, S. M. (2012). Competitive Strategy in the Nonprofit Sector. *Oxford Handbook of Managerial Economics*.

[38] Skillern, J. C. W., 2008. Putting Entrepreneurship in the Social Sector. Interview made by Sean Silverthorne in 04 Feb 2008. Accessed 26 August 2014 link http://hbswk.hbs.edu/item/5782.html

[39] Statista. Estimated number of Universities around the worldwide as of July 2018. Retrieved from October 10, 2019, from <https://www.statista.com/statistics/918403/number-of-universities-worldwide-by-country/>.

[40] Stengos, T., and A. Aurangzeb. 2008. "An Empirical Investigation of the Relationship between Education and Growth in Pakistan." International Economic Journal 22 (3): 345–359.

[41] Summerton, J. (Ed.), 1994. Changing Large Technical Systems. Westview Press, Boulder/San Francisco/Oxford.

[42] Wong, P.K. (1995), National Innovation System: The Case of Singapore, Seoul: Science and Technology Policy Institute (STEPI).

[43] Wong, Po K., (1999): National Innovation Systems for Rapid Technological Catch-up: An analytical framework and a competitive analysis of Korea, Taiwan and Singapore. Paper presented at the DRUID Summer Conference on National Innovation.

[44] Whalley, J., and X. Zhao. 2010. "The Contribution of Human Capital to China's Economic Growth." NBER Working Paper 16592, National Bureau for Economic Research, Cambridge, MA

[45] World Bank. 2018. *World Bank Education Overview: Higher Education (English)*. World Bank Education Overview. Washington, D.C.: World Bank Group.

Copyright Disclaimer