

**FACHHOCHSCHULE MÜNSTER
-Fachbereich Wirtschaft-**

**Responding to the Entrepreneurial
University: A measurement scale**

Bachelor - Thesis

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Chapter I Problem Statement

1.1. Introduction

Nowadays we talk about entrepreneurship as if it was a new phenomenon, but what many people overlook is that the first symptoms were already several years ago, if someone is walking down the streets looking for people to give him/her their personal concept about what entrepreneurship is, probably this person will find answers like "It is the action of creating a company", "It is to have an innovative idea and from there to make a business plan," "It is to identify and exploit an opportunity", definitions which are right but unfortunately they do not go beyond they do not transcend. If this person had been asked about this before getting enlist with the theme of entrepreneurship he/she would have been thinking like this for a long time, which is not wrong, but this definition only applies to one of the many variants that entrepreneurship represents.

Entrepreneurship can occur in many settings and has both, similar and different characteristics. Thus, this thesis will focus on one of these variants, known as "entrepreneurial universities".

By starting to make a general research about this concept, the idea of what an entrepreneurial university is seemed vague and did not have much support since most of the information found on this concept is in papers that compile information from many authors but each paper has a tendency depending on the writer, because they are the ones who have tried to define and explain the concept, then they are only going to focus on their propositions and postulates. Some papers contain more complex information than others and this should be one of the reasons why the Internet research on this topic contains unstructured information.

With this thesis it is aimed to develop aspects like to break-down in a simple way and with a conceptual order the theory proposed by

academics with more experience and trajectory in this area, in addition to provide a personal definition according to the theoretical and methodological framework and finally to identify the most important practices that characterize an entrepreneurial university, so that the understanding on this issue is greater for the general public.

1.2. Reality Description

“Entrepreneurial University” as concept has been strongly developed since the last three decades by several authors, despite few universities in the world i.e. Stanford had the first symptoms in the twenties. As originators of the “Entrepreneurial University” are the Professor Henry Etzkowitz, senior Researcher of Stanford University and director of the Triple Helix Organization, and Burton R. Clark (1921-2009), who was emeritus professor of the University of California, Los Angeles and a renowned specialist in the sociology of education.

Universities play an important role in the social-economic development because they offer training, ideas and research, which is basically what many countries need in order to progress. Research is a differentiator factor of the “Entrepreneurial University” because it started to behave as a business that seeks a profit. This new approach of research took place when Academics in the United States realized that many companies were born due to inventions which came from American universities. However, this approach is problematic, opponents criticize how the interests could change the traditional mission of the universities, which is to educate students and likewise teaching impediment as consequence of the strong charge of work by researching.

1.3. Problem Formulation (Issue Statement)

Whether there are no scales or official parameters for assessing a university as “entrepreneurial”, how can universities measure if they are responding to this concept?

1.4. Objectives of Research

1.4.1. General objective

To create a scale that assesses how entrepreneurial universities are by analyzing different groups and practices within them.

1.4.2. Sub-objectives

- To detect concrete entrepreneurial practices and qualities used by students, academics, researches and the university’s management based on theoretical research.
- To classify these practices and qualities into categories and to formulate questions in order to make them measurable.
- To design a possible measurement method to verify if a university is considered as “entrepreneurial”.

1.5. Justification of Research

Thousands of academics have been researching through the years on the concept “entrepreneurial university”, all of them propose

different definitions and analyze it under different points of view; however no one has really worked on doing a standard scale for classifying universities worldwide into a range of entrepreneurship. Almost all the universities name themselves as entrepreneurial but there is no scientific ranking. Thus this research pretends to solve a praxis problem, which is the absence of a classification which determines the level of entrepreneurship of a university.

The reason for doing this research is because there is no scale and its existence could bring several benefits.

With the design of the scale, all the practices, qualities and activities that the different stakeholders of a university do can be measured and they can see if they are fulfilling the requirements for responding to the “entrepreneurial university”.

This study has especially implications for the university managers. First of all, with the results obtained from the scale measurement method they can restructure, redesign, improve or continue applying the strategies that make them entrepreneurial, emergent entrepreneurial or no entrepreneurial, and secondly researches in this topic can use this study to develop further research in this topic, both conceptual and applied. Moreover this study can have an indirect impact in the society where the universities are located, because their practices will not only benefit them but also the external community.

Chapter II Theoretical Framework

2.1. Literature Review

When I do reference on an “entrepreneurial university” I mean with university every higher education institution (HEI) for example: school of art, school of education, college, polytechnic, etc. because the scale that I am designing can be applied on all of these institutions.

A decisive fact to identify the transformation of the traditional university to a more entrepreneurial one was the change suffered by Stanford University in the 20s, which exposed the first key elements. According to Etzkowitz, a university goes through some stages to finally become an entrepreneurial one, the primary mission of a traditional university focuses on providing quality education to its students, however this thought is considered obsolete, therefore emerges the research university, which includes to its educational mission organized research groups aimed to commercialize those ideas, projects, findings, businesses, etc., which have economic potential. However the traditional and research mission of a university was not enough to become entrepreneurial, the element that completes these two missions is the integration of academic and non-academic organizational elements, i.e. a university does not become entrepreneurial if it focuses on growing for itself, but it is one that involves industry as part of its mission to grow together, for this reason it is said that an entrepreneurial university arises from the need of economic and social development (Etzkowitz, 2003).

The interdependence of an entrepreneurial university (Clark, 1998) is not limited to the creation of university-industry units that support the creation of new or existing firms through liaison and transfer offices, but it must also engage with other entities to gain advancement of knowledge and to further regional innovation (Etzkowitz, 2006),

however an entrepreneurial university must be also independent from other institutional domains (Etzkowitz, 2004).

According to this interdependence principle emerges the triple helix model, which points to produce hybrid organizations that come up from three spheres: university, industry and government, each one acting as the other one, a clear example of this interaction are: science parks, spin-offs, university-run enterprises and incubators (Etzkowitz, 2004; 2006).

Furthermore Burton Clark studied the entrepreneurial university culture on all levels, because of that he accomplished a study in five European universities, i.e. Warwick in England, Strathclyde in Scotland, Twente in the Netherlands, Joensuu in Finland and Chalmers in Sweden where he basically identified several aspects that determine how the entrepreneurial university culture should be shaped, such as risk-taking , decision making body, proliferation of professional outreach offices, sources of funding, entrepreneurial ethos, hierarchy, etc. This study is called "*Creating Entrepreneurial Universities: Organizational Pathways of Transformation*" (Clark, 1998).

Although several authors have been commissioned to analyze different aspects of the entrepreneurial university only M. Guerrero and D. Urban set out to collect all these studies and give them a little more shape to this concept. These two authors divided this theoretical compilation into two groups, the first group was named external factors which are categorized in formal and informal factors and the second group covered the internal factors which are categorized in capabilities and resources. To deepen in this approach the authors suggested the following:

- Formal factors: referring to how entrepreneurial the organization is.

- Informal factors: referring to how entrepreneurial the methodologies and students are.
- Resources: it covers resources such as, human capital, financial, physical, and commercial.
- Capabilities: referring to the university's recognition, networking and localization.

All this classification was made to link it with the entrepreneurial university, because it has to fulfill these four criteria (Guerrero, 2010).

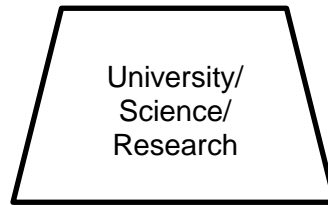
2.2. Conceptual Definitions

In 2012 the German professor Thorsten D. Barth collected five models, which he called "the models of innovation" to explain the evolution of the entrepreneurial university.

Mode 1 marked that knowledge production takes place not only in universities and colleges but also in non-university centers, government agencies, industrial laboratories, think-tanks, consultancies, etc. all these sites networking electronically, organizationally, socially and informally. The differentiation of all sites produced a subdivision into finer specialities which brought new forms of useful knowledge, as a result knowledge does not stay in the traditional disciplinarily, but transcends to new societal contexts (Gibbons *et al.*, 1994).

In conclusion the "Mode 1" concentrates essentially on basic university research organized in a disciplinary way. (Gibbons *et al.*, 1994)

Figure 1: Mode 1

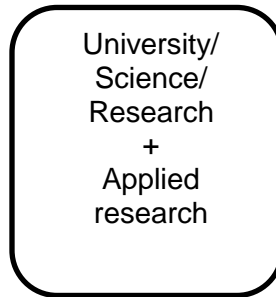


Source: Gibbons, et al. (1994). Own elaboration

In Mode 2 the form of organizations change, there is more interaction between the groups, because they are constantly working together depending on the problem, it means that they create temporary groups to dissolve a problem and when it is already solved the groups disappear, that is why the groups always include different people, solving a different problem in a different environment or location, therefore it is said that research groups are less institutionalized. In this mode the knowledge production takes place in more institutions and organizations both academic and non-academic, such as, multinational firms, network firms, small high-tech firms, government institutions, research universities, laboratories and institutes with national and international research programs (Gibbons *et al.*, 1994).

In another words, the “Mode 2” refers to “knowledge application” and “knowledge-based problem-solving” (Carayannis *et al.*, 2012).

Figure 2: Mode 2



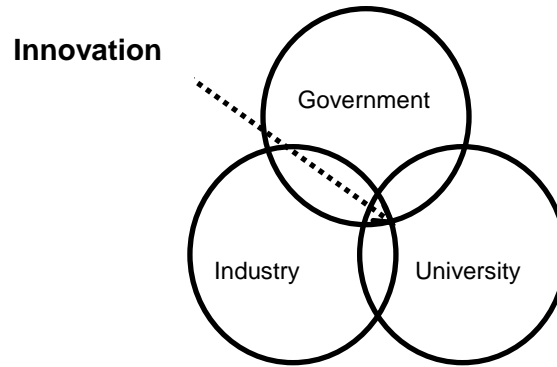
Source: Gibbons, et al. (1994). Own elaboration

The Triple Helix model by H. Etzkowitz refers to three stakeholders, university, industry and government, each sphere taking the role of the other one e.g. ., university forming firms; government as adventure capitalist; industry raising training to higher levels. In this model the university is seen as the primary institutional sphere because its main role is the knowledge based society, the industry is seen as a national champion and the government as bureaucratic (top-down).

If we see each sphere as separate the government will characterize for its limitation to the market, industry for its relation with the market and university for researching and putting to disposition human talent.

The idea of the triple helix model is that each sphere joins with each other and at the focal point is the stimulated innovation (Etzkowitz, 2007).

Figure 3: Triple Helix Model



Source: Etzkowitz (2006). Own elaboration

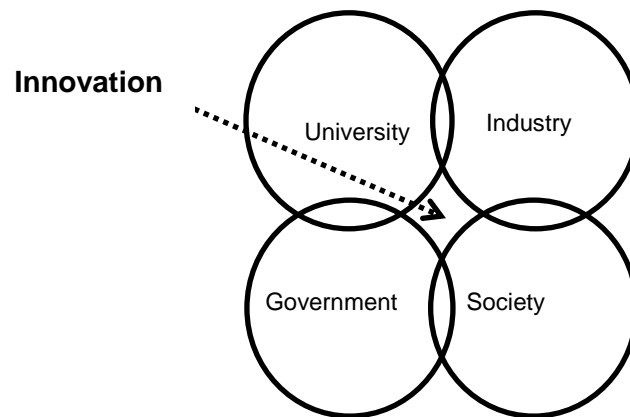
The history tells us that the triple helix model helped US from the depression of 1930 and that is why Etzkowitz describes the entrepreneurial university as an important fact in the history, due to the adding of a third mission of “economic and social development” (Etzkowitz, 2003), and that is what US brought, a tool for overcoming this failure phase.

Based on this model the entrepreneurial university has to capitalize the knowledge and be prepared for the changing environment when dealing with the industry and government (Etzkowitz, 2003).

The Mode 3 of knowledge production is the Quadruple Helix by Carayannis et al. (2012), which is an expansion of the “Mode 1” and “Mode 2”. This model integrates another sphere, “civil society”, in the process of knowledge production, it means these three stakeholders have to cooperate with the society i.e., through development projects, social responsibility projects, a clear example of this interaction are institutions such as: the institution of social innovation at Stanford and social innovation parks in Singapore and Bilbao, Spain (Carayannis et al., 2012).

This model focuses on higher order learning, it means, on learning, on learning to learn and on learning to learn how to learn. It also focuses on making better, more effective and efficient the government, university and industry policies and practices.

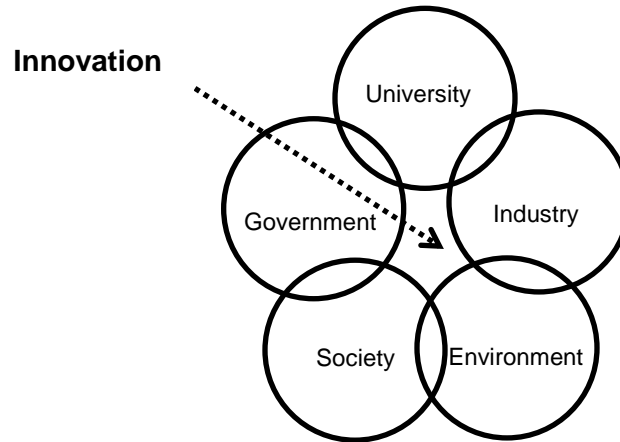
Figure 4: Quadruple Helix



Source: Carayannis, et al. (2012). Own elaboration.

The “mode 4” or also known as “Quintuple Helix” integrates a new participant in this process of innovation, which is the natural environment. This is the most recent approach regarding the “entrepreneurial university” and basically environment is interpreted as sustainable development and social ecology. With this model appear the concepts “eco-innovation” and “eco-entrepreneurship”

Figure 5: Quintuple Helix



Source: Carayannis, et al. (2010). Own elaboration.

2.3. Critic

The three approaches by Slaughter and Leslie, Etzkowitz and B.R Clark were a discussion theme because of the conflicts on values and practices in the evolution of the entrepreneurial university (Allan N, 2006). The new trend of “entrepreneurial universities” was not totally approved by Slaughter and Leslie because they were wondering about the autonomy of universities due the hybridization process where universities are constantly dealing with the government and industries that is why these two authors argue that when a university is hybrid, its autonomy decreases (Slaughter and Leslie, 1997). However Etzkowitz’ point of view contradicts what Slaughter and Leslie affirm, because according to him universities acquire the capacity to change easily due to the different complex and changing environments where they are interacting and for this reason they develop hybrid forms which let them to behave autonomously (Etzkowitz, 2003; 2004). In an intermediate point is Clark B.R who agrees with some aspects from each approach, on the principle that a university has to be autonomous in order to be

entrepreneurial but the fact of the top-down governance of the state screws the principle of autonomy (Clark, 2004).

Another critical point was the fact of the inclusion of research in the professorial role, because all these activities related to research were taking them away from their academic activities and this traditional role as teacher was disappearing. But the reason behind of this was the need of the universities to contribute to economic development and to obtain personal wealth (Etzkowitz, 2003).

One of the most critical aspects is the conflict between the university values and the economic values because many authors argue that universities are only interested and looking for industrial funding. It is asked if the universities have an educational or a commercial mission. This is often discussed because many universities with the help of the government or industries commercialize their research, so it becomes a conflict of interests. There are two possible solutions in order to avoid the conflict of interests: to separate as much as possible the academic and business activities by delimiting clearly the activities that are pointing to the advancement of knowledge and those which are involved with the commercialization. The only problem by separating these two activities is the unnecessary financial cost that brings to separate them. However, there are some people who question why we have to separate two approaches which function effectively together. Therefore the recommendable action is to integrate these two approaches but keeping in mind that each involved party has different rights and obligations, so students, professors, universities management and industry have to behave according to their rights and obligations and work together under these common regulations (Etzkowitz, 2003). But at this point it is when real “entrepreneurial universities” have to differentiate because a real one “maximizes the potential of commercialization their ideas and create value in society and do not see this as significant threat for academic values” (Gibb, 2005).

Chapter III Methodology

The methodology of this thesis consists on making a systematic review of the most important scientific papers, which were the primary source of information. These papers were published by academics with experience in the evolution of the entrepreneurial university's concept. The advantage of this source is that these publications are relatively recent from 1994 to 2012, which gives us more exactness for comparing this concept in the current world. Around fifteen papers were mainly used. A blog about entrepreneurship was also taken into account for identifying the most entrepreneurial practices that must present a HEI.

In order to select the papers for this thesis I focused on the two academics commonly known as the fathers of the "entrepreneurial university" and from there I selected those authors with whom they shared ideas, but likewise to those with whom they disagreed, this to have a contrast and a critic of each of the postulates and to encourage reflection in this thesis.

In order to have a more comprehensive approach, this methodology contains two streams; the first stream is American and it is supported by Henry Etzkowitz and the European stream by Burton R. Clark. Both authors agree in several aspects but also we can find differences between both streams according to the environment.

On the one hand, a thorough review of the literature was carried out, at this point a series of entrepreneurial practices were identified and divided according to thinking and practices, because in many cases the authors made reference to characteristics or qualities that could not be measured, because they were describing qualitatively how an "entrepreneurial university" should behave. On the other hand, all these practices and qualities were classified in four different groups, because some authors focused mostly on academics, students, researchers and the university's management, so that these practices and qualities were assigned to each of these groups, being the combination of all of them

the base for measuring an entrepreneurial HEI. The practices of three of the groups named as academics, students and researches were divided into entrepreneurial “thinking” and “acting” and the other group that represents the university’s management was divided into organizational, teaching and financial structure.

These practices were the primary source of information for designing this scale, which has as purpose to measure a university in relation to entrepreneurship.

In order to make measurable these practices questions were formulated based on the praxis in order to make them the measurement tool of this scale.

The survey consists of a series of yes / no questions; all practices have a variable amount of questions, the total quantity of question will be 100%, every question answers with a “yes” will be part of this 100%, “no” answers are not going to be taken into consideration.

However, questions are not sufficient for measuring each group; that is why a series of interview questions were created as a complement to the questionnaire in order to clarify and verify the dominium of this theme and the reliability of the questionnaire’s answers.

The reason for using both quantitative and qualitative methods is supported by the triangulation theory developed by Norman K. Denzin in 1970, who proposed the use of different methods or data in order to ensure the validity of the research, because diverse points of view are put into consideration (Denzin, 1970). In this thesis the open questions complement the yes/no questionnaire and if the results are similar it means they are more reliable and the conclusions will be more robust.

3.1. Systematic Literature Review

3.1.1. Practices of an „Entrepreneurial Academic“

a) *Entrepreneurial practices*

- i. An „entrepreneurial academic“ designs academic core units with entrepreneurial focus in order to link with external organizations or activities, i.e. private businesses, regional and local government, intellectual property development, continuing education, fundraising and alumni affairs, thus the “entrepreneurial university” will obtain third stream income. (Gjerdning et al., 2006)

Do you include entrepreneurship in the curriculum?

Do you involve external organizations in the development of the curriculum?

Do you consider this brought a monetary profit for the university?

- ii. An “entrepreneurial academic” teaches innovatively. Innovation is understood as development of education and pointing it in new directions (Gjerdning et al., 2006).

Are you able to manage, train, guide and motivate students during the lectures and after the lectures?

- iii. An “entrepreneurial academic” transfers knowledge to the external community. (Gibb, 2005)

Have you ever made consulting contracts with outside companies, social organizations or people in general?
(Clouser, 2010)

- iv. An “entrepreneurial academic” designs competence levels with their respective contents, to ensure that graduates can be educated meeting international and national required standards of bachelor and master degrees (Gjerding et al., 2006).

Do you know the international and national standards of bachelor and master degree?

Do you apply these standards to help the university’s international profile?

- v. An “entrepreneurial academic” acts as advisor when a student is forming a firm (Etzkowitz, 2003).

When your students have a start-up idea, do you advise them in this process?

- vi. An “entrepreneurial academic” takes use of incubators like project genesis to identify and develop opportunities and innovations on his/her students (Etzkowitz, 2003).

Do you use incubators to encourage students to start a firm?
(Clouser, 2009)

- vii. An “entrepreneurial academic” educates students to shape organizations by encouraging them to exchange ideas and to formulate common objectives when doing a project (Etzkowitz, 2006).

Do you consider business projects in your curriculum?

Do you encourage exchange of ideas among students?

- viii. An “entrepreneurial academic” makes applied research. (Etzkowitz, 2003)

Do you make applied research?

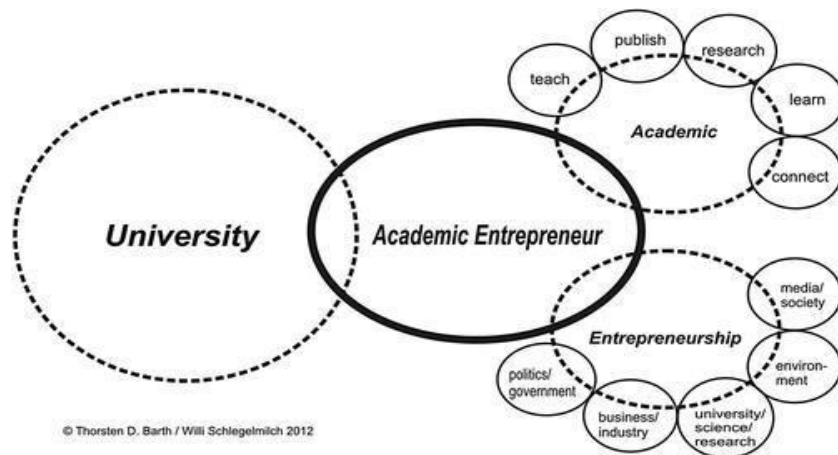
Have you ever set up a business?

Have you ever commercialized a research?

- ix. An “entrepreneurial academic” cooperates with excellent universities and other organizations to gain more knowledge, to improve networking or to carry projects out (Clark, 2005).

Do you use your know-how to create, ideas, technologies, think tanks, etc., for customers belonging to different sectors?

Figure 6: The models of Innovation



Source: Barth, et al. (2012)

An academic entrepreneur in the helix area of:

Government/Politics: offers his/her Know-how for doing political consultancy.

Business/Industry: offers consultancy services for private enterprises, i.e. strategy development, new findings, invited lectures.

Environment: works as natural scientist and registers patents for the university, which could be promoted in cooperation between the university and a pharmaceutical enterprise.

Media/Society: writes articles for several newspapers, which could be part of a scientific journal.

University/Science/Research: uses his/her Know-how gained by researching to make strategic changes in the university development in order to benefit the society, businesses and the university itself.

(Barth, et al. 2012)

- x. An “entrepreneurial academic” delivers his/her curriculum, by bringing external people to teach, explain or put in practice the theory included in the academic core units.

Have you ever prepared case studies with speakers from another universities, countries or enterprises?

- xi. An “entrepreneurial academic” is constantly learning.

Do you take any type of further education or training?

b) *Entrepreneurial thinking*

- i. An “entrepreneurial academic” stimulates his/her students to generate new firms (Etzkowitz 2003; 2006).

Have you ever put your students to create innovative products or services or to find needs in the market as part of a project?

- ii. An “entrepreneurial academic” has autonomy to set up activities which are outside of the core know-how (Clouser, 2009).

Do you have “entrepreneurial freedom” to explore new businesses opportunities with your students?

3.1.2. Practices of an “Entrepreneurial Student”

a) *Entrepreneurial practices*

- i. An “entrepreneurial student” practices entrepreneurship within individuals and small organizational groups.

Do you belong to any club, committee, group or organization to develop or put in practice entrepreneurial skills?

- ii. An “entrepreneurial student” solves real-life problems by group researching and learning (Gjerding et al., 2006).

Do you solve real-life problems by group researching and learning?

- iii. An “entrepreneurial student” starts new ventures: intellectual, commercial and conjoint (Etzkowitz, 2003).

Have you ever engaged in new a venture?

- iv. An “entrepreneurial student” engages him-/herself with business projects (Gibb, 2005).

Have you ever engaged with business projects?

- v. An “entrepreneurial student” resolves societal problems (Gibb, 2005).

Do you care about the society?

Are you conscious of some societal problems?

Have you ever tried to solve some?

Did you solve any of it?

b) Entrepreneurial thinking

- i. An “entrepreneurial student” acts as a leader of research groups managing them as “quasi firms” (Etzkowitz, 2003).

Do you consider yourself as a leader?

Have you ever managed a team?

- ii. An “entrepreneurial student” is able to initiate a start-up (Etzkowitz, 2006).

Do you have a strong entrepreneurial spirit?

Are you afraid of taking risks?

3.1.3. Practices of an “Entrepreneurial Researcher/Research Group”

a) *Entrepreneurial practices*

- i. An “entrepreneurial research group” lacks a direct revenue object (Gjerding, et al. 2006).

Does your research group lack a direct revenue object?

- ii. An “entrepreneurial research group” works together with businesses through its liaison and technology transfer offices. (Gjerding, et al. 2006)

Do you carry out research projects in cooperation with businesses through your liaison and technology transfer offices?

- iii. An “entrepreneurial research group” researches together with other excellent universities (Clark, 2005).

Do you take part in research projects in cooperation with other high quality universities?

- iv. An “entrepreneurial research group” carries out organized technology transfer processes into the region (Clark, 2005).

Have you ever transferred technological knowledge to any organization at a regional level or higher?

- v. An “entrepreneurial researcher” takes use of his/her incubators to educate research group members to behavior as an effective organization (Etzkowitz, 2006).

Do you use incubators as a practical example to show your group members how an effective organization should behave?

- vi. An “entrepreneurial research group” commercializes research results with scientific potential (Etzkowitz, 2004).

Have you ever commercialized scientific research results achieved by your research group?

- vii. An “entrepreneurial researcher” teaches to research according to international research standards (Gjerding, et al. 2006).

Do you know any international research standard?

Do you apply them to teach your research group members?

- viii. An “entrepreneurial researcher” writes publications of research (Etzkowitz, 2003).

Have you ever published scientific publication about your research?

- ix. An “entrepreneurial research group” acts as a research and development center (Gibb, 2005).

Does your research group act as a R&D center?

- x. An “entrepreneurial research group” works with the stakeholder community, offering consultancy services, training,

research and development, technology transfer or making available science parks or incubators (Gibb, 2005).

Has your research group ever been involved with the community?

Did your research group offer service and support to the community regarding entrepreneurship projects?

Can the community access to science parks or incubators of your university?

- xi. An “entrepreneurial researcher” designs a rewards system (Gibb, 2005).

Do you reward your members when they do successful findings related to research and publication?

- xii. An “entrepreneurial researcher” hires successful young researchers for the group because the good image and reputation of them attract students and benefactors, but also they bring excellent research results (Clark, 2005).

Do you attract students and benefactors by recruiting successful young researchers?

b) Entrepreneurial thinking

- i. An “entrepreneurial research group” operates as a firm (ibid., p.111).

Does your research group operate as a firm?

- ii. An “entrepreneurial researcher” increases the business orientation of the group (Etzkowitz, 2004).

Do you focus the research group activities on the market?

- iii. An “entrepreneurial researcher” takes intellectual risks without risking his/her job and academic reputation (Gibb, 2005).

Do you take intellectual risks but without risking your job and academic reputation?

- iv. An “entrepreneurial researcher” has autonomy to set up activities which are outside of the core know-how (Gibb, 2005).

Do you set up activities outside the core know-how of your research?

3.1.4. Practices of an “Entrepreneurial University Management”

According to the following fields:

a) *Organizational*

- i. It is known that most of universities do have a management hierarchy; however an “entrepreneurial university management” modifies this traditional structure into a flat one, where administrative managers have equal self-made autonomy to professors, department heads and research team directors (Clark, 2005).

Does the university management have a rather flat structure?

Does the university management promote autonomy in different positions?

- ii. An “entrepreneurial university management” promotes an entrepreneurial culture and ethos as part of university’s core strategy, combining leadership with freedom (Etzkowitz, 2006).

Does the management promote an entrepreneurial culture within whole university by implementing and designing conferences, fairs, forums, etc.?

- iii. An “entrepreneurial university management” changes its status quo continuously (Clark, 2004).

Does the university change its status quo continuously?

An “entrepreneurial university management” takes advantage of the triple helix model by Etzkowitz to produce hybrid organizations such as:

Science parks

Spin-offs

University-run enterprises

(Etzkowitz, 2006)

Has the university management produced a science park?

Has the university management produced spin-offs?

Has the university management produced university run-enterprises?

- iv. An “entrepreneurial university management” invests in an attractive campus and environment, whose infrastructure charms excellent students (Clark, 2005).

Is the university’s infrastructure continuously changing and adapting to the new trends i.e. green, sustainability, etc.?

b) Teaching

- i. An “entrepreneurial university management” works together with faculties on issues such as:

- Knowledge transfer
- Industrial contracts
- Intellectual property development
- Continuing education
- Fundraising
- Alumni affairs

(Gjerding, et al. 2006)

Do you keep informed about the new contracts, events, cooperation, etc. carried out in the faculties?

Do you propose ideas or review these issues?

- ii. An “entrepreneurial university management” accepts foreign talent either students, researches or faculty members (Wong, 2007).

Does the management cooperate with other universities to promote students mobility?

Does the management recruit foreign staff?

- iii. An “entrepreneurial university management” introduces an entrepreneurship focus not only to business schools but it encompasses all careers and faculties; that is why entrepreneurship must be integrated into the curriculum (Gibb, 2002; 2006).

Is there an entrepreneurship module included into the curriculum pointed to every single career of the university?

- iv. An “entrepreneurial university management” pays permanent attention to the development of how it is taught and researched in order to adapt and response to the market requirements (Clark, 2005).

Do you make any type of tracking to professors and researchers?

c) *Financial*

- i. An “entrepreneurial university management” enjoys a solid and wide financial base by finding monetary resources through financial diversification, the so called “third stream funding”:

- Private business
- Regional and local government
- Intellectual property rights
- Campus services
- Student fees
- Alumni fundraising

(Clark, 2005)

Does the management carry out activities with or to the last ones to receive money?

- ii. An “entrepreneurial university management” applies preferable a lump sum budgeting (Clark, 2005).

Does the management apply lump sum budgeting?

- iii. An “entrepreneurial university management” keeps its alumni in mind by doing extensive activities like alumni funding or alumni support activities (Clark, 2005).

Does the management do alumni funding or any type of alumni support activity?

- iv. An “entrepreneurial university management” gets donations due to its reputation, procedures, ideas and alumni (Clark 2005).

Does the management receive donations from ideas, alumni, and result of procedures or for the good university’s image?

- v. An “entrepreneurial university management” does not stay with its traditional core unit of bachelor programs but extend it to get more revenues, i.e. post-graduation and masters (Clark 2005).

Are there post-graduation and master programs in the university?

3.2. Defining an “Entrepreneurial University”

The fact of reviewing the papers made unleash the analysis, it was also asked by me what an "entrepreneurial university" is and after reading many points of view, some ideas came up for building an own definition.

After designing the scale and dividing it into groups, it was found out that making reference to academics, students, researchers and university's management, all the stakeholders that interact in a university were being covered.

Becoming an entrepreneurial university involves a holistic development, namely that entrepreneurship takes hold in each of the spaces, however when it is talked about entrepreneurship It is not meant just encouraging an entrepreneurial culture for business creation, but to the fact of identifying itself as entrepreneurs from the students to the management.

An academic is an entrepreneur when he goes beyond his educational work as a teacher, because its mission is not just limited to teaching but also within its functions are, advising and consulting for the university and the external environment, not necessarily he/she must have many titles, but goes in search of his passing, that in his thought-provoking classes, analysis, autonomy and attempts to put students in real situations that differ completely from what they learned in class. Also, an academic entrepreneur is informed of the new educational trends, offers ideas for improving college students engages with the outside world either through cooperation with industry or government, cares about the community and engages college with him and her methods designed for the community to become part of the university, such as development centers in different parts of the region where is located the university to instruct people and take advantage of advisory and consulting , competitions, funding or become part of programs offered by the center.

A student entrepreneur is not limited only to attend to the lectures, but he/she is one that goes further, he does not only assist to the lectures and get good scores, he/she also tries to put in practice all this theoretical framework learned in the HEI by being active member of any student organization or research group to increase leadership,

responsibility, self-learning, etc. in order to grow him-herself but also to have a positive impact in the society.

A researcher entrepreneur thinks big because apart of making applied research with the students in the HEI, he/she interests on making research with economical and scientific potential in order to beneficiate the HEI and also the industries by cooperating, i.e. technology transfer processes between them. He/she also belongs to recognized research organizations and participates with projects and ideas on competitions to enhance the reputation of him/her, group, HEI and region.

An entrepreneurial university's management is flexible, gives autonomy to all stakeholders of the HEI, promotes an entrepreneurial culture as way of learning and teaching, cares about its finances by working together with students, academics and researches in order to get funding in way of donations, profit of projects, ideas, consultancy services etc.

The combination of the attitudes and behaviors of these four groups is what defines how entrepreneurship a university is, because as I said earlier when a university is entrepreneurial, it is holistically, as a HEI is not made only of students and teachers, but it is an open set of students, teachers, academics and management which involve with the external environment, i.e. community, industry and government.

An entrepreneurial university functions as a system that brings together the following elements, the academics, students, researchers and management, which are organized according to a common goal that is to be entrepreneurs, and at the same time these elements are interacting with each other. When we refer about an "entrepreneurial university" we do not talk about each of these items separately, or judge them separately, but it must be defined in relation to each other, it means, as a whole, holistically.

Likewise an entrepreneurial university is an open system that exchanges energy, matter and information with the environment, the environment is composed by the community, industry and government. In this

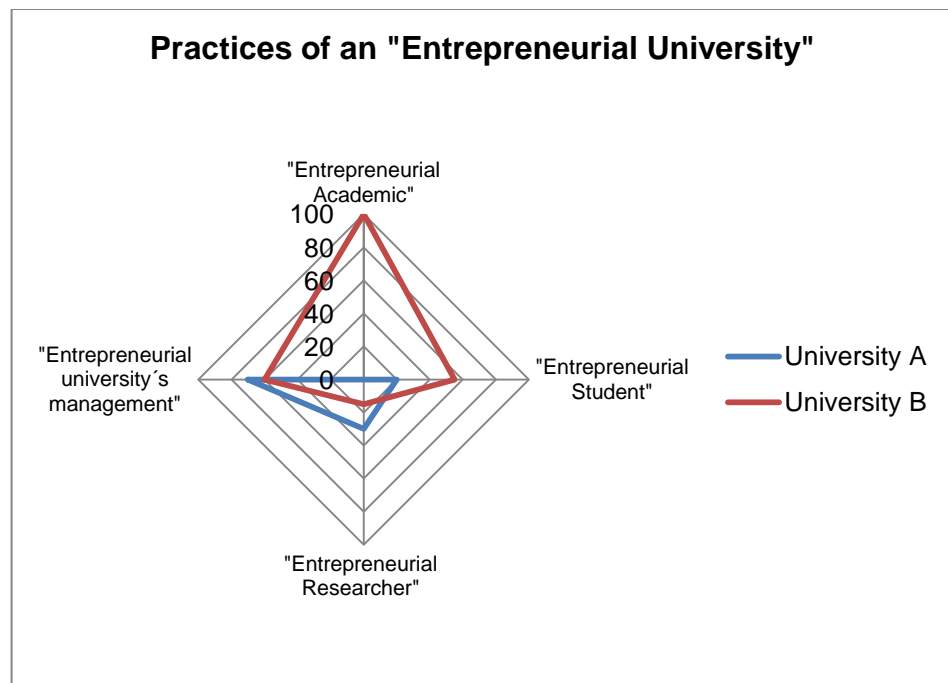
entrepreneurial process, the HEI is an open system that transforms everything that comes from the external environment to come out what you want to achieve with that environment.

All this previous definition was based on the theory of systems of management, which in my opinion is the basis for a truly “entrepreneurial university”.

3.3. Possible Measurement Method

3.3.1. Valuation Matrix

Figure 7: Valuation Matrix of an “Entrepreneurial University”



Source: Gjerding, et al. (2006). Own elaboration.

3.3.2. Rating

Figure 8: Rating of an “Entrepreneurial University”

| Entrepreneurial practices | Percentage value | |
|------------------------------------|------------------|---------|
| | HEI “A” | HEI “B” |
| Academics | | |
| Curriculum development | | |
| Innovative teaching | | |
| External knowledge transfer | | |
| Competence levels design | | |
| Advising | | |
| Project genesis (incubators) | | |
| Shape organizations | | |
| Promotion of applied research | | |
| Universities cooperation | | |
| Curriculum development | | |
| Constantly learning | | |
| Promotion of creation of new firms | | |
| Autonomy | | |
| Student | | |
| Entrepreneurial practices | | |
| Solve real-life problems | | |
| New ventures initiative | | |
| Business projects engagement | | |
| Leadership | | |
| Resolve societal problems | | |
| Generation of start-ups | | |
| Researcher/research group | | |
| Lack of direct revenue motive | | |

| | | |
|------------------------------------|--|--|
| Cooperation with businesses | | |
| Cooperation with universities | | |
| Technology transfer processes | | |
| Incubators | | |
| Research results commercialization | | |
| International education | | |
| Publications of research | | |
| R & D centers | | |
| Service to the community | | |
| Rewards system | | |
| Successful young researchers | | |
| Intellectual risks | | |
| Firm-like entities | | |
| Taking risks | | |
| Autonomy | | |
| Management | | |
| Flat structure | | |
| Entrepreneurial culture | | |
| Changing of status quo | | |
| Attractive campus | | |
| Cooperation with faculties | | |
| Foreign human capital | | |
| Entrepreneurial curriculum | | |
| Adaptation to the market | | |
| Third stream funding | | |
| Lump sum budgeting | | |
| Alumni activities | | |
| Donations | | |
| Post graduate programs | | |

Source: Gjerding, et al. (2006). Own elaboration

3.4. Propositions Formulation

According to the literature in order to understand how entrepreneurial a university is it was necessary to consider several groups and each of these groups must be separately analyzed by taking practices and behaviors that characterize each one of them, so it will be easier for the understanding and measurement of the entrepreneurship's degree.

According to the literature the university evolved from its traditional role of teaching to research and then to the entrepreneurial, so that most of the authors focused more on studying the transition from the research to the entrepreneurial mission, for this reason the group that has to be more considered are researchers and research groups, because the main differentiating character of this concept came with the researchers when the research groups became as quasi-firms; one of the first indications of an "entrepreneurial university".

The entrepreneurial university is very concerned about their finances, it does not mean that it only fulfills its educational mission to get money, but to bring economic and social development, therefore it must cooperate with many organizations and internal and external entities, at this point it is where it becomes important the so called "third stream funding".

Chapter IV Limitations

The main limitation of this thesis is not about the design of the scale, as this is based on literature taken from the main authors specialized in this area, but this study is limited by cultural variables, technological, political, according to the social environment in which they want to perform this scale, as higher education institutions differ by region and country, i.e. whether for economic development, structure of universities, etc..

Additionally, another limitation of this scale is that the primary theoretical source is upwind recent exclusive. Also in the past it has not been carried out empirical tests to identify characteristics and practices that point out that a university can be considered entrepreneurial.

Chapter V Conclusions and Recommendations

The main conclusion of this thesis is that although many authors have spent years trying to give theoretical framework to the concept of entrepreneurial universities, the absence of a scale makes that HEIs do not strive enough to gather a number of features that reflect on the idea of being competitive in the market under the postulates of the entrepreneurial university. Also the fact that the concept has been used only from a few decades ago shows that there is still a lot of ignorance around it.

For being an entrepreneurial university it must fulfill some characteristics by groups, it is much more difficult to get a high score in each of them, unfortunately there are few universities in the world that can accomplish in a large proportion the practices established on the scale, some universities put efforts into the goal of being entrepreneurial, but they are considered still not enough as entrepreneurial, for that reason it can be concluded that despite this concept is taking force, universities are still not prepared for fulfilling with most of the practices.

The entrepreneurial universities contribute to economic and social development of a country since they carry out activities to benefit to themselves, but these activities to be successful must be interdependent from industry and government, in this exercise of cooperation between these three entities ideas and projects are created and they also provide services to society but HEIs, industry and government still benefit themselves, which brings progress to a country. Thus becoming a "entrepreneurial university" is one of the most successful solutions for the improvement of education in HEIs, also to diversify the mission of the university; students, academics and researchers become more competitive, the community benefits from the development centers that offer counseling, advice, training, support, financing, and finally the university becomes more prestigious, more recognized, and strengthens its financial base, but remove on the other hand industries and government get competitive ideas, innovative projects which have

economical potential, therefore all parts are benefited from this circle of interdependence.

Along this thesis can be seen that all the value added that can bring an entrepreneurial university to the economy, because it is known that universities provide qualified human talent, but when they are entrepreneurial they also stand out by knowledge commercialization and knowledge transfer.

The questionnaire can be applied just to certain groups within the university or the institution as a whole and can be used as a benchmarking tool to compare different universities. The open questions give a different perspective of the same topic, providing more validity and robustness to results.

Despite this scale applies for all the HEIs, it's important to recognize that every institution has its own culture, values and way of doing things according to the type of university or its geographical area, that is why when using this scale people must be careful when comparing different HEIs with totally different environments.

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Appendix

Survey of “Entrepreneurial Universities”

Below appear a series of practices, please read each question carefully and answer yes or no to each of them.

Note that the survey is divided into four parts; answer only the part that will be assigned by the interviewer.

Finally you will find a series of open questions, please read them and ponder your answer, upon completion time of the survey, you should discuss your answers to these open questions with the interviewer.

First part: Academics

1. Practices of an „Entrepreneurial Academic“

1.1. *Entrepreneurial practices*

- Do you include entrepreneurship in the curriculum? ___
- Do you involve external organizations in the development of the curriculum?
- Do you consider this brought a monetary profit for the university? ___
- Are you able to manage, train, guide and motivate students during the lectures and after the lectures? ___
- Have you ever made consulting contracts with outside companies, social organizations or people in general? ___

- Do you know the international and national standards of bachelor and master degree? ___
- Do you apply these standards to help the university's international profile? ___
- When your students have a start-up idea, do you advise them in this process? ___
- Do you use incubators to encourage students to start a firm? ___
- Do you consider business projects in your curriculum? ___
- Do you encourage exchange of ideas among students?
- Do you make applied research? ___
- Have you ever set up a business? ___
- Have you ever commercialized a research? ___
- Do you use your know-how to create, ideas, technologies, think tanks, etc., for customers belonging to different sectors? ___
- Have you ever offered or do you offer your know-how for doing political consultancy? ___
- Have you ever offered or do you offer consultancy services for private enterprises, i.e. strategy development, new findings, invited lectures? ___

- Have you ever worked as natural scientist and registered patents for the university, which could be promoted for example in cooperation between the university and a pharmaceutical enterprise? ___
- Have you ever written or do you write articles for newspapers, which could be part of a scientific journal? ___
- Do you use your know-how gained by researching to make strategic changes in the university development in order to benefit the society, businesses and the university itself? ___
- Have you ever prepared case studies with speakers from other universities, countries or enterprises? ___
- Do you take any type of further education or training? ___

1.2. Entrepreneurial thinking

- Have you ever put your students to create innovative products or services or to find needs in the market as part of a project? ___
- Do you have “entrepreneurial freedom” to explore new businesses opportunities with your students? ___

Second part: Students

2. Practices of an “Entrepreneurial Student”

2.1. *Entrepreneurial practices*

- Do you belong to any club, committee, group or organization to develop or put in practice entrepreneurial skills? ___
- Do you solve real-life problems by group researching and learning? ___
- Have you ever engaged in a new venture? ___
- Have you ever engaged with business projects? ___
- Do you care about society? ___
- Are you conscious of some societal problems? ___
- Have you ever tried to solve some? ___
- Did you solve any of it? ___

2.2. *Entrepreneurial thinking*

- Do you consider yourself as a leader? ___
- Have you ever managed a team? ___
- Do you have a strong entrepreneurial spirit? ___
- Are you afraid of taking risks? ___

Third part: Researchers

3. Practices of an “Entrepreneurial Researcher/Research Group”

3.1. *Entrepreneurial practices*

- Does your research group lack a direct revenue object? ___
- Do you carry out research projects in cooperation with businesses through your liaison and technology transfer offices? ___
- Do you take part in research projects in cooperation with other high quality universities? ___
- Have you ever transferred technological knowledge to any organization at a regional level or higher? ___
- Do you use incubators as a practical example to show your group members how an effective organization should behave? ___
- Have you ever commercialized scientific research results achieved by your research group? ___
- Do you know any international research standard? ___
- Do you apply them to teach your research group members? ___
- Have you ever published scientific publications about your research? ___
- Does your research group act as a R&D center? ___

- Has your research group ever been involved with the community? ___
- Did your research group offer service and support to the community regarding entrepreneurship projects? ___
- Can the community access to science parks or incubators of your university? ___
- Do you reward your members when they do successful findings relating to research and publication? ___
- Do you attract students and benefactors by recruiting successful young researchers? ___

3.2. *Entrepreneurial thinking*

- Does your research group operate as a firm? ___
- Do you focus the research group activities to the market?___
- Do you take intellectual risks but without risking your job and academic reputation? ___
- Do you set up activities outside the core know-how of your research? ___

Fourth part: University's Management

4. Practices of an "Entrepreneurial University Management"

According to the following fields:

4.1. Organizational

- Does the university management have a rather flat structure? __
- Does the university management promote autonomy in different positions? __
- Does the management promote an entrepreneurial culture within whole university by implementing and designing conferences, fairs, forums, etc.? __
- Does the university change its status quo continuously? __
- Has the university management produced a science park?
- Has the university management produced spin-offs?
- Has the university management produced university run-enterprises?
- Is the university's infrastructure continuously changing and adapting to the new trends i.e. green, sustainability, etc.? __

4.2. Teaching

- Do you keep informed about the new contracts, events, cooperation, etc. carried out in the faculties? __

- Do you propose ideas or review these issues? ___
- Does the management cooperate with other universities to promote students mobility? ___
- Does the management recruit foreign staff? ___
- Is there an entrepreneurship module included into the curriculum pointed to every single career of the university?___
- Do you make any type of tracking to professors and researchers? ___

4.3. Financial

- Does the management carry out activities with or to the following institutes or services to get money?
 - Private business ___
 - Regional and local government ___
 - Intellectual property rights ___
 - Campus services ___
 - Student fees ___
 - Alumni fundraising ___
- Does the management apply lump sum budgeting? ___
- Does the management do alumni funding or any type of alumni support activity? ___

- Does the management receive donations from ideas, alumni, result of procedures or the good university's image? __

- Are there post-graduation and master programs in the university? __

Open questions of the interviews

1. Since your point of view, what is an entrepreneurial university?
2. What does an entrepreneurial university characterize? Do you consider this university as entrepreneurial? Which activities practiced here aim this concept?
3. How would you define the entrepreneurial culture of this university?
4. Which barriers do affect entrepreneurship in this university?
5. Does this university cooperate with an external organization that promotes entrepreneurship? Which one?
6. Would you like to add something else about entrepreneurship in this university not discussed before?
7. How far this university does generate social-economic development?

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