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DEVELOPING A FRAMEWORK FOR UNDERSTANDING THE OPPORTUNITY RECOGNITION PROCESS IN UK ENTREPRENEURIAL UNIVERSITIES: A STUDY OF FIVE WINNERS OF THE TIMES HIGHER EDUCATION ENTREPRENEURIAL UNIVERSITY OF THE YEAR AWARD

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**DEVELOPING A FRAMEWORK FOR UNDERSTANDING THE OPPORTUNITY
RECOGNITION PROCESS IN UK ENTREPRENEURIAL UNIVERSITIES: A
STUDY OF FIVE WINNERS OF THE TIMES HIGHER EDUCATION
ENTREPRENEURIAL UNIVERSITY OF THE YEAR AWARD**

ALVIN ALDAWOD

A thesis submitted to the University of Huddersfield in partial fulfilment of the
requirements for the degree of Doctor of Philosophy

The University of Huddersfield

September 2019

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Abstract

There have been continuous challenges for UK universities to behave in an entrepreneurial manner, and there is existing literature on which component parts make up an entrepreneurial university. The context in which universities operate and interact with stakeholders is constantly changing, additionally universities are working in a turbulent sector in which societal and governmental expectations are becoming more demanding. In the UK, the endeavours of Gibb, Haskins and Robertson and the National Centre for Entrepreneurship in Education (NCEE) have produced analytical frameworks and encouraged further debates. This thesis considers five UK entrepreneurial universities, who have been awarded the "Times Higher Education Entrepreneurial University of the Year Award" and explores how their senior staff recognize entrepreneurial opportunities.

A conceptual framework is developed from the literature and is based on both the factors that determine the OpRec process and the factors specific to entrepreneurial universities. The framework is also impacted by the principles of Resource Based Theory (RBT), which underpins the thesis. To validate this framework, a multiple case study approach was the chosen research strategy for this qualitative study. Three methods were used to collect the data: documented secondary data, website content and semi-structured in-depth interviews with directors of entrepreneurship/enterprise centres and deans. Twenty-five interviews were conducted and each lasted between 41-109 minutes. Data obtained through the interviews was analysed by using the Template Analysis (TA) technique; the data gained from the universities' documents and web pages was analysed by employing the Framework Analysis technique.

The findings show that when seeking to recognise entrepreneurial opportunities and the factors that determine the opportunity recognition process, it is vital to consider the context in which opportunities are being recognised. The findings also show the importance of an optimal mix of resources and capabilities to ensure effectiveness in recognizing entrepreneurial opportunities.

This research contributes to the debate by adding clarity to the concept of entrepreneurial opportunity recognition and then expanding it to cover the university context. It has also contributed to filling the gap relating to the criteria that can be used to decide whether or not a university is entrepreneurial. The results from this thesis will help senior staff at UK universities to gain a better understanding of the mechanism for the recognition of entrepreneurial opportunities, as well as the 'enablers' that make universities more entrepreneurial. The results could also interest the NCEE, by reflecting upon the criteria used to choose the Entrepreneurial University of the Year.

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Dedication

I dedicate this thesis to my family for their love and support.

List of Abbreviations

ACEEU: Accreditation Council for Entrepreneurial and Engaged Universities

EntUni: Entrepreneurial University

EULP: Entrepreneurial University Leaders Programme

HEFCE: Higher Education Funding Council for England

HESA: Higher Education Statistics Agency

IPA: Interpretive Phenomenological Analysis

KTPs: Knowledge Transfer Partnerships

NCEE: National Centre for Entrepreneurship in Education

OpRec: Opportunity Recognition

RBT: Resource Based Theory

TA: Template Analysis

THE: Times Higher Education

UUK: Universities UK

VRIO: Valuable, Rare, Imperfectly Imitable and Organization

List of Publications

Aldawod, A. & Day, J. (2017). Entrepreneurial Environmental Challenges to Be Addressed on the Journey to Becoming an 'Entrepreneurial University': A Case Study of the University of Duhok, Kurdistan. In *The 7th Global Innovation and Knowledge Academy (GIKA), Lisbon*.

Aldawod, A. & Day, J. (2017). Opportunity Recognition Mix – The 4Cs. In *BAM Conference, Coventry*.

Aldawod, A. & Day, J. (2017). A Critical Reflection upon the Postmodernist Philosophical Positions and Issues Relevant to Entrepreneurship Research. In *BAM Conference, Coventry*.

Aldawod, A. & Day, J. (2018). Criteria for Entrepreneurial Universities: Evidence from the UK Universities. In *11th Annual Conference of the EuroMed Academy of Business, Valletta*.

Aldawod, A. & Day, J. (2018-forthcoming). A Framework for Understanding Opportunity Recognition Process in the UK Entrepreneurial Universities. In *ISBE Conference, Birmingham*.

Chapter One: Introduction

UK universities operate in an ever-changing environment, which is both continuous and rapid. This has increased the levels of uncertainty, and so universities are facing 'troubled times', especially with regards to discharging their responsibilities towards their stakeholders' needs and expectations alongside the changed business model they now must operate under. Furthermore, they are expected, perhaps demanded, not only to behave in an entrepreneurial manner, but also to signal such behaviour to both their immediate stakeholders and the wider community. What makes this even more complicated is the fact that a consensus on a single definition of entrepreneurship is difficult to establish. Therefore, it can be argued that it is logical that entrepreneurial endeavours are 'not an absolute but a continuum' of behaviour ranging from Schumpeterian waves of 'creative destruction' (Schumpeter, 1943) to Kirznerian market adjustment (Kirzner, 1973).

Formerly, entrepreneurship in universities was substantially linked to joint ventures with businesses, commercialisation of inventions, and the establishment of incubators. Now, there is also an internal focus on encouraging and enabling staff and students to be more entrepreneurial. In addition, there is an increasing need for senior staff to behave entrepreneurially, both in strategy formulation and implementation.

There are a number of questions that can be asked when considering the topic at hand; for instance, what is an entrepreneurial university (EntUni)? Why do universities need to be entrepreneurial? How can they shift towards the EntUni mode? How do entrepreneurial universities conduct their activities? The present research addresses one of the aspects of the latter question, which is known as opportunity recognition (OpRec). Hence, the main research question of this thesis is: *How are entrepreneurial opportunities recognized in entrepreneurial universities?*

To pave the way to answer this question, this chapter provides an overview of the context, aims and objectives of the present research, along with the research gaps that will be addressed. Then potential contributions are discussed. Finally, this chapter provides an outline of the structure of this thesis.

1.1 Entrepreneurial University Context

1.1.1 Overview on the UK universities

Before discussing what attention has been paid to the EntUni phenomena in the UK context, some facts about UK universities will be presented. This is essential to support the present research, because it will contribute to our understanding of the so called "third mission" of universities, which will be discussed in detail in the Literature Review chapter. Also, understanding the different roles played by universities bolsters the importance of the present

research context, which is considered by this thesis as one of the more interesting and worthwhile contexts for entrepreneurship research.

UK universities have a strong international reputation in education and research. Therefore, there is a growing demand for the services of these universities. Not only this, but satisfaction with these services is high. For instance, the 2018 National Student Survey (NSS) showed that overall student satisfaction at UK universities was 83% (THE, 2018). This can explain the growing demand for studying in UK universities by both native and international students. With regards to the latter, HESA (2016) shows that the number of international students who are wholly studying overseas for a UK qualification in 2014/15 reached 663,915 (as shown in Figure 1.1). By comparing the number of those students in the years 2013/14 and 2014/15, it can be seen that there was a 4% increase (636,675 in 2013/14). By considering the other years, for example, 2012/13 and 2011/12, it can be observed that this population was lower, 598,925 in 2012/13 and 571,010 in 2011/12. This demonstrates the constantly growing demand for studying in UK universities (HESA, 2013, 2014).

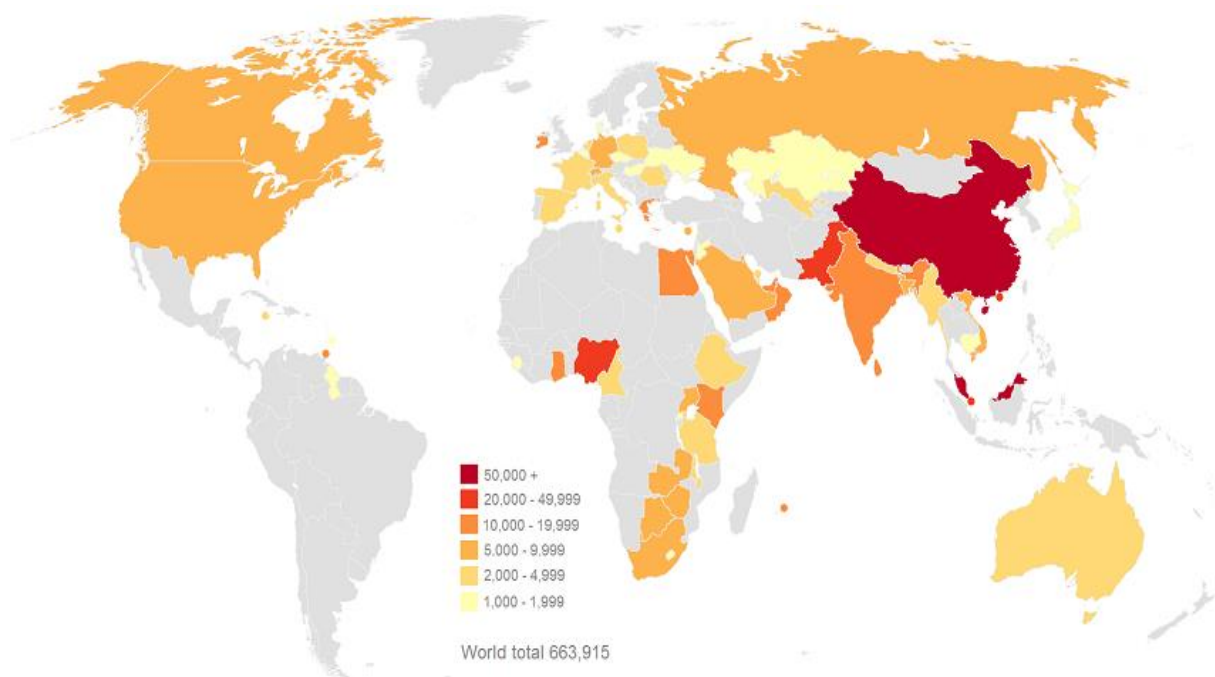


Figure 1.1 Transnational students studying wholly overseas for a UK qualification in 2014/15
Source: HESA (2016).

As for research, UK universities carry out life-changing research that shapes the world and improves lives (UUK, 2018a). UK research is actually recognized as being the most productive and cost-effective in the world, with more than three-quarters of its output rated “world leading” or “internationally excellent” (HEFCE, 2014). In addition, “*research at UK universities underpins innovation, which in turn contributes to economic growth*” (UUK, 2018a, p. 3).

With respect to the latter, UK universities are considered a vital part of the UK economy; they also have a positive social impact on their communities. Such a socio-economic impact is the

result of promoting collaborations with industry and government, and supporting innovation and entrepreneurial activities (UUK, 2018b). Below are seven facts that support the above arguments:

- (1) UK universities create over 20,000 jobs every year (UUK, 2016).
- (2) They generate around £100 billion every year in output for the UK economy (UUK, 2018b).
- (3) They contribute no less than £59 billion to the UK economy and generate nearly 3% of UK GDP (UUK, 2016).
- (4) Nearly £370 million is generated from graduate start-ups (University Alliance, 2016). Over eleven new graduate start-ups are created every day (UUK, 2016). For instance, UK Higher education institutions produced more than 4,000 of such start-ups in 2017 (HESA, 2018b).
- (5) The UK HE sector's total income reached £35.7 billion in 2017. £17.7 billion was from the tuition fees (HESA, 2018a).
- (6) In 2015, international students were responsible for £10.8 billion of UK export revenue, which includes both off-campus and university expenditure. This has supported over 206,000 jobs all over the UK (UUK, 2015).
- (7) The estimated return on investment of the Higher Education Innovation Funding from £1 is £9.70 in benefits for society and the economy (HEFCE, 2015).

All the discussions presented in this section show that Higher Education is one of the most important sectors in the UK. Therefore, it is very possible for the research conducted in this sector to gain great attention and value. The present research examines one of the phenomena that has recently attracted the attention of entrepreneurship researchers, namely entrepreneurial universities.

1.1.2 Entrepreneurial university phenomenon in the UK context

EntUni is one of phenomena that appeared for the first time in the developed countries context. Specifically, the roots of this phenomenon go back to the 'academic entrepreneurial transition' that occurred at MIT; this experience was then transferred to Stanford University (Etzkowitz, 2014). Later, the EntUni phenomenon has gathered great interest in the UK context. Therefore, UK universities have made considerable effort to embed entrepreneurship and enterprising behaviour within their curriculum, as well as through a broad selection of empirical activities (Culkin, 2016).

One articulation of appropriate entrepreneurial behaviour and values in the UK can be seen in the NCEE sponsored Times Higher Education (THE) Entrepreneurial University of the Year

Award¹. NCEE, which is the 'trading name' for the National Council for Graduate Entrepreneurship (NCGE), aims at supporting *"organisations to develop their entrepreneurial capacity – providing a range of services to universities, and their senior leadership and practitioners – to ensure UK higher education remains at the forefront of enterprise and entrepreneurship"* (NCEE, 2018a).

In addition to the above-mentioned award, NCEE contributes to the spread of entrepreneurship in UK universities by delivering the Leading Change Programme², which is a development programme provided for university leaders with senior positions to introduce them to the EntUni concept and to encourage them to think and behave entrepreneurially. It *"offers entrepreneurial leaders the opportunity to interact with influential policy makers, leading vice-chancellors and experts in the field of university education. This gives them valuable insight and strategies on how to positively respond to change"* (NCEE, 2018b).

1.1.2.1 Times Higher Education Entrepreneurial University of the Year Award

This award is provided by THE to those universities that *"have embedded entrepreneurial activity into the fabric of their institution to the extent that their environment and culture not only fosters enterprising thinking among all members of its community but also delivers significant entrepreneurial impact at regional, national and international levels"* (NCEE, 2017a). THE awards often self-refer as the "Oscars of higher education sector" awards (Times Higher Education Awards, 2017).

The judging criteria obviously include more than just technology transfer and development; there are four top-level criteria: culture and mindset, vision and strategy, entrepreneurial impact and policy and practice³ (NCEE, 2016). Based on these criteria, ten universities in the UK have been awarded the EntUni of the Year Award.

Table 1.1 The winners of the THE EntUni of the Year Award (2008/09-2017/18)

Year	The University
2008/09	The University of Nottingham
2009/10	Queen's University Belfast
2010/11	University of Hertfordshire
2011/12	Coventry University
2012/13	University of Huddersfield
2013/14	University of Strathclyde
2014/15	Anglia Ruskin University
2015/16	University of Leeds
2016/17	London South Bank University
2017/18	Liverpool John Moores University

Source: Author

Tables 1.2 and 1.3 provide more detail about the winners of the THE EntUni of the Year Award from 2008/09 to 2017/18.


¹ This title has been used for this award from 2008-2017; however, it is now called Times Higher Education, Outstanding Entrepreneurial University Award. The author uses the old title because it was the one used when the data was collected for the present thesis.

² This programme used to be called Entrepreneurial University Leaders Programme (EULP) till 2017.

³ More detail about these criteria will be provided in the Literature Review chapter.

Table 1.2 The winners and short-listed universities of the THE EntUni of the Year Award (2008/09-2017/18)

The university	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	Number of nominations
Coventry University	✓	✓		✓					✓		4
Queen's University Belfast	✓	✓									2
University of Leeds	✓							✓			2
The University of Nottingham	✓							✓			2
University of Oxford	✓										1
University of Salford	✓									✓	2
University of Hertfordshire		✓	✓								2
University of Portsmouth		✓									1
University of Surrey		✓				✓					2
University of Strathclyde		✓			✓	✓					3
Brunel University			✓								1
University of Central Lancashire			✓	✓			✓	✓	✓		5
Imperial College London			✓				✓				2
University of Plymouth			✓	✓	✓						3
Teesside University			✓			✓	✓				3
The University of Edinburgh				✓	✓						2
The University of Northampton				✓	✓						2
The University of York				✓							1
The University of East Anglia					✓						1
The University of Huddersfield					✓						1
University of Chester						✓	✓				2
University of Lincoln						✓		✓	✓		3
University of Sheffield						✓					1
Kingston University							✓				1
Anglia Ruskin University							✓				1
Loughborough University								✓			1
Northumbria University								✓			1
Aston University									✓		1
London South Bank University									✓		1
Manchester Metropolitan University									✓		1
City, University of London										✓	1
Liverpool John Moores University										✓	1
Falmouth University										✓	1
Pearson College London										✓	1
Southampton Solent University										✓	1

 The winners of the THE EntUni of the Year Award

Source: Author

Table 1.3 The key reasons for winning the THE EntUni of the Year Award (2008/09-2017/18)

The university	Year	Key reasons for winning the THE EntUni of the Year Award
The University of Nottingham	2008/09	<ul style="list-style-type: none"> - The University has committed to support the enterprising and internationally-oriented graduates of British universities. - Its culture has paid an evident attention to entrepreneurialism. This led to the spread of entrepreneurial culture at various levels of the university, from senior level to student societies. - It had a great strength regarding academic enterprise. For example, it won 28 awards of spin-out companies; it has collaborated with global brands, such as, Rolls Royce, AstraZeneca and Ford; it also has added an Innovation Park to its Jubilee Campus. - Nottingham University Business School was one of the 'pioneer' schools regarding embedding entrepreneurship education within many modules at first year undergraduate level as well as developing a Masters Programmes in Entrepreneurship. - Nottingham University students have been announced as national winners of Enacts⁴ four times (2005, 2006, 2007 and 2008). (The University of Nottingham, 2008)
Queen's University Belfast	2009/10	<ul style="list-style-type: none"> - Entrepreneurship skills have been embedded into 90% of the curriculum of all students throughout the university. - Around 15,000 students a year have been accepted in this university. - The university has been described as a real example that fulfils the requirements, the four criteria identified by NCEE, of being an EntUni. (Dhugga, Gibson, Culkin, Williamson, & Smith, 2012) - It has demonstrated an evident impact on businesses and the local community (Queen's University Belfast, 2010; Dhugga et al., 2012). - It has created a massive engagement with students (Queen's University Belfast, 2010).
University of Hertfordshire	2010/11	<ul style="list-style-type: none"> - The university have paid considerable attention to provide innovative and entrepreneurial approaches by its members, students, graduates and stakeholders. This results in delivering noticeable economic and social impact. - Its culture has promoted clearly an entrepreneurial spirit to the point of seeking significantly to be a leading EntUni. (Dhugga et al., 2012) - It has sought to explore and develop entrepreneurial activities within the areas of its work. - It has invested more than £10 million in creating BioPark, one of the biggest bioscience research and development centre in the UK. - Enterprising and entrepreneurship has boosted researching and teaching throughout all faculties and schools of this university. - It has encouraged and supported its staff to have their own business. - More than 250,000 SMEs have been engaged with this university. - Nearly 10,000 new ventures have been created by this university. - 45 organizations in Third Sector have been provided business, research and consultancy support by a Social Enterprise Unit in this university. (Willettts & Robertson, 2013)
Coventry University	2011/12	<ul style="list-style-type: none"> - An entrepreneurial culture has permeated all levels of the university. - The university has supported the entrepreneurial spirit and business engagement. - It has offered enterprise and entrepreneurship bachelor's degree, Master of Global Entrepreneurship and Master of Enterprise Education. - It has led the Innovation University Enterprise Network (i-UEN). - It has encouraged staff to pay attention to Applied Research. - Its culture has promoted empowerment and accountability. (Dhugga et al., 2012)

⁴ Before 2012, Enactus was known as Students In Free Enterprise (SIFE) (Enactus, 2012).

The university	Year	Key reasons for winning the THE EntUni of the Year Award
Coventry University (continue)	2011/12	<ul style="list-style-type: none"> - It has considered as a home for entrepreneurship by Higher education-business and community interaction survey (HE-BCI). - According to HE-BCI survey, Coventry University was the top one for the number of consultancy contacts completed on behalf of SMEs and in top five for the number of consultancy contracts with large companies. - It has established a Student Entrepreneurial Fund, which has provided £125,000 for its students to pitch for their enterprising ideas. - It has annually awarded its staff for their entrepreneurship activities. - It has encouraged its staff to participate in ELUP. - It has been become well-known for its enterprising and innovation. <p>(Willettts & Frost, 2013)</p>
University of Huddersfield	2012/13	<ul style="list-style-type: none"> - The university has paid great attention to enterprise. Therefore, it has provided a supportive infrastructure for enterprising with designations of a Pro-Vice Chancellor for Research and Enterprise, a Director of Research and Enterprise and a Head of Enterprise. - It has integrated enterprise into its institutional strategies in order to prepare enterprising and employable graduates and also to have a social and economic impact. - It has formed a strategic partnership with 3M, Siemens and the Princes Trust. - It has established the 3M Buckley Innovation Centre (3MBIC) for open innovation and The Engineering and Physical Sciences Research Council (EPSRC) centre for Advanced Manufacturing in Advanced Metrology - It has been highly ranked for employability, start-ups support and students' placements in industry. - It has presented Vice-Chancellor's Enterprise Awards and a Students' Union award for enterprising students. - It has offered an Enterprise Development bachelor's degree as well as Post-Graduate degrees relating to enterprise. - It has benefited from entrepreneurial Visiting Professors in Social Enterprise, Entrepreneurship and Collaboration. - It led the National Enterprise Educator Awards (NEEA) in 2011. - It has benefited the local economy substantially. <p>(Dhugga et al., 2012; Willettts & Frost, 2013)</p>
University of Strathclyde	2013/14	<ul style="list-style-type: none"> - The university has been descried as an impressive institution by NCEE as it has emphasized behaviours such as "Encouraging innovation in all that we do", "Challenging traditional boundaries" and "Questioning their own approaches". - It has paid great attention to develop a climate that supports 'entrepreneurial thinking' and 'entrepreneurial impact'. <p>(NCEE, 2014a)</p> <ul style="list-style-type: none"> - Its essential mission is being 'a place of useful learning' (NCEE, 2014a; University of Strathclyde, 2013). - It is one of biggest employers in Glasgow. - It has been known as "a leading international technological university". <p>(University of Strathclyde, 2013)</p>
Anglia Ruskin University	2014/15	<ul style="list-style-type: none"> - The university has delivered value for its students and stakeholders by adopting a corporate strategy that fosters the entrepreneurial culture. - The behaviours of its students and staff are influenced by enterprise and entrepreneurship notions, which are obviously embedded with all activities of this university. - It has produced both entrepreneurial graduates and graduate entrepreneurs. - Its 'Centre for Enterprise Development and Research' has known for best engagement between academics, entrepreneurs and business owners. <p>(NCEE, 2014b)</p> <ul style="list-style-type: none"> - Its post graduate medical centre has reflected a strategic entrepreneurship approach in the areas of health and social care. <p>(Anglia Ruskin University, 2014; NCEE, 2014b)</p> <ul style="list-style-type: none"> - Its subsidiary, Ixion, has supported 5000 start-ups (Anglia Ruskin University, 2014).

The university	Year	Key reasons for winning the THE EntUni of the Year Award
University of Leeds	2015/16	<ul style="list-style-type: none"> - Enterprise has been considered as one of its four major strategy pillars as well as one of the five Student Union values. - In 2013-2014: <ul style="list-style-type: none"> • It earned around £5.3 million from its intellectual property and was granted 374 patents. • £43.2 million in investments were attracted by its spin-outs. • Its "Goldman Sachs 10,000 Small Businesses Growth Programme" contributed to establishing 275 ventures. (THE, 2015) • Over 900 of its students undertook enterprise elective modules; around 50% of them were not Business School students. • It obtained £40 million for its "University Innovation and Enterprise Centre". (NCEE, 2016; THE, 2015) - In 2014, it was awarded a 'Gold Standard' by the Small Business Charter (SBC) for its local and regional impact (NCEE, 2016).
London South Bank University	2016/17	<ul style="list-style-type: none"> - Enterprise and entrepreneurialism have been placed at the heart of their strategic vision which permeates all levels of the university. - The above vision has been translated into actions that have impact on their internal activities as well as their external networks locally, nationally and internationally. - Enterprise has been embedded into staff values. - More than 10,000 students and staff have engaged in entrepreneurial activities. - This university has more than 1,000 employer partners; this helps in sponsoring one in five students by those employers. - 600 local SMEs were supported by this university in 2014-15. - 193 SMEs obtained consultancy services from academic experts of this university. - The university has been engaged in a wide range of entrepreneurial activities. - Clarence Centre for Enterprise and Innovation and its SMEs tenants, which are based on campus, generated around £37 million for local region in 2014-15, raised to £54 million in 2015-16. - It has a vital entrepreneurial role in its community. - The university is driving business engagement through research projects collaborations with industry. - The university is supporting the SMEs which contribute to solving real world issues. (NCEE, 2016)
Liverpool John Moores University	2017/18	<ul style="list-style-type: none"> - It is recognized for providing its students with the skills and qualities required for establishing and growing businesses. - Establishing the 'Entrepreneurship Educators Academe' unit which has contributed remarkably to make the university more entrepreneurial through the following: <ul style="list-style-type: none"> • It facilitates creating curricula that are clearly connected to entrepreneurialism. Therefore, "<i>entrepreneurship is now embedded in the pathway of more than 10,000 students in 100 degree programmes</i>". • It has contributed to establish many and varied partnerships and collaborations with businesses and other organizations. • It has helped in, through 'train the trainers' programme, coaching more than 600 staff in 'entrepreneurship mentor junior colleagues'. This, in turn, contributed to "<i>create a peer support community that has significantly increased the number of university educators actively using an enterprise education pedagogical approach</i>". • It has linked around 17,000 students with 1,800 with different types of organizations. - It has supported, through 'Bathgate Start-up Fund' initiative, 23 student new ventures. (Liverpool John Moores University, 2017; NCEE, 2017b)

Source: Author

Table 1.2 shows that although the winners of the THE EntUni of the Year Award have fulfilled the requirements (the four criteria) identified by the NCEE, each one of them have accomplished this in slightly different way, for instance, by paying a little more attention to one requirement (criterion) than another. Also, there is a degree of overlap between the activities that have helped these universities to gain the above-mentioned award; in fact, one of these activities could lead to another.

Table 1.2 also shows that there is an interest in entrepreneurial opportunities by the universities under consideration. Here, it can be claimed that part of the reason that led these universities to become more entrepreneurial is their ability to recognize and exploit entrepreneurial opportunities. Examples of the these include, but are not limited to, being proactive in embedding entrepreneurship modules in their curricula (The University of Nottingham), encouraging and supporting new ventures and SMEs (University of Hertfordshire, University of Leeds, Anglia Ruskin University and Coventry University); being creative (University of Strathclyde), seeking patents and spin-outs (University of Leeds), and collaborating with multinational and well-known companies (University of Huddersfield). Thus, another claim can be made here that entrepreneurial universities are one of the most effective environments for recognizing entrepreneurial opportunities.

All the activities conducted by the universities included in Table 1.2 (and other entrepreneurial universities in the UK) contribute to socio-economic development in the UK. Along this line, Guerrero, Cunningham, and Urbano (2015) find, by drawing on the 'endogenous growth perspective', that the activities (education, research and entrepreneurship) of the UK entrepreneurial universities (Russell Group⁵ and non- Russell Group universities) have a significant positive impact on the economy. The greatest economic impact of the Russell Group universities comes from their spin-offs. On the other hand, the greatest economic impact of the remainder of UK universities is related to their knowledge transfer.

Another contribution to the economy, according to table 1.2, comes from supporting SMEs. In this regard, Culkin (2016) makes, through analysis of the effective role played by eight of the winners of THE EntUni of the Year Award, four observations relating to what is required from anchor institutions⁶, including universities, and policy makers for supporting micro and small business: (1) intensifying efforts to expand university-business collaborations; (2) facilitating university-industry-government relations; (3) promoting strategic entrepreneurial mind-set among small business; and (4) endorsing the idea that universities are the 'thought leaders' in shaping the UK labour market differently.

⁵ The Russell Group universities are known as "elite". This group includes 24 universities, who "carry out some of the most highly rated research in the world and have a reputation for academic excellence" (The Guardian, 2012).

⁶ Anchor institutions are the "organisations that have an important presence in the local community and make some strategic contribution to the local economy" (Culkin, 2016, p. 4).

1.2 Research Gaps

Despite the wide range of research in entrepreneurship literature on OpRec and EntUni, there are still some gaps that need to be addressed. The most significant gap is that there have been insufficient studies that highlight how entrepreneurial opportunities can be recognized in the entrepreneurial universities context; the existing studies do not explain this process well (the entrepreneurial OpRec process in entrepreneurial universities). With respect to each separate phenomenon, there are still gaps that need to be considered. The common gap between these two phenomena is that they are seen as areas in which diverse and rival views exist. Therefore, it is important to add greater clarity to the concept of both phenomena, especially given that the literature shows that there is no a single definition of either OpRec (Glavas, Mathews, & Bianchi, 2017; Siegel & Renko, 2012) or EntUni (Jaminki, 2017; Kirby, Guerrero, & Urbano, 2011).

The literature also shows that there are a considerable number of factors that determine the OpRec process. Therefore, it has been challenging to develop a model that covers a reasonable number of these factors. Also, the large number of factors offered can be one of the main reasons for inconsistent and rival views on the OpRec phenomenon. Such a gap can be a catalyst to think of a different way to develop the models that address issues relating to the OpRec process, and then find a connection between the factors that seem to be unrelated. This can be done through underpinning research with a flexible theory that can provide such a connection.

On the other hand, the EntUni literature lacks an explicit framework that addresses the criteria that can be used to decide whether a university is entrepreneurial (Mavi, 2014). Yet, NCEE and the University Industry Innovation Network (UIIN) consider these criteria; each one of them have developed their own framework for the above-mentioned criteria. These two frameworks have not been extensively tested through academic research, rather they have been used in practice to judge whether universities are entrepreneurial. Therefore, using these frameworks in academic research can add to the extant body of knowledge.

To contribute towards bridging all the above-mentioned gaps, the present research adopts the Resource Based Theory (RBT) to investigate entrepreneurial OpRec in five UK entrepreneurial universities.

1.3 Research Aims and Objectives

The overall aim of the present research is to explore how entrepreneurial opportunities are recognized in the UK entrepreneurial universities context. To achieve this aim, the following three objectives are considered:

- (1) To develop a conceptual framework that helps in understanding how entrepreneurial opportunities can be recognized in the entrepreneurial universities context.

- (2) To explore how UK entrepreneurial universities define both entrepreneurial OpRec and EntUni.
- (3) To produce an empirical model for entrepreneurial OpRec in the context of entrepreneurial universities.

1.4 Significance of the Research

Since a full picture of the OpRec process in the entrepreneurial universities context is not yet complete, conducting the present research is significant. This is because it is one of few studies that investigates the OpRec phenomena in the entrepreneurial university context. Thus, several contributions are expected from this thesis. These contributions, which can reflect the significance of the present research, are distributed over three groups: theoretical, methodological and practical contributions.

1.4.1 The expected contribution to theory

Six theoretical contributions are expected from conducting the present research, which can be summarised as follows:

- (1) To add greater clarity to the concept of EntUni by producing a new definition of this concept and matching it with the existing definitions.
- (2) To develop a more rigorous framework for the criteria that can be used to decide whether a university is entrepreneurial.
- (3) To produce a new definition for entrepreneurial OpRec that is appropriate for the context of entrepreneurial universities, in addition to clarifying the entrepreneurial OpRec phenomenon by comparing the definition produced with those available currently in the literature.
- (4) To add greater clarity to the six most discussed factors, which determine the OpRec process in the entrepreneurship literature.
- (5) Extending RBT to consider the link between the OpRec process and the EntUni context.
- (6) Developing an empirical model that can be used by the universities that believe in entrepreneurialism, with a view to recognize entrepreneurial opportunities.

1.4.2 The expected contribution to methodology

The main expected contribution to the methodology body of knowledge is to make the use of Template Analysis (TA) technique in multiple case study research clearer through making some necessary amendments to the procedural steps followed by this technique, with a view for it to become appropriate for this type of research. This is significant because the above-

mentioned technique has not yet been used for analysing data collected for conducting multiple case study research.

1.4.3 The expected contribution to practice

The expected practical contributions of the present research can be summarised as follows:

- (1) To provide a clearer picture for senior staff at the UK entrepreneurial universities regarding using their capabilities and resources available in their universities to recognize entrepreneurial opportunities.
- (2) To help the above-mentioned staff maintain their entrepreneurial status by considering the outcome of the present research regarding the criteria used to judge whether universities are entrepreneurial.
- (3) To help the senior staff of non-entrepreneurial universities to understand what is required to move towards the entrepreneurial university mode.
- (4) To help the NCEE update the criteria they use to choose the winner of the THE EntUni of the Year Award.

1.5 Outline of the Thesis

The present research comprises of seven chapters (as shown in Figure 1.2). This chapter introduces this thesis by providing a brief overview of the research context, gaps, aims, objectives and contributions as well as the outline of this thesis structure.

Chapter Two considers the theoretical foundations of this research, as well as the literature relating to the main phenomena addressed by the present thesis. This requires presenting the arguments relating to the OpRec and EntUni phenomena, as well as the RBT. Doing so results in producing the conceptual framework for the present research.

Chapter Three highlights the methodology followed to conduct this research, as well as the criteria used to assess the quality of its outcomes. Therefore, this chapter is divided into three parts. The first part addresses the methodological considerations, the second part considers the methods used to collect and analyse the data of this research, and the third part involves judging the criteria of the research quality.

Chapter Four presents the five case studies. Each case provides details about the entrepreneurial OpRec concept, factors that determine OpRec process, the EntUni concept, EntUni factors and resources characteristics.

Chapter Five compares the five case studies with each other, in order to provide deeper interpretations and capture in-depth findings. In this chapter, the assumptions of RBT and the RBT-VRIO framework are considered to ensure the effective presentation of these findings.

Chapter Six discusses the major findings from the multiple case studies within the context of the OpRec and EntUni literature to discover the similarities and differences between them. Doing so helps with deciding the final version of the empirical model produced by the present research for the entrepreneurial OpRec process in the context of entrepreneurial universities.

Chapter Seven concludes the present thesis by revisiting the research objectives, highlighting the key contributions, discussing the study's main limitations, and identifying some directions for future research.

Chapter One: Introduction (Paving the way to conduct the present research)		Introduction
Chapter Two: Theoretical Foundations and Literature Review (Presenting the arguments relating to the OpRec and EntUni phenomena as well as the RBT)		Theoretical background
Chapter Three: Methodology (Discussing the methodology followed to conduct the present research as well as assessing the quality of its outcomes)		Empirical part
Chapter Four: Multiple Case Studies (Case-by-Case Analysis) (Presenting the five case studies)	Chapter Five: Findings from Cross-Case Analysis (Providing deep interpretations and capture in-depth findings)	
Chapter Six: Discussion and the Developed Empirical Model (Discussing the major findings from the multiple case studies and presenting the empirical model)	Chapter Five: Conclusion (Critically reflecting on the previous six chapters of the present research)	Conclusions

Figure 1.2 Thesis outline

Source: Author

Chapter Two: Theoretical Foundations and Literature Review

As discussed in the previous chapter, the conceptual framework of the thesis is based on a combination of the entrepreneurial opportunity recognition (OpRec) phenomenon, Resource-Based Theory (RBT) and the context in which the research is conducted - namely entrepreneurial universities. This chapter presents the arguments relating to RBT, OpRec, and entrepreneurial universities, and consists of nine sections, starting with a brief overview of the entrepreneurship concept. The aim of such an overview is to show which view on entrepreneurship will be adopted within this thesis. Next, it explains the theory that underpins this research, which is RBT. This includes the reasons behind selecting this theory, its role in the entrepreneurship field, and how both resources and capabilities are considered in this theory. The third section of this chapter deals with the arguments relating to entrepreneurial opportunities, provides OpRec definitions, characteristics, and describes its role in the entrepreneurial process. The fourth section presents the debates on the creation and discovery views concerning OpRec. Then, the factors that determine the OpRec process are discussed. The sixth section evaluates the models of OpRec that are available in the literature. The seventh section addresses the arguments relating to entrepreneurial challenges facing universities, concept and characteristics of entrepreneurial universities, along with the criteria used to decide whether a university is entrepreneurial. Then, in section eight, the relationship between OpRec and EntUni is discussed. The chapter ends with developing a conceptual framework for the present research.

2.1 The Concept of Entrepreneurship

Before discussing the concept of OpRec, the entrepreneurship concept will be considered briefly. This is because OpRec is an integral part of entrepreneurship, which is considered a multidisciplinary field of research (Costa, 2015; Hills, 2003). It is a phenomenon that takes place in different contexts and environments, and its process could take various forms (Churchill & Muzyka, 1994). Gartner (1994) argued that entrepreneurship is multifaceted, large in scope, and equivocal, and it is thus difficult to identify and examine entrepreneurial activity and entrepreneurs, and difficult to establish a consensus on a single definition of this phenomenon (Gartner, 1994; Hatt, 2018). However, Day, Reynolds, and Lancaster (2006) argue that having no consensus on a particular definition for entrepreneurship is not the problem, providing there is transparency in terms of the complementary and competing views claiming to consider the core actors and process of entrepreneurship. Gartner (1994) made the plea that entrepreneurship scholars should simplify their views of entrepreneurship, make it smaller, and specify features of the events and find suitable interpretations of the consequences of these events. Obviously there is a real need for finding a suitable 'heuristic'

for entrepreneurship *"that is neither too simplistic, restricting and unrealistic, nor so wide that it fails to provide focus"* (Day, 2015, p. 36).

Despite a lack of consensus on a particular definition for entrepreneurship, Churchill and Muzyka (1994) claim that there is an implicit consensus in that entrepreneurs seek to identify opportunities that can be converted into 'economic value'. This is in line with the early views of both Shane and Venkataraman (2000) and later Chen and Yang (2009), who put forward the notion that the field of entrepreneurship examines the sources of opportunities, the OpRec and exploitation process, and those individuals who recognize and exploit these opportunities. Along similar lines, Suddaby, Bruton, and Si (2015) claim that the entrepreneurship field is dominated by the idea that entrepreneurs seek to discover opportunities.

In this connection, Churchill and Muzyka (1994) argued that there are five factors that can be considered the most justifiable factors for entrepreneurship to emerge. These factors are: an action, creation of an organization, innovation and opportunity, an individual and risk. After taking the above-mentioned factors into consideration, Churchill and Muzyka (1994, p. 16) define entrepreneurship as *"a process that takes place in different environments and settings that causes changes in the economic system through innovations brought about by individuals who generate or respond to economic opportunities that create value for both these individuals and society"*. One important point worth mentioning regarding the above-mentioned factors is that entrepreneurship can involve, but is not necessarily limited to, the establishment of new organizations. In fact, it can take place within existing organizations; equally, the opportunities recognized can be sold to other organizations or individuals (Shane & Venkataraman, 2000).

Within the universities context, Gibb (2012, p. 17) distinguishes between entrepreneurship and enterprise, but at the same time, he shows that they are complementary to each other. With respect to the enterprise, it *"focuses upon the development of the 'enterprising person and entrepreneurial mindset'. The former constitutes a set of personal skills, attributes, behavioural and motivational capacities⁷ (associated with those of the entrepreneur) but which can be used in any context (social, work, leisure etc.). The latter focuses upon creating empathy with the life-world of the entrepreneur and entrepreneurial ways of doing, thinking, feeling, communicating, organising and learning"*. While, entrepreneurship *"focuses upon the application of these enterprising skills etc. to the setting up a new venture, developing/growing an existing venture and designing an entrepreneurial organisation (one in which the capacity for effective use of enterprising skills will be enhanced)"*.

⁷ Example of these are; networking, risk-taking, self-efficacy, opportunity recognition, the idea of 'being your own boss', strategic thinking, creativity (Gibb, 2012).

2.2 Theoretical Underpinning

Theory is considered the most important basis for research. This is because most academic research is generated from a theoretical framework, and at the same time, academic research makes a significance contribution to the body of theory in its field (Quinlan, Babin, Carr, Griffin, & Zikmund, 2015). In this respect, Amolo and Migiro (2014) believe that theories help in comprehending the concepts and shaping judgements regarding the results gained by a research. Therefore, this section will deal with the theory that underpins the present thesis.

2.2.1 The selection of the Resource-Based Theory (RBT)

Understanding 'opportunity' including OpRec, has often been explained through an economic perspective. However, a consideration of the cognitive perspective may increase our understanding of OpRec (Baron, 2004a). A decade later, Wang, Ellinger, and Jim Wu (2013) argued that whilst it is valuable to explain the nature of OpRec from an economic viewpoint (given that the OpRec phenomenon is rooted in an entrepreneurship literature dominated by economic theory) this, in itself, is insufficient to explain this phenomenon. Therefore, researchers have transferred their concentration, *inter alia*, to two other social science fields: sociology and psychology, thus allowing the consideration of both personal cognitive paradigms and social context.

A significant number of theories for conducting research related to the opportunity phenomenon can be found in the extant literature, for example: discovery theory, creation theory structuration theory, organizational learning, coherence theory and social cognitive theory (Short, Ketchen, Shook, & Ireland, 2010). In respect of OpRec, Felin and Zenger (2009) claim that much of that research is underpinned by the 'information processing theory' and the learning experiential models of Kolb (1984).

Whilst the author of this thesis concurs with Short et al. (2010), that the existence of different definitions for opportunity in the entrepreneurship literature can assist in creating more new theories, this present thesis uses the RBT lens. RBT looks to a firm as comprising of a historically specified heterogeneous assortment of resources/assets attached to the management of that firm (Vohora, Wright, & Lockett, 2004). The author will show that although RBT is rooted in firms, it is applicable to universities who may have more of a social agenda, despite their contemporary behaviours resembling private companies. More specifically the reasons for using RBT lens are as follows:

1. The role of RBT in understanding entrepreneurship: RBT can be seen implicitly and explicitly in the literature as one of the theories that has contributed to the development of entrepreneurship. Taxonomies to classify theory and practice abound in the literature, but, for example, Amolo and Migiro (2014) convincingly set RBT as one of a seven discernible broad theory clusters attempting to explain the development of the 'entrepreneurship

phenomenon'. The other six are Classical and neo-classical economics theories: The Austrian market process theory, Psychological entrepreneurship theories (locus of control, personality traits theory and need for achievement), Sociological entrepreneurship theory, Anthropological entrepreneurship theory, and Opportunity-based entrepreneurship theory.

2. Individual-specific resources: Alvarez and Barney (2007) argue that entrepreneurial OpRec can be facilitated by possessing 'individual-specific resources'. An analysis of the assumptions related to the above argument helps the researcher develop the main assumption of the framework developed by the present thesis. This assumption indicates that recognizing entrepreneurial opportunities requires finding an optimal resources/capabilities mix. Such a mix needs to be dynamic and evolving (Ramachandran & Ray, 2006) and difficult to be imitated (Morgan, Vorhies, & Schlegelmilch, 2006).

3. Resource heterogeneity: the heterogeneousness of resources is one of the fundamental conditions for RBT. However, alone it is insufficient for gaining sustained competitive advantage. Similarly, resource heterogeneity is one of the essential conditions in entrepreneurship. Therefore, having different views on the relative value of resources, presently or in the future, is one of the most common explanations for the existence of entrepreneurial opportunities (Alvarez & Barney, 2002; Alvarez & Busenitz, 2001).

4. The sustainability of competitive advantages: RBT confirms that resources contribute towards sustaining competitive advantages (Barney, 1991; Barney & Clark, 2007; Colbert, 2004; Dierickx & Cool, 1989; Newbert, 2007; Ray, Barney, & Muhanna, 2004). This is important for entrepreneurial universities, because the adoption of the EntUni mode assists in gaining competitive advantages (Guerrero & Urbano, 2012). Gaining such advantages is not good enough, however, since they need to be sustained. Therefore, underpinning EntUni research can considerably add to the EntUni body of knowledge.

5. Large organizations context: much of RBT research has been conducted in a large organizations context (Barney, Wright, & Ketchen, 2001). This is significant for the present thesis, because the research population is a group of universities. The latter are considered large organizations because they behave in many ways as large corporations (Andreatta, 2012). Thus, it can be argued that RBT can be applied to the universities context.

6. The importance of the cognitive perspective for OpRec: Baron (2004a) argued that cognitive theory can significantly benefit the entrepreneurship field, especially in answering three particular questions: What leads some individuals, but not everyone, to decide to become entrepreneurs? Why do some individuals, but not everyone, recognize lucrative opportunities? Why do not all entrepreneurs have the same level of success? With respect to the second question, Baron and Ensley (2006) argue that because OpRec involves cognitive activities and process(es), then underpinning OpRec with cognitive theories is required. They believe that individuals with better-developed cognitive potential may be better at recognizing

opportunities. This is because “*the cognitive ability of entrepreneurs to frame situations in an opportunistic manner is a heterogeneous resource that can be used to organize other resources*” (Alvarez & Barney, 2007, p. 759). Bonney and Williams (2009), commenting on the then still evolving cognitive perspective, argued that recent entrepreneurship research has embedded cognitive dimensions relating to innovative thinking and alertness for solving problems, along with processes needed to respond to market dynamics. As argued by authors such as Corso, Martini, Pellegrini, and Paolucci (2005), RBT has a significant cognitive underpinning that is particularly compatible with this perspective on OpRec.

7. The external and internal resources: according to RBT, resources are accumulated and leveraged from both internal and external environments (Westhead, Wright, & McElwee, 2011). This assumption is significant, because the factors that have been considered in the present thesis need both internal and external resources to be enhanced.

8. Tangible and intangible resources: according to RBT, firms are seen as a bundle of resources or factors that must be consistently deployed in order to add value (Michael, Storey, & Thomas, 2002). These resources can be tangible and/or intangible (Eisenhardt & Schoonhoven, 1996). The latter argument matters because both tangible and intangible resources will be considered in the conceptual framework developed for the current thesis. Thus, RBT can provide a high level of flexibility while conducting this research. This, in turn, can lead to producing informative research.

9. Resource complementarity: from the lens of RBT, Harrison, Hitt, Hoskisson, and Ireland (1991, 2001) emphasize the importance of resource complementarity. They argue that acquisitions and alliances enable firms to integrate different resources. This integration highlights the value of resource complementarity in creating the possibility for a greater synergy, and as a result, achieve higher organizational performance over the long term. Accordingly, valuable, rare and inimitable synergy can be considered sources of a sustained competitive advantage. In fact, complementary resources also contribute towards enhancing learning and developing new capabilities. The above view supports the main assumption of the present thesis, especially the assumption relating to finding an optimal mix of resources capabilities that can assist in being effective in recognizing entrepreneurial opportunities.

In summary, RBT is one of the most appropriate theories for understanding OpRec, which itself is at the heart of entrepreneurship. Accordingly, the remainder of this section will be considered for the clarification of the development of RBT, its implications in the entrepreneurship field, its components, and its drawbacks.

2.2.2 RBT development

RBT is one of the most renowned and potent theories that underpin organizational relationships. RBT, as with many theories, has undergone a group of developmental stages:

introduction, growth and maturity (Barney, Ketchen, & Wright, 2011). Barney and Clark (2007) argue that there are four articles that contribute towards setting some of the fundamental assumptions of RBT. The first article was a "resource-based view of the firm", published in 1984 by Wernerfelt, who coined the term 'resource-based view' (Barney & Clark, 2007; Mills, Platts, & Bourne, 2003). Wernerfelt (1984) emphasizes the importance of analysing firms from a resource perspective, rather than the product's perspective. The second article was "Towards a Strategic Theory of the Firm" by Richard Rumelt, published in 1984. This emphasised the importance of unique resources in recognizing strategic opportunities and obtaining a competitive position.

The third article was "Strategic Factor Markets: Expectations, Luck, and Business Strategy" of Jay B. Barney, published in 1986. In this article, the concept of strategic factor markets was introduced. Barney (1986) emphasized the importance of the resources by claiming that adopting the concept of strategic factor markets requires providing the resources that help in implementing a competitive strategy. The fourth article was "Asset Stock Accumulation and Sustainability of Competitive Advantage" of Ingemar Dierickx and Karel Cool in 1989. They argue that "*critical resources are accumulated rather than acquired in strategic factor markets*" (Dierickx & Cool, 1989, p. 1504).

Reviewing the literature related to the development of RBT shows that in addition to the above four articles, the work of Penrose (1959) has had a significant impact on the development of RBT (Barney et al., 2011; Newbert, 2007). She believes that the growth of the firm is impacted by the methods of using the owned resources (Newbert, 2007; Penrose, 1959). The author of the present thesis believes that the work of Schumpeter also has an impact on the emergence of RBT. In this context, Mathews (2003) argues that although the language of resources had not been used within the work of Schumpeter, his perspectives can be easily translated into a number of terms that are used in the language of competitive resource, such as resource transfer, resource imitation, transfer, and resource substitution. The above terms are used in the RBT. Mathews (2003) continues arguing that sustained competitive advantage, from the lens of RBT, is achieved through the possession of resources that are imperfectly imitable and not easily substituted or transferred. The above arguments highlight the importance of the Schumpeterian dynamics for the development of RBT.

The arguments presented in this section show that within the early developmental stage of RBT, the focus was on finding relationships between the existence of resources and the achievement of sustained competitive advantages. Lately, the focus is more on how to obtain such resources (Barney et al., 2011).

2.2.3 RBT in the field of entrepreneurship

In addition to strategic management, RBT has drawn the attention of scholars of other fields, such as economics, international business, entrepreneurship, marketing and human resource

management (Barney et al., 2011; Barney et al., 2001). In fact, entrepreneurs' behaviours are substantially explored by using RBT (Westhead et al., 2011). In this connection, Shane and Venkataraman (2000) believe that entrepreneurs need to have different beliefs about the importance of resources. This is for two reasons: first, entrepreneurship can be based on the idea of 'joint production', which requires a combination of various resources to offer new products or services. The second reason is that having the same entrepreneurial speculations by all potential entrepreneurs can lead to competition to obtain the same entrepreneurial opportunities, which, in turn, leads to the elimination of the incentive to seek entrepreneurial opportunities.

The work of Alvarez and Busenitz (2001) contributes significantly towards clarifying the considerable role played by RBT in addressing critical issues in the entrepreneurship field. They argue that focusing on organizational resources is an important action for all phases of the entrepreneurial process. They also argue that the possession of individual-specific resources can facilitate the process of entrepreneurial OpRec, as well as the assembly process of resources for the firms. Such a facilitation helps the firms in creating heterogeneous outputs, which are viewed as superior to the market.

In terms of the OpRec phenomenon, which is the fundamental phase of the entrepreneurial process and the main focus of the current thesis, Alvarez and Busenitz (2001) argue that identification of the proper resources in this phase can play a considerable role in supporting the entrepreneurial process as a whole. In this context, Davidsson and Honig (2003) argue that OpRec may require seeking for and evaluating new opportunities outside of the regulatory boundaries, or broadening and strengthening relationships in order to diversify and expand the required resources. In the same context, Shane and Venkataraman (2000, p. 220) argue that an entrepreneurial discovery happens when individuals make "*the conjecture that a set of resources is not put to its best use*".

In addition to the above two arguments, it worth mentioning that the differences between individuals' experiences, perspectives, and capabilities lead those individuals to understanding and valuing opportunities in a different way, and thus they behave differently in dealing with opportunities (de Jong & Marsili, 2015). At the same time, the aforementioned behaviour is affected by the acquirable resources (Aldrich & Martinez, 2001).

The above arguments show that RBT can contribute significantly to understanding a group of fundamental aspects of the entrepreneurship phenomenon; particularly the entrepreneurial process. Different entrepreneurial opportunities can be recognized by finding various combinations of possessed/acquirable resources. The recognized opportunities, then, are evaluated and exploited based on the available resources.

2.2.4 Resources and capabilities in RBT

Helfat and Peteraf (2003) contend that both theoretical and empirical studies of RBT consider both organizational resources and capabilities. Ray et al. (2004, p. 24) argue that the terms 'capabilities' and 'resources' are used interchangeably. They define them as "*the tangible and intangible assets firms use to develop and implement their strategies*". However, the author of this thesis agrees with the idea that capabilities and resources each have their own meaning, whilst together they constitute the main components of the RBT. Therefore, the Helfat and Peteraf (2003, p. 999) definition is adopted. Here, a resource is defined as "*an asset or input to production (tangible or intangible) that an organization owns, controls, or has access to on a semi-permanent basis*". Further, organizational capability is defined as "*the ability of an organization to perform a coordinated set of tasks, utilizing organizational resources, for the purpose of achieving a particular end result*". Along this line, Brush and Artz (1999) argue that resources may be created by a firm through its activities, or can be obtained from the external environment; however, capabilities arise from the combination and integration of obtainable resources. Over different periods in the organization's life cycle, these resources and capabilities may be subject to evolution and change in a way that benefits the organization (Helfat & Peteraf, 2003).

Brush and Artz (1999) argue that there is a huge variety of organizational resources and capabilities that can help a firm to gain competitive advantage. This assumption leads to raising an important question: how can it be decided which resources and capabilities contribute to the growth of a firm? This question encourages the author of the present thesis to raise the same question in a more specific context: how do public organizations, including universities, determine which resources and capabilities are the most important to them?

Bryson, Ackermann, and Eden (2007) argue that successful public organizations are those that can single out and establish their capacity, in particular, the distinctive competencies that can create the greatest value for their stakeholders. Ray et al. (2004) add that competitive advantage, from the lens of RBT, is gained and sustained by relying on valuable resources and capabilities that are insensitive to changes in supply.

With respect to the benefits provided by the resources and capabilities to the organizations/firms, Barney (1991) argues that not all of a firm's resources can contribute to sustained competitive advantage. At most, resources that can make such a contribution must have four characteristics or requirements: valuable, rare, imperfectly imitable and sustainability. However, Barney in his work with Clark in (2007) considers sustainability as a complementary requirement to 'imperfectly imitable' and they believe that organizing the resources can be the fourth requirement for realizing sustained competitive advantage. The following is a brief description of the most important requirements that must be associated with resources in order to gain sustained competitive advantage:

- (1) Valuable resources: resources can be considered valuable when they reinforce the ability of a firm to formulate or execute strategies that enhance its efficiency and effectiveness (Barney & Clark, 2007). They also help with gaining opportunities (Li, Chen, Liu, & Peng, 2014). Here, it is significant to point out that universities themselves are seen as a source of valuable resources (Rasmussen & Borch, 2010).
- (2) Rare resources: the above valuable resources can be considered rare if they are acquired by only few firms/competitors.
- (3) Imperfectly imitable (or costly to imitate) resources: valuable and scarce resources can be sources of sustained competitive advantage only if they cannot be obtained by firms that do not own them. One of (or a combination of) the following three reasons makes firm resources imperfectly imitable: (1) unique historical conditions; (2) causal ambiguity (a poor understanding of the connection between resources of a firm and its sustained competitive advantage); and (3) social complexity (firms resources are based on complex social phenomena, such as interpersonal relationship between managers in a firm). Here, sustainability considerations should be taken into account. Therefore, the resources must be very difficult to substitute (strategically) with other resources, in order to gain a sustained competitive advantage.
- (4) Organization: valuable, unique and imperfectly imitable resources can be considered as a source for sustained competitive advantages, only if a firm can exploit the competitive potential offered by them, surpassing the restrictions that prevent it, such as formal structures and compensation policies.

(Barney & Clark, 2007)

Newbert (2007, p. 124) argues that although there is an indispensable need for firms to own "*valuable, rare, inimitable, non-substitutable resources and capabilities*", this is not enough, because firms need to be able to improve these resources in a way by which their full potential can be recognized; thus achieving competitive advantage. In this context, it can be argued that the nature and quality of the possessed or acquirable resources/capabilities have a considerable role in achieving long term success (Dollinger, 2003).

In terms of the types of the above-mentioned resources, Barney (1991) divided firms' resources into three groups: human, physical and organizational capital resources. However, as work on RBT has progressed, new groups have emerged. For example, Mills et al. (2003) categorize organizational resources into six groups: tangible resources, knowledge resources, skills and experience, cultural resources and values, networks resources and resources with potential dynamic capability. By reviewing the work of Newbert (2007), who systematically assesses RBT grounded empirical articles, a large number of new groups of resources/capabilities can be found, for example: entrepreneurial resources, managerial resources, economics of scale, reputation, racial diversity, top management team, technological resources, innovate capabilities, IT, information acquisition.

Recently, from the entrepreneurs' and researchers' viewpoints, Kellermanns, Walter, Crook, Kemmerer, and Narayanan (2016) provide a comprehensive picture for resources/capabilities addressed in RBT. They identify a considerable number of resources/capabilities, which are classified into five groups: Human capital, organizational capital, financial capital, physical capital and relationship capital.

The above classifications show that the resources/capabilities that can be possessed or acquired by firms are numerous. The present thesis takes into consideration (as will be mentioned later) those resources that are required to deal with factors that determine the entrepreneurial OpRec process.

2.3 Concept of Entrepreneurial Opportunity Recognition

Before clarifying the concept of OpRec, it is important to understand what is meant by entrepreneurial opportunity. This phenomenon has been conceptually and empirically examined, by entrepreneurship scholars, within the context of opportunity-related processes, as well as by the context of opportunity itself (Hansen, Shrader, & Monllor, 2011; Hulbert, Gilmore, & Carson, 2015). This present study takes into consideration both contexts; however, the focus is on the issues related to OpRec only. Accordingly, the remainder of this section will firstly deal with the notion of entrepreneurial opportunity and then will examine the concept of OpRec.

2.3.1 Entrepreneurial opportunity

According to Ardichvili, Cardozo, and Ray (2003), entrepreneurial opportunity has received the attention of the scholars in various fields, including marketing, organization theory entrepreneurship and strategic management. Therefore, this kind of opportunity can be considered an interdisciplinary phenomenon (McMullen, Plummer, & Acs, 2007). Despite the above view, the entrepreneurship field is viewed by several scholars as the origin of entrepreneurial opportunity (Suddaby et al., 2015). In addition, entrepreneurship research needs to establish a valid concept of 'opportunity' (García-Cabrera & García-Soto, 2009). In this respect, Gartner (1994) argues that word 'opportunity' has played a considerable role in defining the concept of entrepreneurship. More importantly, Short et al. (2010) argue that it is not possible to establish entrepreneurship without opportunities, even if entrepreneurs work hard and possess enormous creative capabilities, because the absence of the opportunity hinders the process of establishing entrepreneurial activities. Here, it is worth criticising the latter argument, that it is true that it is difficult for entrepreneurship to take place without an opportunity. However, possessing creative capabilities can contribute towards establishing entrepreneurship, as they can help in creating opportunities rather than waiting to discover existing unexploited opportunities.

Several definitions have been provided for the entrepreneurial opportunity phenomenon, however, the most cited definition is the one provided by Shane and Venkataraman (2000, p. 220) which describes this phenomenon as a *"situation in which a person can create a new means-ends framework for recombining resources that the entrepreneur believes will yield a profit"*. To explain entrepreneurial opportunity phenomenon further, Ardichvili et al. (2003) conclude that an entrepreneurial opportunity refers to the chance through which a market need can be met. This may require innovative thinking; combining the available resources in order to create outstanding value. Therefore, newness, uniqueness and practicality can be considered the distinctive attributes of entrepreneurial opportunities (Baron, 2004a). Accordingly, Sarasvathy, Dew, Velamuri, and Venkataraman (2010) argue that the concept of entrepreneurial opportunity involves three main components: (1) innovation(s) or novel idea(s) that may or may not result in achieving one or more profitable goals; (2) beliefs that assist in achieving valuable goals; and (3) activities required to convert these goals into reality, in the form of products, services, standards, ventures, organization or markets.

The above discussion shows the considerable role of ideas in finding entrepreneurial opportunities. Ideas basically represent a new means for assigning resources. Accordingly, ideas can be converted into opportunities when individuals create or discover an applicable commercial use for those ideas (Bonney & Williams, 2009). Along these lines, O'Connor and Rice (2001) claim that OpRec links the breakthrough ideas to the fundamental step in the process of innovation evaluation. Here, it is worth mentioning what has been argued by Gielnik, Frese, Graf, and Kampschulte (2012), that creating too many business ideas leads managers to simultaneously work on many business opportunities, which in turn may lead them to fail in sufficiently exploiting any of those opportunities.

By analysing the above two arguments, it can be claimed that it is important to establish an integration between lucrativeness and creativity, with a view to obtain entrepreneurial opportunities. This integration is important, as it is expected that this kind of opportunity should generate profits (Bonney & Williams, 2009). At the same time, the main difference between making profit through entrepreneurial opportunities and through other phenomena is that entrepreneurial opportunities necessitate the formation of a novel 'means-ends' frameworks, rather than only improving old frameworks (Shane, 2003). Taking this line, Shane (2003) claims that not all entrepreneurial opportunities are lucrative. This is because some individuals may incorrectly assess the recombination of resources, which may in turn, lead to unprofitable opportunities.

Time also plays a noticeable role in obtaining this kind of, because entrepreneurs should understand that the largest number of opportunities require time to be revealed (Lumpkin, Hills, & Shrader, 2004). Barringer and Ireland (2016) argue that taking advantage of an opportunity requires opening the 'window of opportunity'. The latter phrase refers to the

period of time in which a business can be realistically established in a new market (Barringer & Ireland, 2016).

The above arguments can justify the overuse of the term 'entrepreneurial opportunity' in the entrepreneurship literature (Corbett, 2007; Hansen, Shrader, et al., 2011; Hulbert et al., 2015; Shane, 2003; Short et al., 2010; Tominc & Rebernik, 2007). Despite this, Hill and Birkinshaw (2010) argue that most of the entrepreneurship literature has paid scant attention to the distinction between the different types of opportunities.

Hansen, Shrader, et al. (2011) raise two other issues related to using the term 'opportunity' in entrepreneurship research. The first issue is that there are few explicit definitions of the term 'opportunity' in the entrepreneurship literature. This is because scholars have defined this term in a way that is compatible with the purpose of their studies. The second issue, which results from the first one, is that the scholars rarely use the definitions provided by their peers. As a result, it is difficult to find a single definition of the entrepreneurial opportunity phenomenon. In this regard, Sarasvathy (2014) argues that the lack of agreement on a single or universal definition for a phenomenon is acceptable because, on one hand, it is difficult to find universal definitions, because there are always different conceptualizations, all which deserve attention (and are provided by different scholars), and on the other hand, generally accepted or near-universal definitions impact the field of research negatively, because they narrow it down to the point that prevents the intellectual development of that field (Sarasvathy, 2014). The above argument shows that the issues related to the multiplicity of opportunity definitions can be considered a positive step.

Another issue related to opportunity research is that managers tend to diagnose threats rather than recognize opportunities (Gregoire, Barr, & Shepherd, 2010). This can be considered a serious issue, because it may indicate that individuals see difficulties, challenges and changes in a negative way. In fact, this is not desirable in entrepreneurship, because entrepreneurs look at issues, challenges and needs as opportunities. They seek creative ways to convert them into opportunities. This ability returns to the nature of entrepreneurs, which is that they are optimistic, confident, strategic and diligent, as well as not being afraid of failure (Oviawe, 2010). The above arguments on entrepreneurial opportunities are significant as they will help individuals to sense the importance of lucrativeness, practically, creativity, distinction and timing when they look for or recognize opportunities.

2.3.2 Opportunity recognition

2.3.2.1 Opportunity recognition definitions

In terms of OpRec⁸, Shane and Venkataraman (2000) argue that the entrepreneurship phenomenon can be understood by considering three main questions. These questions are related to the “Why”, “When” and “How” questions for the following areas:

- Recognizing opportunities for producing products and services.
- The ability of certain people, but not others, to recognize and exploit opportunities.
- Using different ways for exploiting entrepreneurial opportunities.

Despite this seemingly strong reductionist and practical viewpoint, other authors argue that only vague answers can be provided to the questions related to when, who and how opportunities can be recognized (Siegel & Renko, 2012). This is because of the different ontologies concerning opportunity itself, as well as the lack of agreement in terms of what constitutes the OpRec phenomenon (Glavas et al., 2017). So, Renko et al. (2012) argue that entrepreneurial OpRec still lacks cohesion given the diversity of (or even contradictory) definitions related to opportunity. The author of this present thesis would thus justify the usefulness of a comparative study of definitions of OpRec. Doing so will help us obtain a more comprehensive, and hopefully, consistent picture of the OpRec phenomenon.

With respect to the latter argument, and before discussing the OpRec definitions, it is worth mentioning that the roots of this phenomenon (as a subject of research) were found in the classic entrepreneurship literature (Park, 2005). The studies related to this subject have speedily progressed and have become a central topic of the recent entrepreneurship literature (Baron, 2004a; Corbett, 2007; Gaglio & Katz, 2001; George, Parida, Lahti, & Wincent, 2016; Hills, Singh, Lumpkin, & Baltrusaityte, 2004; Lumpkin & Lichtenstein, 2005; Renko, 2008; Short et al., 2010; Tominc & Rebernik, 2007). More importantly, Renko (2008) concludes that entrepreneurial opportunities and their recognition is considered one of the phenomena that differentiates entrepreneurship research from research in other business fields.

A group of definitions that has been provided by several entrepreneurship scholars for the OpRec phenomenon will be discussed and evaluated. In this regard, Ardichvili and Cardozo (2000, p. 104) define this phenomenon as the “*awareness that a chance to develop a business exists*”. However, they argue that an operational definition is required for OpRec because of difficulties in identifying or measuring such awareness. Consequently, they describe this phenomenon as “*the decision to peruse or reject further development of a specified opportunity at a particular moment*” (Ardichvili & Cardozo, 2000, p. 104). Moreover, Ardichvili and Cardozo (2000, p. 105) provide a definition for effective entrepreneurial OpRec, which is characterized as the “*recognition that results in a creation of viable new business*”.

⁸ It is also referred to as identification, perception, discovery or notice. However, the term ‘recognition’ is the most commonly used terminology in entrepreneurship literature (Renko, Shrader, & Simon, 2012).

The above views pay explicit attention to developing a realistic new business. This attention is in line with the view of Hills and Singh (2004, p. 20), who define OpRec as *"perceiving a possibility for new profit potential through (a) the founding and forming of a new venture (b) the significant improvement of an existing venture"*. This definition shows the importance of seeking lucrative opportunities. The latter view is supported by the views of both Lumpkin and Lichtenstein (2005) and Barringer and Ireland (2016). In fact, there is a match between the definition of Barringer and Ireland (2016, p. 78), *"the process of perceiving the possibility of a profitable new business or a new product or services"*, and the definition of Hills and Singh (2004). As for the Lumpkin and Lichtenstein (2005, p. 457) definition, which refers to OpRec as *"the ability to identify a good idea and transform it into a business concept that adds value and generates revenues"*, it provides the main principle behind perceiving a profitable business. This principle promotes the grounding of those creative notions that exist in the minds of entrepreneurs, by seeking pragmatic and lucrative businesses. The definition of Hills and Singh (2004) indicates that not only is OpRec required for creating new ventures, it can also be required after establishing the venture, or during the life cycle of the firm.

Baron (2006, p. 107) views OpRec as *"the cognitive process (or processes) through which individuals conclude that they have identified an opportunity"*. In light of this definition, it can be claimed that a large part of OpRec indicates the situation of identifying opportunities (Ozgen & Baron, 2007). This definition also elucidates that OpRec focuses on using mental capabilities to create a prospect, which helps individuals to be sure that an opportunity is worth exploiting. In addition to the above, this definition confirms that OpRec is a process. Accordingly, it can be claimed that a group of steps is required for recognizing an entrepreneurial opportunity. This is in line with Foss and Foss (2008), who argue that opportunity recognition is a process, which consists of a group of overlapping phases that require significant endeavour, knowledge and investment. The latter two arguments can be supported by the definition from Lim and Xavier (2015, p. 107), which refers to OpRec as *"a process with a number of steps and not simply rather a coming flash of sudden insights"*.

Sarasvathy, Dew, Velamuri, and Venkataraman (2003, p. 145) clarify the concept of OpRec by arguing that *"if both sources of supply and demand exist rather obviously, the opportunity for bringing them together has to be recognized and then the match-up between supply and demand has to be implemented either through an existing firm or a new firm"*. They then distinguish two further cases, where only either supply or demand is known (discovery view), or where neither demand nor supply is known (creation view). Taking this line, Renko (2008) argues that despite the above-mentioned attempt of Sarasvathy et al. (2010) to distinguish between the three aforementioned views, most entrepreneurship scholars have considered OpRec as synonymous with creation or discovery. Dyer, Gregersen, and Christensen (2008) use the term 'OpRec' to refer to all three views: allocative, discovery and creation. This indicates that OpRec goes well beyond the idea that individuals need to simply bring together

the existing resources of both demand and supply when they wish to have the opportunity to establish a new firm.

Recently, Kuckertz, Kollmann, Krell, and Stöckmann (2017, p. 92) have shown that OpRec "is characterized by being alert to potential business opportunities, actively searching for and gathering information about them, communicating them, addressing customer needs and evaluating the viability of such potential entrepreneurial activities". This definition provides a focus that is more on the factors that facilitate the process of OpRec. Thus, this definition supports the idea of the importance of investigating the factors that determine the OpRec process, in order to better understand the concept of OpRec.

Drawing on the above definitions, the author believes that the preliminary definition that will be adopted by this thesis for OpRec is that it is a process of perceiving lucrative and achievable opportunities by which a business concept can be established.

2.3.2.2 Characteristics of opportunity recognition

Hills and Singh (2004) claim that OpRec has special characteristics, which are identifiable and testable. However, a number of arguments have been raised regarding these characteristics. The reasons behind the emergence of these arguments, which will be discussed in the coming paragraphs, may return to the lack of consensus on the nature of this phenomenon due to the different ontologies of the opportunity concept. In addition, this phenomenon may overlap with other phenomena related to the notion of opportunity.

In this context, it has been argued that OpRec is considered a multi-staged, recursive, complex, process (Lumpkin et al., 2004). Even though Davidsson and Honig (2003) agree that OpRec process is complex, they argue that it may be infrequent, and it is thus too expensive to be captured at present. In terms of infrequency, it can be claimed here that the nature of entrepreneurial opportunities may prevent entrepreneurs from recognizing them frequently, as this behaviour may not be attractive to everyone. Sarasvathy (2014) argues that the upside of compelling opportunities is not obvious, however, the downside of these kinds of opportunities is obvious and can be controlled. Sarasvathy (2014, p. 307) continues arguing that if the upsides of an opportunity are obvious, then it will attract a considerable number of competitors, who may be better positioned, in both resources and skills, to exploit it. On the other hand, an opportunity with no obvious upside and downside under control can only be exploited by *"those who care about the upside in ways other than externally defined metrics of winning"*.

With respect to recurrence, Lumpkin and Lichtenstein (2005) argue that OpRec is an on-going process that requires finding novel ideas, obtaining new information and constantly creating valid knowledge; thus, it is also a learning process (Marvel & Droege, 2010). The latter process provides a good basis to understand how future opportunities will be recognized

effectively and efficiently. Linking with the preceding discussion, it is worth presenting what has been argued by Holcombe (2003) - that creating or discovering new opportunities leads to create new markets and thus the discovery of more new opportunities. Therefore, discovering more opportunities does not decrease the number of future opportunities, as there is no fixed stock of opportunities which can be diminished by discovery or taking advantages of these opportunities. Rather, it increases that number, as the discovered opportunity may shed the light on other new opportunities, which can be considered dependable opportunities that appear as a result of creating or discovering specific opportunities.

There are also arguments regarding whether OpRec is proactive or reactive (O'Connor & Rice, 2001; Schwartz, Teach, & Birch, 2005). Here, it is important to understand that for organizations to be grown, the desire for growth is not enough, rather, there is a need for opportunities that help with achieving that growth. These opportunities can be internally created, for example by employing the available production facilities for making new products, or they may originate externally as a result of environmental changes (Hulbert et al., 2015). In the same way, entrepreneurs rely on one of two ways for establishing their venture: either externally or internally. In the former, entrepreneurs decide to establish a firm and they then search for and recognize an opportunity that helps them to start their business. On the other hand, depending on the internal method, entrepreneurs recognize a gap or a problem and then create a business that fills the gap recognized, or deal with the problem identified (Barringer & Ireland, 2016; Hills & Singh, 2004). Accordingly, it can be claimed that there are two ways to recognize opportunities: internally and externally. The internal way reflects the creative view and the external way considers the discovery view.

The other argument is related to the positive connotations of the word 'opportunity', which brings to mind favourable outcomes, luxury, health and gladness (Sarasvathy, 2014). In this context, Gaglio and Katz (2001) argue that recognizing opportunities leads to finding solutions for social problems or to creating social value. However, it is important to take into consideration what has been argued by Ardichvili et al. (2003) - that some individuals may identify the problems or market needs more easily. However, they may not be able to generate solutions for the problems identified, because not everyone who is proficient at asking questions is necessarily skilful at finding answers. Ardichvili et al. (2003) also argue that some individuals can effortlessly identify un- or underutilized resources, however, they may not be adept in determining proper uses or users from which the value can be created.

In the same context, Churchill and Muzyka (1994) argue that OpRec can play a significant role in creating value as the identified opportunity can be converted into a feasible product or service. Barringer and Ireland (2016) argue that entrepreneurs recognize opportunities, with a view to convert them into a successful business. Accordingly, managers, entrepreneurs and CEOs are required to be able to recognize new opportunities in order to assist with the growth of their organizations, to achieve a good competitive positioning and to increase profits

(Gregoire, Shepherd, & Lambert, 2010). The above discussion can support the argument of Gregoire et al. (2010), that OpRec is important for creating new firms, as well as for organizational renewal, learning, adaption and strategy. Accordingly, to take advantage of the opportunities recognized, the lucrative and convenient ones should be exploited (Siegel & Renko, 2012). In the terms of establishing new ventures, Baron (2004a) argues that this action can be achieved by individuals who believe that they have identified a novel opportunity that has not been recognized by anyone else. In fact, identifying this kind of opportunity can help them take advantage of being proactive in entering the market (Baron, 2004a) and contribute towards making considerable gains (Gregoire et al., 2010).

Baron (2008) argues that the entrepreneurship literature shows that the phenomena or processes existing in the minds of certain individual are embedded in OpRec. Therefore, the latter is seen as a cognitive process (Baron, 2004b; Lim & Xavier, 2015). Siegel and Renko (2012) go beyond the latter view and claim that OpRec focuses only on perception. In terms of individuals whom OpRec depends on, O'Connor and Rice (2001) argue that research managers in lower and middle levels play a significant role in OpRec. As for corporate executives, they rarely act as opportunity recognizers. However, Hisrich, Peters, and Shepherd (2013) have a different opinion, that the entrepreneurs who are in a strategic position are more likely to recognize valid opportunities for finalizing the 'product planning and development process', and then go on to establish successful new ventures.

The above arguments show that it is difficult to identify specific characteristics for OpRec. However, the above characteristics can help in understanding the OpRec phenomenon. Particular characteristics can be identified in the light of the ontological assumptions that underpin the philosophy of opportunity recognizers.

2.3.2.3 Opportunity recognition and the entrepreneurial process

To obtain a holistic view of OpRec, it is important to explain the role it plays in the entrepreneurial process. In this respect, Shane (2012) argues that it seems that the idea of entrepreneurship as a process that relies on both individuals and opportunities has been accepted by entrepreneurship scholars. Therefore, entrepreneurship is triggered through recognizing an entrepreneurial opportunity and exercising the intention to act according to the opportunity recognized (Audretsch & Keilbach, 2007), which plays a crucial role in managing the entrepreneurial process. In addition, it is considered an incentive for this process (Dyer et al., 2008), as it is also considered the engine of the entrepreneurial process (Chen & Yang, 2009). Also, Alvarez and Busenitz (2001) argue that the identification of the proper resources in this phase can play a considerable role in supporting the entrepreneurial process as a whole. It has been argued that the recognition of applicable lucrative opportunities is a fundamental phase in the entrepreneurial process (Baron, 2004a; Churchill & Muzyka, 1994; Hisrich et al., 2013; Ozgen & Baron, 2007), which is often followed by others

phases in the entrepreneurial process: evaluation and exploitation (Baron, 2006; Shane & Venkataraman, 2000).

In this context, García-Cabrera and García-Soto (2009) argue that there is consensus by academics and entrepreneurs on the subsequent steps of the firm creation process. This process starts by recognizing the opportunity, then the opportunities recognized are accurately evaluated and eventually a business plan is implemented. However, Lumpkin and Lichtenstein (2005) consider the evaluation phase as a sub-phase of OpRec. They argue that the process of OpRec is based on two concepts: discovery and formation., Kohlbacher, Herstatt, and Levsen (2015) argue that entrepreneurial action is seen as a process that includes two stages: OpRec and opportunity exploitation. Despite the above combination, Ardichvili et al. (2003) view OpRec as an element of opportunity development, alongside opportunity evaluation. This pushes the author towards a separate evaluation process from the recognition process.

Ardichvili et al. (2003) provide other details about what constitutes OpRec. They argue that this phenomenon involves three processes: (1) sensing and realizing market demands and/or un-/underutilized resources; (2) finding a harmony between certain market demands and specific resources; and (3) establishing a business concept through finding out a new harmony between disconnected demands and resources. In connection with the third process, Hills et al. (2004) argue that the business concept may be modified as a result of entering the market, as well as obtaining customers' feedback. Hills et al. (2004) add that one of the most significant requirements for the process of OpRec is to understand why and how the business concepts of some entrepreneurs (not everyone) are subject to modification. The existence of the above process leads Ardichvili et al. (2003) to argue that the above-mentioned process goes beyond discovery and perception concepts.

Gregoire et al. (2010, p. 120), by relying on the above process, develop a measure for OpRec beliefs, which consists of three dimensions: "the degree of alignment between an opportunity's specific means of supply and a target market, the general feasibility of the opportunity and the general desirability of the opportunity". This measure is designed to be appropriate for studying the recognition of different types of opportunities within different contexts, employing different sorts of data, as well as using different methods for collecting and analysing the data.

2.4 Scholarly Debates on Opportunity Recognition

The extant entrepreneurship literature shows that there are two approaches to understanding how opportunities can be recognized: Schumpeterian and Kirznerian (de Jong & Marsili, 2015; Siegel & Renko, 2012). Both perspectives are underpinned by Austrian School theories (Buenstorf, 2007; Vaghely & Julien, 2010). These two approaches have raised a continual debate on the concept and sources of opportunities. These debates led to the emergence of

two ontologies for recognizing opportunities. The first is an objective ontology, which indicates that opportunities exist 'out there' and can be identified by the people with the most precise perceptions about the 'objective environment'.

By contrast, the second ontology is subjective, which indicates that opportunities are generated through creation and interpretation. Therefore, opportunities can be explored by people with 'creative abilities' (Alvarez & Barney, 2007; Gregoire et al., 2010; Kohlbacher et al., 2015; Short et al., 2010). In this regard, Lim and Xavier (2015) argue that the objective perspective is underpinned by a positivist philosophy, which stipulates that reality is independent of people's perceptions, since it has an objective nature. Accordingly, opportunities are shaped by external forces (exogenous shocks) on existing markets. On the other hand, the subjective perspective is underpinned by a constructionist philosophy, which assumes that reality is a product of a social construction; it exists depending on people's perceptions. Accordingly, opportunities are created by entrepreneurs themselves.

Wang et al. (2013) argue that the above debate leads many scholars to explore, from a psychological perspective, why in the same institutional context not every individual can recognize opportunities.

Mainela, Puhakka, and Servais (2014) claim that arbitrage and innovation opportunities, as well as opportunity creation and opportunity discovery, signalize different concepts of opportunity phenomenon. However, it can be argued here that innovation opportunities reflect the Schumpeterian ontology of opportunity (Fiet, 1996), which calls for opportunity creation, and, at the same time, arbitrage opportunities reflect the Kirznerian view (Fiet, 1996), which seeks to discover existing opportunities. Consequently, there are two main trends for opportunity phenomenon: creation and discovery.

Sarasvathy et al. (2010) claim that there is another trend for opportunity phenomenon, which is the allocative view. This view assumes that resources are obviously identified and ends are given. Thus, the sources for both demand and supply exist. Here, individuals need to bring these sources together, if they want to have an opportunity to offer a new product/service or establish new firms. Accordingly, this kind of opportunity appears in existing markets. Despite the above view, however, the literature shows that the predominant views to understand how an entrepreneurial opportunity is recognized are creativity and discovery. Accordingly, the remainder of this section will address the debate on creation and discovery views.

Drawing on teleological theories, Alvarez and Barney (2007) explain the individuals' behaviours that impact their ability to create or discover opportunities. They argue that although there is much in common between opportunity creation and discovery, they produce several different expectations on the best time for entrepreneurial actions to assist in forming effective opportunities. Alvarez and Barney (2007) use three critical criteria, which are proposed by the teleological theories, to identify these differences.

The first criterion is the nature of opportunity, in which two types of opportunities are categorized: opportunities that apply a realist philosophy and opportunities that apply an evolutionary realist philosophy. With the former, opportunities independently exist of entrepreneurs (Alvarez & Barney, 2007), therefore, discovered entrepreneurial opportunities are considered as a 'free-standing entity', because they can be examined and measured separately from entrepreneurs (Harmeling, Sarasvathy, & Freeman, 2009). On the other hand, within an evolutionary realist philosophy, the opportunities depend on the existence of entrepreneurs (Alvarez & Barney, 2007).

Consistent with the above discussion, it can be argued that opportunity creation is endogenously developed in the day-to-day entrepreneurial practices and interactions between different actors. That is why opportunity creation arises from imagination and social interaction (Mainela et al., 2014). On the other hand, Kirznerian opportunities are established for meeting unsatisfied market needs (Mainela et al., 2014). Therefore, opportunity discovery is connected to the 'exogenous shocks', such as technological advances or market changes (Mainela et al., 2014).

The second criterion is the nature of entrepreneurs, where entrepreneurs who adopt discovery theory differ from non-entrepreneurs in some important ways, but entrepreneurs who adopt creation theory may or may not be different from non-entrepreneurs. However, Schumpeterian entrepreneurs need to have three traits: creativity, imagination and boldness. Therefore, they do not have a passive role in this world, rather they try to create a different world (Kirzner, 2009; Shane, 2003). For example, they introduce unexpected products, they pioneer novel methods of work and/or they establish new markets in undiscovered zones. The above behaviours lead to creating a disequilibrium in the market (Day et al., 2006; Kirzner, 2009; Shane, 2003), because the opportunity is established by 'creative destruction', at which the market is disequilibrated. Here, individuals create new solutions with more fitting value to the market than the current alternatives (Mainela et al., 2014).

On the other hand, Kirznerian entrepreneurs do not agitate any current (and even prospective) states of equilibrium, rather they contribute in driving the equilibration process (Day et al., 2006; Kirzner, 2009; Shane, 2003). Consequently, they do not need to be creative, rather they have to be alert to price differences that others have not yet perceived. Therefore, alertness is considered one of the main factors for understanding the process of opportunity discovery (Kirzner, 2009; Shane, 2003).

de Jong and Marsili (2015) add that, according to the Schumpeterian view, innovative entrepreneurs take the initiative to work as they seek a new discovery. On the other hand, the Kirznerian view shows that innovative entrepreneurs aim at finding more effective ways to utilize misallocated resources or meet currently unsaturated market needs. Thus the discovered opportunities are not particularly innovative when compared to the created ones, which are innovative (Shane, 2003). The above argument shows that Schumpeterian

opportunities differ from Kirznerian opportunities in that they are created through creative activities, therefore, it is not pre-assumed that entrepreneurial activity is taking place (Buenstorf, 2007; Siegel & Renko, 2012).

Yet, the nature of the required innovativeness for opportunity creation differs from the one for opportunity discovery. For opportunity creation, radical innovations are required, and for opportunity discovery, incremental innovations are required (Shane, 2003). The latter argument may create a need for new information to create opportunities, however, this kind of information is not required for discovering opportunities (Shane, 2003). The above arguments may make the opportunities created rare compared to discovered opportunities, which are considered common (Shane, 2003).

The third criterion discussed by Alvarez and Barney (2007) is the nature of the decision making context, where decisions for discovering opportunities are taken under risk conditions (Alvarez & Barney, 2007; Shane, 2003). However, decisions for creating opportunities are taken under uncertainty conditions (Alvarez & Barney, 2007; Shane, 2003).

In addition to the criteria discussed by Alvarez and Barney (2007) to distinguish opportunity creation from opportunity discovery, several authors present additional differences between the above-mentioned phenomena. de Jong and Marsili (2015) claim that Kirznerian opportunities are adopted more by small ventures, young entrepreneurs, and individuals with less innovative behaviour. The focus of these kinds of opportunities is on present needs. On the contrary, Schumpeterian opportunities are the focus of attention of the larger ventures, which operate in growing markets and concentrate on strategic future needs (de Jong & Marsili, 2015; Shane, 2003). Along this line, Kirzner (2009) argues that it is logical to consider the whole dynamic of the capitalist system as the outcome of two different types of 'entrepreneur-driven changes'. The Schumpeterian perspective is reflected by a longer term dynamic. On the other hand, the Kirznerian perspective is reflected by a short term dynamic.

To summarize, it can be claimed that the recognition of Kirznerian opportunities requires, to a large extent, a discovery process. On the other hand, Schumpeterian opportunities are recognized through the creation process (Shane, 2003). Table 2.1 summarizes the points discussed earlier relating to the differences between opportunity creation and opportunity discovery.

Table 2.1 The main differences between Schumpeterian and Kirznerian opportunities

	Schumpeterian opportunities	Kirznerian opportunities
<i>The main concept for understanding the process of OpRec</i>	Innovativeness	Alertness
<i>The consideration of appearing new opportunity</i>	Disequilibrating nature	Equilibrating nature
<i>Informational requirements</i>	Requires new information	Does not require new information
<i>Innovation type</i>	Radical innovations	Incremental innovations
<i>The ability to obtain</i>	Rare	Common
<i>Process of opportunity recognition.</i>	Creation	Discovery
<i>Time scale</i>	Short term	Long term
<i>Actions of</i>	Academics	Non-academics

Source: Author - drawing on the above arguments

Despite the above differences between opportunity creation and opportunity discovery, the literature does contain some blended/complementary approaches for the above-mentioned concepts. In a new contribution, Kirzner (2009) argues that Kirznerian entrepreneurs permanently seek, in the short term, to establish equilibrium by finding a harmony between the market and new possibilities and circumstances (which may include those who tend towards creativity and imagination). This argument indicates that the Kirznerian approach does not necessarily necessitate rejecting the creative approach of Schumpeter. This leads Kirzner (2009) to argue that there must be a domain for both Schumpeterian entrepreneurs, who make pure profit, and Kirznerian entrepreneurs, who sense lucrative opportunities before others and immediately exploit them. In the same context, Alvarez and Barney (2007) argue that despite the fact that the emergence of an opportunity depends either on a discovery process or on a creation process, at the same time, each process offers significant benefits for a group of entrepreneurial actions within different contexts.

Siegel and Renko (2012) conclude that combining Schumpeterian ontology and the Kirznerian approach is important for OpRec. The Schumpeterian and Kirznerian philosophies are not contradictory, rather they outline different cases that can exist simultaneously (de Jong & Marsili, 2015; Shane, 2003; Shane & Venkataraman, 2000). This argument is based on the assumption that the creative process involves the recognition and discovery process as essential inputs. On the other hand, the recognition and discovery processes cannot be done without most major elements of a creativity mind-set. This appears to be logical because, for example, 'prior to recognizing or discovering an outstanding piece of art, that piece of art needs to be already created' (see, Sarasvathy et al., 2003, p. 157). Rae (2007) claims that a discovery process can be considered as a creative process. This view can be supported by the "creativity-based model of entrepreneurial OpRec" which had been developed by Lumpkin et al. (2004). This model, as mentioned earlier, clarifies that the "OpRec process based on creativity" relies on two stages: discovery and formation. Accordingly, to creatively recognize opportunities, individuals need to take into consideration the requirements of the discovery process. Sarasvathy et al. (2010) argue that the three views of entrepreneurial opportunity

can be integrated through realizing that each view is valuable under different situations, therefore, these views are considered 'context-dependent'.

The above argument shows that there are two different perspectives for recognizing opportunities. These perspectives include incommensurable assumptions concerning the nature of opportunities. It can be claimed that instead of arguing which perspective is better, entrepreneurship scholars need to recognize both the value and shortcomings of each of these perspectives in order to identify the conditions required for applying each of them (Suddaby et al., 2015). This is, in essence, a reiteration of the view of Sarasvathy et al. (2003, p. 157).

2.5 The Factors That Determine the Opportunity Recognition Process

The ability of certain people to discover opportunities has been a central point of interest in OpRec research (Bhagavatula, Elfring, van Tilburg, & van de Bunt, 2010; Lim & Xavier, 2015). This ability may rely on a group of factors, which are presented in Table 2.2. These factors have been studied by a number of entrepreneurship scholars (García-Cabrera & García-Soto, 2009). However, they rely on a partial analysis approach to conduct their studies. This leads to examining the impact of one, or a small number of these factors, on the process of OpRec (García-Cabrera & García-Soto, 2009; Park, 2005). The reason for such a reliance may be due to the presence of a considerable number of factors, both individual and environmental (Wang et al., 2013), or controlled and uncontrolled factors (Hills et al., 2004) that impact the process of OpRec. Gregoire et al. (2010) argue that there are two key questions that should be asked when the factors that determine the OpRec are identified. The first one is - what factors can facilitate OpRec? The second question is - why these factors can provide such a facilitation?

Table 2.2 Factors that determine the OpRec process

	Factors that determine the OpRec process																																										
	Prior knowledge	Alertness	Networking	Cognitive properties	Technology orientation	Systematic search	Creativity	Optimism	Self-efficacy	Human capital	Environmental changes	Entrepreneur's perspective	Market analysis	Potential financial reward	Organizational learning	Entrepreneur's passion	Meeting intrinsic needs	Serendipity	Diversified competencies	Openness to experience	Motivation	Perception of threats	Altruism toward others	Associational thinking	Problem construction ability ⁹	Learning ability	Organizational development	Entrepreneurial orientation	Failure	Intuition	The desire for autonomy	Entrepreneur's demographic	Locus of control	Personal turbulence	Possessing expert opportunity prototypes	Time	Entrepreneurial posture	Risk-taking	Positive affect				
Ardichvili and Cardozo (2000)	✓	✓	✓																																								
Shane and Venkataraman (2000)	✓			✓																																							
Shane (2000)	✓				✓																																						
Gaglio and Katz (2001)		✓																																									
Ardichvili et al. (2003)	✓	✓	✓			✓	✓	✓	✓																																		
Davidsson and Honig (2003)			✓							✓																																	
Gaglio (2004)	✓	✓																																									
Macpherson, Jones, and Zhang (2004)	✓		✓		✓						✓	✓	✓																														
Lumpkin et al. (2004)			✓				✓																																				
Arenius and De Clercq (2005)			✓							✓																																	
Shepherd and DeTienne (2005)	✓													✓																													
Park (2005)	✓				✓							✓																															
Lumpkin and Lichtenstein (2005)															✓																												
Baron (2006)	✓	✓	✓			✓																																					
Pech and Cameron (2006)	✓					✓										✓	✓																										

⁹ The ability to re-frame and raise problems in new and uncommon ways.

[illegible]

	Factors that determine the OpRec process																																											
	Prior knowledge	Alertness	Networking	Cognitive properties	Technology orientation	Systematic search	Creativity	Optimism	Self-efficacy	Human capital	Environmental changes	Entrepreneur’s perspective	Market analysis	Potential financial reward	Organizational learning	Entrepreneur’s passion	Meeting intrinsic needs	Serendipity	Diversified competencies	Openness to experience	Motivation	Perception of threats	Altruism toward others	Associational thinking	Problem construction ability	Learning ability	Organizational development	Entrepreneurial orientation	Failure	Intuition	The desire for autonomy	Entrepreneur’s demographic	Locus of control	Personal turbulence	possessing expert opportunity prototypes	Time	Entrepreneurial posture	Risk-taking	Positive affect					
Sinclair and D'Souza (2011)				✓		✓					✓																																	
Smith-Nelson, Sardeshmukh, Sehora, and Reiter-Palmon (2011)				✓																					✓																			
Mueller and Shepherd (2012)	✓																												✓							✓								
Hulbert, Gilmore, and Carson (2013)	✓	✓											✓																															
Wang et al. (2013)	✓		✓								✓																																	
George et al. (2016)	✓	✓	✓	✓		✓					✓																																	
Hulbert et al. (2015)	✓	✓				✓	✓											✓																										
Lim and Xavier (2015)	✓	✓	✓																																									
Kohlbacher et al. (2015)	✓	✓									✓																																	
Bloodgood, Hornsby, Burkemper, and Sarooghi (2015)	✓			✓																						✓																		
de Jong and Marsili (2015)		✓					✓																																					
Barringer and Ireland (2016)	✓	✓	✓				✓				✓																																	
Kuckertz et al. (2017)	✓	✓					✓																																					
Veilleux, Haskell, and Béliveau (2018)	✓	✓	✓			✓												✓																									✓	✓
Total	30	17	18	5	3	10	9	2	2	3	10	2	4	1	2	1	1	2	1	1	2	2	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	

Note: The researcher continued to update the literature therefore there is a reference from 2018 in this table.

Source: Author

The analysis of the above table shows that entrepreneurship scholars pay a great deal of attention to six of the factors that determine OpRec: prior knowledge, networking, entrepreneurial alertness, external environment changes, systematic search and creativity. These six factors are intangible. This may be due the importance of the cognitive perspective for OpRec (Baron & Ensley, 2006). Also, some factors listed in Table 2.2 are considered sub-themes of the major factors discussed in the literature. Thus, they will be dealt with in chapter five and six (Finding and Discussion).

Before discussing the literature related to the above, the most significant factors that determine OpRec and look at them from RBT lens, it is worth mentioning two important points. The first one is that some scholars, such as Hills and Singh (2004) and Barringer and Ireland (2016) use cognitive properties synonymously with alertness. This enhances the validity of the selection of alertness as one of the factors that determine the entrepreneurial OpRec.

The second point is that by reviewing the work of Ardichvili et al. (2003), it can be concluded that evaluating the opportunities recognized can lead to recognizing extra opportunities, and thus the evaluation process can be considered one of the factors that determines OpRec. Despite the above conclusion, however none of the studies, even the study of Ardichvili et al. (2003), presented in Table 2.2, have explicitly considered the evaluation process as one of the factors that determines OpRec. Accordingly, it will not be included in the conceptual framework. This is because only the most considered factors by entrepreneurship scholars will be included in the aforementioned framework.

2.5.1 Prior knowledge

Table 2.2 shows that OpRec is highly affected by the prior knowledge of individuals (Arentz, Sautet, & Storr, 2013; Felin & Zenger, 2009). According to Foss and Foss (2008), the above considerable attention to prior knowledge in the entrepreneurship literature explains the importance of cognitive approach for OpRec. In this context, Arentz et al. (2013) claim that opportunity can be recognized only if individuals possess both cognitive properties and prior knowledge; the former helps in understanding the relevance of the latter. Audretsch and Keilbach (2007) argue that entrepreneurial opportunities have endogenous features, as they are systematically created by investing in knowledge. In the same context, Felin and Zenger (2009) argue that the main focus of the OpRec literature is on individuals' observations and experience. The latter is considered the main method of market knowledge development (Hills & Singh, 2004).

The importance of prior knowledge and experience has garnered the attention of many entrepreneurship researchers (Park, 2005). Obviously, this is because prior knowledge, as mentioned earlier, is considered a substantial component in the process of OpRec (Arentz et al., 2013; Felin & Zenger, 2009). Rather, Siegel and Renko (2012) consider distinctive

knowledge as a core engine of the process of entrepreneurial OpRec. The latter argument shows the importance of unique knowledge, which leads, as Wang et al. (2013) claim, to recognize particular opportunities that others disregard. Consequently, having prior knowledge helps with concentrating on the significant aspects of the existing information and deal with such information efficiently, in order to recognize a larger number of opportunities (Shepherd & DeTienne, 2005).

Siegel and Renko (2012) conclude that there is a positive correlation between the amount of individuals' knowledge and the number of entrepreneurial opportunities recognized by those individuals. This is in line with what has been found by Audretsch and Keilbach (2007), that more entrepreneurial opportunities can be generated by contexts with greater knowledge. In this respect, Arentz et al. (2013) argue that accumulating pertinent knowledge may assist individuals to develop their intuitive abilities. The latter can help individuals to be alerted to opportunities and thus recognize new ones. Along this line, Arentz et al. (2013) argue that based on prior experience and knowledge of what was effective in the past, individuals may be able to identify principles to find out new opportunities in the future. Accordingly, individuals may be able to extrapolate how things can be run in the future by taking advantage of the knowledge of how things work at the present time (Webb et al., 2011). When considering the above arguments, it is worth mentioning that to take advantage of prior knowledge, it is important to share this knowledge because this action helps in creating a required climate for engaging in entrepreneurial activities.

Prior knowledge is considered the whole knowledge possessed by individuals at a certain moment in time (Arentz et al., 2013). It has been argued that prior knowledge comes from relevant education, experience (Ardichvili & Cardozo, 2000) or a combination of these factors (Ardichvili & Cardozo, 2000; Hisrich et al., 2013). Ardichvili et al. (2003) argue that prior knowledge includes two domains. The first domain is related to special interest knowledge (Hills, Shrader, & Lumpkin, 1999). The second domain is associated with industry knowledge, which involves three main aspects: individuals' prior knowledge about markets, individuals' prior knowledge about methods of serving markets and individuals' prior knowledge of customer issues (Shane, 2000).

By reviewing the work of Cooper, Gimeno-Gascon, and Woo (1994), Westhead et al. (2011) conclude that possessing various levels of human capital, which is considered one of the main resources included in RBT, can facilitate the establishment and development of new firms. Those levels are divided into groups: general human capital and specific human capital. The latter is divided into four groups: management know-how, the ability to acquire financial capital, prior business ownership experience and specific industry know-how.

Comparing Ardichvili et al. (2003) and Cooper et al. (1994), it can be argued that they are two views that reflect one idea. This provides considerable support for using RBT to explore

the OpRec phenomenon in general, and the importance of knowledge as resource for recognizing entrepreneurial opportunities in particular.

For individuals' prior knowledge about markets, Cliff, Jennings, and Greenwood (2006) find that experience in the essence of the organizational domain leads individuals to be "imitative entrepreneurs", who reproduce decided routines. On the other hand, founders who possess considerable experience in their field's setting, or in other industries, have more chance to be innovative entrepreneurs. As for individuals' prior knowledge about methods of serving markets, Ko (2004) argues that knowing how to serve the market has a significant role in dealing with opportunity, since this knowledge helps people to understand rules and processes that exist in the market. For individuals' prior knowledge about customer issues, Shepherd and DeTienne (2005) claim that this kind of knowledge helps in recognizing more opportunities, and, at the same time, more innovates ones (Shepherd & DeTienne, 2005).

The above arguments show that prior knowledge comes from different sources. In this context, Foss and Foss (2008) argue that prior knowledge is the outcome of resource 'learning'; at the same time, this knowledge is substantial in the initial phase of venture creation. Shane (2000) argues that entrepreneurial opportunities are not equally recognized by all individuals, rather, only some of those individuals can recognize the above-mentioned opportunities. This is because of the 'information asymmetry' that is possessed by the individuals (Shane, 2000). Moreover, Gielnik et al. (2012) find that divergent thinking has a positive effect on the OpRec. This effect can be enhanced by the diversity of information. In this regard, it is worth mentioning that the aforementioned thinking is considered by Day et al. (2006, p. 591) as an is a "necessary, but not wholly sufficient, criterion for defining the entrepreneur in that the divergent thinking must be within an appropriate context that is contiguous with true entrepreneurial behaviour".

Despite of the importance of prior experience in industry for OpRec, Barringer and Ireland (2016) argue that 'anecdotal evidence' indicates that individuals outside industry may sometime step inside it with a new 'pair of eyes'. This may help them to be more innovative than individuals with prior experience. Renko et al. (2012) claim that OpRec is driven by perception rather than knowledge. However, the current thesis agrees with the view that emphasizes the importance of prior knowledge for recognizing entrepreneurial opportunities. This is justified by the proven evidence that supports the idea that knowledge and knowledge management plays a significant role in being innovative (Darroch, 2005; Du Plessis, 2007; McAdam, 2000).

OpRec researchers pay great attention to knowledge, whilst RBT scholars also emphasize the importance of knowledge as a resource to gain other resources. In this context, Alvarez and Busenitz (2001) argue that ensuring the best use of resources to make a profit requires entrepreneurial knowledge, which identifies where and how these resources can be obtained. Westhead et al. (2011) highlight the importance of knowledge for RBT by arguing that a

competitive advantage fundamentally relies on owned knowledge. In fact, the required knowledge can shape the best way to use the firm's capabilities and resources to gain sustained competitive advantages.

2.5.2 Networking

Networking assists entrepreneurs to be integrated into the environment in which they operate (García-Cabrera & García-Soto, 2009). This integration, which appears in the form of engagement with different parties in the external environment, such as customers, researchers, suppliers and competitors, can assist individuals to build strong networks (Wang et al., 2013). These networks, in turn, provide a chance to obtain more resources (Bhagavatula et al., 2010; Wang et al., 2013), especially informational resources relating to the external environment. The resources obtained can assist in boosting the possibility for recognizing entrepreneurial opportunities (Wang et al., 2013). In this context, Barringer and Ireland (2016) argue that individuals with strong networking are in a strong position to recognize technological advances more than individuals with weak networking.

Because of the above considerable role of networking in recognizing valuable opportunities (Franzoni, 2007), it is important to provide training that develops individuals' competences related to networking. Such developmental training may, in turn, develop individual industry-related knowledge plans and guide them how to be more responsive to the entrepreneurial information and opportunities that exist within and outside of their organizations (Wang et al., 2013). Davidsson and Honig (2003) find that social capital, which is viewed as one of the main resources included in RBT, plays a significant role in OpRec. Therefore, it is important to maintain and develop relationships.

To understand how networking impacts the OpRec process, it is crucial to consider the different impacts of weak-tie versus strong-tie relationships. The former refers to infrequent interaction, such as intermittent acquaintances (Barringer & Ireland, 2016). Examples of these, from the perspective of universities, are networking with industry (Bramwell & Wolfe, 2008; Clark, 2001; Jacob, Lundqvist, & Hellsmark, 2003; Lazzeroni & Piccaluga, 2003; O'shea, Allen, Chevalier, & Roche, 2005; Wong, Ho, & Singh, 2007), networking government, which help in gaining huge support (Clarysse, Tartari, & Salter, 2011) and resources (Le & Nguyen, 2009; Yiu & Lau, 2008); along with networking with other universities (Ankrah, Burgess, Grimshaw, & Shaw, 2013; Bosetti & Walker, 2010). Along this line, it is worth mentioning that weak ties can be a gate that allows to access to novel resources (Aral, 2016).

On the other hand, strong-tie relationships refer to frequent interaction, such as ties with friends, family, co-workers (Barringer & Ireland, 2016) and colleagues (Rasmussen, Mosey, & Wright, 2015). This may indicate that internal networking can be one of the examples of strong ties. Internal networking can have a significant contribution to the success of

entrepreneurial initiatives (Miller, 1983; Rasmussen, Mosey, & Wright, 2011; Walter, Auer, & Ritter, 2006).

In this respect, it is worth mentioning, as proposed by Rasmussen et al. (2015), that while weak ties are significant for searching for potential opportunities in the market, strong ties contribute to better refining the existing opportunities. Therefore, it can be claimed that OpRec benefits more from weak ties, whilst on the other hand, strong ties can be more useful for the evaluation phase in the entrepreneurial process.

2.5.3 Entrepreneurial alertness

The first use of the entrepreneurial alertness concept to explain OpRec was by Kirzner in 1973 (Ardichvili et al., 2003). Kirzner (1979, p. 48) defines alertness as "*the ability to notice without search opportunities that have hitherto been overlooked*". This definition leads many scholars to believe that that possessing a high level of alertness can help individuals to identify entrepreneurial opportunities, even without an active search for them, or by only watching the phenomena (George et al., 2016). The author does not agree with the latter argument, because one of the three dimensions of alertness, according to Tang, Kacmar, and Busenitz (2012), is 'alert scanning and search'¹⁰, by which entrepreneurs are encouraged to scan and search extensively for opportunities to obtain a wider range of information and knowledge, which, in turn, can help them to enhance their awareness to the potential opportunities and threats (Amanatidou et al., 2012; Tang et al., 2012; Van Rij, 2010).

Tang et al. (2012) argue that alertness has become a central topic in the area of entrepreneurial opportunity. In fact, entrepreneurial alertness can be considered a significant dimension of entrepreneurship, because most entrepreneurs think that they are more alert than other individuals (Barringer & Ireland, 2016). More importantly, it is considered the 'sixth sense' of entrepreneurs (Barringer & Ireland, 2016). The above discussion supports the idea of considering alertness as one of the main factors that determine the OpRec process. In this regard, Baron (2008) argues that the role of alertness in OpRec can be enhanced through a positive affect. The latter argument shows the importance of the cognitive approach for alertness, and, in fact (as mentioned earlier) some scholars use cognitive properties synonymously with alertness.

In the context of entrepreneurial cognition, Alvarez and Busenitz (2001) argue that the way of thinking and making decisions plays a considerable role in recognizing entrepreneurial opportunities. Alvarez and Busenitz (2001) claim that a heuristic-based logic is a favourite for individuals with an entrepreneurial cognition orientation. Such logic helps them find new ways for developing and assembling resources. Doing so requires assembling sufficient relevant information, however, it is usually assembled in a non-linear way.

¹⁰ The other two dimensions are 'alert association and connection' (Campos, 2017; Tang et al., 2012) and 'evaluation and judgement' (Tang et al., 2012).

From the lens of RBT, Zaheer and Zaheer (1997, p. 1495) consider alertness as a cognitive capability. Therefore, they look at alertness as *"the manner by which firms proactively manage their networks to yield superior private information"*. In this regard, Pech and Cameron (2006) argue that OpRec might require lots of 'informational cues'. These cues can facilitate the process of OpRec if they meet substantial needs, as well as remaining consistent with the individuals' knowledge and passion.

Reviewing the literature of RBT reveals that gaining new information plays a considerable role in being entrepreneurially alert. Such a role is more noticeable when the new information is compared with what already is known (Gregoire et al., 2010). The above argument shows the significant role played by searching for different sources of information when recognizing entrepreneurial opportunities (Cooper, Woo, & Dunkelberg, 1989; Ozgen & Baron, 2007; Shane, 2003). In this respect, Ozgen and Baron (2007) argue that there are many different sources that entrepreneurs can depend on for acquiring the aforementioned information, such as: their current jobs (in particular R&D or marketing jobs), various work experience, and engaging in an active search for information and networking.

2.5.4 External environment changes

Table 2.2 shows that a large number of authors have a concern for environmental factors. This is important because the emergence of entrepreneurial opportunity requires an interaction between an individual and their environment (Renko, 2008). Changes in the latter, at both the macro and micro levels, help individuals obtain new information that can be employed to recombine resources in more effective ways (Siegel & Renko, 2012). This new information, along with existing competencies, motivates organizations constantly to find new opportunities, in order to grow and prosper (Shepherd & DeTienne, 2005). Buenstorf (2007) argues that industry development leads to the emergence of new opportunities, and, at the same time, may lead to the emergence of new entrepreneurs who are competent to deal with these opportunities. In addition, Charles (2003) and Arentz et al. (2013) argue that the socio-economic situation leads to the emergence of different opportunities. The above argument by Sinclair and D'Souza (2011) is that it is important to possess a situational awareness, as this kind of awareness helps entrepreneurs to identify unique entrepreneurial opportunity. Such an identification can be achieved through interaction between cognitive properties and information access.

de Jong and Marsili (2015) argue that 'technological dynamism' and 'demand growth' can explain how the changes in the external environment impact OpRec. With technological dynamism, it can be claimed that rapid technology advances contribute to creating new knowledge bases, which in turn can help entrepreneurs find ideas and solutions. As for demand growth, it can be argued that expanding the market assists entrepreneurs in gaining

resources, even those that are controlled by existing firms, in an easier way or/and less expensive way (de Jong & Marsili, 2015).

In the context of the changes in the external environment, Alvarez and Barney (2007) argue that seeing these changes, particularly in uncertain environments, as new opportunities rather than threats, requires possessing entrepreneurial cognition orientation. This discussion justifies the reasons that lead Zaheer and Zaheer (1997) to argue that there are two (cognitive) capabilities that are required to compete successfully in the rapidly changing environment: alertness and responsiveness. The former was discussed in the previous section.

As for responsiveness, Zaheer and Zaheer (1997, p. 1496) look at it as the capability that *"allows firms to gather superior private information by quick response to changing environmental signals"*. Thus, responding quickly to the changes in the external environment (Fiet, 2007) and obtaining unique information about the changes in the external environment, play a considerable role in recognizing entrepreneurial opportunities. Regarding the latter argument, Zaheer and Zaheer (1997) argue that the organizational capabilities that produce outstanding exclusive information help a firm to be at the forefront of the market and adapt to rapid environmental changes.

Having the above swift response may require risk taking, which is considered by Neill, Metcalf, and York (2017) as one of the factors that has an impact on the entrepreneurial OpRec process. This is due to the fact that entrepreneurs are known for their desire and ability to take the risks (Djankov, Qian, Roland, & Zhuravskaya, 2006; Hatt, 2018; Hébert & Link, 2006; Mordi, Simpson, Singh, & Okafor, 2010).

From the lens of RBT, Westhead et al. (2011) argue that the external environment can be considered a pool of resources. New firm establishment and development are impacted by the abundance of resources. Therefore, firms need to have proactive/reactive strategies to obtain the required resources. Navarro and Gallardo (2003) argue that proactiveness is one of the requirements that needs to be considered by universities to respond to the dramatic changes in their environment. The above arguments show the importance of resources in the external environment for OpRec, as the latter is considered the first step for the establishment of a new firm. The latter argument emphasizes the importance of possessing responsiveness capability for recognizing entrepreneurial opportunities.

2.5.5 Systematic search

It has been argued that much of the entrepreneurship literature shows that OpRec requires a systematic search. However, this approach is challenged by some scholars of entrepreneurship, who claim that OpRec occurs through recognizing the value of information that the individuals already possess (Ardichvili et al., 2003; Ardichvili & Cardozo, 2000). For

example, in their case study which aims to develop a model for the process of entrepreneurial OpRec, Ardichvili and Cardozo (2000, p. 116) find that systematic searching is not considered a factor that determines the OpRec process. This is because the result of their study shows that *"entrepreneurial opportunities are discovered not identified through purposeful search"*. Therefore, they argue that successful entrepreneurs, in most cases, discover entrepreneurial opportunities accidentally rather than searching for them systematically. In this connection, Hulbert et al. (2015, p. 623) argue that opportunities are recognized accidentally as a result of "being in the right place at the right time". Therefore, "being in possession of appropriate resources and being able to use them to take advantage of a sudden opportunity could be considered fortune".

In this respect, Ardichvili et al. (2003) argue that accidental opportunity discovery might be the outcome of high 'entrepreneurial alertness' when the entrepreneur is in a position of passive search, by which s/he is receptive and not taking part in a formal deliberate search process. Baron (2006) supports this view by arguing that high levels of alertness decreases the need for searching for opportunity. However, it is not necessarily the case that deliberate search for opportunities is the opposite of entrepreneurial alertness (George et al., 2016; Murphy, 2011). In addition to alertness, Dew (2009) believes that strong networking helps in recognizing opportunities serendipitously

The above arguments show that opportunity can be recognized either through systematic search or serendipitous discovery (Gaglio & Katz, 2001; Murphy, 2011; Renko et al., 2012; Sambasivan et al., 2009). The current thesis will consider systematic search as one of the factors that determines OpRec. This is because such a consideration will not ignore the fact that there is always room for the occurrence of a few things by accident, thus providing the flexibility needed to deal with this issue.

In terms of the active search for opportunities, Sambasivan et al. (2009) argue that entrepreneurs must engage constantly in the activities of deliberate search for opportunities if they want to be effective in finding viable business opportunities. Ozgen and Baron (2007), in this regard, argue that the opportunities identified for creating applicable new ventures somehow require perceiving, collecting, explaining and applying information about certain markets, technologies, sectors and any other factors that may affect the ventures. To enhance this role, Baron (2008) suggests that individuals need to have positive affects regarding active search for information. Possessing the above-mentioned factor helps the advocates of purposeful search to overcome suspicion in terms of whether the entrepreneurial opportunities are serendipitously discovered or deliberately identified.

2.5.6 Creativity

Schumpeter, in 1934, in his book "Capitalism, Socialism and Democracy", was the first to argue that successful entrepreneurs find opportunities that cannot be perceived by others

(Ardichvili et al., 2003). Schumpeter pays great attention to the 'creative abilities' to perceive the above opportunities (de Jong & Marsili, 2015). The emphasis of Schumpeter on creativity led him to establish the 'creation ontology' of entrepreneurial opportunity, as it has been discussed in section 2.4. This ontology has become one of the main approaches that can be relied on to understand entrepreneurial opportunities (de Jong & Marsili, 2015; Siegel & Renko, 2012). The above argument shows the importance of the creativity factor in understanding the cases related to opportunity phenomenon.

Hansen, Lumpkin, and Hills (2011) argue that the entrepreneurship literature shows that there is a growing association between entrepreneurial opportunity and creativity. The latter seeks to produce valuable and novel ideas (Barringer & Ireland, 2016; Heinonen, Hytti, & Stenholm, 2011; Koch, Wenzel, Senf, & Maibier, 2018). Therefore, entrepreneurial OpRec can be, at least partially, a creative process (Barringer & Ireland, 2016). More importantly, OpRec is considered an innovative action (Lumpkin et al., 2004; O'Connor & Rice, 2001). Moreover, Shane and Nicolaou (2015) find that recognizing entrepreneurial opportunities is expected more from individuals with creative personalities. To make the most of creativity, it is important to identify what can meet people's needs and what can be bought by those people, rather than what entrepreneurs are passionate about (Barringer & Ireland, 2016). Therefore, meeting people's needs is one of the main motives for OpRec (Marvel & Lumpkin, 2017; Shaw & Carter, 2007). Accordingly, connecting market information to creativity and innovation results in obtaining valid opportunities (Vaghely & Julien, 2010).

Because of the importance of creativity for OpRec, Shane and Nicolaou (2015) suggest that employers should take into consideration the creative personality criteria to select employees for activities where OpRec is essential, for example, through corporate entrepreneurship and product development. Therefore, it can be claimed that OpRec requires both entrepreneurial and managerial skills, as well as innovative individuals (Hulbert et al., 2015). This shows the importance of teamwork in promoting creativity (Folkestad & Gonzalez, 2010; Robinson, 2011). In this context, Barringer and Ireland (2016) emphasize the importance of teams of entrepreneurs, who usually possess creative skills, since this kind of team is considered a source of creativity for their organizations.

Baron (2008) argues that to enhance the creativity required for OpRec, entrepreneurs need a positive affect. This is because emotions can have an impact on the individuals while addressing issues, or dealing with opportunities (Lerner, Li, Valdesolo, & Kassam, 2015). Therefore, creative individuals who play a significant role in recognizing opportunities, need to be supported by the organizational context and mechanisms of organizational learning, since this kind of support may promote the creativity required for OpRec (O'Connor & Rice, 2001). In this respect, it is worth mentioning that 'Radical Innovation Hubs' can play a significant role in the aforementioned kind of support, as they are seen as a home for generating ideas (O'Connor & Rice, 2001).

Despite the above significant role played by creativity in OpRec, Ardichvili and Cardozo (2000) argue that an extraordinary level of creativity is not required for OpRec. Therefore, they did not include creativity in their model for OpRec, which they developed in 2000. This is because well-networked entrepreneurs to opportunities' sources might not need to have as much creative capabilities as those with a lack of networks (solo entrepreneurs). However, Ardichvili and Cardozo with Ray in 2003 developed another model for opportunity identification and development, in which creativity is then considered a key factor for the process of opportunity identification and development.

Reviewing the literature on RBT shows that innovation and creativity occupy a privileged position in this theory. Creativity is explicitly considered one of the capabilities included in RBT (Kellermanns et al., 2016; Newbert, 2007). The latter shows that one of the determinants of innovation are the resources (Hadjimanolis, 2000). More importantly is the argument of Colbert (2004), who proposes that proponents of RBT believe that a firm's resources with 'latent creative potential' and 'idiosyncratic capabilities' significantly contribute to gaining sustained competitive advantage. In fact, it can be concluded from the above argument that creativity, and any related activities, can be considered one of the more significance resources for recognizing entrepreneurial opportunities. This assumption can be supported by the argument that the expected result from recognizing entrepreneurial opportunities is to gain a competitive advantage (Alvarez & Busenitz, 2001).

Following the idea of some models of OpRec, for example Ardichvili and Cardozo (2000) model of the OpRec process, leads the author to claim that the process of OpRec requires those factors that lead to recognizing an opportunity to be simultaneously present (Renko, 2008).

Park (2005) argues that in practice there is a necessity to integrate business, entrepreneurial and scientific reasoning. This is in line with the literature, which shows that there are interactions between:

- (1) Networking and alertness (Adomako, Danso, Boso, & Narteh, 2018; Ardichvili et al., 2003; Khare & Joshi, 2018; Zaheer & Zaheer, 1997).
- (2) Networking and prior knowledge, where this interaction assists in determining customers and market problems (Hisrich et al., 2013).
- (3) Networking and creativity (Ardichvili et al., 2003).
- (4) Systematic search and networking. Ozgen and Baron (2007) emphasize the importance of 'opportunity-related information' through social sources, in particular 'informal industry networks', mentors, and involvement in 'professional forums'.
- (5) External environment changes and systematic search (Brouthers, Nakos, & Dimitratos, 2015).
- (6) External environment changes and prior knowledge, entrepreneurial alertness, networking and creativity (Barringer & Ireland, 2016).

- (7) Prior knowledge and creativity, since the former is considered one of the fundamental components of latter (Shepherd & DeTienne, 2005).
- (8) Prior knowledge and entrepreneurial alertness (Ardichvili & Cardozo, 2000; Hulbert et al., 2015).
- (9) Entrepreneurial alertness and creativity (Obschonka, Hakkarainen, Lonka, & Salmela-Aro, 2017).

Reviewing the literature relating to the interactions between the above factors shows that the nature of the interaction is two-way. The order of this effect depends of the context in which the phenomenon is studied. This review also shows that entrepreneurial OpRec may require an interaction between groups of cognitive/environmental factors. This could help in finding a mix of resources/capabilities, which reflect the factors included in this mix.

2.6 Models of Opportunity Recognition

Reviewing the entrepreneurship literature shows that a good number of OpRec models can be found. In this context, Ardichvili et al. (2003) claim that although a significant number of models have been developed for OpRec and/or opportunity development, these models rest on different (indeed, mostly incompatible) assumptions derived from various fields, ranging from Austrian economics theories to cognitive psychology theories. The above issue leads to an incomprehensive understanding of the process of OpRec/development. The author of this thesis believes that this still exists. There are two possible reasons for this - the first is that there is a lack of agreement on the concepts that explain and operationalize the entrepreneurial process. The second reason is that the aforementioned models include one or few aspects that determine the above-mentioned process (Ardichvili et al., 2003). One could argue that whilst considering only a few aspects of a process can help in obtaining a deeper understanding regarding the role played by each factor in facilitating that process, this does not negate the fact that not considering all factors of this process can lead to a poor understanding concerning how the process works.

Ardichvili et al. (2003) argue that despite the numerous attempts to provide a clear understanding of all those matters related to OpRec, a comprehensive theory for this phenomenon is still under development (Ardichvili et al., 2003). Therefore, OpRec research is still in its preliminary stage (Gaglio & Katz, 2001; Hill & Birkinshaw, 2010). The reason for the above is that entrepreneurial opportunity research is disconnected and empirically underdeveloped (George et al., 2016). This in turn may return to the assumption that studying issues associated to discovery are the most difficult issues for entrepreneurship research. However, at the same time, they can be considered the most important topics for the above-mentioned research (Davidsson & Honig, 2003). In this regard, George et al. (2016) recommend that there is a need for conducting more rigorous empirical studies of

OpRec, using both quantitative and qualitative approaches, and also investigating the OpRec process in various contexts.

The above arguments encourage the author of this thesis to present and evaluate the models of (or related to) OpRec. Doing so is significant for this thesis, especially when developing the empirical model, because looking at how other scholars develop their own models will direct the author to produce a robust model for OpRec.

Starting with the OpRec process model, which is developed by Ardichvili and Cardozo (2000), this model includes two main aspects: the first is those factors that facilitate OpRec: prior knowledge, entrepreneurial alertness and networks. The second aspect is the outcome of this process, which is successful OpRec. Although this model presents a simple view on OpRec, which is required in entrepreneurship research (Gartner, 1994), it does not provide a comprehensive picture of OpRec; for example, changes in the external environment and their impact on the OpRec process are not taken into account in this model. In 2003, Ardichvili and Cardozo, with Sourav, developed another model, which covers both opportunity identification and opportunity development. This model considers personality traits (creativity and optimism) in addition to the factors considered in the previous model. It also pays more attention to the interactions between those factors. Moreover, this model shows that the type of opportunity can play a considerable role in the opportunity identification and development process (Ardichvili et al., 2003). Although this model considers more aspects relating to opportunity identification than the previous model, it is not developed only for OpRec, rather the focus is on the opportunity development process, which includes both OpRec and opportunity evaluation.

A different perspective on OpRec has been provided by Lumpkin et al. (2004) who developed a creativity-based model of entrepreneurial OpRec, based on the 'classic psychological theory of creativity'. This model identifies two main phases for the OpRec process. The first one is the discovery phase, which includes preparation, incubation and insight. The second phase is the formation phase, which includes evaluation and elaboration. Although this model provides logical phases for recognizing opportunity, the factors that determine these phases are not considered, or at least are not mentioned explicitly. The above argument may indicate that this model restricts OpRec to creativity.

Based on cognitive frameworks, Baron (2006) develops a model which involves much detail about OpRec. This model starts with following up on the directions, events and changes in the external environment that can be perceived and interpreted through cognitive frameworks (e.g. prototypes and exemplars), which are impacted by knowledge and experience. Then, through searching and being alert, patterns can be perceived in those events, changes and directions. These patterns provide the foundation for new products, services or ventures (business opportunities). Although this model provides clear steps for recognizing opportunities, it does not take into account some significant factors, such as networking.

Rae (2007) presents the OpRec hexagon model of OpRec. This model consists of six dimensions: people, strategy, learning, market potential, innovation, investment. Each dimension has a group of factors that can be employed for assessing an opportunity to ensure whether it has high value. This model can be used as a guide to assist in deciding on business opportunities, as well as strategies required to exploit those opportunities. However, the factors included have not gained the consensus of entrepreneurship scholars.

Lim and Xavier (2015) propose a framework for OpRec, which considers five components: prior knowledge, alertness, networking, OpRec and business performance. This model is similar, to a large extent, to the model of Ardichvili and Cardozo (2000). Therefore, a comprehensive picture is absent in this model as well.

An evaluation of the models discussed in this section shows that there has not been a model that covers all six factors that determine OpRec. In addition, most of the above models are based on a theoretical basis, rather than a practical basis. Also, it can be claimed there are three concepts that play a significant role in understanding OpRec: process, cognition and creativity. This latter view is consistent with the arguments provided by both of Renko (2008) and Hulbert et al. (2015). For Renko (2008), she argues that the entrepreneurship literature shows that there are two approaches to studying OpRec. Firstly, the cognitive approach, which explains the behaviours and thinking of entrepreneurs through which lucrative and valuable opportunities are recognized and exploited. Secondly, the stage approach, which focuses on the inputs of the OpRec process. As for Hulbert et al. (2015), they argue that much OpRec research either deals with the process approach or the behavioural approach. In the process approach, the focus is on the steps of opportunity development. As for the behavioural approach, certain factors determining the OpRec are identified.

By evaluating the above two arguments, it can be argued that there is an overlap between them. This is because although the behavioural approach should reflect what is referred to by Renko (2008) as the cognitive approach, since it focuses more on the factors that determine OpRec. These factors, in fact, can be considered inputs for the OpRec process. Such inputs are the main focus of the stage approach of Renko (2008). This overlap indicates that OpRec research should be conducted by taking into consideration the two main approaches: cognitive (or behavioural) and stage (or process).

In addition to the issues discussed in this section that are related to OpRec, there are two further issues related to this phenomenon that are worth presenting and evaluating. The first is raised by Wang et al. (2013), who argue that the OpRec literature has paid inadequate attention to investigating the correlation between OpRec and its prospective outcomes, such as innovation and strategic renewal. In this respect, the author of this thesis claims that because OpRec is part of the entrepreneurial process (or rather the first stage in this process), the above-mentioned outcomes should be obtained from the process as a whole. The most

important outcomes for the OpRec process are opportunities that deserve evaluation for the purpose of exploitation.

The second issue is related to what has been claimed by O'Connor and Rice (2001), that a big part of the OpRec literature is focused on the significance and nature of the phenomenon, rather than understanding the role that can be played by the strong firm's capacity in supporting this phenomenon. The author of this thesis claims that although the main focus of the OpRec phenomenon research is on the expected contribution of this phenomenon to the entrepreneurial process, OpRec research does not ignore the factors that determine OpRec. However, as mentioned earlier, a comprehensive model that deals with the above-mentioned factors has not yet been found.

2.7 Entrepreneurial University

2.7.1 Entrepreneurial challenges facing universities

This purpose of this section is to clarify why universities need to be entrepreneurial. This question has become important, because many scholars discuss the reasons behind the emergence of this phenomenon (EntUni). For example, Etzkowitz (2013), Guerrero and Urbano (2012), Philpott, Dooley, O'Reilly, and Lupton (2011) and Sam and van der Sijde (2014) believe that the reason for the emergence of the EntUni is that is part of the "second academic revolution" and the "third mission of the universities", which called universities to contribute towards socio-economic development (Etzkowitz & Zhou, 2008; Farsi, Imanipour, & Salamzadeh, 2012; Gibb, 2009; Guerrero et al., 2015; Guerrero, Urbano, Cunningham, & Organ, 2014; Guerrero, Urbano, & Salamzadeh, 2014; Nelles & Vorley, 2010; Rómulo Pinheiro & Stensaker, 2014; Salamzadeh, Salamzadeh, & Daraei, 2011; Urbano & Guerrero, 2013).

Williams and Kluev (2014) add that today's universities need to behave entrepreneurially in order to commercialize their research and contribute to the knowledge-based economy. In this regard, Lundqvist and Williams-Middleton (2008) argue that universities can generate returns on investment through entrepreneurial activities. What makes this even more possible is that universities are considered a suitable environment for facilitating these activities (Baron, 2006). On the other hand, Coyle, Gibb, and Haskins (2013) argue that there are two main reasons for the emergence of this phenomenon. The first reason is that universities need to be entrepreneurial and proactive in exploiting opportunities in order to cope with the complex environment, which also includes a high level of uncertainty surrounding them. The second reason is the universities need to respond to the behaviours of those staff who have entrepreneurial tendencies.

In addition to the above reasons, some entrepreneurial universities, for example in Russia, emerged as a result of government initiatives aimed at boosting the impact of research and

entrepreneurship, as well as making them centres for 'regional innovation development' (Williams & Kluev, 2014).

For the above reasons, universities are challenged by industry, funding organizations, government (Todorovic, McNaughton, & Guild, 2011) and senior university management (Martin, 2016) to become more entrepreneurial. Actually, there are multiple challenges that motivate universities to shift towards the EntUni mode. Examples of these challenges are: "maintain research capacity, combining elite with mass Higher Education, offering lifelong education, independent thinking" (Guerrero, Urbano, & Salamzadeh, 2014, p. 163), responding to the demands of the government to find solutions for unemployment and economic issues, meeting employers' need and producing highly skilled graduates (Hannon, 2013).

Gibb, Haskins, and Robertson (2013) provide a comprehensive picture for the challenges that motivate universities to become more entrepreneurial. They divide these challenges into two groups. The first group focuses on eleven entrepreneurial environmental challenges: "the massification of higher education, the employability agenda, the student voice, developing entrepreneurial skills, the challenge of globalization, the internationalization strategies of universities, the global knowledge configuration, the knowledge transfer and engagement process, regional and local engagement, university funding, enterprise, autonomy and academic freedom and creating public value" (Gibb et al., 2013, p.6). By reviewing the work of Gibb et al. (2013) relating to entrepreneurial environmental challenges, it can be claimed that whilst presented as eleven separate components, these challenges interact with one another. Figure 2.1 is an attempt to map the discussion by Gibb et al. (2013) as a diagram.

The second group focuses on entrepreneurial organizational challenges, which in turn include the organization's development challenges (e.g. the need for moving from a 'community of scholars' towards a 'community of practice'), the governance challenges and the challenges resulted from behaviours of individuals with entrepreneurial predispositions.

The above arguments show that today's universities are internally and externally challenged to shift toward a more entrepreneurial mode. This may be the main reason for the growing interest in the EntUni concept by scholars and higher education institutions, governments and universities' stakeholders.

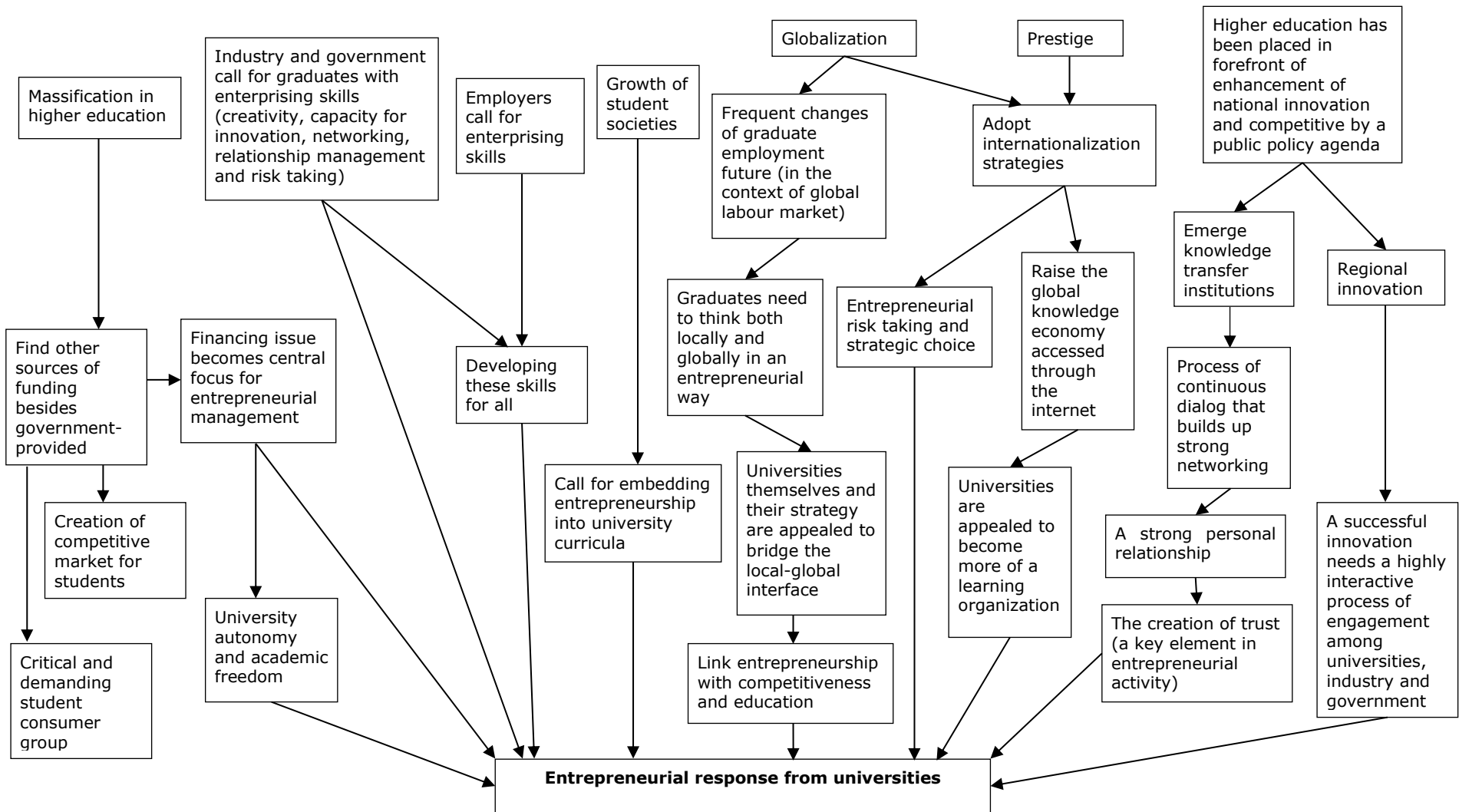


Figure 2.1 The overlap between entrepreneurial environmental challenges

Source: Author - drawing on the work of Gibb, Haskins and Robertson (2013)

2.7.2 Definitions and characteristics of entrepreneurial universities

EntUni, like other phenomena related to the entrepreneurship field, has been defined in various ways (Kirby et al., 2011; Meyers & Pruthi, 2011). Therefore, the consensus on a single definition does not exist yet (Jaminki, 2017; Kirby et al., 2011). Table 2.3 presents the definitions of the EntUni phenomenon.

Table 2.3 Definitions of the EntUni phenomenon

Author(s)	The main focus	Contribution to understanding the EntUni concept
Etzkowitz (1983)	Funding sources	To be an EntUni, the potential of new sources of funds are required: those sources can be come from patents, knowledge transformation and/or partnerships.
Clark (1998)	Creativity and maturity	EntUni seeks innovative business, fundamental transformation in organizational character, promising future and being a 'stand-up' university.
Subotzky (1999)	Partnerships, funding sources and professional management	EntUni is interested in establishing ties with the industry, reaching external sources of funding and establishing managerialism culture.
Kirby (2002)	Entrepreneurial culture	To be an EntUni, there is a need to adopt a culture that promotes creativity, OpRec, teamwork, risk taking, which responds to challenges.
Jacob et al. (2003)	Commercialisation and commodification	EntUni includes both commercialisation activities, such as consultancy services and outreach activities, and commodification activities, such as licensing, business start-ups, patents.
Zhou and Peng (2008)	Industry and economic development	EntUni impacts the process of industry and economic regional development through employing high-tech entrepreneurship, which is based on entrepreneurship capacity, impactful research and technology transfer.
Burykhina (2009)	Innovation technologies and profits	An institution which seeks to develop 'high-tech innovation technologies' as well as make profits.
	External environment	An institution which can operate within risky circumstances and changing demands.
	Commercialization	A fundamental institution which operates to create commercial companies.
	Income generation and risk management	The management structure, which is an institution in which the mission of senior management determines the developmental strategies of the income generation. Also, staff balance between earnings and risks when performing their jobs.
Salamzadeh et al. (2011)	Social and economic development	EntUni is a 'dynamic system', by which particular inputs (culture, structure, entrepreneurial capabilities, resources, instructions and mission as well as expectations of the society, government, industry and market) are converted to entrepreneurial human resources, entrepreneurial networks, innovations, entrepreneurial hubs and valid research for market needs. This conversion can be done through commercialization, research, teaching, development activities, managerial, logistical and financial processes, multilateral interaction, networking, innovations and development activities. The above process is done to achieve the third mission of universities.
Etzkowitz (2013)	Originating knowledge	A phenomenon that emphasizes expanding the role of the universities from a conservator to an originator of knowledge.
Sam and van der Sijde (2014)	Society and innovation	An institution that plays a significant role in developing society as well as the innovation (eco) system.
NCEE (2017a)	Supportive environment for entrepreneurship and socio-economic impact	Entrepreneurial universities develop an environment and culture that supports entrepreneurial behaviour, which in turn helps in having a positive impact on the economy and society.

Source: Author

By analyzing the above definitions, a group of characteristics can be found that distinguish such a university from other types of universities, which can be summarized as follows:

- (1) Entrepreneurial universities search for new resources of funding (Burykhina, 2009; Etzkowitz, 1983; Jacob et al., 2003; Salamzadeh et al., 2011; Subotzky, 1999). This is consistent with what has been claimed by Gibb (2009), that one of the EntUni characteristics is the ability to build its own independence, agreeing with the idea that the lowest funding of the university is provided by the government.
- (2) They pay great attention to innovation when carrying out their activities (Clark, 1998; Salamzadeh et al., 2011; Sam & van der Sijde, 2014).
- (3) They have a positive impact on the surrounding society as well as the businesses within this society (Etzkowitz, 1983; NCEE, 2017a; Salamzadeh et al., 2011; Zhou & Peng, 2008). This is consistent with the characteristics identified by Gibb (2009), Zhou and Peng (2008) and Sam and van der Sijde (2014). As for Gibb (2009), he claims that these kinds of universities are known as universities that adopt a 'commercialisation' notion to create value for the community and academia. Therefore, entrepreneurial universities have a significant impact on the region of industries and economy in which they operate (Zhou & Peng, 2008). In this context, Sam and van der Sijde (2014) argue that EntUni is characterized as university that develops itself (in terms of education and research) and its environment (third mission: transmission of knowledge); and it is able to organise the reciprocal dependency and the influence of the university's third mission.
- (4) They are an 'originator of knowledge' (Etzkowitz, 1983, 2013; Salamzadeh et al., 2011). This is in line with what has been argued by Gibb (2009), that one of the characteristics of EntUni is to pay great attention to the acquisition and integration of knowledge, as well as through sharing this knowledge with a more extensive community.
- (5) They help in creating new ventures (Burykhina, 2009; Jacob et al., 2003; Salamzadeh et al., 2011). In this regard, Gibb (2009) argues that an EntUni is known by supporting the establishment of 'science parks', 'incubators', 'technology transfer offices' and patent safeguard systems. The latter argument is supported by Zhou and Peng (2008), who argue that one of the characteristics of an EntUni is to activate the link between university and industry. Such an activation can be made through certain organizational techniques, for instance, through 'industry-university collaboration committees' and 'technology transfer offices'. These, according to Cassanelli, Fernandez-Sanchez, and Guiridlian (2017), help in establishing strong networking, which in turn contributes to improving the applicability of the research and increases revenues.

The above characteristics are significant for the present thesis, because all of them are in line with the motivations for conducting this research. In addition to the above-mentioned

characteristics, several scholars identify other characteristics for entrepreneurial universities, which are as follows:

- (1) They internally support entrepreneurial endeavours.
- (2) They involve themselves effectively in a more extensive 'stakeholder community'.
Such involvement can help them develop their organisational learning strategy.
- (3) They promote establishing 'interdisciplinary departments' and R&D hubs.
- (4) They take a broader obligation to student and employee development.
- (5) They seek to obtain entrepreneurial human resources.
- (6) They reward their staff according to criteria that go beyond those related to publications and teaching.
- (7) They make certain that the idea of 'entrepreneurship education¹¹' is established within the facilities used by core staff and merged with the educational program.
(Gibb, 2009)
- (8) They respond to opportunities in the external environment quickly, flexibly and strategically (Gibb & Hannon, 2006).
- (9) They have the ability to make progress within risky circumstances and within a changing business environment; they are able to preserve their economic competences (Burykhina, 2009).
- (10) They seek to move from theory to actuality, availing knowledge, forming new firms and controlling risks (Etzkowitz, 2013).

2.7.3 Criteria of entrepreneurial universities

In this section the criteria that can be used to decide whether a university is entrepreneurial will be discussed. This is significant for the present thesis because identifying these criteria helps in understanding what the indirect/contextual factors¹² are that can impact the OpRec process.

A very few studies examine these criteria explicitly. This is because "*many empirical researches focused on entrepreneurial orientation of university students, but studies on antecedents and criteria of the entrepreneurial universities are scarce*" (Mavi, 2014, p. 370). This thesis adopts the NCEE framework for judging whether a university is entrepreneurial as part of its conceptual framework. This framework was based on the work of Gibb (2005), and was later updated through considering the works of Gibb (2012, p. 3). This work focuses on "*exploring synergies in entrepreneurial university development*" that contribute to the achievement of strategic goals.

¹¹ The present thesis will use the term entrepreneurial education (Erkkilä, 2000). The latter includes three approaches: education 'about', 'for' (Co & Mitchell, 2006; Laukkanen, 2000) and 'through' entrepreneurship (Caird, 1990; Johnson, 1988; Mwasalwiba, 2010).

¹² Due to the importance of the context to the present thesis, the factors relating to entrepreneurial universities will be taken into account. These factors will be considered as contextual factors that have an indirect impact on the OpRec process.

The Gibb (2012) framework includes five main components. The first one focuses on the university's mission, governance and strategy. These in turn consider organizational design, organizational knowledge, techniques for leveraging public finance, and ways for measuring excellence and public value. The second component considers entrepreneurship education, including exploring potential, supporting entrepreneurial initiatives and developing entrepreneurship curricula. The third component concentrates on knowledge transfer, exchange and support, which in turn consider IP policies, science parks, spin-offs and incubators. The fourth component is stakeholder engagement, including local and regional partnerships, entrepreneurs, alumni engagement and social enterprise. The fifth component is related to internationalization by taking into account the sharing culture, student and staff mobility, overseas campus development and international partnerships.

The NCEE framework¹³ is inspired by the above framework and includes a number of criteria distributed over four groups, which are as follows:

- (1) Vision and strategy: entrepreneurial universities are those institutions that develop their strategies and vision in a way that considers entrepreneurship, enterprise and innovation as the central part of the university.
- (2) Culture and mindset: entrepreneurial universities create a supportive environment for entrepreneurial mind-sets and behaviours for both students and staff.
- (3) Entrepreneurial impact: entrepreneurial universities make a difference to the quality of entrepreneurial activity among students and alumni, as well as staff, in a way that can have a remarkable entrepreneurial impact, not only locally, but also nationally or internationally.
- (4) Policy and practice: the activities and experiences of entrepreneurial universities have an impact on policy at all levels. They also demonstrate effectiveness and good practices.

(NCEE, 2016)

There are three reasons behind choosing the NCEE framework to be part of the conceptual framework of this thesis. First, this framework, as mentioned earlier, is based on academic work. Second, it has been used to choose the winners of the THE EntUni of the Year Award. Third, it is the most comprehensive model with respect to the criteria used to judge whether a university is entrepreneurial.

In addition to the NCEE framework, there are four other views on EntUni criteria. These views have not been considered by the conceptual framework of the present research for reasons

¹³ The criteria used by NCEE have been updated three times. From 2008-2013 the criteria were institutional environment, student engagement, innovative and entrepreneurial staff and entrepreneurial impact. While, from 2014-2016 the criteria were culture and mindset, vision and strategy, entrepreneurial impact and policy and practice. In 2017, the fourth criterion was changed to influencing and improving the work of other institutions. This thesis uses those that were used at the time when the author of the present thesis collected the data in 2016 for this research.

that will be presented later in this section. One of these views belongs to Zhou and Peng (2008), who considers four characteristics of continuous participation in the societal technological innovation as the criteria of EntUni capacity, which is as follows:

- (1) Entrepreneurial universities commit themselves to conduct high-tech R&D in order to transfer technology and perform entrepreneurial activities.
- (2) They accept entrepreneurship in ideology widely and support it systematically.
- (3) Their resources of science and technology research are adequate.
- (4) They have the mechanisms required for engagement with industry. Examples of these include technology transfer offices and an industry-university collaboration committee.

(Zhou & Peng, 2008)

The above view is limited, because the criteria identified are insufficient to decide whether a university is entrepreneurial. Kirby et al. (2011) provide a more comprehensive view by identifying eleven criteria for the success of entrepreneurial universities; three of these are related to the first mission of universities: the number of students engaged in entrepreneurial programmes, the level of support for entrepreneurial initiatives of the students, and the number of programmes and courses relating to entrepreneurship. Four of the criteria are related to the second mission of universities: technology and knowledge transfer, courses relating to entrepreneurship research, gaining funds from both the industry and private sector, and the number of start-ups established and the amount of revenue generated. The remainder of the criteria are related to the third mission of universities: the funding system, the extent of university community involvement in funding efforts, disseminating entrepreneurial activities, and the nature of the university governance and structures.

Despite Kirby et al. (2011) offering eleven different criteria, the focus is only on the factors relating to the three missions of universities, ignoring, or at least not explicitly stating, other criteria relating to entrepreneurial staff, a supportive environment for entrepreneurship and embedding entrepreneurialism into the university's overall strategy.

Guerrero and Urbano (2012) develop a conceptual model of EntUni, which has also been employed by Mavi (2014), to measure EntUni outcomes. In this model, a number of criteria for such a measurement are identified. These criteria are: (1) environmental conditioning factors: entrepreneurship education programs, entrepreneurial organization and governance structure, role models, support measures for entrepreneurship and reward systems; (2) internal conditioning factors: financial capital, human capital, social capital, status, prestige and technological capital; (3) resources: physical, human, and commercial; and (4) capabilities: networking, location and reputation.

Despite the above model providing greater detail about the above-mentioned criteria, it could not provide a comprehensive picture of all the criteria that should be taken into consideration when judging whether or not a university is entrepreneurial.

With a view to encourage universities around the world to become more entrepreneurial and engaged, the University Industry Innovation Network (UIIN) has established the Accreditation Council for Entrepreneurial and Engaged Universities (ACEEU), which is managed by a group worldwide recognized experts in entrepreneurship and engagement (ACEEU, 2017; UIIN, 2016). ACEEU and its stakeholders are based on the belief that universities can substantially contribute towards socio-economic development. They envision universities to achieve the above contribution through becoming more entrepreneurial and/or engaged (ACEEU, 2016a). ACEEU offers both single accreditation (either entrepreneurial or engaged university) (ACEEU, 2016b).

In terms of EntUni accreditation, ACEEU has develop a framework to decide whether a university is entrepreneurial. This framework is composed of five dimensions, where each dimension includes a set of standards. The first dimension is related to the orientation and strategy (financial plans, institutional commitment and shared goals). The second dimension is related to the role of the EntUni in enabling its staff to take risks and behave entrepreneurially and intrapreneurially. This can be seen in the university's leadership, staff profile and reward system. The third dimension is focused on the drivers and enablers (the university's culture, internal supportive structures and compatibility with external services). The fourth dimension is concentrated on the three missions of entrepreneurial universities (education, research and external entrepreneurial activities of universities). The fifth dimension revolves around the innovation and impact. This can be seen in the university's programmes of continuous improvement, its influence within the ecosystem and the university's impact (ACEEU, 2017).

Despite the ACEEU framework providing a comprehensive picture of the criteria that should be considered when deciding whether a university is entrepreneurial, it is not certain whether this framework is based on academic work (as is the case for the NCEE framework). There is no indication from the ACEEU in this regard.

2.8 Opportunity Recognition and Entrepreneurial University

Before discussing the literature related to the relationship between OpRec and EntUni, it is worth mentioning two points. First, all universities are large organizations and behave in various ways as large corporations (Andreatta, 2012). Second, many universities are public service institutions (Drucker, 1994). These points are important because they will help in discussing the literature related to the role played by OpRec in entrepreneurial universities, and will also help us consider the arguments related to OpRec in large and public organizations. Doing so may help in providing a more comprehensive understanding of how universities can recognize opportunities.

With respect to public service institutions, Drucker (1994) argues that these institutions, as with other organizations, aim to grow. Therefore, in the absence of a profit criterion, size is

considered the most important criterion of success for these institutions. However, to achieve a growth goal, certainly, significant effort needs to be made, and new things need to be done, which may be painful and difficult for these institutions as significant shifts will await them (Drucker, 1994). In fact, engaging in entrepreneurship often assists in achieving growth goals, as well as enhances organizational performance via strategic renewal and discovering opportunities for creating new ventures (Lumpkin & Lichtenstein, 2005). In addition to the growth goal, these institutions are impacted by rapid changes in the macro-external business environment, which can concurrently become threats to public service institutions or create opportunities to them (Drucker, 1994).

The above arguments indicate that these institutions, including universities, need to be entrepreneurial and unconventional as businesses (or even more so). However, to be able to behave entrepreneurially, they need to learn how to be innovative. Therefore, the policies and practices of these institutions should include a continuous search for innovative opportunities. They also need to consider changes relating to economic, socio-cultural, technological and political variables, as opportunities, rather than threats (Drucker, 1994). Moreover, their leaders need to realize that all types of universities have the ability to foster departments' capabilities associated with reaching high commercial performance (Chang, Yang, Martin, Chi, & Tsai-Lin, 2016).

Accordingly, existing businesses need to expel exceptional effort to become innovative and entrepreneurial. This is because, as Drucker (1994) claims, entrepreneurship is not natural or creative, but rather it is work. Therefore, it needs to be strived for, learned and treated as a duty, as well as worked and practised. This is in line with has been argued by Day, Dean, and Reynolds (1998), that entrepreneurship could be somewhat learned, therefore, non-entrepreneurial organizations have an opportunity to learn from more entrepreneurial ones.

With regard to the role played by OpRec in large organizations, O'Connor and Rice (2001) identify a group of capabilities for recognizing opportunities in these organizations: (1) establishing a context for generating ideas and recognizing opportunities through; (2) developing the organizational enablers that assist in linking OpRec to external and internal sources of information; (3) paying constant attention to developing disconnected innovations, opportunities recognition and search for novel business opportunities; (4) encouraging and supporting informal networking; and (5) developing mechanisms that help opportunity recognizers obtain new ideas.

Returning to the argument relating to the importance of learning and innovation in becoming entrepreneurial, Drucker (1994) argues that there is a misunderstanding regarding the ability of large organizations to innovative, because there is a belief that these organizations do not (and also cannot) innovate. This is, according to Drucker (1994), not true for two reasons.

First, there are many large companies¹⁴ that have achieved excellent performance with respect to innovation and entrepreneurialism. The second reason is that bigness does not constitute an obstacle in the way of innovation and entrepreneurship. With respect to the latter reason, Drucker (1994) argues that despite large organizations dealing primarily with 'bureaucracy' and 'conservatism', which are significant hindrances to innovation and entrepreneurship, there are many large businesses that are considered as entrepreneurial organizations. Drucker (1994) adds that it is not size that impedes innovation and entrepreneurship, in fact it is the existing operations - in particular, the successful ones. Most importantly, large (or at least medium) businesses are more likely to overcome obstacles related to change the existing operations. However, to achieve that, continuous effort and attention is required.

The above discussions presented in this section motivates the author to claim that universities can be innovative and entrepreneurial and that they are more likely to control the obstacles of innovation.

Before discussing the role of OpRec in entrepreneurial universities, the author believes that it is important to present the models of the EntUni available in the literature. Such a presentation can have two advantages. First, it will help with identifying the position of the present thesis among the other studies. Second, it may show which of the above-mentioned models deals with the OpRec phenomena. This in turn can contribute to a better understanding of the relationship between OpRec and EntUni. Table 2.3 presents the above-mentioned models.

¹⁴ The examples of these companies, according to Drucker (1994), are: Johnson & Johnson, 3M, Citibank, Hoechst, ASEA, American General Electric Company and RCA.

Table 2.4 Models of entrepreneurial universities by published data

Model	Aim of the model	Elements of the model
Entrepreneurial transformation of universities (Clark, 1998)	To identify the pathways of entrepreneurial transformation for universities	<ul style="list-style-type: none"> - A strengthened steering core - An integrated entrepreneurial culture - A diversified funding base - An expanded developmental periphery - A stimulated academic heartland
Entrepreneurial paradigm (Etzkowitz, Webster, Gebhardt, & Terra, 2000)	To identify the processes associated with the essential changes in producing, exchanging and using knowledge	<ul style="list-style-type: none"> - Interface processes - Trans-institutional impact - Recursive effects - Internal transformation
Adaptive University (Sporn, 2001)	To identify the factors that support the universities that tend to become more entrepreneurial	<ul style="list-style-type: none"> - Environment - Culture - Mission and goals - Leadership - Governance - Structure - Management
Triple Helix (Etzkowitz, 2002)	To clarify how the interaction between university, industry and government establishes basis for innovation in a knowledge-based economy	<ul style="list-style-type: none"> - Industry: the production locus - Government: the contractual source - University: originator of the novel knowledge/technology
Entrepreneurial Research University (Rothaermel, Agung, & Jiang, 2007)	To identify what makes universities more entrepreneurial	<ul style="list-style-type: none"> - Factors related to university: Incentive system, status, location, culture, defined role and identity faculty, intermediary agents, policy, experience and technology - External factors: industry conditions and government policies - Entrepreneurial activity
Entrepreneurial Architecture (Nelles & Vorley, 2010)	To assist in implementing the third mission of the universities	<ul style="list-style-type: none"> - Structures - Entrepreneurial Strategies - Systems - Leadership - Culture
ENTRE-U (Todorovic et al., 2011)	To measure the entrepreneurial orientation of the universities	<ul style="list-style-type: none"> - Unconventionality - Research mobilization - Collaboration with industry - University policies perceptions
University entrepreneurial potential (Gibb, 2012)	To explore a strategic approach for the development of EntUni	<ul style="list-style-type: none"> - Entrepreneurship education - Stakeholder engagement - Governance, mission and strategy - Knowledge transfer and exchange - Internationalisation
EntUni Conceptualization (Farsi et al., 2012)	To develop a conceptual framework for EntUni that suits developing countries	<ul style="list-style-type: none"> - Resources: soft resources and hard resources. - Capabilities: resource absorption and management, status and localization, networks and partners and background - Mission: knowledge/technology transfer, entrepreneur generation, socio-economic development, applied research and establishing an entrepreneurial culture - Impeding elements: political behaviour and lobbying
Conceptual Model for Entrepreneurial Universities (López, 2013)	To clarify that being EntUni requires adopting the process of commercialization, which further requires institutional, human, financial and commercial resources	<ul style="list-style-type: none"> - Opportunity sources: faculty members, students, industry members and individuals holding a patent - Tangible and intangible: institutional, human, financial and commercial resources - Outcome: consultancy agreements, business start-ups, licensing, or spin-offs - Commercialization process: OpRec and discovery, development and assessment of potential business models, development of business prototypes and plans, evaluation and negotiation of entry strategies, commercialization and market entry
EntUni conceptual meta-model (Aranha & Garcia, 2014)	To develop a meta-model that collects, synthesizes and integrates the existing EntUni frameworks	<ul style="list-style-type: none"> - An integrated entrepreneurial culture - Capitalization of innovative - Knowledge - Entrepreneurial vision - Generation of innovative knowledge - Economic and social development. - Committed strategic leadership

Note: this table uses the exact terminology that have been used by the authors for the elements of the models considered.

Source: Author

Two main arguments relating to EntUni can be raised by analyzing the contents of Table 2.3. First, EntUni is a very broad area, therefore, one model cannot cover all factors that influence universities that move towards entrepreneurial universities, as well as the activities carried out by entrepreneurial universities. The above argument clarifies why there is no single definition for the EntUni phenomenon. It also justifies why different types of EntUni can be seen in different contexts. The second argument is that the common dimensions, which are mentioned by at least three authors, among the models pretended in Table 2.3 are: culture, knowledge, mission, structure, governance and Leadership.

Analyzing the contents of the Table 2.3 also shows that all the models (except one) do not pay attention to the role of OpRec in shifting towards becoming an EntUni. The one in which OpRec is considered focuses on the commercialization process and only a few details are provided about OpRec. Therefore, it can be argued that there have not been sufficient studies that highlight how entrepreneurial opportunities can be recognized in entrepreneurial universities. Furthermore, the existing studies do not provide sufficient detail about those resources required for the above-mentioned recognition, as well as the factors that determine the process.

For the relationship between OpRec and EntUni, Siegel and Renko (2012) argue that OpRec is a requisite action for commercializing the technologies and science of universities. This argument can be supported by the model developed by López (2013), which can assist in encouraging and facilitating the development of commercialization at universities, and thus helps in shifting to the EntUni mode. In this model, López (2013) argues that opportunities sources in universities are the faculty and students, individuals with patent grants and industry partners. In addition, this model shows that the first step to developing commercialization at universities, and of course for being an EntUni, is OpRec and discovery. Developing this model shows that commercial resources are required for identifying and exploiting entrepreneurial opportunities by entrepreneurial universities (López, 2013). It also indicates that providing the most recent technologies may assist in recognizing opportunities, as these applications might create new businesses (López, 2013). Moreover, it reveals that EntUni's climate provides structures that entrepreneurially support the discoveries to be translated into new ventures (López, 2013). Vohora et al. (2004) identify four junctures in the establishment of the university spin-outs process: OpRec, venture credibility, entrepreneurial commitment and venture sustainability.

Another argument that highlights the importance of OpRec in EntUni is presented by Sam and van der Sijde (2014), who argue that entrepreneurial universities are vigorously discovering and exploiting opportunities in order to develop themselves (in terms of education and research) and their environment (third mission: transmission of knowledge), and they are further able to organise the reciprocal dependency and the influence of the university's third mission.

One way for universities to achieve the above-mentioned impact is to enhance research ambidexterity. This has been connected to the EntUni context by Chang et al. (2016), who consider the individual antecedent for developing ambidexterity as OpRec. They find that there is a positive and significant correlation between OpRec and individual research ambidexterity. Accordingly, universities' members can facilitate research ambidexterity through developing their OpRec capabilities. Doing so alongside organizational and institutional support (e.g. the provision of better resources) can play a considerable role in becoming entrepreneurial universities.

In terms of the factors that determine OpRec in universities, Franzoni (2007) argues that competencies and information existing in teaching and research activities are considered sources of outstanding OpRec. This argument shows the importance of the knowledge in recognizing opportunities within different contexts. In this respect, Vohora et al. (2004) find that although universities and academics possess considerable technological experience, there has not been adequate knowledge about how the market can be served, and there are no realistic expectations about the earnings that can be obtained from their discovered technology. The above argument shows that universities need to possess the two domains of knowledge, that is, special interest knowledge and industry knowledge, in order to be effective in recognizing opportunities.

Ardichvili and Cardozo (2000) call on other scholars to test their model of the entrepreneurial OpRec process in public, non-profit and other non-private organizations, where their missions and performances are evaluated differently from those of private sector organizations. This above call is due, since these organizations are challenged to behave entrepreneurially and find new opportunities concerning self-financing. In this regard, Wardale and Lord (2016) identify ten practices that assist in obtaining funding from industry: seize opportunities, tactical, relationship building, energy, solution focused, strengths, feedback, reciprocity, engage in the process and exchange rate¹⁵. By analysing these practices within the entrepreneurial process stages, Wardale and Lord (2016) find that seven of these practices can support OpRec: seize opportunities, relationship building, energy, tactical, engage in the process, solution focused and reciprocity.

2.9 Conceptual Framework

As the main aim of the present thesis is to grasp how entrepreneurial opportunity can be recognized in the context of entrepreneurial universities, the conceptual framework is developed based on both the factors that determine the OpRec process and the factors relating to entrepreneurial universities. The framework is also impacted by the principles of RBT. Therefore, it can be said that the conceptual framework shown in Figure 2.2 is a product

¹⁵ The author of the present thesis uses the exact words that used by Wardale and Lord (2016) for the ten practices mentioned above.

of a combination of three main components of the determinants of OpRec, the factors that distinguish entrepreneurial universities from others and RBT.

With the respect to the first component, the main factors were selected from Table 2.2. Each of these factors is impacted by some other factors, which actually can be considered as sub-factors that determine the OpRec process. Below is a brief presentation of both the main factors and the sub-factors that impact on the above-mentioned process:

- (1) Prior knowledge and experience, which include special interest knowledge, knowledge about industry, knowing how to manage organizations, knowing how to gain financial capital, and business ownership experience.
- (2) Networking, which involves both internal and external networks. With respect to external networking, the focus is on those with industry, government and other universities.
- (3) Entrepreneurial alertness, which considers alert scanning and search, alert connection and association and judgement and evaluation.
- (4) External environment changes, which need to be dealt with through effectively responding to changes in the external environment factors, being quick, taking risks and being proactive/reactive.
- (5) Systematic search for opportunities, which needs to be constant and may require positive affects.
- (6) Creativity, which requires producing novel ideas, meeting people's needs, teamwork, individuals with creative personalities and positive effects.

It is worth mentioning here that some of the above factors, as shown in Section 2.5 of this chapter, interact with one another. Such an interaction can impact the nature of the resources/capabilities required for facilitating the OpRec process.

For the second component, the criteria that help in deciding whether a university is entrepreneurial are considered as the factors that can indirectly impact the OpRec process. These can be called contextual factors, which, according to the NCEE framework adopted by this thesis, are distributed over four groups: culture and mindset, vision and strategy, entrepreneurial impact and policy and practice (see section 2.7.3).

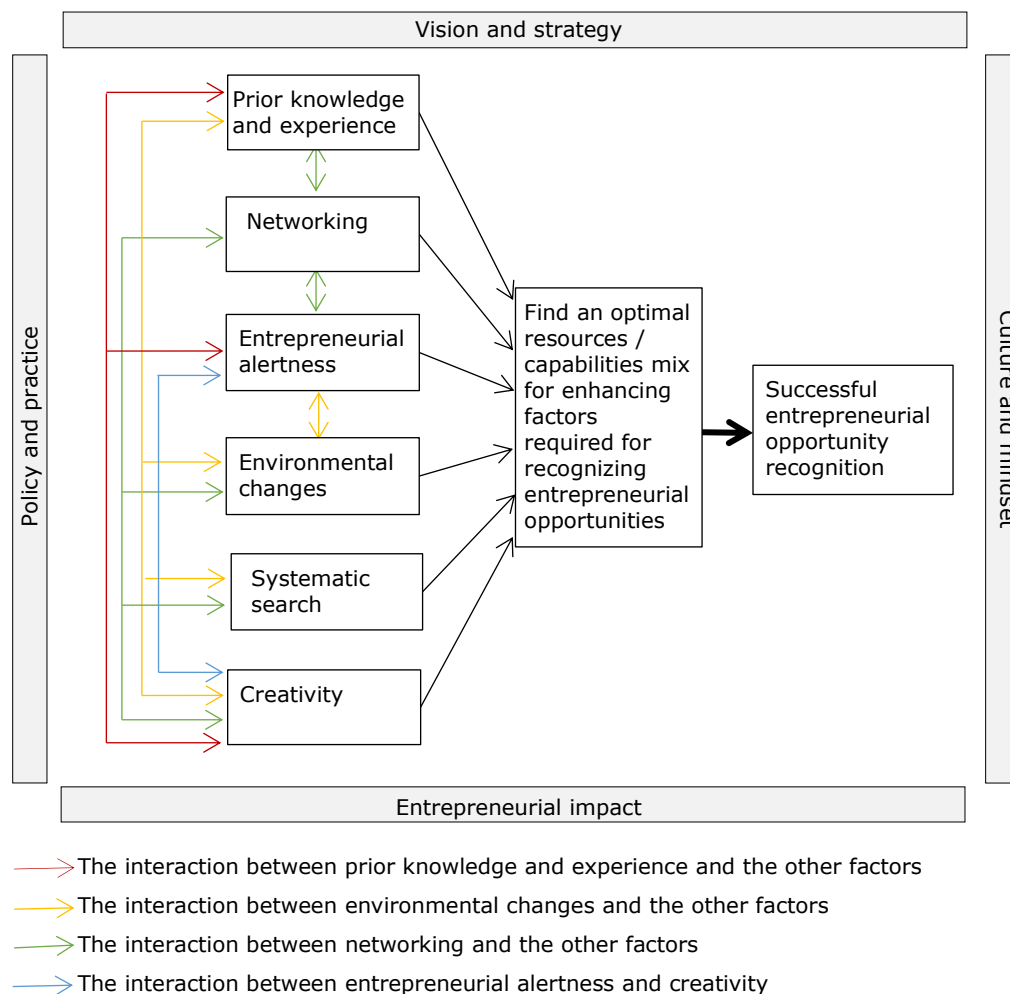


Figure 2.2 The conceptual framework

Source: Author

As for the third component, the idea behind finding an optimal mix of resources and capabilities is the most obvious principle of RBT in the conceptual framework. These resources and capabilities are determined by both the six factors that determine the OpRec process and the factors relating EntUni. Here, it is worth mentioning that the above-mentioned mix may vary while recognizing different types of entrepreneurial opportunities, because some opportunities are impacted more by certain factors when compared with others. For instance, some opportunities may require more networking, others may rely more on creativity and so on. Thus, it can be claimed there is no single scenario for the OpRec process. Each type of opportunity may require a different scenario, however, this does not mean that the main principle is different, because according to the conceptual framework developed by this thesis, the OpRec process, for all types of entrepreneurial opportunities, is determined by a number of factors that are suitable for all contexts, but it may be impacted by the contextual factors as well. In addition, it may be influenced by the beliefs of the opportunity recognizers. Those beliefs, according to this thesis, are related to the importance of resources and capabilities for OpRec.

2.10 Chapter Summary

In this chapter, the main areas of entrepreneurial OpRec and EntUni (as well as the RBT) have been reviewed. In doing so, several knowledge gaps relating to OpRec in the context of EntUni have been identified. Also, the above review has contributed to making a number of propositions, which in turn help in developing the conceptual framework of this research. The main views that have been obtained from presenting this chapter are listed below:

- (1) Entrepreneurial opportunities can be recognized by some people, but not by everyone.
- (2) The opportunity discovery process and opportunity creation process are not contradictory, rather each process is valuable under different situations.
- (3) Entrepreneurship literature pays great attention to six of the factors that determine the OpRec process: prior knowledge, networking, entrepreneurial alertness, external environment changes, systematic search and creativity.
- (4) The factors that determine the OpRec process need to be presented simultaneously in order to recognize entrepreneurial opportunities.
- (5) There is interaction between some of the factors that determine the OpRec process.
- (6) Resources and capabilities play a considerable role in recognizing entrepreneurial opportunities; therefore, there is a need to find an optimal mix from these resources and capabilities for enhancing factors required for recognizing entrepreneurial opportunities
- (7) Universities need to look at changes as opportunities to behave entrepreneurially.
- (8) Universities need to be fully entrepreneurial in order to grow and improve their performance, as well as respond to the external environment changes.
- (9) Universities can be judged based on whether they are entrepreneurial by a number of criteria distributed over four groups: culture and mindset, vision and strategy, entrepreneurial impact and policy and practice.

The above views have directed many aspects of this research, and some of them have greatly contributed to the development of the conceptual framework of the present research. Therefore, they can be considered the foundations upon which research is based.

Chapter Three: Methodology

This chapter discusses the methodology followed to conduct the research and assesses the quality of its outcomes. The chapter is divided into three parts. The first presents the four main methodological considerations, which are the philosophy that underpins the present thesis, logical reasoning, methodological choice and the strategy followed to conduct research. The second part considers the procedures employed to collect and analyse the data of the present research. Then, in the third part, the four criteria used to judge the quality of social science research are presented.

3.1 Methodological Considerations

3.1.1 Research Philosophy

A research philosophy is described as “*a system of beliefs and assumptions about the development of knowledge*” (Saunders, Lewis, & Thornhill, 2016, p. 124). In social science fields, there are a number of frameworks (see Table 3.1) that elucidate such a philosophy and underpin research attempting to explain reality. This leads to the emergence of different types of realities. Therefore, social science researchers need to think seriously about the importance of understanding the philosophical frameworks on which their research is based. In this regard, McGregor and Murnane (2010) believe that both quantitative and qualitative methods need to be harmonized with the research philosophy. Quinlan et al. (2015) go further by arguing that the philosophy that underpins research can be observed in all phases of the research process.

The above arguments show that a correct understanding of the philosophies dominating the social world results in an accurate understanding of methodologies that are followed in social science research. This, of course, helps with conducting valid research, thus contributing to the body of knowledge by creating novel knowledge. The latter may provide new interpretations of social science phenomena, thus finding new solutions or developing new ways to deal with issues that are facing a given group of individuals, organizations or communities.

Table 3.1 The philosophical frameworks of social sciences

	Positivism	Postpositivism	Constructivism	Feminism	Queer Theory	Ethnic	Marxist	Cultural studies	Critical theory	Post-modernism	Participatory	Pragmatism	Social Constructionism	Hermeneutics	structuralism	Critical realism	Transformative framework	Disability theories	Intpretivism	Post-structuralism	Symbolic Interactionism	Functionalism	Realism
Denzin and Lincoln (2011)	✓	✓	✓	✓	✓	✓	✓	✓															
Lincoln, Lynham, and Guba (2011)	✓	✓	✓						✓	✓	✓												
Wahyuni (2012)	✓	✓	✓									✓											
Easterby-Smith, Thorpe, and Jackson (2012)	✓			✓					✓	✓		✓	✓	✓	✓								
Creswell (2013)		✓	✓	✓	✓				✓	✓		✓					✓	✓					
Mertens (2014)		✓	✓									✓					✓						
Quinlan et al. (2015)	✓		✓	✓					✓	✓				✓	✓				✓	✓	✓	✓	
Saunders et al. (2016)	✓									✓		✓							✓				✓
Total	6	5	6	4	2	1	1	1	4	5	1	5	1	2	2	1	2	1	2	1	1	1	1

Notes:

- (1) There are certain other views that consider philosophical frameworks, however, they have not been included in this table because they have been considered an element of epistemological/ontological assumptions.
- (2) Only eight views are considered in this table, although there are many studies that address topics relating to research philosophy. This is because the views considered provide a clear picture of the classification of philosophical frameworks.
- (3) Constructivism and social constructionism are not considered a single framework in this table because although they are used interchangeably in many cases, there are some difference between them. The most important of these is that in the constructivism framework the "*reality construction is a private, mental process that is triggered by engagement in the social and physical world*". However, the social constructionism framework considers "*reality construction as a purely social process*". Therefore, the notion of a 'private mental process' is not appreciated by the social constructionism framework (McNamee, 2018, p. 361).

Source: Author

Table 3.1 shows that positivism and constructivism have gained the attention of most of the authors whose classifications of philosophical frameworks are considered in the above-mentioned table. There could be two broad explanations for such attention, the first being that both positivism and constructivism are really the most prevalent philosophical frameworks in social science research (Shkedi, 2005). A second explanation is that some of the above-mentioned authors may have discussed the philosophical underpinnings from a qualitative research perspective.

Table 3.1 also shows that post-positivism, postmodernism and pragmatism have gained the attention of five authors whose views are considered in this table. Therefore, they will be compared (as shown in Table 3.2) with positivism and constructivism in order to make the philosophical position of the present thesis clearer. Before detailing this comparison, it is important to point out that qualitative researchers consider four philosophical assumptions when they conduct their research. These are ontological, epistemological, axiological and methodological assumptions (Creswell, 2013); such assumptions can establish a basis for comparison between the philosophical frameworks.

Table 3.2 A comparison between five philosophical frameworks

		Philosophical frameworks				
		Positivism	Postpositivism	Constructivism	Pragmatism	Postmodernism
Philosophical Assumptions	Ontology: What is reality?	Naïve realism: reality is real; realities exist and can be discovered.	Critical realism: reality is real but it is probabilistically and incompletely understood or perceived.	Relativism: there are multiple realities that are constructed through the social interactions and lives experiences.	Reality is what is practical, valuable and workable.	Participative reality - subjective-objective reality: reality is formed by minds and surrounding cosmos. Single reality cannot be found, rather, there are multiple viewpoints/interpretations.
	Epistemology: How reality is known?	Dualist/Objectivist: findings are authentic; reality can be revealed through a 'one-way mirror'.	Modified dualist/Objectivist: findings are probably authentic, therefore, there is need for triangulation.	Transactional/subjectivist: knowledge is derived from social construction assumptions.	Accepted knowledge is produced by either or both subjective and objective stances.	Inter- subjectivist ¹⁶ : findings are co-created; multiple ways of knowing are required.
	Axiology: What is the role of values in research?	Value-free and etic: Researcher is unbiased and independent of the data; therefore, positivism research is purely objective.	Value-laden and etic: researcher is somewhat biased because they are influenced by the world perspectives, culture, background and experiences.	Value-bond and emic: Researchers, in many cases, are subjective because they are part of the topic being studied.	Value-bond and etic-emic: Values play a fundamental role in the interpretation of the results.	Value-constituted research: researcher is thoroughly reflexive.
	Methodology: What is the model behind the research process?	Mainly focuses on testing theory/theories. The research methods which are therefore used are quantitative, these include: experiments, questionnaire, and the testing of hypotheses.	Aims mainly at the falsification of hypotheses. Uses quantitative methods but it may also consist of qualitative methods.	The philosophy concentrates on the generation of theory. Research methods which are used are for example: in-depth unstructured interviews, observations and the use of grounded theory research.	Mixed, or as known by some theorists, multi-methods research design, i.e. the use of quantitative and qualitative research methods.	The philosophy believes that there is not an ideal method for gaining knowledge. Therefore, there is a variety of data types, typically qualitative methods of analysis.

Source: adapted from Creswell (2013), Easterby-Smith et al. (2012), Lincoln, et al. (2011), Wahyuni (2012) and Saunders et al. (2016).

¹⁶ Inter-subjectivist refers to "the variety of possible relations between people's perspectives" (Gillespie & Cornish, 2010, p. 19).

Table 3.2 shows that reality in positivism exists and that there is one reality that can be revealed through testing theories. As for postpositivism, although reality exists, it can be perceived probabilistically and incompletely. Therefore, triangulation is needed for postpositivism research. On the other hand, the notion of multiple realities is appreciated by constructivists, and the knowledge of constructivism research is a product of social constructions. Table 3.2 also shows that reality in pragmatism research is what is beneficial, feasible and workable and knowledge here can be produced by either (or both) subjective and objective meanings. As for postmodernism, reality is participative; it is created by the mind and the surrounding cosmos, and requires multiple ways of knowing.

Thus, it can be claimed that despite the fact that none of the above mentioned framework fully fits the nature of this study, constructivism is the most appropriate philosophical framework for underpinning the present research. This is because the constructivism framework acknowledges various interpretations and also appreciates knowledge that is created based on opinions and social interactions. These can be helpful when conducting research wherein its main themes have no single or universal definition, but rather they accept various views. Here, Creswell (2013) argues that within the constructivism perspective, individuals develop a number of multiple and varied subjective meanings, relying on their own experience. Typically, these meanings are historically and socially negotiated. They are a result of both the interactions between individuals and the historical customs and traditions prevailing in the communities of these individuals. In fact, such meanings lead researchers to examine complicated views, rather than address meanings with limited ideas or categories (Denzin & Lincoln, 2000).

The above discussions show that the constructivism framework plays a remarkable role in conducting qualitative research. In this regard, Creswell (2013) believes that qualitative researchers understand that their own backgrounds affect their methods of interpretation; they position themselves in their research to show that their interpretations are impacted by their historical and cultural experiences. These researchers, therefore, seek to translate the meanings (views) by which the world is viewed by others into research. The above view is often the main reason that causes a number of researchers to describe qualitative research as interpretive research.

To understand more about the appropriateness of the constructivism framework in underpinning the present research, it is important to address the ontological, epistemological, axiological and methodological assumptions of this framework. This will be done in the next four sub-sections.

3.1.1.1 Ontological assumptions

In social science, ontological assumptions are related to the nature and characteristics of reality (Creswell, 2013). Saunders et al. (2016, p. 722) believe that ontology is a "*branch of philosophy concerned with assumptions about the nature of reality or being*". Despite having some agreement on the ontology notion, a single way to interpret the social world has not yet been found. This is because each group of scholars have a different ontological perspective (Sekaran & Bougie, 2013). Such a difference is due to the perception of how things vary from person to person, and also from one context to another. Thus, to define the ontological stance of a study, there is a need to consider the phenomena, entities or social realities under study (Mason, 2002).

Ritchie, Lewis, Nicholls, and Ormston (2013) believe that social science research was formed by considering two ontological stances: realism and idealism. The former asserts that in the social world reality is independent from the social actors who take part in it. Realism proponents believe that reality is recognized through the senses (Matthews & Ross, 2010). On the contrary, idealism confirms that reality, in principle, is mind-dependent. Therefore, it is possible to be recognized through social constructions and human reasoning (Ritchie et al., 2013).

Reviewing the literature indicates that the idealism ontology, to a relatively large extent, is more suited to explaining the nature of reality according to the constructivism paradigm. That is why constructivists are relativists, and believe that there is no one reality, rather, multiple interpretations or realities for social phenomena can be found (Denzin & Lincoln, 2011; Lincoln et al., 2011).

In terms of entrepreneurship research, Kirby et al. (2011) argue that there is no consensus on the entrepreneurship concept. This leads entrepreneurship researchers to accept the notion of multiple realities, which can help when developing new concepts, and it is also an applicable concept in different contexts. This is valuable for the entrepreneurship field because, for example, what is considered entrepreneurship in developing countries may not be considered the same in developed countries (Lingelbach et al., 2005). Not only this, but the entrepreneurship concept in public sector organizations is not treated in the same way as in private organizations (Kearney, Hisrich, & Roche, 2009); the same applies to large organizations, which look at entrepreneurship differently from small and medium enterprises (SMEs) (Carrier, 1994). Differences in dealing with the notion of entrepreneurship by organizations with a different context, nature and size have led entrepreneurship scholars to develop various terminologies relating to the entrepreneurship phenomenon, such as corporate entrepreneurship, intrapreneurship and social entrepreneurship. Thus, it can be claimed that ontologies that promote relativism and multiple realities can contribute significantly to interpreting phenomena related to the entrepreneurship field.

3.1.1.2 Epistemological assumptions

Epistemology is seen as “*the theory of knowledge and how we know things*” (Matthews & Ross, 2010, p. 23). Therefore, the relationship between knowers (respondents) and the one(s) who will be the knower (the researcher(s)) contribute remarkably to understanding such a stance (Ponterotto, 2005). Ritchie et al. (2013) argue that, in social science research, the best way to obtain knowledge is considered one of the main epistemological issues.

In general, it can be argued that the main focus of epistemology is the methods of creating novel knowledge, and thus adding to the knowledge body. In this regard, it is important to point out that researchers need to provide good justifications for the arguments raised in their research, especially those related to developing new ideas. Reasonable justifications are also required for the methods used for conducting research that contributes to creating new knowledge. Doing so will allow for criticising, judging and accepting or rejecting the knowledge being created (Quinlan et al., 2015).

Along these lines, Creswell (2013) argues that the creation of new knowledge must be based on current situations and the various viewpoints of the members of communities under examination. This may indicate that developments and changes can be one of the best sources for obtaining new knowledge; it also indicates that obtaining knowledge may require thinking of new ways and considering different perspectives, all of which can change over time. This supports the view of Grix (2010), wherein knowledge and the methods used for exploring it are changing. Such changes push researchers to keep up with research methods developments.

To ensure that the best methods are used for obtaining the target knowledge, the questions asked and designs used need to be formed by considering both ontological and epistemological stances (Cameron & Price, 2009; Leitch, Hill, & Harrison, 2010). In fact, relative views on a certain social phenomenon can be different due to the different ontological and epistemological stances of each group of researchers (Grix, 2010). This is why there should be an integration between the answers gained from epistemological questions and the answers from ontological questions (Mason, 2002). This strong relationship between epistemological and ontological assumptions is depicted in Figure 3.1.

From the constructivism perspective, epistemology is based on subjectivity (Denzin & Lincoln, 2011) and concentrates on the details of a situation and the realities that can be created from those details (Wahyuni, 2012). Then, the knowledge created is based on social construction assumptions (Lincoln et al., 2011), by which multiple knowledge/realities can be realised by facing different circumstances, as well as using various ways of knowing. This, of course, is valuable for entrepreneurship research, because, as mentioned in Chapter Two, entrepreneurship is considered a multidisciplinary field of research (Hills, 2003). Therefore, contributing to the entrepreneurship body of knowledge requires underpinning

entrepreneurship research with perspectives that promote pluralism, comprehensivity and diversity (Leitch et al., 2010). Constructivism can be considered a perspective that can provide such features. In addition, “*entrepreneurship research aims at creating understandings of how and why actors interpret and construct entrepreneurial processes*”. This could lead researchers to become less interested in conducting deductive research, because knowledge can be created as a result of interaction between individuals and their environment (Lindgren & Packendorff, 2009, p. 33).

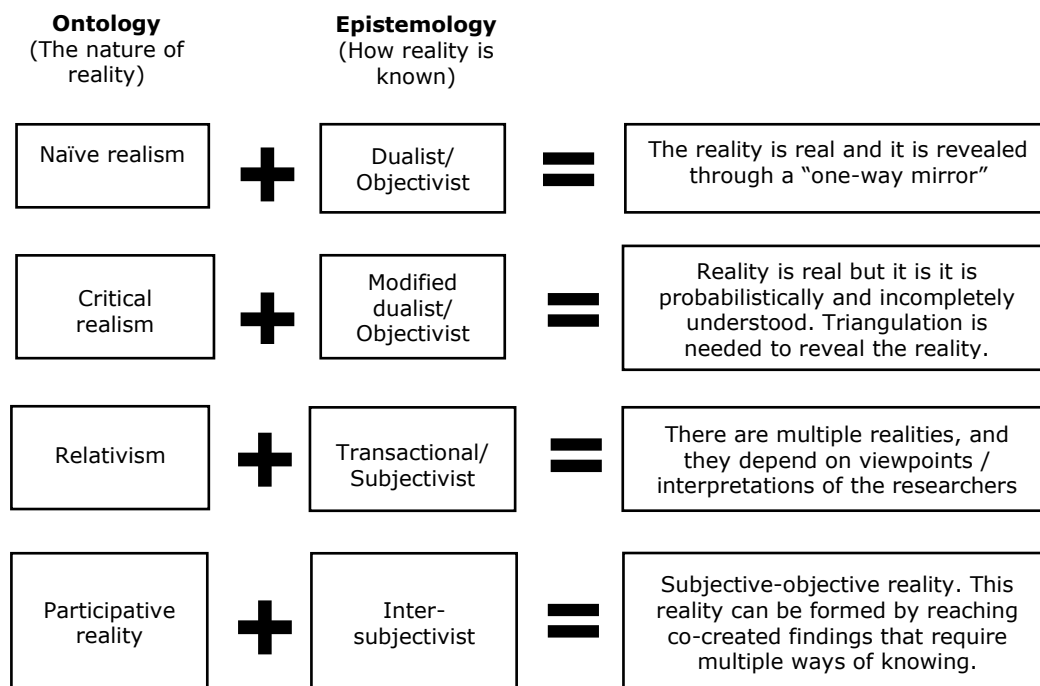


Figure 3.1 The relationship between ontological and epistemological assumptions

Source: Author

3.1.1.3 Methodological assumptions

The previous section shows that there is a robust relationship between epistemology and ontology. However, reviewing the work of Hay (2002) and Easterby-Smith et al. (2012) shows that considering methodological assumptions is important to make the above relationship even stronger, because methodology follows from the ontological and epistemological stances (Easterby-Smith et al., 2012). Hay (2002) argues that research ontology precedes research epistemology, which in turn precedes research methodology. In the same context, Fleetwood (2005) stressed the importance of having a strong relationship between the above philosophical assumptions, namely, how researchers believe reality to be (ontology), and how it influences what knowledge can be produced about this reality (epistemology), and that such knowledge can be investigated by using different methods (methodology). The latter is described by Quinlan et al. (2015, p. 397) as “*the overall approach to the research project;*

the way in which the research is carried out; a means of supporting the philosophical assumptions that underpin the research project”.

Hence, methodology deals with all research considerations by developing a research question to present the research findings. Therefore, methodology books include many aspects of research, such as logical reasoning, approach, strategy and methods. These will be addressed in the next sections of the present research.

3.1.1.4 Axiological assumptions

Saunders et al. (2016, p. 711) look at axiology as “a branch of philosophy concerned with the role of values and ethics within the research process”. So, it is concerned with the value stance taken by the researchers (Creswell, 2013). This raises questions regarding how these researchers could address their own values and also those of the research participants (Saunders et al., 2016). Considering these values is very important because they have a considerable impact on a number of the research process aspects, such as developing the research question(s), choosing the research paradigm, developing the theoretical/conceptual framework, deciding the main methods employed for both data collection and data analysis, choosing the research context, dealing with values already established within the research context and choosing the method of presenting the findings (Lincoln et al., 2011).

This shows that values permeate almost every aspect of the research process. Therefore, it can be claimed that there is a strong link between axiological assumptions and the other three philosophical assumptions, thus, the argument raised in the previous section relating to the relationship between ontology, epistemology and methodology can be extended by claiming that this relationship is completed only when axiological considerations are considered, as depicted in Figure 3.2. Then, finding a coherent connection between these assumptions leads to conducting valid research, which in turn adds to the body of knowledge.

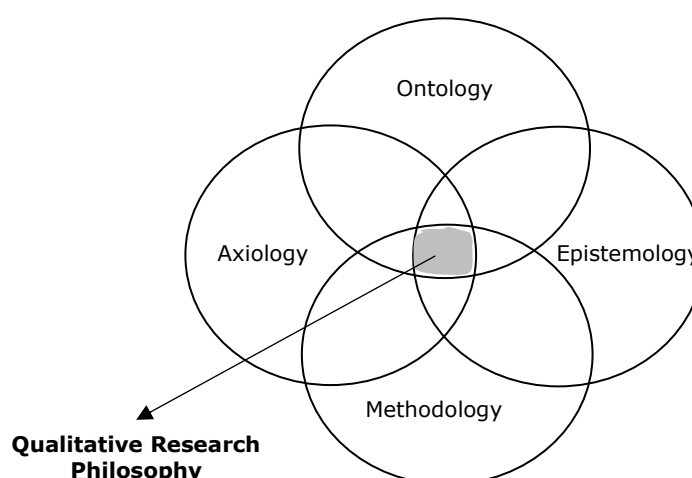


Figure 3.2 The relationship between ontology, epistemology, methodology and axiology

Source: Author

In terms of entrepreneurship research, Canedo, Stone, Black, and Lukaszewski (2014) believe that values play a remarkable role in conducting entrepreneurship studies. This increases the importance of the constructivism framework in underpinning entrepreneurship research, because this paradigm pays substantial attention to values (Saunders et al., 2016). In this regard, Wahyuni (2012) believes that constructivists are part of their research, therefore, they are subjective.

3.1.2 Approach to theory development (Logical reasoning)

There are three kinds of logical reasoning used to identify the type of relationship between research and theory: deductive, inductive and abductive (Bryman, 2016; Saunders et al., 2016). Deductive reasoning helps with developing and testing hypotheses based on what is known about a phenomenon. On the other hand, inductive reasoning helps in generating a theory through specific observations/findings of empirical data (Bryman, 2016). Further, deductive reasoning is related to theory testing, whereas inductive reasoning is concerned with theory building. As for abductive reasoning, it is described as an *"approach to theory development involving the collection of data to explore a phenomenon, identify themes and explain patterns, to generate a new – or modify an existing – theory which is subsequently tested"* (Saunders et al., 2016, p. 710).

A number of scholars have taken advantage of mixing deductive and inductive reasoning, by following either the deductive-inductive approach (e.g. Castelló & Lozano, 2009; Goyal, Sergi, & Jaiswal, 2016; Janssen, Kuk, & Wagenaar, 2008; Sartor, Orzes, Di Mauro, Ebrahimpour, & Nassimbeni, 2016; Varjas, Nastasi, Moore, & Jayasena, 2005; Vecchi, Brusoni, & Borgonovi, 2014; Vignieri, 2018) or the inductive-deductive approach (e.g. Gao, Zuzul, Jones, & Khanna, 2017; Serkkola, Ikavalko, Hanninen, & Kauranen, 2010; Thrassou, Vrontis, & Bresciani, 2018). The author of the present research claims that the deductive-inductive approach is best suited for this thesis for two reasons. First, it includes an element of induction in its process, and at the same time, it is grounded in a theoretical understanding of the context and individuals under study. Second, it is expected to be flexible enough to modify existing theories. These two reasons reflect the advantage of following the deductive-inductive approach. This advantage can be seen clearly through the way in which this research has been carried out, in that it started deductively and continued inductively (Castelló & Lozano, 2009; Goyal et al., 2016; Vecchi et al., 2014).

The inductive element allows relying on the literature to develop a conceptual framework that has been employed to guide the data collection process. The latter has obtained a sufficient amount of data from three sources, semi-structured interviews, documents and website content, which have been used to validate the above-mentioned framework but also to be inductively employed in order to uncover the unpredicted themes/issues that add significant

clarity to the phenomena under study. In short, deductive-inductive reasoning helps with conducting qualitative research in an informative way (Goyal et al., 2016).

3.1.3 Methodological Choice (Research Approach)

In the social sciences, there are three predominant research approaches: qualitative, quantitative and mixed methods (Denzin & Lincoln, 2011). Suddaby et al. (2015) claim that early entrepreneurship research was predominantly underpinned by quantitative research. Such a quantitative foundation has restricted entrepreneurship research. Despite quantitative research generating significant knowledge accumulation, entrepreneurship researchers have generally failed in developing an 'indigenous theory'. Therefore, entrepreneurship theory is often considered a branch of strategic management theory. They argue that the above issue can be addressed by employing a qualitative research approach, which is used by the present thesis. Such an approach is seen as research which is *"interested in analysing the subjective meaning or the social production of issues, events, or practices by collecting non-standardized data and analysing texts and images rather than numbers and statistics"* (Flick, 2014, p. 542).

Lewis and Nicolls (2014) argue that qualitative research needs to be designed with a clear research question, structure and procedure. This will help with generating reliable data, which can be obtained through the resources available. However, at the same time the qualitative researcher should be flexible and open to further developments. The latter requirement is essential because, firstly, social science research always includes an 'element of the unknown' (Lewis & Nicolls, 2014), secondly, qualitative data analysis often produces new themes (Given, 2015). In this regard, Janesick (2000, p. 384) argues that *"qualitative researchers have open minds, but not empty minds"*. Therefore, they develop research questions that direct their study; however, these questions are constantly changing as a result of being continuously revised.

With respect to the adoption of the qualitative approach by the present research, this is justified for two reasons. The first is that there is a lack of agreement on the concept of both OpRec (Glavas et al., 2017; Siegel & Renko, 2012) and the EntUni (Jaminki, 2017; Kirby et al., 2011). This requires accurately comprehending relying on detailed and in-depth investigations, which can be provided by the qualitative approach (Flick, 2014; Gilmore & Carson, 2007). Second, the adoption of the qualitative approach is perfect for conducting case study research. This is because that the latter seeks to deal with 'how' or 'why' research questions, as well as to provide in-depth and detailed descriptions about the phenomena under study (Yin, 2012). These are what qualitative research seek to provide. Thus, it can be said that qualitative approach is consistent with the strategy of the present research, which is addressed in the next section.

3.1.4 Research Strategy

The strategy used by the present research is a case study, which is described as “*a research strategy which focuses on understanding the dynamics present within single setting*” (Eisenhardt, 1989, p. 534). In this regard, Easterby-Smith et al. (2012) argue that this strategy, in general, concentrates on one or few phenomena, organizations or individuals. There are three reasons for choosing the case study approach to conduct the present research. First, it is an appropriate strategy to answer “how” or “why” questions (Yin, 2014). This helps in answering the research question of the present thesis, which is a “how” question type. The second reason is that the case study approach, as mentioned earlier, is relevant to providing in-depth and detailed descriptions about social phenomena (Yin, 2014). Therefore, employing this approach can contribute significantly to understanding the OpRec phenomenon, as it is seen as an area by which diverse and rival views exist (Renko, 2008). Using the case study strategy is also important for EntUni topics, because of the lack of agreement among scholars about the concept of EntUni (Jaminki, 2017; Kirby et al., 2011)

The third reason behind employing the case study approach by the present research is that it helps with combining the data collected from various sources of evidence, such as observations, interviews and questionnaires (Eisenhardt, 1989). This is significant for the present thesis because its data has been collected from three sources of evidence. In this regard, Yin (2014) argues that it is not recommended to conduct case study research using an individual source of evidence. There are four designs that can be followed when conducting case study research, as illustrated in Figure 3.1. Choosing one of these designs depends on the nature of both the context and unit of analysis of the research (Yin, 2014).

An embedded multiple case study design (type 4) is followed by the present research. There are two reasons for choosing this design. First, the research population of the present study consists of five UK entrepreneurial universities; these have been dealt with as five separate cases. Second, the unit of analysis of the present research involves both the deans and directors of entrepreneurship/enterprise centres in these five universities.

Yin (2014) argues that when researchers have the resources and the potential to make a choice, they prefer to use multiple case study designs. This is because that single case design is seen as a vulnerable approach, because using it leads researchers to “put all eggs in one basket”. Then, the evidence from a multiple case design is seen as more convincing and thus more robust, because it helps reduce the potential biases in the qualitative research (Shekhar Singh, 2014; Voss, 2010) and also adds confidence to the findings, as well as enhance the research quality (Shekhar Singh, 2014). However, conducting multiple case study research usually requires more resources and time when compares to single case study research (Voss, 2010; Yin, 2014).

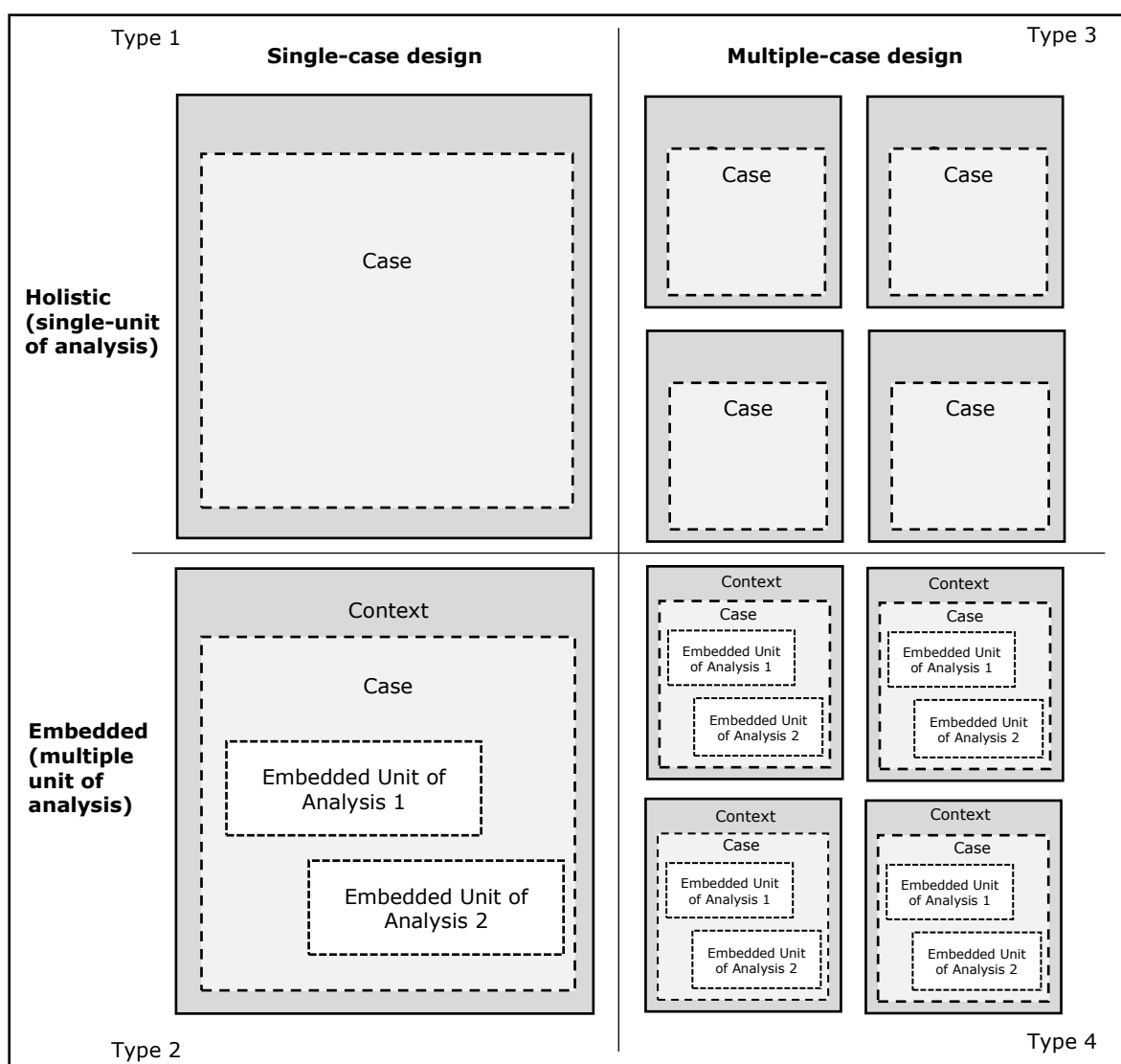


Figure 3.3 Types of case study designs

Source: Yin (2014, p. 50)

3.2 Research Design

3.2.1 Data collection

Creswell (2012) believes that collecting data for qualitative research is not just about deciding on whether the researcher will interview or observe people. He argues that there are five steps for the process of qualitative data collection: identifying the sample, gaining access to the sample, deciding on the types of qualitative data that will be collected, developing the procedure for recording data, and managing the data collection process in an ethical way.

3.2.1.1 Identifying the sample (participants and sites)

Making a decision regarding the research sample is significant because choosing a proper sample results in collecting appropriate data that helps with answering the research

question(s) effectively. This is due to the fact that there should be a strong link between the research aim(s) and research design (Lewis & Nicolls, 2014), and further, choosing the research participants needs to be compatible with the research focus. Therefore, choosing these participants is likely to not be an easy task until the research focus is clear (Saunders, 2012).

The main reliance of qualitative researchers for collecting data is on non-probability (purposeful) sampling. By relying on such, researchers use their own judgements to choose the research population and sample, thus, not all of the research population will have the same chance to be chosen (Saunders, 2012). Therefore, qualitative research, paradoxically does not usually employ sampling methods that seek to establish statistical representativeness (King & Horrocks, 2010). In this regard, Creswell (2012) argues that one of the main considerations when selecting the sample for qualitative research is that the individuals (or sites) selected can best help with exploring a central phenomenon in-depth, therefore, qualitative researchers intentionally select the sample for their research. Such a sample comprises of a number of strategies available for researchers to choose from. Table 3.3 provides some details about these strategies, as well as the decisions made in relation to strategies chosen for the sample of the present research.

The decision behind selecting the sample of the present thesis has been made on two levels: institutions selection and individuals selection. With respect to institutions selection, the two criteria identified by Yin (2014) have been used to make this selection. First, the researcher needs to have adequate access to the data required for conducting their research. Second, the selected cases should be one of the most likely cases that can effectively answer the research question(s). Based on these criteria, the winners of the Times Higher Education (THE) EntUni of the Year Award have been identified as the research population and the context of the present research. Five universities¹⁷ were selected to be the main source for gaining data. There were two main reasons for such a selection. First, winning the above-mentioned award can be considered proof that they are entrepreneurial institutions; at least in respect of one independent and consistent set of external criteria. The role of the NCEE in the process lends legitimacy to these criteria. Thus, the data (both primary and secondary) that will be collected from them can be considered the most valid data for addressing the research questions of the present thesis.

The second reason is that there was the possibility to gain a sufficient number of participants from these universities and also obtain data saturation from the above-mentioned five universities. Here, it is important to realize that gaining sufficient access to the sites and individuals is one of the fundamental criteria used to decide the qualitative research sample (Devers & Frankel, 2000). This is because despite this, researchers ideally aim at collecting

¹⁷ At the time that the data was collected, the number of the winners of the THE EntUni of the Year Award was nine.

data from a group of participants in a particular community/organization or group of organizations. Their abilities to achieve such an aim are associated with, firstly, accessing those communities/organizations and target participants, and secondly, gaining permission for collecting the required data (Saunders, 2012). It is worth mentioning that the other two sources of evidence (universities' documents and web pages) of the present study were accessible from all ten universities that represent the research population.

As for individual selection, the deans and directors of entrepreneurship/enterprise centres in the above-mentioned five universities were chosen to be part of the present research. In addition to the accessibility discussed above, there are two other reasons for choosing these deans and directors. First, the interview questions of the present research (related to OpRec and EntUni) are preferably answered by the individuals who have a senior post in the university. This is because these individuals are able to provide the support needed to move toward being an EntUni (Coyle, Gibb & Haskins, 2013); they are more likely to recognize valid entrepreneurial opportunities (Hisrich et al., 2013). This is may be because "*they have the ability to control information, accumulate and allocate resources, and assess the performance and productivity of their*" faculties, schools or units (Rosser, Johnsrud, & Heck, 2003).

The second reason is that there is a need to narrow down the sample (at the individual level), because universities can be considered complex and heterogeneous systems/entities which contain a variety of levels, roles, positions and activities (Angiola, Bianchi, & Damato, 2018; Bartell, 2003; Cappiello & Pedrini, 2017; Romulo Pinheiro & Nordstrand Berg, 2017). Thus, recruiting participants from different levels who are conducting different activities will not contribute towards gaining an in-depth understanding regarding the issues under study. This is because they may provide views that are contradictory to the more common points. This could lead to a loss of focus and may provide only general views about the phenomena, especially if the views of the participants are not completely identical because they are from different backgrounds and specialities.

Extreme case sampling and theory or concept sampling strategies have been employed to make the above mentioned selections (both institutions and individuals). For the additional participants, the snowball sampling strategy has been employed. Firstly, the decision was made to interview the deans of the schools/faculties of the universities under study only. However, this decision was modified after conducting a few interviews, because some of the interviewees stressed the importance of considering the director of their entrepreneurship centre with the sample of the present research. In fact, even after making the decision and interviewing some of these directors, some other interviewees asked the author whether he met the director of the entrepreneurship/enterprise centre of their universities. This shows the huge importance of considering these directors.

Having mentioned purposeful sampling, it is worth stating that data saturation is the criterion for inductively establishing the purposeful sample size. Accordingly, qualitative researchers

stop collecting data when they realize that no new themes/information are obtained from collecting extra data (Saunders, 2012).

Table 3.3 Strategies of purposeful sampling and their relationship with the present research

	The strategy	Purpose of use	Researcher decision	Justifications for the decision made
Before data collection	Maximal variation sampling	To obtain multiple perspectives through selecting a sample that includes individuals (or cases) who differ on some characteristics.	Not Considered	N/A
	Extreme case sampling	To describe cases that are enlightening or causing annoyance, or cases that are noticeable for their success or failure.	Considered	This strategy has been used to select the institutions that are noticeable for their entrepreneurial success.
	Typical sampling	To represent what is typical to those unfamiliar with the situation (case).	Not Considered	N/A
	Theory or concept sampling	To understand a concept or theory, or generate theories or explore particular concepts within a theory.	Considered	This strategy has been employed to select the individuals (the deans and directors of entrepreneurship/ enterprise centres), who are seen as one of the groups of preferred individuals to answer the questions relating to OpRec and EntUni. Then, it is expected that they will contribute in adding clarity to the concept of entrepreneurial OpRec.
	Homogeneous sampling	To describe a subgroup in-detail and in-depth.	Not Considered	N/A
	Critical sampling	To describe cases that dramatically elucidate the situation.	Not considered	N/A
After data collection has started	Opportunistic sampling	To take advantage of new information from unfolding events, during collecting the data, that can best answer the research question.	Not considered	N/A
	Snowball sampling	To find other suitable participants who are recommended by the selected participants.	Considered	Many participants suggested that recruiting the director of entrepreneurship centres to be part of the present research can have a significant impact on the findings.
	Confirming and disconfirming sampling	To examine cases that confirm or disconfirm initial findings.	Not considered	N/A

Source: Author - drawing on the work of Creswell (2012)

3.2.1.2 Gaining access to the sample identified

Gaining access to the participants was not an easy task due to the participants' position in the organizational hierarchy, which made them busy and difficult to access. The author used different strategies to gain access to them. First, most of the interviewees were emailed directly; many of them responded, either with approval or refusal. For those who did not respond initially, the author emailed their personal assistants to act as a link between him and the interviewees. This strategy was effective because these personal assistants have contributed to gaining the opportunity to recruit more interviewees for the present research. Therefore, it can be claimed that this approach can be an effective strategy for gaining access

to the identified sample. For both strategies, the emails had a supportive letter attached from the Post Graduate Research Administrator (See Appendix C) and a confirmation of ethics approval.

In addition to the above two strategies, the author took advantage of the relations of his supervisory team and one of the professors who contacted a number of deans and directors of entrepreneurship/enterprise centres of universities. This strategy contributed to recruiting seven interviewees for the present research. The second and third strategies are supported by Devers and Frankel (2000, p. 266), who believe that *"using a personal contact who can vouch for the researcher or write a letter of support can be critical"* for gaining access to participants.

3.2.1.3 Deciding on the types of qualitative data that will be collected

With regards to the application of the case study strategy, three methods were used for collecting the data: website content, document secondary data and semi-structured in-depth interviews with senior staff of the selected universities. Combining the above three methods increases flexibility and helps obtain a variety of data, which in turn helps gain a deeper and broader understanding regarding complex and ambiguous phenomena. This is because each source can contribute to an understanding of certain aspects of these phenomena. Thus, a combined approach can significantly contribute to moving forward towards obtaining a comprehensive picture of a particular phenomenon (Gilmore & Carson, 2007; Gilmore, 2010).

In addition to the above benefits, using multiple sources of data collection will help with meeting some of requirements of the constructivism framework, as this philosophy does not promote a single rule, paradigm or method (Denzin & Lincoln, 2011).

3.2.1.3.1 Interviews

Qualitative interviewing has become the most widely used method for generating data by qualitative researchers (King & Horrocks, 2010), who employ it within different types of research strategies (Saunders & Townsend, 2016), including the strategy of the present research. In fact, qualitative interviews are considered one of the most significant sources of evidence for the case study research. Therefore, they are widely used in such research. This is because most case studies deal with human behaviours and issues (Yin, 2014).

King and Horrocks (2010) argue that the above-mentioned interviews are different from other types of interviews, such as job interviews, investigative journalistic interviews and celebrity interviews, in four main ways, which are as follows:

- (1) Qualitative interviews are primarily built on open-ended and non-leading questions.
- (2) They focus more on individuals' experiences.

- (3) They help with minimising the imbalance power between the interviewer and the interviewee.
- (4) They are expected to provide a high level of confidentiality and anonymity.

Employing in-depth qualitative interviews as one of the main methods for collecting data can have significant advantages for the present research. This is because such interviews help answer the research questions that focus on opinions, behaviours, experiences and processes (Rowley, 2012). This is significant for the present thesis because the answers for its research question depend mainly on the views of the respondents; the final product is a model that describes the OpRec process in entrepreneurial universities.

Another benefit of qualitative interviews is related to the fact that such interviews can be considered a flexible (King & Horrocks, 2010), empirical and informative method that helps with examining complex, changing and interactive situations (Gilmore & Carson, 2007; Gilmore, 2010). This view is supported by Lewis and Nicolls (2014), who believe that qualitative in-depth interviews help with exploring issues in-depth and in-detail; they can be used for understanding complex issues and processes. This is because qualitative interviewing covers a broad variety of interest and key issues. It also allows "opportunity for further probing and examining until mutual understanding is reached" (Gilmore, 2010, p. 14). Therefore, it can be claimed that qualitative interviews can contribute in dealing with issues relating to rival views in the fields of OpRec and EntUni.

Despite the many advantages of interviews, they are not without disadvantages. For example, Yin (2014) believes that the weaknesses of qualitative interviewing are the biases in asking questions (by the interviewer) and in the responses (by the interviewees) and inaccuracy due to 'poor recollection'. In addition, the interviewees sometimes provide the answers that the interviewer wants to hear.

There are three types of qualitative interview: unstructured, semi-structured and structured interviews (Cachia & Millward, 2011; Corbin & Morse, 2003; Qu & Dumay, 2011; Rowley, 2012; Saunders et al., 2016). In the former, questions evolve once the interview starts. Therefore, the first question in the interview is usually a broad open-ended one, but at the same time it is connected to the research question(s). Hence, the interviewer employs prompts and probes in order to obtain details and further clarification (Cachia & Millward, 2011). Due to the above reason, the participants have "*control over the pacing of the interview, what will be disclosed (the amount of detail, scope of the interview, etc.), and the emotional intensity*" (Corbin & Morse, 2003, p. 340).

In contrast, structured interviews require a group of pre-established questions that can offer a set of possible answers, which the participants can choose from (Cachia & Millward, 2011); therefore, such interviews "can be quite similar to questionnaires, except that instead of leaving the respondent to complete and return the questionnaire at their own leisure, the

interviewee poses the questions" (Rowley, 2012, p. 262). Ergo, to a large extent, the interviewer controls the interview. The participants can only accept or refuse to respond (Corbin & Morse, 2003).

The third and most common type (the semi-structured interviews) (Rowley, 2012), involves elements from both the aforementioned types of interviews (Cachia & Millward, 2011). Therefore, in semi-structured interviews, there is a set of themes that need to be covered. However, the way in which these themes are used may vary from one interview to another (Saunders et al., 2016). Thus, these interviews require preparing some key questions before the interview; probes can also be used in such interviews when more detail and clarification are needed.

The above principles make this type of interview "*flexible, accessible and intelligible and, more important, capable of disclosing important and often hidden facets of human and organizational behaviour*" (Qu & Dumay, 2011, p. 264). Therefore, semi-structured interviews can take various forms (Cachia & Millward, 2011). The present research used semi-structured in-depth interviews as one of the main methods for collecting data. To ensure its effectiveness, two main phases were considered to gain data from the interviews: a pilot study and the main study.

a. The pilot study: To obtain valid data from the interviews, the development of the interview questions' schedule went through three steps. The first step was to evaluate the interview schedule. The very first evaluation of the interview schedule was done by the researcher and the supervisory team. The evaluation aimed to ensure that the interview questions cover all the themes included in the conceptual framework and also guarantee that they are flexible enough to capture new themes that can contribute towards providing a more comprehensive picture relating to the issues under study.

After the first evaluation, the interview schedule was sent to a number of professors and academics who specialised in entrepreneurship/qualitative research; twelve of them (ten experts in entrepreneurship research and two experts in qualitative research, specifically in Template Analysis technique) provided feedback on the validity of the interview schedule. The feedback obtained helped the researcher to improve the schedule in five areas:

- (1) Decreasing the number of questions and focusing on the "necessary to know" question rather than the "good to know" questions.
- (2) Formulating related questions rather than generic ones.
- (3) Using common terminologies rather than technical ones.
- (4) Making the questions more user friendly and more understandable.
- (5) Avoiding assumptions.

The second step was piloting the pilot study. Here, the author conducted two interviews with his colleagues, who were conducting qualitative research in the entrepreneurship field, before

conducting the pilot study. Three aims were expected to be achieved from this step, which are as follows:

- (1) To ensure that the interview questions are clear and understandable.
- (2) To estimate how much time a single interview would require.
- (3) To know if the questions were phrased appropriately.

The two main contributions of the previous step to the interview schedule were first, to reword the questions that were difficult to understand, and second, to merge some questions to ensure that the time that will be allocated later by the interviewees will be sufficient to cover all the questions. Despite the above contributions, there was still a need for one more step, which was conducting a pilot study. This has been done by conducting three semi-structured Skype interviews¹⁸ with three deans at three non-winner entrepreneurial universities which were listed in the several shortlists for the THE EntUni of the Year Award (as shown in Table 3.4).

The main aims from conducting such a pilot study were to refine the interview questions and the procedures of data collection of the present thesis (Yin, 2014), and to amend the questions that do not contribute to answering the main (and sub) research questions (Matthews & Ross, 2010). Yin (2014) identifies three criteria for choosing the sample for the pilot study: access, appropriateness and geographic proximity. The pilot study of the present thesis has met two of the above criteria. There was no need for the third criterion because the interviews were conducted through Skype.

For the first criterion, the quick response and acceptance of the three deans to talk to the author made the task of reaching them easier. However, accessibility alone was not enough to consider those deans as a valid sample for the pilot study. Therefore, there was a need for a second criterion, which has been met as a result of choosing people who are in the position of dean in three UK entrepreneurial universities. This is significant, as the sample of the present research is the deans and directors of entrepreneurship/enterprise centres in those UK universities who have been winners of the THE EntUni of the Year Award. Such significance comes from the fact that the participants of the pilot study have the same characteristics of those of the main study.

Table 3.4 Details of the interviews of the pilot study

Interview number	Interviewee Specialization	Duration of the interview
1	Social Science and Health	40 minutes
2	Sustainable Chemistry	30 minutes
3	Law and Society	47 minutes

Source: Author

¹⁸ These interviews have not been included in the main study; they have been used only for pilot study purposes.

As illustrated in Table 3.4, the pilot study includes three interviews. After conducting the first pilot interview, the interview questions were modified according to the interviewee's answers and comments. So, the second pilot interview was conducted by using the modified version of the interview protocol. Then, the same procedure was applied when conducting the third pilot case (Yin, 2014).

The outcomes of the third steps can be summarised as follows:

- (1) The number of questions was decreased to obtain a more in-depth understanding of the issues that are substantially and directly associated with research question.
- (2) Removing questions that may provide similar answers.
- (3) Keeping the focus on the areas and levels targeted by the research question.
- (4) Rewording leading questions as well as the questions that gained short answers.
- (5) Replacing technical terminologies with alternate terms that make the questions clearer.

By observing the above three steps, it can be said that they provide some common benefits. This helps the authors to better refine the questions of the interview schedule by checking the validity of the schedule through three stages. Therefore, it can be claimed that the present thesis uses 'questions validity triangulation'.

b. The main study: The three phases of the pilot study, as discussed in the previous section, have contributed greatly to obtaining the appropriate number of questions. The very first interview schedule included twenty-five questions. The feedback obtained from the first stage helped the author to decrease the number of the questions to eighteen questions. After conducting the pilot study, the number of question has decreased further to fifteen questions, which are shown in Table 3.5. In fact, using prompts and probes has also helped in this regard. However, these prompts and probes have not been used in all interviews, because some answers from the main questions have provided some details that were expected from the prompts and probes included in the interviews schedule. Using prompts and probes has also helped in gaining further clarification as well as more in-detail responses (Qu & Dumay, 2011). In addition, prompts and probes have contributed to maintaining the flow of the interviews (Cachia & Millward, 2011).

Table 3.5 Interview questions and prompts with literature justification

		Questions	Prompts and probes	Literature	Objectives
OpRec		What does the term entrepreneurial OpRec mean to you?	N/A	There is a lack of agreement on what constitutes the OpRec phenomenon (Glavas et al., 2017). Therefore, there is a need to add more clarity to this concept. In the present research, this has been done through starting every interview by asking the participant this question.	This question contributes to fulfilling the second objective regarding exploring how UK entrepreneurial universities define entrepreneurial OpRec.
OpRec determinants	Prior knowledge and experience	How do you believe that prior knowledge and experiences help in recognizing entrepreneurial opportunities?	N/A	Prior knowledge and experience impact on OpRec significantly (Ardichvili et al., 2003; Ardichvili & Cardozo, 2000; Baron, 2006; Barringer & Ireland, 2016; Bloodgood et al., 2015; Franzoni, 2007; Gaglio, 2004; García-Cabrera & García-Soto, 2009; George et al., 2016; Hulbert et al., 2015; Kohlbacher et al., 2015; Lim & Xavier, 2015; Marvel & Droege, 2010; McMullen & Shepherd, 2006; B. Mueller & Shepherd, 2012; Park, 2005; Patzelt & Shepherd, 2011; Pech & Cameron, 2006; Ramos-Rodríguez et al., 2010; Sambasivan et al., 2009; Shane, 2000; Shane & Venkataraman, 2000; Shepherd & DeTienne, 2005; Tang, 2010; Wang et al., 2013; Webb et al., 2011).	These questions are formulated to explore how these factors contribute to the entrepreneurial OpRec process. The answers to these questions contribute to fulfilling the first and third objectives regarding the factors that determine OpRec.
		What types of knowledge can help in recognizing entrepreneurial opportunities?	Please explain and give examples.		
	Networking	How do you believe that networking helps your university in recognizing entrepreneurial opportunities?	N/A		
		Who are the most important parties with whom strengthening relationships helps in recognizing opportunities?	Please explain and give examples.		
	Entrepreneurial alertness	Are you always alert to entrepreneurial opportunities?	Please explain and give examples.		
		In your opinion, what are the main characteristics that senior staff need to be more alert to entrepreneurial opportunities?	- Does recognizing entrepreneurial opportunities require finding connections between unrelated pieces of information? - How do you distinguish between profitable and unprofitable opportunities? - Are you aware of entrepreneurial opportunities that are overlooked by others?		

		Question	Prompts and probes	Literature	Objective
OpRec determinants	Environmental Changes	To what extent does a quick response to the changes in the external environment help in recognizing opportunities?	Please explain and give examples.	Environmental changes is considered as one of the factors that significantly impact on OpRec (Barringer & Ireland, 2016; Buenstorf, 2007; García-Cabrera & García-Soto, 2009; George et al., 2016; Kohlbacher et al., 2015; McMullen & Shepherd, 2006; Sinclair & D'Souza, 2011; Tang, 2010; Wang et al., 2013).	These questions are formulated to explore how these factors contribute to the entrepreneurial OpRec process. The answers for these questions contribute to fulfil the first and third objectives regarding the factors that determine OpRec.
		Which external environment factors have had the greatest impact on the entrepreneurial OpRec process in your university?	Why?		
	Systematic Search	Do you actively search for opportunities or you accidentally find them?	- What are the main actions you take to search for entrepreneurial opportunities? - What are the main sources you obtain information from when you search for new opportunities?		
	Creativity	How do you believe that creativity contributes to recognizing entrepreneurial opportunities?	Why?		
Resources and capabilities questions		How do you characterise the resources of your university? What are their main attributes?	- How do your resources help in increasing the value of your services? - Do you have resources that are owned by only few other universities? - Are they costly to imitate? - How do you exploit the competitive potential offered by your resources?	Resources are considered as the main source for gaining and sustaining competitive advantage. These resources are valuable, rare, imperfectly imitable or (costly to imitate) and well organized (Barney & Clark, 2007).	The answers for these questions contribute to fulfil the first and third objectives regarding the optimal mix of resources and capabilities.
EntUni	What does the term EntUni mean to you?			There is no strong agreement on a singular definition of the EntUni (Jaminki, 2017; Kirby et al., 2011). Therefore, there is a need to add more clarity to this concept.	This question contributes to fulfilling the second objective relating to the definition of EntUni.
	What attention does the office of Vice-Chancellor pay to entrepreneurship? And how has it resourced?				
	In your opinion what are the main criteria that can be used to decide whether a university is entrepreneurial?		- What about placing entrepreneurship at the heart of the university's strategy? - And creating a supportive environment for entrepreneurial activities? - What about having a positive influence on the economy? - What about promoting good practices and effectiveness in the surrounding society?	Four criteria need to be met by a university to be nominated to win the THE EntUni of the Year Award: culture and mindset, vision and strategy, policy and practice and entrepreneurial impact (NCEE, 2016).	These questions are formulated to identify the contextual factors that impact the OpRec process. The answers to these questions contribute to fulfilling the first and third objectives regarding the context.

Source: Author

The studies included in Table 3.5 have contributed greatly to formulating the questions of the interview schedule, which have been derived from the main components of the conceptual framework. However, for questions relating to EntUni criteria, the author exchanged a number of emails with the NCEE team and also had a telephone interview with the Acting Deputy CEO of the NCEE. These have contributed to obtaining a clearer picture of the criteria in general and provided adequate detail about each criterion, thus formulating proper interview questions relating to the EntUni criteria.

Using the questions and prompts and probes shown in Table 3.5 has helped in conducting the twenty-five interviews (sixteen Skype interviews and nine face to face interviews), which in turn contributed to fulfilling the three main objectives of this thesis. In total, 1497 hours of audio-recorded interviews were collected. These have produced 146,440 words after data cleansing¹⁹.

Before conducting the interviews, the interviewees were provided with information about the research and themes that have been discussed in the interviews. This was done through the emails exchanged with the interviewees, especially in the very first email (interview request email), in which information about the research question and the main themes expected to be addressed in the interview were provided. Also, before the interview, the participants were provided with an information sheet, which involved eight main sections (See Appendix A). These sections focus on the purpose of the research, why the participants have been chosen to take part in this research, the duration of the interview and how the data will be managed. The latter includes information about how to ensure confidentiality regarding the data collected (Gilmore & Carson, 2007).

In addition to the above information, at the beginning of each interview, the interviewer was provided with a clear introduction, in which the interviewees were reminded of the research question and ensured in terms of its confidentiality. Having such an introduction helped both the interviewee and the interviewer to be more prepared for interactive discussions. After the introduction, the interviewer used the interview schedule to conduct the interviews. Despite the fact that the questions comprised in this schedule were asked for all interviewees, the order of questions varied from one interview to another. This is because the interviewer sometimes depended on the interviewees' answers to decide when the next question should be asked. When an interviewee alluded to one of the themes involved in the interview schedule, the interviewer jumped to ask the questions related to that theme. Afterwards, he returned back to the order included in the schedule. Doing so has increased the level of engagement between the interviewer and the interviewees and maintained the flow of the interviews. This is because the interviews took the character of a conversation, rather than asking questions that might seem to belong to unrelated topics.

¹⁹ After completing the transcription process, the author went through the transcripts and removed incomplete answers.

Table 3.6 Details about the interviews of the main study

Interview number	Interviewee Specialization	Position	Interviewees' code	Duration of the interview (in minutes)		Method used to conduct the interview
1	Public administration	Director	A1(DR)	29 31	60	Skype
2	Materials engineering	Dean	A2(DN)	55		Skype
3	Higher education enterprise	Dean	A3(DN)	82		Skype
4	International business, finance and logistics	Dean	A4(DN)	53 16	69	Skype
5	Health and social care	Dean	A5(DN)	48		Skype
6	Entrepreneurship	Director	A6(DR)	67		Skype
7	Dental public health	Dean	B1(DN)	53		Face to face
8	Entrepreneurial practice	Director	B2(DR)	87		Skype
9	Mechanistic biology	Dean	B3(DN)	70		Skype
10	Chemical engineering	Director	B4(DR)	46		Skype
11	Innovation	Director	C1(DR)	59 50	109	Face to face
12	Construction engineering	Dean	C2(DN)	57		Face to face
13	Biochemistry	Dean	C3(DN)	66		Face to face
14	Public health	Dean	C4(DN)	61		Face to face
15	Applied psychology	Dean	C5(DN)	65		Face to face
16	Production economics	Dean	C6(DN)	45		Face to face
17	Psychology	Dean	C7(DN)	41		Face to face
18	Musicology	Dean	C8(DN)	67		Face to face
19	Analytical chemistry	Dean	D1(DN)	55		Skype
20	Labour law	Dean	D2(DN)	42		Skype
21	Entrepreneurship	Director	D3(DR)	41		Skype
22	Public law	Dean	E1(DN)	58		Skype
23	Journalism	Dean	E2(DN)	44		Skype
24	Higher education management	Director	E3(DR)	28 25	53	Skype
25	Mental health sciences	Dean	E4(DN)	56		Skype

Note:

- Interviews 1, 4, 11 and 24 were conducted in two part at different times. This is because at the first meeting, there was not enough time to cover all of the interview questions.
- DR refers to directors and DN refers to deans.

Source: Author

3.2.1.3.2 Documents secondary data

Institutional and organizational documents have gained the attention of qualitative research. Recently, the number of researchers that have employed document analysis as part of their research methodology has increased (Bowen, 2009); the author of the present thesis is among them. A number of documents have been collected from the universities under study to be part of the present case study data. This is significant because documentary information is a suitable source of evidence and is particularly applicable for case study research (Bowen, 2009; Yin, 2014).

Data collected from the universities' documents have been used to support the views gained from the primary data of the present research (the interviews). In this regard, Yin (2014) argues that the most important use of documentary information in case study research is to enhance information/evidence from other sources in three different ways. First, documentary information ensures the correct spelling of names, titles of people and/or organizations that are mentioned by the interviewees. Second, it helps with producing inferences about the topic

under study. Third, it provides other more precise details that reinforce information obtained from other sources. With respect to the third way, during the interview, some interviewees encouraged the interviewer to gain more information about issues discussed from the documents available on their university's website; two of them even sent some documents to the interviewer via email.

Therefore, it can be said that the 'documents secondary data' method has been used in this research as a complementary method to gain a better understanding and enhance the views expressed by the interviewees, especially when the evidence provided is inadequate. It has also been used for triangulation purposes. In this regard, Bowen (2009) argues that documents secondary data is often employed as a means of triangulation by combining it with other qualitative methods. It is expected that qualitative researchers will rely on multiple (at least two) sources of evidence in order to bring about convergence and confirmation through using different methods and sources of data. This particularly applies to the case study research (Yin, 2014).

In addition to the above benefits, using documents as a source of evidence for research can have a number of advantages, which are as follows:

- (1) Employing documents secondary data helps with obtaining background information and historical insights. Gaining such information and insights can help with understanding the historical development of the phenomena under study, which can help with better dealing with the research question because of the high impact (in some cases) of the prior events in terms of what is happening in an organisation/context.
- (2) Many documents are available for use in research purposes. In fact, uploading such documents on websites helps with ease of access to them.
- (3) Documents are non-reactive and unobstructive because they are not impacted by the research process.
- (4) They can cover numerous events and many contexts over a long period of time.
(Bowen, 2009)
- (5) They require less time to obtain; it is considered a very efficient method for gaining data (Bowen, 2009; Lee, 2012). This actually could go back to the fact that this method needs data selection rather than data collection.
- (6) They touch on various aspects/issues that play a critical role in organizations' journeys relating to their processes, plans and policies (Lee, 2012).
- (7) They can be considered a valid source for addressing a wide range of research questions (Yin, 2014).

Despite all the above benefits, using documents as a source of evidence, according to Bowen (2009), may have three disadvantage, which are as follows:

- (1) Documents do not provide adequate detail that is required to answer the research question, because those documents are not produced for research, rather for other purposes.
- (2) Using documents secondary data method can sometimes lead to 'biased selectivity'.
- (3) Documents are sometimes difficult to retrieve because access to these documents may sometimes be intentionally blocked.

The present research has not been impacted by the first two disadvantages, because the documents secondary data method has been used as an additional method; it is not the only method used for collecting the data of this research. To avoid 'biased selectivity', all the documents available that relate to being the entrepreneurial university of the year (as well as the university's opportunities) have been selected to part of the present research data. With respect to the third disadvantage, access to all the documents of the universities under study would definitely have contributed more to the present case study. However, the author claims that what has been obtained is adequate because other supporting details have been obtained, as will be shown later, from the universities' website content. With respect to retrieval issues, the author has stored all the documents obtained using Nvivo projects.

In terms of the sources that a researcher can obtain documents from, Bowen (2009) shows that the documents secondary data method considers both electronic (computer-based online-transmitted) and printed materials. With regards to electronic documents, Lee (2012) argues that the development of the internet has played a considerable role in facilitating access to various types of documents, such as annual financial reports, employment policies, corporate social responsibility reports and many others types of documents. In addition to documents issued by an organization, there are many other documentary sources, such as government publications and newspaper reports (Lee, 2012).

The present research relies only on the electronic documents issued by the universities under study. A variety of these documents have been considered. The focus was more on the corporate strategy, strategic plan, strategy map, case studies, annual review, research strategy and financial statements. These documents, as will be shown later, have a significant role when the data is analysed. This is because they have been employed in conjunction with the main source of evidence (the semi-structured interviews). Although many of the above-mentioned documents have been obtained from the universities' web pages, some of them have been sent by the interviewees via email. Therefore, document secondary data is considered as a separate method from web content in the present research.

3.2.1.3.3 Website content

Using websites as a source of evidence has been commonly and widely accepted (Samkin & Schneider, 2014) in both qualitative and quantitative research (Bryman, 2016). The main advantage of utilizing websites as a source of evidence is to gain a large amount of

data/information (Huizingh, 2000). In addition, the organizational website reflects, to some extent, the organisation's perspectives (Kiyatkin, Reger, & Baum, 2011). On the other hand, two issues can be experienced by using such a method. First, there is a lack of information disclosed on certain websites. Second, this disclosed information usually changes quickly (Samkin & Schneider, 2014). The present research has not been affected by the above two issues, because the amount of information available on the websites of the five considered universities was adequate. Actually, these websites provide information about most activities of these universities. Regarding the second issue, the author collected the data from the above-mentioned websites within a relatively short time frame.

The author of the present thesis believes that the above-mentioned advantages and disadvantages are not the only ones the website content method has. Actually, the author believes that this method can have the same advantages and disadvantages of the documents secondary data. This is because the nature of the data obtained from both of these methods is similar.

To collect data from the websites of the sample, the author examined all the pages of the websites and then selected those related to the themes considered by the present research. All the pages selected were stored in Nvivo projects, in order to be ready for analysis and avoid retrieval issues. However, not all the selected pages have been considered because the second reading of these pages helped with deciding which ones can be used in the analysis. In the end, 277 pages were selected to be part of the data of the present research.

Table 3.7 Number of pages selected from the websites of the universities under study

	Number of pages selected	
	Initial selection	Final selection
University A	99	33
University B	120	94
University C	59	30
University D	108	53
University E	67	67
Total	453	277

Source: Author

The above-mentioned selection has helped with obtaining an adequate amount of information that has been used (in conjunction with the non-web-based documents) to support the views obtained from the primary source of evidence (the interviews). The information obtained covers a variety of topics related to university activities - for example, the reasons for being an entrepreneurial university, types of opportunities, networking activities, strategic orientation, research activities, collaborations and partnerships with business, student and staff support, entrepreneurial activity, entrepreneurship, enterprise or/and innovation centres activities.

By presenting particular details about the three methods used to collect data for the present thesis, it can be said that they can contribute significantly towards answering the research

question. This research has benefited greatly from the advantages offered by these methods. In addition, it was certainly possible to deal with their disadvantages. Table 3.8 provides a brief summary of the advantages and disadvantages of the three data collection methods employed by the present thesis.

Table 3.8 Data collection methods of the present thesis: advantages and disadvantages

Data collection methods	Advantages	disadvantages
Interviews	<ul style="list-style-type: none"> - They directly concentrate on the research question - They provide in-detail explanations, as well as distinctive viewpoints, such as meanings, perspectives and perceptions - They are flexible - They can be employed to understand complex issues and processes 	<ul style="list-style-type: none"> - They are prone to biases - Some interviews experience inaccuracies.
Documents Secondary data	<ul style="list-style-type: none"> - Gaining background information and historical insights - It includes accurate details, references and names relating to an event - The possibility of being repeatedly reviewed - It requires less time to be obtained - It may include plenty of events and contexts as well as a wide range of time 	<ul style="list-style-type: none"> - It may be difficult to obtain and restore - Biased selection of documents - The possibility of facing difficulties in finding the required evidence/information
Website content	<ul style="list-style-type: none"> - Gaining a large amount of information - Reflecting the organisation's perspectives 	<ul style="list-style-type: none"> - Lack of information disclosed on some websites - The quick change of disclosed information

Source: Author

3.2.1.4 Developing the procedure for recording data

Creswell (2012) believes that once the types of data to collect are decided, the researcher needs to develop a means for recoding the information. For the present research, a case study protocol has been used for this purpose. This protocol is defined as "*the procedural guide for collecting the data for a case study, including a set of field questions to be addressed by the researcher, representing the researcher's mental agenda*" (Yin, 2014, p. 240). It includes four main sections. First, there is an overview of the case study, which involves the rationale, objectives and the conceptual framework of the case study. Second, there is the data collection procedure, which deals with information about the institutions and individuals considered in the case study, data collection plan and expected preparation, before collecting the data. Third, the key questions used to collect the data are detailed. Fourth, there is a guide for reporting the case study (Lee & Saunders, 2017; Yin, 2012). The present research follows this protocol (See Appendix D). This is significant because while a case study protocol is advantageous for all case study research, it is indispensable for conducting multiple case studies (Yin, 2014).

3.2.1.5 Managing the data collection process in an ethical way.

Due to the huge importance of the ethical considerations for the research, the author has paid attention to every single detail that contributes to ensure ethicality within the process of data collection. The very first action taken in this regard was obtaining the ethical approval of the Huddersfield Business School Ethics Committee (Flick, 2014; Quinlan et al., 2015). This was done by submitting a Postgraduate Student Research Ethical Review application to the above-mentioned committee.

The second ethical action was to develop the procedures required for ensuring and reassuring interviewees that their names and any other personal information will remain anonymous (Yin, 2014). Sending a participant consent form (see Appendix B) and an information sheet to the interviewees played a considerable role in this regard (Bryman & Bell, 2011; Creswell, 2012; Flick, 2014; Quinlan et al., 2015; Saunders et al., 2016; Yin, 2014). In fact, there is minimal likely harm for participants because the research deals with the organizational level, not with an individual one. In addition, the data provided by the participants will be analysed at an aggregate level.

The third action was to hold signed consent forms and audio recordings in a secure place (Bryman & Bell, 2011; Saunders et al., 2016). Then, the fourth action was to transcribe each interview word by word and send the interviewees a copy of their interview to ensure that the information provided is allowed to be used by the researcher. After obtaining approval from the participants to use the data included in the transcripts, these transcripts, along with the documents and website contents (obtained from the universities under study) have been stored in Nvivo projects with password protection to be ready for analysis. Only the researcher has the access to this data.

3.2.2 Data Analysis

There are various approaches to analysing qualitative data. The present research has employed two of these approaches: Template Analysis (to analyse the primary data) and Framework Analysis (to deal with the secondary data).

3.2.2.1 Template Analysis

The data obtained through interviews has been analysed by employing the Template Analysis (TA) technique, which is seen as *"a style of thematic analysis that balances a relatively high degree of structure in the process of analysing textual data with the flexibility to adapt it to the needs of particular study"* (King, 2012, p. 426). This definition shows that TA is a form of thematic analysis (King, Brooks, & Tabari, 2018; Saunders et al., 2016). It also shows that TA is not a methodology, but rather it is a technique that can be employed through various philosophical frameworks (King, 2012).

To further clarify the concept of the TA, it is important to present what has been explained by Brooks, McCluskey, Turley, and King (2015), that thematic analysis styles can be examined within two main approaches: top down and bottom up. With the latter, themes emerge from the data, rather than existent theoretical/practical considerations. Such an approach is used by grounded theory and Interpretive Phenomenological Analysis (IPA) researchers. On the other hand, the top down approach tends to define and apply themes that have been informed by a framework or theory. This style is usually used in matrix analysis and framework analysis studies (Brooks et al., 2015; King, 2012). As for template analysis, King (2012) has positioned it in the middle of the above two approaches, because it allows researchers to define in advance a few codes (or themes) that are compatible with the main concepts and context of their study.

In practice, template analysis is similar, to a certain extent, to IPA when it is used within a widely phenomenological approach. However, template analysis tends to use a priori themes (King, 2012; Langdridge, 2007) and it balances between, across and within case analysis. On the other hand, IPA individual cases are analysed in greater depth, even before the initial attempts of developing a complete 'set of case'. As a result, TA can be (in general) less time-consuming than IP, and at the same time can more effectively deal with larger sets of textual data. The preferable number of participants in IPA studies is ten or less. However, this number usually ranges from between fifteen to thirty in TA studies (King, 2012).

The main reason for employing TA to analyse the primary data is that this technique helps with dealing with the research question of the present thesis in the best possible way. This is due to the fact that the present research seeks to understand more about how the entrepreneurial OpRec process works in the context of the universities. However, the literature provides enough detail about the factors that determine the above-mentioned factors, there have not been enough studies that clarify how these factors determine this process in the universities. Here, the need for TA arises to deal with such research, because this technique allows for using a priori themes, and at the same time new themes can emerge when analysing the data. In other words, the main advantage of using TA in the present research is not related to discovering more main factors (since there have already been identified by the literature), rather it is related to exploring more about how these factors are considered from the universities' perspective. Thus, it is expected that in addition to the sub-themes identified by literature, new ones will emerge. Hence this will contribute in gaining a clearer picture about the entrepreneurial OpRec in the universities context.

In addition to the above-mentioned advantages, TA is seen as a flexible technique in which the procedures are less specific (King et al., 2018; Saunders et al., 2016). That helps researchers make the template fit their research requirements (King, 2012). Also, TA helps with analysing data in a more structured way (Brooks et al., 2015; Saunders et al., 2016). However, researchers need to be careful not to fall into a trap of being "*too focused on*

applying the template to the data rather than using the data to develop the template" (Saunders et al., 2016, p. 590).

Regarding the use of TA, Langdridge (2007) argues that the most frequently used source of evidence for TA research are semi-structured interviews. However, this technique can be used to analyse all other qualitative data forms, such as other types of interviews, open-ended questionnaires and documented secondary data (King, 2012; Langdridge, 2007). Using the TA technique requires the following seven procedural steps (King et al., 2018; King & Brooks, 2016), which are as follows:

a. Familiarization with the data: Employing the TA technique competently requires being sufficiently familiar with the data before starting the process of coding. This is because the more the researchers know about their data, the more they are likely to conduct an effective analysis. Therefore, there is a need to read the transcripts several times to ensure that adequate knowledge about the data is obtained. In fact, transcribing the data word by word has helped the author to be familiar with the data even before reading through it later.

In addition, since this research follows the multiple case study strategy, the author was able to become thoroughly familiar with the transcripts before conducting any analysis. This is because each study will be analysed separately, then the amount of data will be less. Thus, it is easier to be familiar with small data rather than large data. For instance, in the present research, five cases have been considered. Each case includes three to eight transcripts. In total, the present case study involves twenty-five interviews. Thus, being familiar with the information of eight transcripts will be easier than with twenty-five transcripts.

b. Preliminary coding: Here, the researcher can code any data that might be relevant to answer the research questions. They can also highlight what interests them as they go through the data. In addition, the preliminary coding can involve considering the data items that support the a priori themes identified previously, based on the conceptual framework. Nvivo software 11, which was used to conduct this step. This was both efficient and effective in carrying out the preliminary coding. To be even more effective, the preliminary coding was conducted on a subset of the transcripts. The first three interviews were coded at this stage. However, only a subset of the data was used; this stage has produced a large number of codes for each case, which later contributed to adding more clarity to the phenomena under study.

c. Clustering: After the preliminary analysis, the codes are categorized into 'meaningful groups'. This contributes to identifying the themes that address the issues under study, as well as the potential relationships between these themes. At this stage, it is important to consider the full list of codes produced previously to merge with those that are very similar under a title that represents them all in order to remove the duplicate ones. Nvivo has played a remarkable role in clustering the codes due to the considerable flexibility provided by this

software regarding moving the codes (nodes) between the themes identified, thus trying various methods of organizing the analysis.

d. Producing an initial template: Clustering the themes in the previous stage provides the basis for producing the initial coding template. Such a template can be represented through a diagram that includes a group of themes organized hierarchically. Each group encompasses a number of one or more levels of sub-themes. Again, employing Nvivo contributed to facilitate this step because it provides a ready hierarchical coding template, which is a result of clustering the nodes into the main groups decided by the researcher. For this research, five initial coding templates have been produced - one for each case.

e. Developing the final version of the template: At this stage, the initial template is applied to the full data set. This helps in amending (through an iterative process) this initial template, where issues, weaknesses and limitations are discovered in order to develop a template that captures what is pertinent and important to answer the research questions. Such an iterative tactic has been used to modify the five initial templates of the present research.

Modifying these templates has had two benefits. First, it has helped with the development of the final version template for each case, which in turn has helped with understanding the process of OpRec of each university under study, separately. Second, the final version templates developed for the cases considered have contributed to developing the template that represents the five universities (cases) together. The researcher refers to this as the *ultimate version template*. This template is a product of the overall commonalities between the final version templates of each case, where there is consensus between at least two of them. As such, the main findings of the present research will be presented by relying on this template.

One could argue that the factors considered in only one of the cases can be considered important for the OpRec process in the universities. Not considering them could provide an incomplete picture of the aforementioned process, thus resulting in an inability to achieve analytic generalization. This could be true, but there are two points here that need to be clarified. The first is that there are many factors that determine the OpRec process, which cannot be considered entirely in a single study. However, the present research considers the most significant factors, more precisely those that have been discussed in most of the entrepreneurship literature. Such a commonality principle is applied to the data analysis as well. Following a multiple case study strategy has helped significantly in this regard. The second point is that if those factors (considered in only one case) are that important, why have they not found any support from the findings from the other four cases.

The templates developed for each case are considered final after all pieces of data pertinent to the present research questions have been coded and after ensuring that the templates are

well-organized and sufficiently coherent to assist in interpreting the data and writing the cases.

f. Applying the final template(s): The moment that the researcher decides that there are no further considerable changes required to the developed template, they can then use it to help them with interpreting the data. For the present research, the final version templates of each case and the ultimate template helped the researcher develop his interpretation of the data.

g. Writing up: The final template(s) contribute greatly to organizing the way used to present the analysis. With respect to the present research, the *final version* templates of each case have been used to present the analysis chapter, while the *ultimate version* template has been used to present the findings from the present research.

Having presented the procedural steps of using the TA technique, there are two points that distinguish the use of this technique in the present research from other studies. The first point is that the final version templates and the ultimate version template include two main sections. This is because the conceptual framework of the present research includes, in addition to OpRec determinants, the factors relating to the context of the study. Thus, the first section in the template deals with the factors that determine the OpRec process, and the second section focuses on the criteria that can be used to judge whether or not a university is entrepreneurial.

The second point is that this research follows a multiple case study strategy. Therefore, there was a need to amend some of the above-mentioned procedural steps somewhat, especially the fifth step, to fit with the research strategy. Then, the idea of developing the ultimate version template is introduced in the fifth step, as explained earlier.

Table 3.9 The application of the Template Analysis technique to the present research

Stage	Application to the present research
1. Familiarization with the data	The author has transcribed the interviews word by word and read the transcripts several times to be familiar with the data.
2. Preliminary coding	The data that was relevant to answering the research question(s) and the one that supports a priori themes were coded by using Nvivo software 11.
3. Clustering	The preliminary codes are clustered into 'meaningful groups'.
4. Producing an initial template	Five initial coding templates have been produced for the cases under study.
5. Developing the final version of the template	The initial coding templates were modified in a way that helped with developing a final version template for each case. The five final version templates have contributed to developing the final version template that represents the five cases together (the ultimate version template).
6. Applying the final template(s)	The final version templates of each case and the ultimate version template have helped with interpreting the data of the present research.
7. Writing up	The final version templates of each case have been used to direct the analysis chapter and the ultimate version template has been used to present the findings chapter.

Source: Author - drawing on King and Brooks (2016) and King et al. (2018).

3.2.2.2 Framework Analysis

The data gained from the universities' documents and web pages have been analysed by employing another form of thematic analysis of the qualitative data, which is the Framework

Analysis technique. Ritchie and Spencer (1994, p. 177) define this approach as “an analytical process which involves a number of distinct though highly interconnected stages”. Although it is possible to use the TA technique to analyse documents and web pages (King, 2012; Langdridge, 2007), the author has used the Framework Analysis technique to analyse the above-mentioned data.

The main reason behind relying on the Framework Analysis is that the purpose of using both website content and document secondary data in this research is to support and triangulate the results from the primary data (the interviews). So, this technique was used after gaining results from the primary data. In other words, the template was developed by analysing the interviews, which were used as a guide to analyse the universities’ documents and web pages. This is actually very possible when using the Framework Analysis, because this technique promotes developing a list of the key themes prior to applying the codes to the data (Gibbs, 2008; Pope, Ziedland, & Mays, 2000; Ritchie & Spencer, 1994; Skinner, Edwards, & Corbett, 2014). Thus, this technique offers a clear-cut procedure, which allows for reconsidering and reworking ideas accurately (Ritchie & Spencer, 1994).

With regards to the use of the Framework Analysis, Ritchie and Spencer (1994) confirms that this technique can be applied to various research strategies, such as archival research and case study, using different types of data collection methods, such as document secondary data, interviews and focus groups. Employing the Framework Analysis technique requires following five steps (Pope et al., 2000; Ritchie & Spencer, 1994), which are as follows:

a. Familiarization: As with TA, the very first step in using the framework analysis technique is to be familiar with data, with a view to gain an overview of the quality, profoundness and variety of this data. Therefore, the author has read the documents and web pages selected several times to ensure that he has gained adequate knowledge about the information offered by these documents and web pages.

b. Identifying a thematic framework: At this stage, there is a need to identify all the themes through which the selected data can be investigated and referenced. Doing so requires considering a priori concepts and issues included in the conceptual framework. Then, it is expected that this stage will produce a ‘detailed index’, which categorizes the themes into manageable groups for following recaptures and explorations. For the present research, the framework that was developed from analysing the primary data (the interviews) has been considered a thematic framework. This is because, as mentioned earlier, the secondary data (documents and website content) are used as a supportive source of evidence for the primary data.

c. Indexing (Coding): The purpose of indexing is to apply the thematic framework systematically to the full data set. For the present research, the author has coded any data that might be relevant to supporting the findings from primary data. Descriptive coding has

been employed for this purpose. Nvivo software 11 has been employed to conduct such an indexing scheme. Using this software has ensured efficiency and effectiveness in carrying out this step.

d. Charting: At this stage, the data is rearranged according to the proper section within the thematic framework. Charts are placed with themes (headings) and sub-themes (sub-headings), which are drawn from a priori concepts and issues included in the conceptual framework that formed the thematic framework. Having such a feature in the Framework Analysis technique has helped the author rearrange the codes produced and place them with the themes to which they belong. Also, this stage has helped with merging similar codes and removing duplicates. Again, Nvivo has played a considerable role in conducting this step.

e. Mapping and interpretation: The fundamental purpose of this step is to compile the main characteristics of the data in order to address the key issues and identify interrelationships between the themes, and then develop an interpretation of the data. For the present research, it was important to stay close to what have been pointed out by the interviewees. Therefore, there were no substantial changes to the findings from the primary data, rather the focus was on adding more clarity to the findings from the primary data, as well as to support and triangulate these findings.

Table 3.10 The application of the Framework Analysis technique to the present research

Stage	Application to the present research
1. Familiarization	The author has read the documents and web pages several times to become familiar with the data.
2. Identifying a thematic framework	The framework developed from analysing the interviews has been employed as a thematic framework.
3. Indexing (Coding)	The thematic framework was applied systematically to the data gained from the universities' documents and web pages by using Nvivo software 11.
4. Charting	The codes have been rearranged and placed with themes and sub-themes to which they relate.
5. Mapping and interpretation	The interpretation of the data has been developed to add more clarity to findings from the interviews, and also to support and triangulate these findings.

Source: Author - drawing on Ritchie and Spencer (1994) and Pope et al. (2000).

The research design is summarized in Figure 3.3.

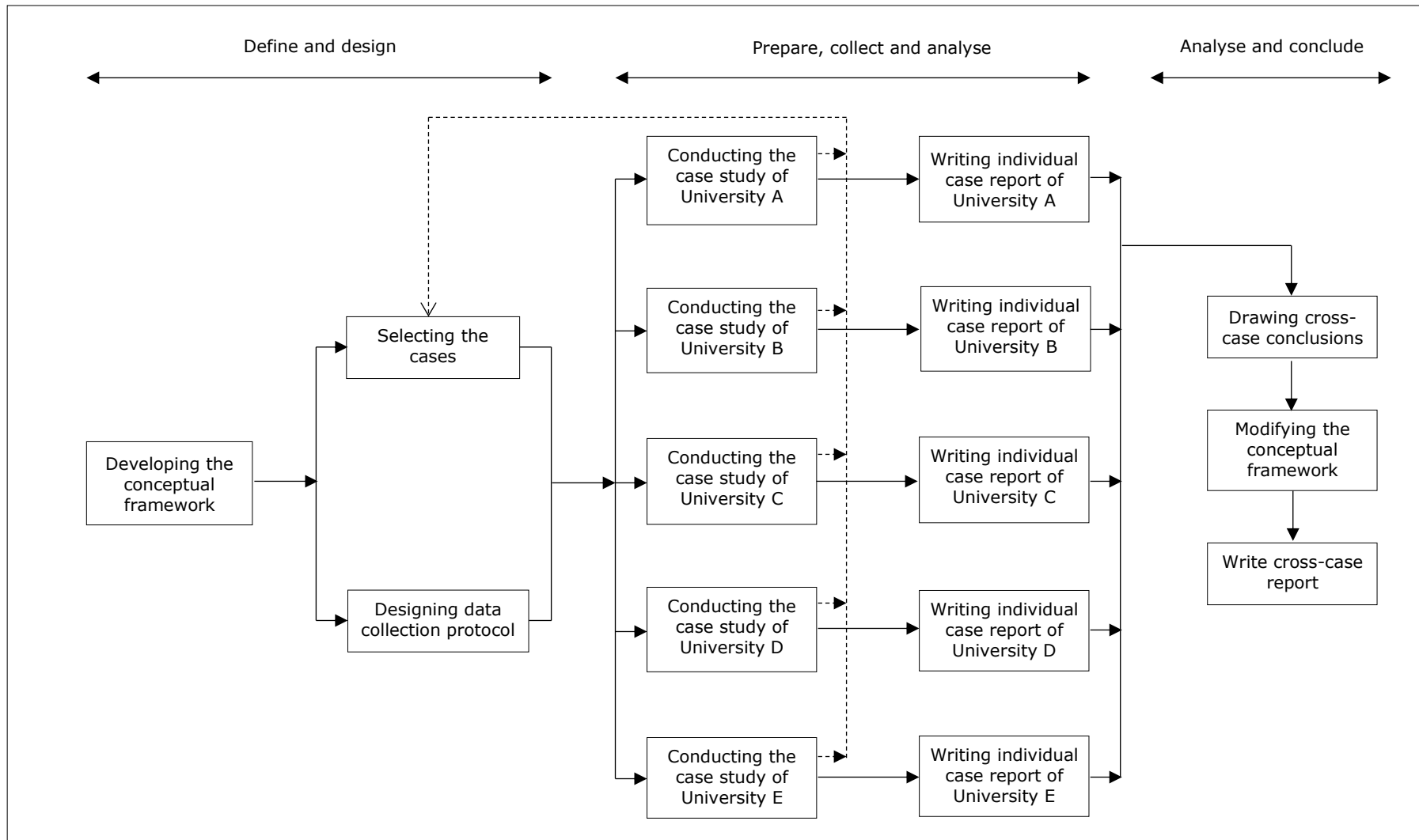


Figure 3.4 Multiple case study procedure

Source: Adapted from (Yin, 2014, p. 60)

3.3 The Quality of Research Design

Assessing the research quality is significant when conducting social science research; the researcher has sought to meet the generally accepted criteria that are used in conducting such research. There are comprised of two main views. The first, which is considered a classical framework (Flick, 2014), is somewhat general; it is used by both qualitative and quantitative researchers. These criteria are construct validity (objectivity), external validity, internal validity and reliability. The alternative view is the one suggested by Lincoln and Guba (1985), which also consists of four criteria, where each has an equivalent in the classical framework. Confirmability parallels construct validity (objectivity), transferability parallels external validity, credibility parallels internal validity and dependability parallels reliability (Bryman, 2016, p. 400).

Yin (2014) considered the above alternative view when he decided the criteria that can be used to assess the quality of case study research. However, he has used the terminologies of the classical framework. The present research follows the view of Yin (2014). Thus, the alternative view will be considered by using the terminologies of the classical view. There are two main reasons for following the view of Yin (2014). First, it looks at the above-mentioned criteria from a case study perspective. Second, it offers a variety of tactics that can be used to deal with the research quality criteria at different stages of conducting case study research.

3.3.1 Objectivity/construct validity

Flick (2014, p. 540) describes objectivity in qualitative research as *"the degree in which a research situation (the application of methods and their outcome) is independent of the single researcher"*. Then, considering objectivity leads to avoiding aware bias and subjectivity when conducting research (Saunders et al., 2016). In fact, guaranteeing objectivity in qualitative research is not an easy task; there is a need to make precautions and follow any procedures which would avoid the researchers' bias (Sorensen, Ussing, Wandahl, & Christensen, 2018). Three tactics can be employed to boost objectivity/construct validity, which are as follows:

a. Employing various sources of evidence: The phenomena of interests of the present case study research will be explored depending on the perspectives of the participants. This could lead to accepting the idea of multiple realities. In this context, it can be claimed that triangulation is important when conducting this type of case study, as it will ensure that the participants' perspectives are presented more precisely. Then, employing multiple sources of collecting data can help with developing convergent evidence, which supports the findings by utilizing more than one source of evidence. Thus, all the evidence is directed towards one conclusion (Yin, 2014).

Although using different sources of evidence is more important for a single case study (Bowen, 2009), triangulation is still significant for multiple case studies, because it contributes towards

reducing the potential bias that can exist in qualitative research, as it “*seeks a confluence of evidence that breeds credibility*” (Eisner, 2017, p. 110). Having mentioned the multiple case studies approach, it is worth stating that following this approach can contribute greatly to establishing construct validity (Shekhar Singh, 2014). The present research relies on three source of evidence, semi-structured in-depth interviews, document secondary data and website content, in order to answer its research question.

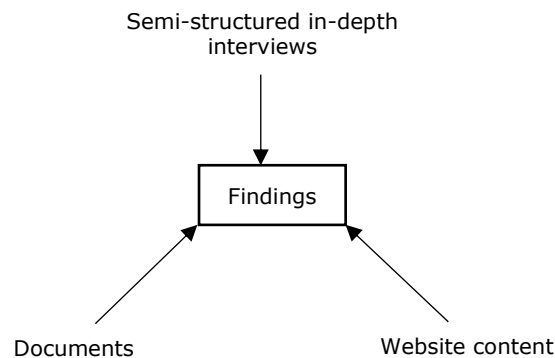


Figure 3.5 Convergence of evidence of the present research

Source: Adapted from (Yin, 2014)

b. Establishing a chain of evidence: This tactic aims at allowing the external observer (the reader) to “*follow the derivation of any evidence from initial research questions to ultimate case study conclusions... Furthermore, this external observer should be able to trace the steps in either direction (from conclusions back to initial research questions or from questions to conclusions)*” (Yin, 2014, p. 127). The author has sought to provide strong evidence relating to all aspects of the present research and has also sought to present this evidence with sufficient detail, and in a coherent manner, so that the reader can easily recognize the evidence presented in the present thesis.

c. Reviewing the draft case study report by the key informants: Yin (2014) argues that to enhance the construct validity, the draft of the case study report needs to be reviewed by the key informants and participants. If those informants show disagreement with the current research’s finding, then the researcher should consider the aforementioned report as an unfinished work until the disagreement is settled by searching for further evidence. This tactic has not been followed by the present research due to the difficulty in obtaining more time from the participants to conduct such a review. However, after completing the interviews’ transcriptions, each participant was sent a copy of their interview(s) to ensure that the information provided is allowed to be used in the present research.

3.3.2 Internal validity

Internal validity, from a qualitative research perspective is “*whether or not there is a good match between researchers’ observations and theoretical ideas they develop*” (Bryman, 2016,

p. 400). In this regard, Shekhar Singh (2014) argues that establishing internal validity requires considering the validity of relationships assumed between the themes under study. Therefore, it is significant to develop strategies that remove vagueness and contradictions and establish robust connections in the data. Yin (2014) identifies four tactics for boosting the internal validity, which are as follows:

a. Employing a pattern matching logic: This tactic requires comparing the pattern based on the findings from the case study with the pattern made/predicted before collecting the data. If these two patterns seem to be analogous, then the findings from the case study can contribute to enhancing the internal validity. This has been achieved by the present research, as the empirical findings appear to be similar to the predicted ones.

b. Explanation building: Using this tactic requires analysing the data collected for the case study through building an explanation that clarifies the causal relationships between the phenomena considered, or to elucidate why or how things took place. In a multiple case study, the target is to establish a 'general explanation' that is appropriate to all cases, even if each case may vary in the details they provide. The present research has established such an explanation through a detailed analysis of the data, which leads to creating an overall explanation for the findings from the five cases considered.

c. Addressing rival explanations: This tactic uses 'rival theoretical propositions', where each has a pattern of 'independent variables'. If one of these patterns is valid, the rest cannot be; the presence of a particular pattern prevents the presence of other patterns. In fact, this tactic has not been followed by the present research, because of the nature of the phenomena under study which are open to various possibilities and interpretations.

d. Employing logic models: This tactic can be considered a particular style of pattern matching, as the use of logic models involves matching the findings (empirically observed events) to the events predicated theoretically. However, it is different from the pattern matching tactic in that logic models operationalize complex sequential stages for events in the long term. Therefore, the iterative cause and effect sequence can play a considerable role in applying this tactic. The present research has not taken advantage of this tactic due to the requirements of the above-mentioned repeated process over a long period of time.

3.3.3 External validity

External validity, from a case study viewpoint, refers to whether or not the findings from the study can be generalised (Riege, 2003; Shekhar Singh, 2014; Voss, 2010; Yin, 2014). While quantitative researchers rely on statistical generalization, case study researchers seek analytic generalization (Shekhar Singh, 2014). The latter refers to "*the logic whereby case study findings can extend to situations outside of original case study, based on relevance of similar theoretical concepts or principles*" (Yin, 2014, p. 237).

External validity can be established by either underpinning a case study by a theory if the single case design is followed, or by using replication logic for a multiple case study (Shekhar Singh, 2014; Yin, 2014). Although the present research follows multiple case design, it has applied both of the above-mentioned tactics, not only replication logic. The reason behind underpinning the present research by a theory is related to the role that can be played by theories in comprehending the concepts and shaping judgements regarding the results gained (Amolo & Migiro, 2014).

3.3.4 Reliability

Reliability is seen as *"an indicator of a measure's internal consistency; dependability of the research, the degree to which the research can be repeated while obtaining consistent results"* (Quinlan et al., 2015, p. 399). In this regard, Riege (2003) argues that unlike quantitative studies, case study research can face issues regarding reliability considerations, because individuals' opinions may change over the time. Shekhar Singh (2014) believes that such issues can, to a certain extent, be dealt with by minimizing errors and bias while conducting case study research. Yin (2014) suggests two tactics to accomplish this. The first one is preparing the case study protocol (as shown in section 3.2.1.4). The second tactic is creating a case study database which helps with documenting and organizing the data collected. Using Nvivo software 11 has played a considerable role in creating this data base, which contains the documents and web pages selected, as well as the interviews transcribed (Shekhar Singh, 2014).

In addition to the above two tactics, Yin (2014) believes that maintaining a chain of evidence can (besides guaranteeing objectivity) contribute to boosting the reliability of the knowledge presented in the case study research. This includes realizing the derivation of the evidence presented in the case study research from the research question to the conclusion.

Table 3.11 Tactics for dealing with the research quality criteria

Criteria	Case study tactics	Application to the present research
Objectivity/ Construct validity	Employing various sources of evidence	Three source of evidence, semi-structured in-depth interviews, document secondary data and website content, have been used to conduct the present research
	Establishing a chain of evidence	Evidence related to conducting all the aspect of the present research have been provided and presented with sufficient detail and in a coherent manner
	Reviewing the draft case study report by the key informants	N/A
Internal validity	Employing a pattern matching logic.	The empirical findings from the present research have been compared with the predicted ones and they appear to be similar
	Explanation building	The present research has established an explanation of how the OpRec process is conducted in the universities under study through a detailed analysis of the data, which in turn has led to creating an overall explanation of the findings from the five cases considered
	Addressing rival explanations	N/A
	Employing logic models	N/A
External validity	Underpinning a case study by a theory	The present research is underpinned by RBT.
	Using replication logic for a multiple case study	Five universities have been selected as a sample to conduct this research
Reliability	Creating a case study database	The interviews transcribed and the documents and web pages selected have been stored and organized in the Nvivo software 11
	Preparing the case study protocol	The present research has prepared a protocol that has been used as procedural guide for collecting the data

Source: Adapted from Yin (2014)

3.4 Chapter Summary

In this chapter, the methodology followed to conduct the present research has been presented. Doing so has shown that the constructivism framework is the most appropriate philosophical framework for underpinning the present research. Therefore, this thesis appreciates the idea of multiple realities and promotes the idea that knowledge is a product of social constructions. Therefore, deductive-inductive reasoning and the qualitative approach have been followed by the author. In addition, the multiple case study approach has been chosen as the strategy through which the present research is conducted.

To apply this strategy, the data has been collected from five winners of the Times Higher Education EntUni of the Year Award, through three main source of evidence: semi-structured in-depth interviews with the deans and directors of entrepreneurship/enterprise centres in these universities, documents and website content. This data has been analysed by applying the principles of both the Template Analysis and Framework Analysis techniques.

This chapter has also presented the four criteria that have been used to assess the quality of the present research: validity (objectivity), external validity, internal validity and reliability of the research. These criteria have been established by employing a number of tactics that can be used at different stages of conducting a case study to produce a quality research.

Chapter Four: Multiple Case Studies (Case-by-Case Analysis)

A case-by-case analysis will assist the researcher to become familiar with the five cases under study. Such familiarity can help present a rigorous comparison between these cases. Therefore, a case-by-case analysis is considered the foundation for the cross-sectional case analysis presented in the next chapter. A case-by-case analysis also helps in realising the unique pattern of each case. This will help show the contribution of each case to the OpRec framework developed by the present research.

In this chapter, each case will be analysed based on the conceptual framework themes, which are OpRec determinants (prior knowledge, networking, entrepreneurial alertness, external environment changes, systematic search and creativity) and contextual factors (culture and mindset, vision and strategy, entrepreneurial impact and policy and practice). Data collected from semi-structured interviews will be analysed by using the Temple Analysis technique, while secondary data (website content and documents secondary data) will be analysed by employing the Framework Analysis technique. Nvivo software 11 was employed for coding and finding patterns in data gathered from each university (case).

With respect to website content, 277 pages were analysed (see table 3.7). The information obtained from these pages covers a variety of topics relating to the university's activities. Examples of these are: networking activities, collaborations and partnerships with businesses, research activities, types of opportunities, strategic orientation, reasons for being an entrepreneurial university, student and staff support, entrepreneurial activity, entrepreneurship, enterprise, and/or innovation centres activities. As for documents secondary data, a number of documents were considered. However, the focus was more on corporate strategy, strategic plan, strategy map, case studies, annual review, research strategy and financial statements.

The secondary data will be used to support/triangulate the views that will be gained from analysing the interviews. The primary data will be analysed separately from the secondary data. However, the results from both of them will be presented²⁰ together in order to provide a more comprehensive and consistent picture of each case. Although the secondary data has not supported/triangulated every view gained from analysing the interviews, it has contributed to providing, in many cases, a clearer picture relating to the pertinent issues, especially when the details provided by the interviewees were inadequate.

Accordingly, this chapter will include five main sections (five case studies); each section will present the results relating to each case study. This includes how respondents defined both

²⁰ When the results for each case will be presented, some quotations will be used to support these results. However, the quotations will be taken from interviews only, rather than from documents secondary data and website content. This is because the author wants to ensure a high level of confidentiality and anonymity.

entrepreneurial OpRec and the EntUni, as well as the views on entrepreneurial OpRec determinants, resources characteristics and the EntUni (contextual factors). Each of the above-mentioned sections starts by presenting the final version template for the case. This template will be used as a guide for the results. It will include the main themes and their associated sub-themes. These are listed in order of importance. Having these templates will help with presenting the results in an organized and flowing manner.

4.1. Case A

The data collected from University A includes five interviews, thirty-three university web pages and two documents (corporate strategy and annual report and financial statements).

a. OpRec determinants

- a.1 Networking
 - a.1.1 Internal networking
 - a.1.2 External networking
 - a.1.2.1 Networking with industry
 - a.1.2.1 Networking with the government
 - a.1.2.3 Networking with other universities
- a.2 External environment changes
 - a.2.1 Responding to external environment factors
 - a.2.1.1 Political factors
 - a.2.1.2 Competition
 - a.2.1.3 Technological advances
 - a.2.2 Being fast
 - a.2.3 Proactiveness
 - a.2.4 Risk taking
 - a.2.5 Meeting stakeholders' needs
- a.3 Prior knowledge and experience
 - a.3.1 Experience
 - a.3.2 Prior knowledge
 - a.3.2.1 Knowledge about industry
 - a.3.2.2 Knowledge about how to run business (Business knowledge)
 - a.3.2.3 Knowledge about enterprising and entrepreneurship
 - a.3.2.4 Knowledge about students
- a.4 Creativity
 - a.4.1 Being different
 - a.4.2 Teamwork
 - a.4.3 Feelings and emotions
- a.5 Entrepreneurial alertness
 - a.5.1 Being aware of opportunities overlooked by others.
 - a.5.2 Distinguishing between value creation opportunities and non-value creation opportunities
 - a.5.3 Horizon scanning
- a.6 Systematic search vs serendipitous discovery
 - a.6.1 Systematic search
 - a.6.1.1 The continuous search for opportunities
 - a.6.1.2 Market research
 - a.6.2 Serendipitous discovery

b. EntUni Criteria

- b.1 Supportive environment for entrepreneurship
 - b.2.1 Supporting entrepreneurship by Vice-Chancellor office
 - b.2.2 Establishing entrepreneurial culture
 - b.2.3 All faculties should have some of entrepreneurial element
 - b.2.4 Encouraging students to be entrepreneurial
 - b.2.5 Entrepreneurship, enterprise and innovation centres
 - b.2.6 Structures for promoting entrepreneurship
- b.2 Placing enterprise and innovation in the university strategy
- b.3 The three missions of universities
 - b.3.1 Teaching (first mission) and entrepreneurship
 - b.3.1.1 Teaching with an entrepreneurship flavour
 - b.3.1.2 Teaching with an innovative flavour
 - b.3.2 Impactful research (second mission) and entrepreneurship
 - b.3.3 Contribution to socio-economic development (Third mission)
 - b.3.3.1 Contribution to societal development
 - b.3.3.2 Greater impact on the economy
- b.4 Entrepreneurial staff
 - b.4.1 Current entrepreneurial staff
 - b.4.3 The need for more entrepreneurial staff

Figure 4.1 Final version template for University A

Source: Author

4.1.1 Defining entrepreneurial opportunity recognition in University A

University A pays remarkable attention to entrepreneurial opportunities. Therefore, there are serious attempts to recognize and search for this kind of opportunity and provide all resources required for turning these attempts into reality.

We would look to all of our business units to produce a surplus, so we can continue to invest in entrepreneurial opportunities. A3(DN)

Table 4.1 The main focus of the definitions provided by the interviewees for the entrepreneurial OpRec phenomenon in University A

	Ethical considerations	Value creation	Commercial intent	New area of activity	Different areas development	New products	Educational space	Gaps in the market	Unexploited opportunity	Responding to external environment changes	Opportunity creation	Entrepreneurial spirit	Problem solving
A1(DR)	*	*	*										
A2(DN)			*	*	*	*	*	*					
A3(DN)			*					*					
A4(DN)											*	*	*
A5(DN)		*								*			
A6(DR)	*	*		*					*				

Note: The column descriptors come from the themes included in the definitions provided by the interviewees for EntUni. This applies to any other tables, in this thesis, dealing with definitions of both entrepreneurial OpRec and EntUni.

Source: Author

Table 4.1 shows that there is no strong consensus on the definition of entrepreneurial OpRec. By analysing the answers from the interviewees, thirteen different features have been identified. Despite the above lack of consensus, there is fairly good agreement that there is a commercial and value creation intention when senior staff recognize entrepreneurial opportunities. Also, there is some agreement regarding the importance of looking for new areas of activity, finding gaps in the market and considering ethical issues when entrepreneurial opportunities are recognized.

Drawing on Table 4.1 and the above discussion, entrepreneurial OpRec can be viewed as a process of perceiving commercial, ethical and value-added opportunities through finding gaps in the market and investing in new areas of activity.

4.1.2 Entrepreneurial opportunity recognition determinants in University A

4.1.2.1 Networking

There is a strong agreement among the interviewees that networking plays a considerable role in recognizing entrepreneurial opportunities. Three of the interviewees referred to the massive importance of networking for entrepreneurial OpRec, even before the interviewer

asked the questions relating to the networking aspects. Such importance is supported by the secondary data, which show that University A pays considerable attention to networking. A number of opportunities have been recognized as a result of strong networking, such as commercial research opportunities, commercial consultancy, spin-outs, growing student numbers (especially international students), manufacturing technology opportunities, subsidiaries and collaborations and partnerships.

There are two main types of networking that contribute to recognizing entrepreneurial opportunities:

a. Internal networking: Two interviewees believe that internal networking can be one of the facilitators for the entrepreneurial OpRec process, especially networking between senior leaders. The latter can help with making concerted efforts to recognize entrepreneurial opportunities at the organizational level of the university.

b. External networking: The interviewees pay substantial attention to external networking when recognizing entrepreneurial opportunities. Such networking takes three further forms:

(1) Networking with industry: University A depends substantially on its networking with different industries when they recognize entrepreneurial opportunities. Three interviewees believe that networking with industry to recognize entrepreneurial opportunities requires engaging with industry in a much more in-depth and meaningful way. One of the most important aspects of university-industry engagement are the contributions of the University towards solving the problems facing the industry. In fact, such a contribution benefits both industry and the University.

(2) Networking with the government: Four interviewees believe in the importance of having strong networking with the government to recognize entrepreneurial opportunities. This is supported by the secondary data, which shows that the university pays remarkable attention to strengthening its relationships with the government. According to one of the interviewees, networking with the government needs to be managed effectively through having somebody in the top management who looks after government relationships and popularizes the same to the different deans and senior staff in the university.

(3) Networking with other universities: Three interviewees believe that networking with other universities can sometimes contribute to recognizing entrepreneurial opportunities; such networking can help universities learn from each other.

There are a number of resources and capabilities that University A uses to maintain and strengthen their relationships and networking. Communications are considered the main capability required for networking, not just internally, but also externally.

Communication skills are really critical in embarking on entrepreneurial activities to articulate ability to engage with and connect with the people that you're trying to work with outside of your own organization, and, to

engage with them and get to a level of being able to work with the broader organizations. A3(DN)

Reputation, social media and collaborations and partnerships are considered the main resources required for strengthening networking. Reputation, in fact, can contribute towards enhancing a number of OpRec aspects. However, the interviewees' answers pay a little more attention to the importance of reputation in facilitating networking and relationships. In addition, social media, to some extent, helps strengthen their relationships.

With regards to collaborations and partnerships, these have received considerable attention from the interviewees and the website content, not only as resources that facilitate the entrepreneurial OpRec process, but also as entrepreneurial opportunities. In addition, they are seen, by three interviewees, as determinants for the above-mentioned process. Collaborations and partnerships are good for reputational brand and assist in dealing with some of the issues facing University A. Also, they help establish new businesses and encourage growth. Therefore, they are seen as one of the main sources of revenue.

University A collaborates with three main parties: industry, the government and other universities. These collaborations take place on a local, national and international level. With respect to industrial collaborations, although university A collaborates with different types of organization in industry, it pays more attention to larger organizations/companies because they provide opportunities to gain more income.

4.1.2.2 External environment changes

Three interviewees believe that the environment in which their universities operate is changing continually and quickly, and that creating a high level of complexity requires adapting to and/or dealing with better than before, and further, people need to be educated for this eventuality. New campus locations and consultancies are considered the main opportunities for University A, and this can be recognized by dealing with the changes in the external environment.

You can't manage universities with rules that have been made five years ago. A6(DR)

Everything changes; knowledge changes, practice changes and so on. We need our staff members to reinvent themselves in this type of environment. If they don't reinvent themselves, they are going to be in a stale situation. A6(DR)

University A deals with changes and complexity in the external environment in the following ways:

a. Responding to external environment factors: Recognizing entrepreneurial opportunities sometimes requires responding to different types of changes in the external environment.

You have to respond to positive and not so positive changes in the external environment. A1(DR)

In fact, recognizing entrepreneurial opportunities does not only require responding to the external environment changes, rather, in some cases, University A seeks out these changes and responds to them. This helps the university take advantage of the opportunities offered by these changes, especially in terms of business opportunities. This made two interviewees look at their university as a business-oriented responsive university.

..... it is very business oriented, always looking for changes to see where the changes are and responding to them, and that's important because, as I said, we do see ourselves very much as a business really. A5(DN)

The interviewees' answers show that three external environment factors have had the greatest impact on the process of OpRec in this university, as will be explained below.

(1) Political factors: Political factors play a considerable role in deciding the type of entrepreneurial opportunity that the university searches for. According to three interviewees, political factors may represent a threat in some cases. However, they frequently provide opportunities and support. The most important political factors that impact different activities of University A are government policies for higher education, REF and TEF, government initiatives, government grants and government support.

In line with these political factors, the potential impact of Brexit is seen by the interviewees as a factor that could negatively affect the OpRec process. Actually, three interviewees believe that it will decrease opportunities, due to immigration issues for both staff and students, as well as the negative impression others will have of UK universities. Thus, it is going to be more difficult to attract European Union students and staff. This, of course, poses a socio-economic disadvantage. In addition, Brexit will make it more difficult to work with European partners. So, senior staff will have to keep monitoring Brexit.

We mustn't be naive in ignoring what could happen with respect to Brexit. A4(DN)

There is a nervousness around Brexit, because lots of things look like they're going to be shut off to us. A4(DN)

Probably all universities are worried about the potential impact of Brexit; not just because of potentially fewer European students coming to the UK to study, but also the kind of message it has sent out around the world about Britain not welcoming people. A1(DR)

Then, there's a significant economic disbenefit as well as a cultural disbenefit, because having a culturally diverse student population is creating a beneficial learning environment. So, there are primarily negative factors. A2(DN)

(2) Competition: Three interviewees pointed out that universities, including University A, now see themselves very much as a business. This increases the level of competition between

them and thus they are looking for opportunities that help with gaining a competitive advantage. Competition, in this context, includes many areas, for example, the UK university league table, number of students and research quality.

It's a very competitive market now in HE, both in the UK and overseas. A4(DN)

There's also still quite a lot of competition between universities, particularly in the UK, which kind of creates a bit more of a reticence for being on some platform and giving too much away. A4(DN)

(3) Technological advances: They are seen as another factor that impact on recognizing entrepreneurial opportunities. Three interviewees look at technology as an enabler. Therefore, in University A, they are always thinking about recent technology.

If you don't embrace the latest technology, then you live right behind the game and you know you will fall behind. A1(DR)

b. Being fast: Five interviewees, supported by document secondary data, stress the importance of quick responses to external changes. One of the interviewees believes that if the university does not deal with these changes quickly, then it will be difficult to gain entrepreneurial opportunities.

(University A) is a very dynamic organization. So, it's not afraid of change and it really tries to be ahead of the game in a lot of aspects. A4(DN)

It becomes about being able to respond quickly and effectively. A5(DN)

.... and obviously, clearly, lots of things never see the light of day, but you know things can gain momentum quite quickly in our university. It's not that it takes forever for something to get the Vice-Chancellor's attention here, despite us being a large, very large organization. A1(DR)

If you are able to respond quickly to the things that are happening outside, then that comes with all sorts of advantages. A2(DN)

Two interviewees pointed out that it is not enough to respond quickly to external opportunities, since the university also needs to deal with external threats very quickly, because dealing with those threats slowly could lead to losing many opportunities and also overcoming these threats quickly could open the door to new opportunities.

If there are changes that are going to impact negatively, then the quicker that you are able to move to mitigate those negative impacts, the better the position you will be in. A2(DN)

c. Proactiveness: Complementarity to the above point regarding rapid response, there is a belief that recognizing entrepreneurial opportunities requires being proactive and being the first to do things. Being proactive is, according to the document secondary data, one of University A's aspects. However, one of the interviewees, despite being convinced of the

importance of being fast and proactive, believes that in some cases the university needs to wait and learn from others' mistakes, and then target that opportunity.

Sometimes you've got to respond very quickly, otherwise you will lose out. Other times you are almost better off holding back and just waiting to see if there really is an opportunity and letting it develop a bit; maybe letting other people try it out first and make some mistakes. A5(DN)

d. Risk taking: There is active encouragement in University A for risk-taking, with a view to be more entrepreneurial. As a result of such an encouragement, there is no blame when things, sometimes, do not go as planned.

If you encourage people to take risks as they work and you don't blame them when they go wrong, you encourage them and support them to look at new opportunities. A5(DN)

In fact, having some appetite for risk and an ability to evaluate and understand risks can contribute highly to being entrepreneurial and recognizing entrepreneurial opportunities. The most important aspects of risk-taking at University A are being brave, bold initiatives and not being afraid to try things out.

e. Meeting stakeholders' needs: Responding to the needs of stakeholders is one of the activities that helps with recognizing entrepreneurial opportunities. The secondary data shows that this university pays a great deal of attention to identifying these needs and responding to them. Four interviewees see their university as a people-focused university and they look at their students as customers.

We are really people focused. People's needs are essential. A3(DN)

It was done very much to meet a need or address a need, which was an opportunity for us, which none of the other universities were addressing. A1(DR)

Responsiveness capability is considered the main capability required for dealing with changes in the external environment. Such responsiveness needs to be quick and efficient. With respect to resources, cash and/or the ability to gain financial resources, can enhance the confidence required for responding to the external environment changes.

4.1.2.3 Prior knowledge and experience

4.1.2.3.1 Experience

People with experience are more likely to recognize entrepreneurial opportunities because they are confident, and have an appropriate approach to carry it out. Not only this, experience also helps with dealing with complexities, using time efficiently and with looking for worthy opportunities. In brief, experience assists in dealing with things in a more robust way.

If you do something for a long time, you learn a lot of lessons and you become better at it. A1(DR)

Experiences help you close down and not waste time on things that look like they might not be worth pursuing. A3(DN)

Despite the above, two interviewees believe that experience only is not enough to recognize entrepreneurial opportunities; there is a need for the right support, especially from top management. This means that experience can be only one of the factors that facilitate the OpRec process.

4.1.2.3.2 Prior knowledge

Five interviewees believe that prior knowledge is complementary to experience when they recognize entrepreneurial opportunities; others see them as two separate aspects of the OpRec process. Focusing on knowledge, two of these interviewees believe that prior knowledge has a huge impact on the entrepreneurial OpRec process.

The greater knowledge you obtain, the more you are potentially able to recognize opportunities. They wouldn't be able to do this if they had a limited knowledge. A5(DN)

There are four types of knowledge that can contribute to recognizing entrepreneurial opportunity in University A:

- a. Knowledge about industry: Having a good understanding of how industry works and what problems they face has contributed substantially to recognizing opportunities regarding collaborations and partnerships, and also in finding solutions for industry.
- b. Knowledge about how to run a business (Business knowledge): To recognize entrepreneurial opportunities, senior staff need to possess some knowledge of how businesses are run and must have some understanding about the commercial side of things.
- c. Knowledge about enterprising and entrepreneurship: People from entrepreneurship centres share knowledge about enterprise and entrepreneurship with different faculties. Having such knowledge helps senior staff have self-confidence and clarity about where they need to look for entrepreneurial opportunities.
- d. Knowledge about students: Having knowledge about students can be an additional factor that helps with recognizing entrepreneurial opportunities, especially long-term opportunities. According to the document secondary data, people in the university obtain knowledge about their students by listening to them and understanding their needs and expectations.

The prior knowledge and experiences of senior staff have contributed highly to recognizing a number of entrepreneurial opportunities, such as creating new businesses, commercial consultancy, licensing, engineering opportunities and establishing new campuses. To keep gaining such opportunities, University A provides a number of resources to enhance the experience and knowledge of its senior staff, who need some capabilities for gaining this knowledge and experience, such as learning, which is considered one of the essential

capabilities required for obtaining knowledge and experience. University A learns from two sources: businesses and other universities (both UK and non-UK universities). One of the interviewees believes that entrepreneurial universities learn more from businesses than they do from other universities.

Experts, business people, project planners, and non-academics entrepreneurs are seen as the main resources for enhancing the above-mentioned types of knowledge. Three interviewees focus more on expertise. They believe that the availability of expertise in the university helps when dealing with problems and using time effectively; this in return motivates industry, who in many cases, come to University A for their particular expertise.

4.1.2.4 Creativity

All interviewees believe that new ideas or new way of doing things, as well as looking at things from a different perspective, are very important for recognizing entrepreneurial opportunities. In fact, the interviewees explicitly state that creativity is a substantial part of entrepreneurial OpRec. Licencing, new campuses and spin-outs are the opportunities that can be recognized from high levels of creativity.

Well, everything starts from creativity. That's on the business side. Creativity is about ideas surrounding innovation and the commercial application of these ideas. A6(DR)

Creativity is really being able to see opportunities that are different from the ones represented themselves in the past. A2(DN)

Three main aspects enhance the creativity required for entrepreneurial OpRec:

a. Being different: Five interviewees consider being different one of the main aspects of creativity. This requires adopting new models for doing the different activities of the university, and also responding differently to challenges and opportunities that exist in the external environment. In fact, being different, according to two of the interviewees, is something that is highly practiced at University A. This can be the result of the encouragement and enablement that the individuals at this university receive to do things differently than they have done traditionally.

We see ourselves as being disruptive. So, we try to do things differently all the time really and look for new opportunities and be responsive. A5(DN)

If you're looking at entrepreneurial types of opportunities, it's probably not quite been done before in the same way. A3(DN)

Being different contributes to recognizing opportunities that help with gaining a competitive advantage for the university. This, in fact, opens doors to more opportunities and makes the entrepreneurial OpRec process an ongoing process.

b. Teamwork: The answers of three interviewees show that teamwork, which according to the document secondary data is substantially encouraged and supported, can increase the level of creativity required for recognizing entrepreneurial opportunities, which appears in the form of finding creative solutions for different kind of problems, as well as finding new opportunities. Two interviewees believe that having multidisciplinary teams can contribute highly to recognizing entrepreneurial opportunities.

People who are different from you can sometimes be extremely irritating, but you do need that mix of creativity; people bringing different things to the table, otherwise, you're not gonna move things on. A4(DN)

c. Feelings and emotions: Three interviewees stated that feelings and emotions can enhance the creativity required for recognizing entrepreneurial opportunities. So, the more people are happy and motivated, the more likely they are to be creative and be able to recognize entrepreneurial opportunities.

If there's a feeling of positivity within the organization, that really helps people be creative in my view. A4(DN)

I don't think creativity can happen in an unhappy, unmotivated or demotivated individual. A1(DR)

Unhappy people don't create good environments for innovation and entrepreneurship. A1(DR)

The answers of interviewees denote that creativity itself is a capability. To enhance this capability, entrepreneurial opportunity recognizers need to use their imagination and creative thinking capabilities. As for the resources, creative individuals (around and in the university) are considered the main resource for enhancing the creativity required for recognizing entrepreneurial opportunities. The importance of these individuals lies in the novel ideas and creative solutions they provide, and also in challenging the internal processes as a way of thinking.

4.1.2.5 Entrepreneurial alertness

Entrepreneurial alertness plays a noticeable role in recognizing entrepreneurial opportunities. Such an alertness helps the university to become better at recognizing entrepreneurial opportunities than other universities. Subsidiaries and new campuses are the opportunities that can be recognized by having a high level of entrepreneurial alertness.

It's there to meet those opportunities when they arise, since they do it better than any other universities. A1(DR)

Three aspects of entrepreneurial alertness can be observed as follows:

a. Being aware of opportunities overlooked by others: This is one of the main reasons behind recognizing entrepreneurial opportunities. Such an awareness is raised as a result of thinking of issues that are not addressed by others, and also meeting a need that has been ignored.

University A seeks to gain those opportunities that are not seen by others in order to be different.

b. Distinguishing between value creation opportunities and non-value creation opportunities: This ability can contribute highly to sustaining the university's ability to recognize entrepreneurial opportunities. Although paying attention to profitable opportunities is important, the answers of two interviewees reveal that the focus is not on profit for profit's sake, or immediate financial returns, rather, it is about longer-term benefits and capacity building, as well as reputation building. Thus, it is about value creation.

c. Horizon scanning: Two interviewees believe that dealing with external environment changes requires horizon scanning, which helps senior staff to see and sometimes predict those changes and generate opportunities from them.

Information is seen as an irreplaceable resource for being entrepreneurially alert by two interviewees. University A obtains information from several sources, including other universities' websites, networking, government data, online resources and social media. With respect to the latter, it is considered a quicker means to obtain information for being entrepreneurially alert.

Social media enables us to get to things very quickly. So, if we are not savvy enough to be looking at social media, we're not going to spot opportunities as quickly as we would otherwise. So, that's an important part of getting information in a timely fashion, or at least then you know perhaps the germ of an idea that may be followed up in a different way.
A4 (DN)

On the other hand, awareness and special sensitivity are the capabilities that senior staff possess and use to recognize entrepreneurial opportunities. Awareness is not only about being aware of things that happen in external environment but also aware of how people and organizations work. As for special sensitivity, two interviewees agree that some senior staff have an extraordinary ability to sniff out entrepreneurial opportunities when they are available.

4.1.2.6 Systematic search vs serendipitous discovery

4.1.2.6.1 Systematic search

All the interviewees believe that entrepreneurial opportunities are searched for. There are two inextricably linked activities that are practiced by individuals who search for opportunities:

a. The continuous search for opportunities: Two interviewees pointed out that searching for entrepreneurial opportunities is an ongoing process. They believe this should be the case, because recognizing entrepreneurial opportunities needs firstly someone to search for them, secondly they require someone to respond to the changes to maintain the level of creativity contained in the entrepreneurial opportunities.

We are on a constant look out for opportunities in different fields, basically.
A6(DR)

b. Market research: Three interviewees believed that market research helps obtain data and facts, and thus proves that there is opportunity out there. These interviewees believe that market research can be considered an essential part of actively searching for opportunities. This is significant because, according to the document secondary data, market research is practiced markedly in this university.

Market research is absolutely fundamental for any business opportunity.
A1(DR)

Researching and analysing data are considered the main capabilities required for searching for opportunities. For developing researching capabilities, there have been various programmes of activity, for example, online resources, events, research training programmes, funding schemes and work with the UK Council for Graduate Education, ARMA and the University Alliance. Searching for new opportunities has contributed to establishing new campuses in different locations.

Table 4.2 Support/triangulation from the secondary data for the results of interviews relating to OpRec determinants in University A

			Website content	Documents
Networking	Internal networking			
	External networking	Networking with the government	*	*
		Networking with industry	*	*
		Networking with other universities	*	
External environment changes	Respond to the external environment factors	Competition		
		Political factors		
		Technological advances	*	*
		Being fast		*
	Proactiveness			*
	Risk taking			
	Meeting stakeholders' needs		*	*
	Experience			
Prior knowledge and experience	Prior knowledge	Business knowledge		
		Knowledge about enterprising and entrepreneurship		
		Knowledge about industry	*	*
		Knowledge about students		*
Creativity	Being different			
	Teamwork			*
	Feelings and emotions			
Entrepreneurial alertness	Being aware of opportunities overlooked by others		*	
	Distinguishing between value creation opportunities and non-value creation opportunities			
	Horizon scanning			
Systematic search vs serendipitous discovery	Systematic search	The continuous search for opportunities		
		Market research		*
	Serendipitous discovery			
Both systematic search and serendipitous discovery				

Source: Author

4.1.2.6.2 Serendipitous discovery

Two interviewees revealed that, in some cases, University A had discovered opportunities accidentally. Such opportunities can substantially benefit the University because they have less of an appetite for discovery. University A discovers opportunities accidentally as a result of strong networking and being highly alerted to changes in the external environment.

(University A) is not necessarily always looking for opportunities; opportunities sometimes come to us. And that's because we linked up with a lot of people. A3(DN)

Having presented this section, it can be said that secondary data (University's A web pages and documents) has helped provide more details about OpRec determinants and in supporting the many views gained from analysing the primary data (the interviews) (see Table 4.2).

4.1.2.7 The relationship between entrepreneurial opportunity recognition determinants in University A

There is some interaction between a number of the entrepreneurial OpRec determinants, as follows:

- (1) Networking and external environment changes: networking helps with being proactive when responding to external changes.
- (2) Networking and entrepreneurial alertness: partnerships with industry, especially through conducting research, help in having an awareness of commercial potential, which heightens the level of entrepreneurial alertness required for entrepreneurial OpRec.
- (3) Networking and serendipitous discovery: one of the main reasons to recognize entrepreneurial opportunities serendipitously is networking.
- (4) Experience and knowledge and networking: knowledge and experience significantly helps with facilitating networking with industry, which is usually translated into partnerships and collaborations.
- (5) Experience and external environment changes: experience contributes significantly towards responding to changes in the external environment in a faster way.
- (6) Entrepreneurial alertness and creativity: information that is considered an indispensable resource entrepreneurial alertness can enhance the creativity required for recognizing entrepreneurial opportunities.

Table 4.3 A summary of entrepreneurial OpRec determinants in University A

Determinants	Sources/aspects	Resources	Capabilities	Type of entrepreneurial opportunity
Networking	<ul style="list-style-type: none"> - Internal networking - External networking <ul style="list-style-type: none"> • Networking with the government • Networking with industry • Networking with other universities 	<ul style="list-style-type: none"> - Reputation - Social media 	<ul style="list-style-type: none"> - Communication - Recruit people with networking capabilities 	<ul style="list-style-type: none"> - Consultancy - Growing in student number - Manufacturing technology opportunity - Commercial research opportunity - Spin-outs - Subsidiaries
External environment changes	<ul style="list-style-type: none"> - Responding to the external environment factors <ul style="list-style-type: none"> • Competition • Political factors • Technological advances - Being fast - Proactiveness - Risk taking - Meeting stakeholders' needs 	Cash/the ability to gain financial resources	<ul style="list-style-type: none"> - Responsiveness - Business development capability 	<ul style="list-style-type: none"> - New campus - Consultancy
Prior knowledge and experience	<ul style="list-style-type: none"> - Experience - Prior knowledge: <ul style="list-style-type: none"> • Business knowledge • Entrepreneurial knowledge • Knowledge about industry • Knowledge about students 	<ul style="list-style-type: none"> - Expertise - Business people - Project planners - Non-academics entrepreneurs 	Learning	<ul style="list-style-type: none"> - Commercial consultancy - creating new business - Engineering opportunities - Global issue research opportunity - License - New campus
Creativity	<ul style="list-style-type: none"> - Being different - Teamwork - Feelings and emotions 	Creative individuals	<ul style="list-style-type: none"> - Creative thinking - Imagination 	<ul style="list-style-type: none"> - Licencing - New campus - Spin-outs
Entrepreneurial alertness	<ul style="list-style-type: none"> - Being aware of opportunities overlooked by others - Distinguishing between value creation opportunities and non-value creation opportunities - Horizon scanning 	Information	<ul style="list-style-type: none"> - Awareness - Special sensitivity toward opportunities 	<ul style="list-style-type: none"> - Subsidiaries - New campus
Systematic search vs serendipitous discovery	<ul style="list-style-type: none"> - Systematic search <ul style="list-style-type: none"> • The continuous search for opportunities • Market research 	No evidence	<ul style="list-style-type: none"> - Data analysis capability - Research as a capability 	New campus
	Serendipitous discovery	No evidence	Communication	No evidence
	Both systematic search and serendipitous discovery	No evidence	<ul style="list-style-type: none"> - Data analysis capability - Research as a capability - Communication 	No evidence

Source: Author

4.1.3 How the respondents defined the entrepreneurial university (University A)

University A is well-known as an EntUni, because it engages with many entrepreneurial activities and, of course, it was chosen as an EntUni of the year by the THE.

Table 4.4 The main focus of the definitions provided by the interviewees for the EntUni phenomenon in University A

	Business oriented	Bold/willing to take risk	Growth	Not bureaucracy	Developing academic enterprises	Strategic planning	Looking for opportunities	Innovative	Value creation	Dynamic	Not afraid of failure	Responsiveness	Customer- oriented	Non-hierarchical within and externally	Solution focused	Disciplined
A1(DR)	*	*	*	*	*											
A2(DN)	*		*			*										
A3(DN)	*					*	*									
A4(DN)		*						*	*	*	*					
A5(DN)	*							*		*		*	*	*	*	
A6(DR)	*	*					*	*	*							*

Source: Author

Table 4.4 demonstrates that there is a lack of strong agreement with regard to the EntUni definition. This is reflected in the sixteen different features of the definition of EntUni that have been revealed from the interviewees' answers. Despite the lack of agreement on all the features of the EntUni definition, there is considerable agreement that entrepreneurial universities are business orientated, and there is moderately good agreement that these universities are innovative and bold. In addition, there is some agreement that entrepreneurial universities are dynamic and that they look for opportunities, create value, aim at growing and set strategic plans.

.... all universities now see themselves as businesses who have to respond to business opportunities. A5(DN)

(University A) is very business oriented, always looking for changes to see where the changes are and respond to them. That's important, because as I said, we do see ourselves very much as a business really. This doesn't mean we just look after these interests. I mean, we don't have shareholders. Our students are very much part of what we do, but we think of our students as customers. A5(DN)

Drawing on Table 4.9 and the above discussion, an EntUni can be viewed as a business oriented, innovative, bold and dynamic university that plans strategically and looks for opportunities in order to grow and create value.

4.1.4 Entrepreneurial university factors

There are a number of factors, distributed over the four groups, that are associated with entrepreneurial universities, and at the same time, they have an indirect impact on the OpRec process. These are explained in detail below.

4.1.4.1 Supportive environment for entrepreneurship

There is considerable agreement among the interviewees, supported by the website content, regarding the importance of creating a supportive environment for entrepreneurship, which enables enterprising, creativity and opportunity. A variety of activities and means are used to create this kind of environment:

a. Support of enterprise and entrepreneurship from the Vice-Chancellor office: One of the significant contributing factors to disseminate and facilitate entrepreneurialism is support for entrepreneurship and enterprising from the Vice-Chancellor's office. This view is supported by the website content. In fact, the interviewees' answers focus on the Vice-Chancellor himself, who is described as a very entrepreneurial person and as an example to others. He takes the advantage of opportunities and he is very empowering. The analysis of the data also shows that one of the pro-vice-chancellors is responsible for enterprise and commercialization, and he spends time engaging with local companies and also with the local government in order to ensure that the university properly networks with external organizations/entities. Actually, two interviewees believe that support for entrepreneurship from the top management is one of the main reasons behind University A being an EntUni and is why entrepreneurial initiatives are supported within the university.

So, without top management support, it's just like a ship in a stormy sea.
A6(DR)

b. Establishing an entrepreneurial culture: University A embeds entrepreneurialism throughout their organizational culture. Therefore, a considerable part of University A's culture is entrepreneurial. This helps with establishing an entrepreneurial among the staff and students of this university. Such a culture is enhanced by the university's high levels of empowerment, freedom, proactiveness, responsiveness, risk taking and transparency.

c. All faculties should have some entrepreneurial element: Three interviewees believe that being an EntUni requires all faculties to be entrepreneurial. However, two interviewees believe that not all people in the university need to be entrepreneurial, although it is expected to see entrepreneurial elements in the significant entities within the university, especially at the senior levels. Regardless, someone dedicated to entrepreneurship should be present in all the faculties, and thus all faculties in the university have some entrepreneurship in their activities.

....and the entrepreneurial concept is not for a specific faculty, it's for all faculties, it's for all departments, and it's not the main focus of specific directors or deans. A6(DR)

If the faculty is a really significant chunk of the university, you would expect to see a bit of an entrepreneurial element in it. A1(DR)

d. Encouraging students to be entrepreneurial: There is considerable encouragement for the students, from different disciplines, to be more entrepreneurial, by embedding

entrepreneurship into their curricula, involving them in the university's subsidiaries and entrepreneurial activities, and enabling them to practice entrepreneurship while they are studying at the university.

Most of the students who come to universities do not come from an entrepreneurial background. So, you need to create the love for enterprise and entrepreneurship there. A6(DR)

e. Entrepreneurship, enterprise and innovation centres: These centres are considered one of the main factors that result in the development of entrepreneurial skills and promote entrepreneurialism within various activities of the faculties. They also promote social entrepreneurship as one of the elements of University A's portfolio.

f. Structures for promoting enterprise and entrepreneurship: Structures that promote enterprising and entrepreneurship is another factor that have contributed to create the supportive environment for entrepreneurship.

Creating a supportive environment for entrepreneurship can substantially and positively impact the six entrepreneurial OpRec determinants discussed in the previous section. This is a good indicator for considering entrepreneurial universities as one of the best fields for recognizing entrepreneurial opportunities.

4.1.4.2 Placing enterprise and innovation in the university strategy

There is noticeable attention on placing enterprise and innovation in University A's strategy. They are considered the main pillar in their corporate strategy and thus there is a strategy for enterprise and innovation in this university. Having such a strategy is not only important for survival, but also for being at the top of the game. Thus, it is important for the university gain entrepreneurial opportunities to achieve the strategy relating to enterprise and innovation.

Embedding innovation and enterprise into the university's strategy has encouraged and supported it being creative and having strong networking. Therefore, it can be claimed that in University A, there is an additional source of creativity and networking required to recognize entrepreneurial opportunities. This source is considered both innovative and enterprising when seeking these opportunities.

4.1.4.3 The three missions of universities

4.1.4.3.1 Teaching (first mission) and entrepreneurship

University A aims at providing high quality teaching, which is impacted by the entrepreneurial culture they have. Therefore, the elements of entrepreneurship can be found in the modules of different subject areas. Teaching is based on two forms, which are outlines below:

a. Teaching with an entrepreneurship flavour: Enterprise is one of the main pillars of the university's education strategy. Therefore, some academics in this university have been entrepreneurial in delivering their modules. Also, the university is continually embedding both entrepreneurship and social enterprise within its educational programmes. Doing so provides an opportunity for their students in different fields to learn more about entrepreneurship.

b. Teaching with innovative flavour: Creativity and innovation are the other two main pillars of the education strategy of this university. Therefore, they are creative, not only in terms of the courses they provide, but also in their ways of delivering their modules. In fact, they are seen as one of the leading providers of innovative education, both nationally and internationally. Considering both entrepreneurship and creativity in education provides the opportunity to deliver top quality teaching at both national and international levels. This has translated into being rewarded a gold rating in the Teaching Excellence Framework (TEF). This, in return, can enhance levels of student satisfaction and engagement.

Analysing the interviews, supported by the website content, shows that the teaching in University A has gained a good reputation in the industry, which in turn supports the university's networking.

4.1.4.3.2 Impactful research (second mission) and entrepreneurship

The interviewees, supported by the documents and website content, see their university as a world leading research university and they, in their research strategy, seek to enhance their position as one of the main providers of impactful research, both locally, nationally and internationally. Therefore, the research is underpinned by the idea of having a significant impact on the real world. Thus, researchers at University A do not conduct their research just for the sake of enterprise and commercialization, but also to make a difference to the world and have the most impact. This justifies the idea of creating and putting lots of effort into research centres.

To get the best out of the research, University A has designed a strategy to encourage and support excellence in research. This, in fact, increases the volume, quality and impact of University A's research, resulting in a considerable contribution to a number of global issues and challenges. To achieve the strategy referred to earlier, the university encourages and bolsters teamwork and creates multidisciplinary teams of researchers from different disciplines within the university. In addition, University A continues to boost its research through collaborations with businesses, external funders and the wider community.

The above efforts regarding conducting excellent and impactful research have been rewarded by the Research Excellence Framework (REF), by which the research of University A is judged as globally outstanding/world-leading.

Research conducted in University A highly supports creative activities and gaining novel knowledge, as well as networking with both industry and government. These factors, in return, contribute to the university recognizing more entrepreneurial opportunities.

4.1.4.3.3 Contribution to socio-economic development

a. Contribution to societal development: University A pays substantial attention to making a difference in society and creating the most impact both locally and regionally. Their significant contribution to society is shown below in order of importance:

- (1) Engaging widely and working hand-in-hand with the local community.
- (2) Addressing social needs.
- (3) Conducting research that helps minimise negative impact on the environment.
- (4) Impacting the work of other universities and motivating them to be more entrepreneurial.
- (5) Supporting alumni in ways that can be useful for both the university and/or its wider community.
- (6) Continually supporting social enterprise.
- (7) Producing high quality graduates.

We focus on social entrepreneurship as one of the elements of our portfolio. A6(DR)

The corporate plan has some very interesting targets on social enterprise, and it's something that the university is very, very keen to promote. A4(DN)

b. Greater impact on the economy: University A plays a considerable role in achieving local and regional economic prosperity, and therefore impacts the national economy. Some of the interviewees believe all universities in the UK have a positive impact on the economy, but entrepreneurial universities have a greater impact on the economy than the other universities.

It is always difficult to imagine an entrepreneurial university that doesn't have a positive impact on the economy. A1(DR)

Entrepreneurial universities should have a positive impact on the economy simply by definition. A1(DR)

.... the natural extension of that is if you're an entrepreneurial university, that is making things happen, that becomes one of the places to go to, then that's going to have an even bigger effect on the economy. A4(DN)

University A has the above-mentioned impact through the following factors, which are listed in order of importance:

- (1) Creating new ventures.
- (2) Establishing new campuses and subsidiaries in different locations.
- (3) Developing academic enterprises.

- (4) Producing business people.
- (5) Employing more people as a result of continuous growth.
- (6) Obtaining a larger number of students, especially international students.
- (7) Engaging with local industry or businesses.
- (8) Helping commercial organizations achieve their goals.
- (9) Developing technology parks and incubations, which are seen as one of the contributing factors to the development of the economy.

We are a very entrepreneurial university. It's one of the things, even before I worked here, we acknowledged that (University A) is very entrepreneurial. You know there is a huge techno park (in University A), where they do business incubation and we have worked it for five years. Now the philosophy is far more entrepreneurial than anywhere else.
A1(DR)

The third mission of the universities encourages them to respond to the changes in the external environment and to be well-networked. Also, it helps enhance their levels of entrepreneurial alertness and helps them gain more knowledge. These factors, of course, can facilitate the process of entrepreneurial OpRec and make this process an ongoing one.

4.1.4.4 Entrepreneurial staff

There is considerable attention at University A on the recognition of staff contribution, which is part of the support provided to the staff. Such support helps in developing them improve in terms of learning, teaching and their research agenda. That does not only apply to the existing staff but also to the potential staff, since the university aims at attracting this kind of better quality staff.

Entrepreneurial individuals are seen as most fundamental of resources. According to one of the interviewees, entrepreneurial universities, logically, should have a number of entrepreneurial staff and this number usually increases in such a university, because entrepreneurial individuals are attracted to entrepreneurial universities. This is supported by the website content, which shows that University A has a number of staff who think and behave entrepreneurially.

Entrepreneurial people will be more attracted to an entrepreneurial organization. A1(DR)

The current entrepreneurial staff have an entrepreneurial spirit, understand the commercial side of things and have the capability to recognize opportunities and then look for how to exploit them.

You have to have the quality of staff who have the research capabilities, and also you've got to have people who understand the commercial side of things. So, they can go out and really make those contacts with industry... you need different staff for different things, but for all of those things you have to recruit quality people. A4(DN)

Analysing the data reveals that University A, as an EntUni, is not satisfied with a fixed number of entrepreneurs; there are continuous endeavours to obtain more. To do so, University A highly encourages and supports its staff to be more entrepreneurial. University A does this through the following methods:

- (1) Encouraging and supporting risk-takers as they work.
- (2) Encouraging staff to look for opportunities.
- (3) Supporting entrepreneurial initiatives offered by staff.
- (4) Rewarding staff for developing excellence in entrepreneurship practice.

Supporting entrepreneurial staff and encouraging the other staff to be more entrepreneurial also can substantially positively affect the six entrepreneurial OpRec determinants discussed in the previous section.

This section has helped to show the contribution of the secondary data in ensuring the views relating to EntUni factors are clearer and by providing support to a number of them (see Table 4.5).

Table 4.5 Support/triangulation from the secondary data for the results of interviews relating to entrepreneurial university factors in University A

			Website content	Documents
Placing enterprise and innovation in the university strategy	Placing enterprise in the university strategy		*	*
	Placing innovation in the university strategy		*	*
Supportive environment for entrepreneurship	Supporting entrepreneurship by the Vice-Chancellor office		*	
	Establishing entrepreneurial culture			*
	All faculties should have some entrepreneurial element			
	Encouraging and supporting students to be entrepreneurial		*	*
	Innovation centres		*	
	Entrepreneurship centres		*	*
	Enterprise centre		*	
Structures for promoting entrepreneurship				
The three missions of universities	Teaching (first mission) and entrepreneurship	Teaching with entrepreneurship flavour	*	*
		Teaching with innovative flavour	*	*
	Impactful research (second mission) and entrepreneurship		*	*
	Third mission	Contribution to societal development	*	*
		Greater impact on the economy	*	*
Entrepreneurial staff	Current entrepreneurial staff		*	
	The need for more entrepreneurial staff		*	*

Source: Author

This section also shows that EntUni factors can facilitate the process of entrepreneurial OpRec through their positive effect on the six entrepreneurial OpRec determinants (see Table 4.6).

Table 4.6 The relationship between EntUni factors and entrepreneurial OpRec determinants in University A

		Prior knowledge	Networking	Alertness	Systematic search	Creativity	Environmental changes
Placing enterprise and innovation in the university strategy	Placing enterprise in the university strategy		*			*	
	Placing innovation in the university strategy					*	
Supportive environment for entrepreneurship		*	*	*	*	*	*
The three missions of universities	Teaching (first mission) and entrepreneurship		*				
	Impactful research (second mission) and entrepreneurship	*	*			*	
	Contribution to socio-economic development (Third mission)	*	*	*			*
Entrepreneurial staff		*	*	*	*	*	*

Source: Author

4.1.5 Resources characteristics

Some elements of the previous sections show the importance of resources and capabilities to the entrepreneurial OpRec process. To make this importance clearer, this section will present the characteristics of these resources and capabilities.

It's very difficult to do anything without resources. A4(DN)

If you've got the resources, you can try things out. A4(DN)

a. Valuable resources: Resources and capabilities contribute substantially to creating quality services and to increasing the worth of the university's services. This, in return, provides opportunities for the university to attract more students, as well as better quality staff. University A's resources and capabilities help it to have a significant impact locally, regionally, and also internationally. This is due to the fact that on the one hand, these resources and capabilities enable the university to invest and be prepared to invest large sums of money in not just its infrastructure, but also in staff and facilities, such as IT. Doing so helps in providing the type of quality service that students and other stakeholders expect. On the other hand, these resources and capabilities enable the university to evidence the way that it engages with industry.

In fact, the university's resources and capabilities make this university a very dynamic organization, not bureaucratic. So, it is not afraid of change, which allows it to structure and almost do the things that for many universities would just look too complicated. In addition, it is not afraid to do more entrepreneurial activities, such as creating new business. This, of course, increases the value of what the university offers.

b. Rare resources: There is no complete agreement on whether or not the resources and capabilities available in University A are unique. Three of interviewees state that the University does not have unique resources and capabilities, however, two other interviewees

believe those unique resources and capabilities are available in University A. Examples of these include the unique learning and teaching facilities (especially the engineering facilities), as well as its unique human resources. In addition, the way that University A is set up is unique when compared to other universities.

c. Imperfectly imitable (or costly to imitate) resources: There is a general agreement among the interviewees that the ideas produced by University A can be copied. This is due to the high level of competition between universities, as well as the availability of information regarding their activities on their websites. However, what cannot be copied, according to two interviewees, is its culture, because it *"tends to be something to be run from the top to the bottom of the university and when new people come in they absorb it."* A2(DN)

d. Organization: To exploit the competitive potential offered by resources and capabilities, the university takes the following actions, which are complementary with one another:

- (1) Deciding priorities and using the resources and capabilities according to those priorities. The answers of the interviewees reveal some of these priorities, which involve doing different things continually, and continuing to be EntUni and continuing to be a globally outstanding university in teaching and research.
- (2) Mixing disciplines and academics and non-academic working together.
- (3) Trying things out and doing things that are somewhat different from what other universities are doing.
- (4) Using different amounts and types of resources and capabilities depending on situation, activity, goal and/or opportunity the university is dealing with. University A is able to do this due to its high level of control over those resources and capabilities.

4.2 Case B

The data gathered from University B includes four interviews, ninety-four university web pages and five documents (strategic plan 2015-2020, annual report 2015/16 and three case studies).

- a. OpRec determinants**
 - a.1 Networking
 - a.1.1 Internal networking
 - a.1.2 External networking
 - a.1.2.1 Networking with industry
 - a.1.2.1 Networking with other universities
 - a.2 Prior knowledge and experience
 - a.2.1 Experience
 - a.2.2 Prior knowledge
 - a.2.2.1 Knowledge about how to run a business (Business knowledge)
 - a.2.2.2 Knowledge about industry
 - a.2.2.3 Knowledge about students
 - a.2.2.4 General knowledge
 - a.3 External environment changes
 - a.3.1 Responding to external environment factors
 - a.3.1.1 Political factors
 - a.3.1.2 Competition
 - a.3.1.3 Technological advances
 - a.3.1.4 Societal factors
 - a.3.2 Being fast
 - a.3.3 Proactiveness
 - a.3.4 Risk taking
 - a.3.5 Meeting stakeholders' needs
 - a.3.5 Creating needs for people
 - a.4 Creativity
 - a.4.1 Continuous support for creativity
 - a.4.2 Teamwork
 - a.4.3 Non-linear thinking
 - a.5 Systematic search vs serendipitous discovery
 - a.5.1 Systematic search
 - a.5.1.1 Market research
 - a.5.1.2 The continuous search for opportunities
 - a.5.1.2 Enthusiasm
 - a.5.2 Serendipitous discovery
 - a.5.3 Both systematic search and serendipitous discovery
 - a.6 Entrepreneurial alertness
 - a.6.1 Horizon scanning
 - a.6.2 Finding connections between unrelated information/areas (dot connection)
 - a.6.3 Distinguishing between profitable opportunities and non-profitable creation opportunities
 - a.6.4 Being aware of opportunities overlooked by others
- b. EntUni Criteria**
 - b.1 Supportive environment for entrepreneurship
 - b.2.1 Supporting entrepreneurship by the Vice-Chancellor office
 - b.2.2 Entrepreneurship, enterprise and innovation centres
 - b.2.3 Encouraging and supporting students to be entrepreneurial
 - b.2.4 Establishing entrepreneurial culture
 - b.2.5 Structures for promoting creativity entrepreneurship
 - b.2 Placing entrepreneurship, enterprise and innovation in the university strategy
 - b.3 The three missions of universities
 - b.3.1 Teaching (first mission) and entrepreneurship
 - b.3.1.1 Teaching with an entrepreneurship flavour
 - b.3.1.2 Teaching with an innovative flavour
 - b.3.2 Impactful research (second mission) and entrepreneurship
 - b.3.3 Contribution to socio-economic development (Third mission)
 - b.3.3.1 Contribution to societal development
 - b.3.3.2 Greater impact on the economy
 - b.4 Entrepreneurial staff

Figure 4.2 Final version template for University B

Source: Author

4.2.1 Defining entrepreneurial opportunity recognition in University B

University B pays considerable attention to recognizing opportunities and providing all the facilities and resources required to develop the capabilities of its staff regarding dealing with opportunities. In this regard, it is worth mentioning that there are many sections on University B's website that consider different types of opportunities, including entrepreneurial ones, for the university.

Table 4.7 The main focus of the definitions provided by the interviewees for the entrepreneurial OpRec phenomenon in University B

	Growth and expansion	Creative process	Doing new things	Lead the competition	Commercial intention	Looking at unique problems	Creating needs	Allow for further entrepreneurial endeavours	Value creation	Understanding the market needs	Translate research closer to market	Understanding the research that is going on
B1(DN)	*	*	*	*	*							
B2(DR)			*			*	*	*	*			
B3(DN)					*				*	*		*
B4(DR)					*						*	

Source: Author

Table 4.15 shows that the interviewees provide no universal consensus on the concept of entrepreneurial OpRec. They have provided twelve different features for the definition of this concept. Despite such a lack of consensus, there is considerable agreement that senior staff at University B aim to achieve commercial benefits when recognizing entrepreneurial opportunities. Also, there is fairly good agreement among these interviewees on the importance of considering value creation and finding ways of doing new things for such recognition.

We have to be much more of a commercial institution and certainly when looking for opportunities, understand that there is a limit to students' intake, and other opportunities for funding have to be taken very seriously. B3(DN)

Drawing on Table 4.15 and the above discussion, entrepreneurial OpRec can be viewed as a process of perceiving commercial and value-added opportunities through doing new things.

4.2.2 Entrepreneurial opportunity recognition determinants in University B

4.2.2.1 Networking

Networking is seen as a critical factor, which positively contributes to various activities, including entrepreneurial OpRec. In fact, there is remarkable encouragement towards strengthening and expanding the university's networking. This, of course, can increase the number of and maximize the quality of the entrepreneurial opportunities being recognized.

Analysing the secondary data shows that University B pays substantial attention to networking locally, nationally and internationally. As a result of such attention, the university is a part of a number of professional, enterprise and research networks, such as the Santander Universities network, Enterprise Educators UK (EEUK), Japan-UK Research and education Network for Knowledge Economy Initiatives (RENKEI) and Worldwide Universities Network (WUN). Such networks help with recognizing more research opportunities and preserving a national and international research presence.

A number of opportunities have been recognized as a result of strong networking, such as funding from industry, commercial research opportunities, creating new businesses, knowledge exchange, consultancy, spin-outs and collaborations and partnerships. In this regard, the website content reveals that partnerships, consultancy and commercial research opportunities make huge financial returns. This contributes highly to the financial sustainability of the university.

Two main types of networking can be seen in University B, which are as follows:

a. Internal networking: Internal networking, especially between the directors of enterprise and entrepreneurship centres and senior staff in the university, has played a considerable role in recognizing entrepreneurial opportunities. Such networking helps find creative solutions for complex problems and increases the number of opportunities recognized by the university.

Internal networking is really important. We've done a lot of work to bring together people from different academic disciplines, and get them to share with one another and address complex problems, by bringing a social scientist alongside an engineer and a clinician. B4(DR)

The bigger the network you have within the institution, the easier it is to be able to identify where you can have things working across different areas, and where you can spot more opportunities. B2(DR)

b. External networking: University B pays considerable attention to external networking, which takes the following two forms:

(1) Networking with industry: There is a huge need, according to all interviewees, to network with industry and listen to them, as well as consider the direction they are going in. Doing so helps with recognizing a number of opportunities that help maximise the university's financial returns on investment. Secondary data shows that networking with industry is very important for University B, because it helps them keep up to date with generic issues in the industry, and identify those that need radical change. Therefore, it is important to attend industrial networking events and keep a good relationship with industry. Interestingly, two interviewees believe that recognizing entrepreneurial opportunities requires not only networking with larger companies but also with entrepreneurs and SMEs.

Links with industry are really important because they have a knowledge of the market and they have a lot of knowledge about us, and where the gaps are. B1(DN)

Industry is really important. I think you really need to connect to industry because that creates the market. And that's what we're looking for all the time - is there any market? And how can we connect our new knowledge into a new market? B4(DR)

The other one that has been very useful for me is a network with entrepreneurs as well. B2(DR)

(2) Networking with other universities: Only two interviewees believe that networking with other universities can help with recognizing entrepreneurial opportunities. In this context, the documents secondary data shows that University B is continuously seeking strong links with other universities, especially on an international level.

A variety of resources and capabilities are available to strengthen the networking required for recognizing entrepreneurial opportunities. The most important of these are relationships, location and collaborations and partnerships. The latter is one of the facilitators of the former, especially those with industry. With respect to relationships, the focus is more on strong-tie relationships when the University B recognizes entrepreneurial opportunities.

A huge important aspect for (University B) is our location, and the fact that we are a city-based campus university with a predominant industry around us, along with small business. I mean that is a huge advantage when you are trying to develop enterprise and entrepreneurship. B2(DR)

With respect to partnerships and collaborations, they are seen as facilitating resources for entrepreneurial OpRec and determinants of this process, and also as mentioned earlier, as entrepreneurial opportunities. Therefore, the university pays considerable attention to and makes significant effort to develop strategic, unique, pioneering and value-added collaborations and partnerships in innovation, enterprise, research and education on regional, national and international levels.

Although these partnerships and collaborations take place with different parties, such as other universities, the government and industry, those of the latter group gain more attention from the university, which already has a big number of them, with some globally leading companies. Such partnerships help with enhancing creativity, growing, creating new businesses and being one of the world's leading research universities.

Analysing the website content shows that having collaborations and partnerships help the senior staff develop their leadership and strategic capabilities where they can use their academic expertise to make business decisions in various areas. These, in return, help with gaining a number of commercial opportunities. Due to the importance of industrial collaborations and partnerships, a large part of the activities of innovation and enterprise centres are employed to facilitate, support and provide new ways of creating collaborations and partnerships.

In addition to collaborations and partnerships, innovation centres, social media, buildings and research facilities are other resources that help enhance University B's networks.

We are investing in capital building projects, we are putting up a new building, which is absolutely devoted to providing a centre for interaction between university and the outside world and industry. B3(DN)

Beside the above resources, two interviewees believe that conferences and industrial networking events, as external resources, can significantly contribute to strengthening the university's networking. In terms of capabilities, internal and external communications are considered by three interviewees as the most important capabilities required for enhancing networking.

4.2.2.2 Prior knowledge and experience

4.2.2.2.1 Experience

The interviewees believe that experience can play a considerable role in recognizing entrepreneurial opportunity. Such a role can clearly be seen in being confident about what needs to be done and knowing when to say that needs to stop. Two interviewees believe that University B is, to a great degree, a supportive environment of trying things out and gaining more experience. In addition, the university provides its staff with the opportunity to operate in different contexts, and thus gain experience in different areas.

But there's no doubt that experience is important in the translation ideas, particularly commercialization ideas. It is extremely important because there are many, many examples of wasted effort in this area, where ideas which look good on paper don't come to fruition and waste a lot of resources in terms of trying to get any commercial outcome. B3(DN)

If you've got some prior example, having done them before, it gives you more confidence about what you're trying to do. B4(DR)

4.2.2.2.2 Prior knowledge

The interviewees believe that their knowledge helps greatly in recognizing entrepreneurial opportunities. One of the interviewees believes that "*knowledge equals experience, but it also gives insights into a particular area that allows you to progress it*" B4(DR). Four types of knowledge are required for recognizing entrepreneurial opportunities, which are as follows:

- a. Knowledge about how to run a business (Business knowledge): Recognizing entrepreneurial opportunities requires senior staff to have sound knowledge of businesses and an understanding of how things can be commercialized.
- b. Knowledge about industry: There is a real need, according to three interviewees, for knowledge about the industry when recognizing entrepreneurial opportunities. Such knowledge, according to the document secondary data, is available on an ongoing and rolling basis in this university. Having this knowledge helps identify the gaps, and thus, gain a

number of opportunities from such identification. To gain this knowledge, the university needs to have strong links with the industry and also needs to listen to them.

c. Knowledge about students: Two interviewees believe that gaining knowledge about students and their needs can be an additional factor in facilitating the entrepreneurial OpRec. In this regard, one of the interviewees pointed out that listening to the students, and thinking in terms of what they want, can contribute substantially to recognizing entrepreneurial opportunities.

d. General knowledge: Two interviewees believe that the general knowledge of the senior staff can be another additional factor that facilitates the process of entrepreneurial OpRec.

Prior knowledge and the experience of the senior staff can significantly contribute to recognizing, creating new businesses, spin-outs, licensing knowledge exchange, partnerships and commercial research opportunities. Therefore, there are considerable efforts to develop these capabilities and provide the resources needed to gain knowledge and experience required for recognizing entrepreneurial opportunities.

Four main resources contribute to the knowledge and experience required from senior people to recognize entrepreneurial opportunities:

- (1) Knowledge brokers, whose job is to make connections and ease exchanging knowledge between researchers and practitioners.
- (2) Knowledge available at the university which can help senior people increase their knowledge in different areas, and thus, gain the sufficient knowledge required for recognizing entrepreneurial opportunities.
- (3) The university's expertise.
- (4) Qualified and experienced staff, who are provided a competitive salary.

On the other hand, learning is the most important capabilities for gaining knowledge and experience. University B learns from different parties, however, according to two interviewees, they learn more from other universities.

There are always things we can learn from other universities; one thing we're learning recently is how to form strategic partnerships and that's something that we want to get smarter at. B4(DR)

4.2.2.3 External environment changes

The continuous and dramatic changes in the external environment impact the different activities of University B, including the OpRec process. Therefore, external environment changes are considered one of the main determinants of OpRec.

The external environment impacts opportunity recognition, and since the rules are changing, we need to respond to them. B1(DN)

Partnerships, recruiting more international students and gaining more industrial funding are seen as the main opportunities that can be recognized by responding to external environment changes. University B deals with the changes in the external environment through the following methods:

a. Responding to external environment factors: Many entrepreneurial opportunities are recognized through continuously responding to changes in the external environment factors. Analysing the data shows that there are a number of external environment factors that have impacted the OpRec process in University B. Four of these, however, have had the greatest impact:

(1) Political factors: The OpRec process is significantly impacted by political factors. These factors, in fact, have been a facilitator for entrepreneurial OpRec. Therefore, two interviewees emphasize the importance of responding to the government, which is now seen as a supporter of entrepreneurship. Actually, the centre of entrepreneurship was established as a result of responding to changes in the political environment.

We have to be very aware of the political environment, or somebody in the institution has to be. B2(DR)

...because obviously at the very senior level they respond to government arguments regarding what we should be doing, and, we are lucky at the moment because the government is very supportive of entrepreneurship. B2(DR)

The above political factors include, for example, changes to the governmental policy, REF, TEF and the potential impact of Brexit. Although the implications of the latter have not been seen as of yet, two interviewees expect that Brexit will have more of a negative impact than a positive impact.

In terms of Brexit, I suppose the fear of academic colleagues who are from European Union countries and are working here, and their fears in terms what's going to happen to them in the future, and whether the government has left us still in that situation wherein it is very hard to provide a positive response. B3(DN)

(2) Competition: Competing with other universities is one of the main reason for thinking of entrepreneurial opportunities. Thus, this factor has had a significant impact on the OpRec process. In fact, University B pays considerable attention to the competitive analysis in order to continue being at the top in many different areas, especially in research.

Actually, there is considerable encouragement to recognize opportunities that help with gaining and sustaining competitive advantages. These include several areas, for example, the university ranking and the number of students. One of the interviewees pointed out, supported by the website content, that the university is not only impacted by national competition, but also by global competition, because of its great global presence.

...we need to be aware of what competitors are up to make sure that you are not falling behind. B2(DR)

Obviously, if you are serious about commercial and enterprise, you need to understand what the competition is. B3(DN)

(3) Societal factors: Two interviewees believe that social changes and the emergence of new needs in the surrounding societies can be one of the reasons for recognizing entrepreneurial opportunities. One of the interviewees believes that embedding enterprise and entrepreneurship into different activities of the university helps it to be a pioneer and effective in responding to social changes at various levels.

(4) Technological advances: Technological advances are seen as one of the main external environment factors that impact the OpRec process, because it is always progressing new technologies.

b. Being fast: A quick response to changes and needs is becoming more and more important for universities, because of the great competition between them. In addition, such a response can help with gaining many opportunities in different areas. Being fast may require building strong internal networks, as well as being flexible.

The quicker the response to the changes, the more advantages you would have over other institutions. B2(DR)

So, building an internal network that allows you to respond more quickly is essential. B2(DR)

Industry hates waiting months and months with nobody getting back to them. So, we always try to be really responsive to make sure that we're going to follow up on things. That's quite good, you know, we try to respond immediately to everything. B4(DR)

c. Proactiveness: As a complementary factor for being fast, University B has become very proactive in recognizing entrepreneurial opportunities. The document secondary data shows that this university strives to be proactive in various areas.

d. Risk taking: Risk taking is seen as one of the more significant attributes for responding to the environmental changes. Such an attribute requires the university to be positive, bold and “comfortable coping with failure and viewing each failure as a step on the path to success”. B1(DN)

e. Meeting stakeholders’ needs and/or creating needs for people: There is a real need to respond to the stakeholders’ needs and expectations, which are both changing continuously. However, according to two interviewees, it is not enough to respond to the above-mentioned needs, rather they need to sometimes create needs for people. This actually requires a high level of creativity and risk taking.

I think you can't just respond to people's needs, because then you make no progress. You have to create new things that people don't know they need, but then suddenly they might decide they need them. So, it's about

pushing the boundaries. I mean if the university doesn't do that, who will? I mean, industry may do it, but I think the university should be leading not following. B1(DN)

The most essential capability used to deal with external environment changes is responsiveness, wherein a university needs to be quick and contribute to gaining and sustaining a competitive advantage. The above-mentioned responsiveness requires time, advanced technology and financial resources. In addition, reputation, as a resource, can play a considerable role in enhancing the university's ability to respond to the huge competition with other universities.

4.2.2.4 Creativity

Creativity, according to two interviewees, is being able to come up with new ideas and to do things in new ways. In fact, creativity constitutes a significant number of the interviewees' answers. Some of these interviewees believe that entrepreneurial OpRec is a creative process, others believe that creativity is a substantial factor in the above-mentioned process.

Creativity is essential for any kind of opportunity recognition. B2(DR)

Everything we do in this faculty is better if there is a creative through in. B3(DN)

Creativity is absolutely fundamental to what we do, without it we are going nowhere. B3(DN)

Creativity contributes substantially to gaining competitive advantage, and actually recognizing a good number of entrepreneurial opportunities, such as developing new products and businesses, licensing and spin-outs. Creativity required for entrepreneurial OpRec has three main aspects:

a. Continuous support of creativity: Two interviewees, supported by document secondary data, believe that having high levels of creativity is the result of continuity in supporting creativity at different levels of the university.

There's all sorts of different ways that we can support creative approaches. And it's pretty important that we do support them fully. B4(DR)

b. Teamwork: Working as a team is one of the strengths of University B. In fact, teamwork contributes highly to increasing the level of creativity required for recognizing entrepreneurial opportunities. This is because bringing people from different academic disciplines together into interdisciplinary teams can help with addressing complex issues and developing innovative ideas, as well as in responding creatively to different types of changes and issues.

c. Non-linear thinking: Analysing the interviews shows that a good number of individuals at University B think non-linearly. Such thinking helps with developing new and innovative ideas, as well as new ways of doing things.

The opportunities might not always be in a straight line between x and y.
B3(DN)

Imagination is seen as the main capability behind being creative. Creative individuals (around and in the university) are seen as the main resource for boosting the creativity required for recognizing entrepreneurial opportunities. The answers of two interviewees show that there is a good number of these individuals at the university and they are substantially supported by the university. They are actually seen as one of the most important resource at the university, since they produce a number of innovative and challenging ideas and creative solutions for different type of issues. One of the interviewees pointed out that there is a need not only for creative leaders, but also creative academics.

We need creative leaders, as well as academics. You need to create the culture and environment that means more ideas are developed. B3(DN)

In my own role as a dean, sitting in a committee with creative people who are coming up with ideas and challenging your leadership through those ideas is extremely important, and far better a situation where you know as a leader you sit and tell people what to do. And I think unless we develop these creative people, we are really missing a lot of things.
B3(DN)

... and you need creative people with their imagination and their flair, who do new things to push the boundaries. B1(DN)

4.2.2.5 Systematic search vs serendipitous discovery

4.2.2.5.1 Systematic search

Recognizing entrepreneurial opportunities, in most cases, requires active search for the same. Funding, collaboration, and knowledge transfers opportunities are seen as the main opportunities that can be recognized when actively searching for opportunities, which be observed through three aspects:

- a. Market research: This is seen as one of the main means that helps with actively searching for entrepreneurial opportunities. This could include finding out what other universities are offering, the number of the students they have, and spotting ways for attracting international audience.
- b. The continuous search for opportunities: Searching for entrepreneurial opportunities is seen as an ongoing process. Therefore, part of the senior staff's job is to look for these opportunities. According to one of the interviewees, some faculties have a team, where one of their main activities is supporting the search for the above-mentioned opportunities.

I'm always looking for opportunities. So, for this sake I don't think it's accidental, because you have to be open to them. So, it's not accidental.
B1(DN)

- c. Enthusiasm: Two interviewees believe that actively searching for entrepreneurial opportunities requires having enthusiasm towards these opportunities. This actually is

supported by appreciating the efforts made and rewarding the individuals for finding new opportunities, as well as providing an environment that helps with having positive feelings.

If you feel that you are rewarded for finding new opportunities and successfully delivering for them, you will continue to do it more. (B4DR)

Researching is seen as an essential capability required for searching for opportunities, whereas, time and cash are considered the main resources for being able to conduct such a search.

4.2.2.5.2 Serendipitous discovery

Although most of the recognized entrepreneurial opportunities are searched for, there are still some entrepreneurial opportunities that have been recognized serendipitously. Networking has played a remarkable role in recognizing such opportunities.

4.2.2.6 Entrepreneurial alertness

The answers of the interviewees show that their senior staff need to be entrepreneurially alert in order to increase the likelihood of recognizing entrepreneurial opportunities. In fact, according to one of the interviewees, having such an alertness helps these individuals to see potential opportunities more easily than others. Funding opportunities, spin-outs, licencing and creating new ventures are the main entrepreneurial opportunities that have been recognized by University B as a result of enhancing its entrepreneurial alertness. Four aspects of entrepreneurial alertness can be seen in University B:

a. Horizon scanning: University B conducts both formal and informal horizon scanning to see what the existing trends are, with a view to decide the areas of opportunities that can be focused on.

We conduct horizon scanning for opportunities a lot. We do that through several ways; both formal and informal. B2(DR)

b. Finding connections between unrelated information/areas: One of the important ways to recognize entrepreneurial opportunities, according to two interviewees, is to find connections between unconnected areas/pieces of information. This is highly possible in universities due to having various expertise in a variety of subject areas.

Many entrepreneurial opportunities require interfaces between previously disconnected areas, and that's one of fantastic opportunities you have in the university, because a university, as a whole, is a mix of different departments and, expertise. This is what is absolutely wonderful about working at a university. So, I think a successfully entrepreneurial university finds that's an added value for having people together from very disparate disciplines. B1(DN)

c. Distinguishing between profitable opportunities and non-profitable opportunities: The university's senior staff make remarkable effort to differentiate between opportunities with value return and opportunities that do not make much profit, because they can substantially

help to continuously recognize entrepreneurial opportunities. Actually one the interviewees point out that the main focus of their centres is gaining profitable opportunities.

We would probably never do non-profitable opportunities, because we're a business. B4(DR)

We always do due diligence to review any opportunity. We would only take forwards a commercialization opportunity. B4(DR)

d. Being aware of opportunities overlooked by others: Two interviewees believe that being aware of previously unexploited opportunities can be one of the main factors for recognizing entrepreneurial opportunities. One of the ways to have such an awareness, according to one of the interviewees and website content, is looking for opportunities in untapped markets.

Awareness and special sensitivity are seen as the main capabilities for being entrepreneurially alert. These two capabilities are enhanced by the information, which is considered the main resource required for being entrepreneurially alert. The information at University B is gained from different sources, such as conferences, partnerships and collaborations, social media, IP search and websites.

Having presented this section, it can be said that secondary data has helped provide more detail about OpRec determinants and helped support many views gained from analysing the primary data (see Table 4.8).

Table 4.8 Support/triangulation from the secondary data for the results of interviews relating to OpRec determinants in University B

			Website content	Documents
Networking	Internal networking			
	External networking	Networking with industry	*	*
		Networking with other universities		*
Prior knowledge and experience	Experience			
	Prior knowledge	Knowledge about how to run a business (Business knowledge)		
		Knowledge about industry		*
		Knowledge about students		
		General knowledge		
External environment changes	Responding to the external environment factors	Competition	*	*
		Political factors		
		Technological advances	*	*
		Societal factors		
	Being fast			*
	Proactiveness			*
	Risk taking			
Creativity	Meeting stakeholders' needs			*
	Continue supporting creativity			*
	Teamwork		*	*
	Non-linear thinking			
Systematic search vs serendipitous discovery	Systematic search	The continuous search for opportunities		*
		Market research	*	
		Enthusiasm		
	Serendipitous discovery			
Entrepreneurial alertness	Horizon scanning			
	Finding connection between unrelated information/areas			
	Distinguishing between profitable opportunities and non-profitable creation opportunities.			*
	Being aware of opportunities overlooked by others			

Source: Author

4.2.2.7 The relationship between entrepreneurial opportunity recognition determinants in University B

There is some interaction between a number of the entrepreneurial OpRec determinants, as detailed below:

- (1) Networking and knowledge: Senior staff use their networks to gain more knowledge required for recognizing entrepreneurial opportunities.
- (2) Networking and external environment changes: networking (especially internally) helps with responding more quickly to changes in the external environment.
- (3) Networking and creativity: networking (especially internally) helps with being open to new ideas and finding creative solutions for complex problems.
- (4) Creativity and external environment changes: creativity contributes to responding to changes, especially in relation to the competition, in the external environment.
- (5) Experience and creativity: Having experience to deal with different types of problems helps with finding creative solutions.

Table 4.9 A summary of entrepreneurial OpRec determinants in University B

Determinants	Sources/aspects	Resources	Capabilities	Type of entrepreneurial opportunity
Networking	<ul style="list-style-type: none"> - Internal networking - External networking <ul style="list-style-type: none"> • Networking with industry • Networking with other universities 	<ul style="list-style-type: none"> - Relationships - Location - Innovation centres - Social media - Buildings - Research facilities - Collaborations and partnerships - Conferences - Networking events 	Communication	<ul style="list-style-type: none"> - Funding from industry - Commercial research opportunity - Creating new businesses - Knowledge exchange - Consultancy - Spin-outs - Collaborations - Partnerships
Prior knowledge and experience	<ul style="list-style-type: none"> - Experience - Prior knowledge: <ul style="list-style-type: none"> • Knowledge about how to run a business (Business knowledge) • Knowledge about market • Knowledge about students • General knowledge 	<ul style="list-style-type: none"> - Knowledge brokers - Knowledge available at the university - experts - Qualified and experienced staff 	Learning	<ul style="list-style-type: none"> - Commercialization of research - Creating new business - Spin-outs - Partnerships - Knowledge exchange opportunities - Licensing
External environment changes	<ul style="list-style-type: none"> - Responding to external environment factors <ul style="list-style-type: none"> • Competition • Political factors • Technological advances • Societal factors - Being fast - Proactiveness - Risk taking - Meeting stakeholders' needs and creating needs for people 	<ul style="list-style-type: none"> - Cash/the ability to gain financial resources - Time - Advanced technologies - Reputation 	Responsiveness	<ul style="list-style-type: none"> - Partnerships - Recruiting more students - Gaining more funding
Creativity	<ul style="list-style-type: none"> - Continue supporting creativity - Teamwork - Non-linear thinking 	Creative individuals	Imagination	<ul style="list-style-type: none"> - Developing new products and businesses - Licensing - Spin-outs
Systematic search vs serendipitous discovery	<ul style="list-style-type: none"> - Systematic search <ul style="list-style-type: none"> • The continuous search for opportunities • Market research • Enthusiasm 	<ul style="list-style-type: none"> - Time - Cash 	Researching as a capability	New campus
	Serendipitous discovery	No evidence	No evidence	No evidence
Entrepreneurial alertness	<ul style="list-style-type: none"> - Horizon scanning - Finding connections between unrelated information/areas - Distinguishing between profitable opportunities and non-profitable creation opportunities. - Being aware of opportunities overlooked by others 	<ul style="list-style-type: none"> - Information 	<ul style="list-style-type: none"> - Awareness - Special sensitivity toward opportunities 	<ul style="list-style-type: none"> - Funding opportunities - Spin-outs - Licencing - Creating new venture

Source: Author

4.2.3 How the respondents defined the entrepreneurial university (University B)

Winning the THE EntUni of the Year award has been very important for University B, because it has opened many doors of opportunities, especially commercial ones, and has enhanced the university's enterprising reputation.

So, winning those kinds of awards is very important. They give us some profile. They gave press coverage and put the name of the university out there. I mean we are the University of the Year according to the Times Higher Education. That's been a massive lift in terms of profile focus and practicality in terms of students' recruitment. So, those are extremely important. B3(DN)

Table 4.10 The main focus of the definitions provided by the interviewees for the EntUni phenomenon in University B

	Value creation	Business oriented	Good at networking	Good at spotting opportunities	Innovative	Openness to change	Entrepreneurship is one of strategic priorities	Providing a creative and supportive environment and structure	Best place for being entrepreneurial	Have people with entrepreneurial spirit	High quality student enterprise activity
B1(DN)	*	*	*								
B2(DR)		*		*	*	*	*	*			
B3(DN)				*	*			*	*	*	
B4(DR)		*						*			*

Source: Author

Table 4.10 shows that agreement on the EntUni concept is not too high. Eleven features have been identified by those interviewees to clarify this concept. However, there is remarkable agreement that such a university is business oriented and provides a creative and supportive environment and structure. In addition, there is a good agreement that entrepreneurial universities are innovative and good at recognizing opportunities and responding to them.

But at the end of the day, the university has the same needs as a business. They have to attract students and have to make money. They have to pay their staff. B2(DR)

Drawing on Table 4.10 and the above discussion, an EntUni can be viewed as a business oriented and innovative university that provides a creative and supportive environment structure that helps with recognizing opportunities and responding to them.

4.2.4 Entrepreneurial university factors

4.2.4.1 Supportive environment for entrepreneurship

Considerable agreement among the interviewees, supported by the website content, has been found regarding the huge importance of creating a supportive environment for entrepreneurship. In fact, a phenomenal amount of money has been allocated for creating

such an environment. In addition to financial resources, a number of activities and means are employed to create this kind of environment, as follow:

a. Supporting enterprise and entrepreneurship by the Vice-Chancellor office: The office of the Vice-Chancellor pays noticeable attention to creativity and entrepreneurship. Such attention has explicitly contributed towards creating a supportive environment for entrepreneurship. The Vice-Chancellor encourages and supports innovative ideas, enterprising and entrepreneurship.

The Vice-Chancellor celebrates success in entrepreneurship. He's very clear about our mission to replace our research income. B1(DN)

b. Entrepreneurship and innovation centres: As mentioned earlier, University B has two main centres relating to entrepreneurialism and innovation. These two centres are seen by the interviewees as huge contributors to developing enterprising skills and disseminating entrepreneurialism within the different activities of the faculties. With respect to the entrepreneurship centre, it supports several leading organizations associated with entrepreneurial education. It also supports and provides resources to the students and staff who are interested in developing their entrepreneurial skills. Likewise, this centre supports research into entrepreneurship and enterprise. This includes a broad range of interests, such as entrepreneurship theory, entrepreneurial education, entrepreneurial learning, SMEs technologies and strategies, small business finance and development, social enterprise, technology entrepreneurship, entrepreneurial leadership and gender and entrepreneurship. This research is presented as international leading research and published in top-ranked journals. In addition to the above support, this centre sponsors, academically, one of the UK's largest networks for small business and entrepreneurship research.

As for the innovation centre, it is seen by three interviewees, supported by the website content, as a gateway to companies of all sizes, who want to work in partnership with the university. It is expected that the links with industry will be even stronger and will increase through the activities of this centre.

c. Encouraging and supporting students to be more entrepreneurial: There is a great encouragement and enablement for University B's students, from different disciplines, to be more entrepreneurial through embedding entrepreneurialism into the curricula, providing a degree in enterprise and a year in enterprise, placing students into companies, supporting their entrepreneurial ideas, and engaging with the entrepreneurship centre. With the respect to the latter, there is a strong relationship between these centres and the medical school. Such a relationship helps to build entrepreneurship modules within their curriculum. According to the above points, it can be said that University B's students are practicing entrepreneurship while studying at university.

One of the things that is core to what we are doing at the moment - we work quite a lot with the medical school, and it is very unusual to build

relationships with medical schools because the undergraduate medical curriculum is incredibly set in stone and decided by the General Medical Council. Thus, it is difficult for us to change things like that... We sat down with people that are interested in that in their schools, and we worked through new ways wherein we can build entrepreneurship into their curriculum. And that allowed us to build really interesting modules within their curriculum. We had our first medical student doing a year in enterprise last year. We had a medical student awarded the innovative medical doctor award from NHS. So, we now have this really great relationship and that is going to give a competitive advantage to the medical school. B2(DR)

d. Establishing entrepreneurial culture: University B has established a collaborative, innovative and enterprise culture, which is seen as one of the enablers for creating a supportive environment for entrepreneurship.

e. Structures for promoting creativity and entrepreneurship: Structures that facilitate creativity and entrepreneurship are seen as one of the factors that are required to create a supportive environment for entrepreneurship. Creating supportive environment for entrepreneurship has considerably impacted the six entrepreneurial OpRec determinants. This makes University B, as an entrepreneurial institution, one of the best contexts for recognizing entrepreneurial opportunities.

4.2.4.2 Placing enterprise, entrepreneurship and innovation in the university strategy

There is remarkable consideration for enterprise, entrepreneurship and innovation in University B's strategy. They are considered the main pillars of this strategy. Actually, according to University B's website content, enterprise is placed at the heart of University B's vision.

As a result of the above-mentioned consideration, two main centres relating to entrepreneurialism and innovation have been established. Doing so has helped in having a strong track record of innovation and enterprise. In addition, the university won a number of awards relating to entrepreneurship, enterprise and innovation. The latter is huge in this university, which provides time, funding and a high level of support to develop a range of innovation pathways. Moreover, the university has established a considerable number of spin-outs, partnerships and agreements.

Entrepreneurship is one of strategic priorities of the university. So, being an entrepreneurial university is part of our university strategy; there are only seven pillars in this university strategy, and to be entrepreneurial is one of those. B2(DR)

The university strategy does support entrepreneurship and encourages faculty strategy and school strategy. C1(DR)

Our Vice Chancellor has built enterprise and innovation into the university's strategic plan. Hence 40 million pounds was invested into... the new innovation and enterprise centre. B4(DR)

Embedding enterprise, entrepreneurship and innovation into the University B's strategy helps to increase the levels of entrepreneurial alertness of the senior staff, and helps promote creativity and strengthen its networking. Thus, it can be argued that following the EntUni approach can help in developing creative strategies for enterprise, entrepreneurship and innovation, and certainly, such strategies can be a great source for alertness, creativity and networking that is required for recognizing entrepreneurial opportunities.

4.2.4.3 The three missions of universities

4.2.4 3.1 Teaching (first mission) and entrepreneurship

As an entrepreneurial institution, the elements of entrepreneurship can be seen in the methods of teaching, as well as the modules of different subject areas in University B, which, according to the website content, has been delivering excellent and inspirational teaching. In fact, the high quality and effective teaching of this university is recognized not only locally and nationally, but also internationally. Therefore, there is a great number of international students in this university.

There are also all sorts of other aspects where academics can be particularly entrepreneurial, can address policy frameworks and can be entrepreneurial in teaching. B4(DR)

Teaching and education in University B could contribute substantially to enhancing its reputation both nationally and internationally. This, in return can support the university's networking. They also can be reason for an effective response to the changes in the external environment. In addition, they can enhance and support the university's creativity.

4.2.4.3.2 Impactful research (second mission) and entrepreneurship

Research is huge at University B, which is seen as a global centre of research and is renowned for high quality and world leading research. This university always seeks to be one of the main providers of impactful research, both nationally and internationally.

We are a Russell Group University; research is the core of what we do. B1(DN)

We have a whole range of what enables us to continue to be at the forefront of what we do. So, we're interested in how we can grow. we are interested in the value we create through our research. So, it is about evidence and impact. B4(DR)

University B has followed a number of tactics and activities to become what it is in the field of research (the below is listed in order of importance).

- (1) Embedding entrepreneurship into the research.

- (2) Responding to global challenges through engaging in research across a broad spectrum of topics.
- (3) Continuing to deliver excellent and inspirational international research.
- (4) Using the university's expertise and intellectual property protection as facilitators for converting research into commercial outputs.
- (5) Maintaining a top-quality supportive environment for research.
- (6) Hiring a large number of individuals for research purposes.
- (7) Conducting impact case studies.
- (8) Undertaking value-added research.
- (9) Allocating a phenomenal amount of money and time for research activity.
- (10) Attracting key research figures.
- (11) Providing cutting-edge equipment for research.
- (12) Focusing on applied and real-world research.
- (13) Undertaking pioneering and entrepreneurial research.

We have fantastic capabilities in terms of research; we have fabulous equipment. B3(DN)

Following the above tactics and activities has helped the university to increase the volume, quality and impact of its world-leading research, thus increasing the total value of the university's research income, which is one of the indicators of being an outstanding research university. Those tactics have also helped the university to achieve superior results in REF 2014. In addition, the aforementioned tactics and activities have contributed towards gaining a number of entrepreneurial opportunities from the university's research, such as developing business partnerships and establishing spin-out companies.

Having such quality, innovative and impactful research has significantly and positively contributed to enhancing the university's reputation. Therefore, research is one of the most important sources of achieving competitive advantage. In fact, this research has substantially supported creativity. It has helped strengthen the university's networking and helped it gain the latest knowledge. It has also contributed to gaining resources and capabilities required for effective and quick responses to changes in the external environment.

4.2.4.4 Contribution to socio-economic development

a. Contribution to societal development: University B has sought to build sustainable societies and have a massive impact on communities locally, regionally, nationally and also internationally. Such an impact can be observed through the following list, which is taken in order of importance:

- (1) Engaging widely with the local city council and the local council authority.
- (2) Conducting climate change and environmental research.
- (3) Motivating other universities to become more entrepreneurial.

- (4) Producing high quality graduates who can make a positive contribution to their societies.
- (5) Supporting alumni, with a view to have a positive impact on their societies.
- (6) Improving the health and welfare of human beings and animals.
- (7) Volunteering, by students and staff, to help local schools.
- (8) Having social enterprises.

Everything we do is done in conjunction with the local community. B2(DR)

It's important to always look for opportunities and to translate that into meaningful outcomes for society. Ultimately, we are funded by society. B3(DN)

b. Greater impact on the economy: University B has had enormous impact on the economy, both directly and indirectly. Such an impact has resulted from the following activities, which are listed in order of importance:

- (1) Working with growing businesses.
- (2) Creating new ventures and spin-outs
- (3) Improving the productivity of businesses.
- (4) Providing opportunities for local businesses.
- (5) Supporting the growth of small businesses in the region.
- (6) Incubations.
- (7) Producing entrepreneurs and business people.
- (8) Employing a large number of individuals due to its large size and continuous growth.
- (9) Obtaining a larger number of international students.

(University B) is a massive contributor to the economy. We looked at the economic value we created - it was 1.3 billion every year. So, we know we're a big economic multiplier. B4(DR)

The willingness to deliver its third mission effectively helps University B gain novel knowledge and become more effective and quicker in responding to changes in the external environment, and thus become more alert to different issues and events in this environment and further become well-networked. These have contributed markedly to enhancing the process of entrepreneurial OpRec and maintain it.

4.2.4.4 Entrepreneurial staff

University B highly encourages and supports its staff to become more entrepreneurial. This is achieved by developing their enterprise skills through entrepreneurship training programmes and creating an entrepreneurial environment for them. This university employs staff from various different nationalities. This actually increases the level of creativity required for entrepreneurship and innovation.

The evidence obtained from the interviews, supported by the website content, show that encouraging and supporting staff to be entrepreneurial can greatly impact the networking and creativity required for recognizing entrepreneurial opportunities. Thus, adopting entrepreneurial universities produces and attracts entrepreneurial staff who can contribute considerably to increasing the level of creativity and building networks needed for recognizing entrepreneurial opportunities.

This section has helped clarify the contribution of the secondary data ensure the views relating to EntUni factors are clearer and has offered support to some of them (see Table 4.11).

Table 4.11 Support/triangulation from the secondary data for the results of interviews relating to entrepreneurial university factors in University B

		Website content	Documents
Placing enterprise and innovation in the university strategy	Placing enterprise in the university strategy	*	*
	Placing innovation in the university strategy	*	
	Placing entrepreneurship in the university strategy		
Supportive environment for entrepreneurship	Supporting entrepreneurship by the Vice-Chancellor office	*	
	Establishing entrepreneurial culture	*	
	Encouraging and supporting students to be more entrepreneurial	*	*
	Innovation centres	*	*
	Entrepreneurship centres	*	*
	Enterprise centre	*	*
	Structures for promoting entrepreneurship		
The three missions of universities	Teaching (first mission) and entrepreneurship	*	
	Impactful research (second mission) and entrepreneurship	*	*
	Third mission	*	*
	Greater impact on the economy	*	
Supporting staff to be entrepreneurial		*	*

Source: Author

This section also shows that EntUni factors can significantly contribute to the process of entrepreneurial OpRec, through their positive impact on the six entrepreneurial OpRec determinants under study (see Table 4.12)

Table 4.12 The relationship between EntUni factors and entrepreneurial opportunity recognition determinants in University B

		Prior knowledge	Networking	Alertness	Systematic search	Creativity	Environmental changes
Placing enterprise and innovation at the university strategy			*	*		*	
Supportive environment for entrepreneurship		*	*	*	*	*	*
The three missions of universities	Teaching (first mission) and entrepreneurship		*			*	*
	Impactful research (second mission) and entrepreneurship	*	*			*	*
	Contribution to socio-economic development (Third mission)	*	*				*
Entrepreneurial staff			*			*	

Source: Author

4.2.5 Resources characteristics

The characteristics of the University B's resources and capabilities that contribute to facilitating the entrepreneurial OpRec process will be presented in this section by considering the VRIN criteria identified by RBT.

a. Valuable resource: University B has very high quality resources and capabilities, which greatly contribute to enhance its creativity and reputation. This, in return, helps the university to be very strategic regarding how to work and achieve the university's goals efficiently and effectively, as well as creating value for the university.

Although all resources are seen as valuable, human resources are considered the most important and valuable resource. Therefore, the university is continuously investing in human resources and attracts key figure academics. Having those human resources has facilitated entrepreneurship and has increased the worth of the university's services.

It is about the people who have to be willing to go through it and make it happen. B2(DR)

The biggest resource is the individuals. So, the most important resources I am proud of is the people work here. B3(DN)

Our strongest resources are people, I would say. People make the difference to entrepreneurship. B1(DN)

b. Rare resources: Although one of the interviewees believes that University B does not do anything massively unique, two interviewees believe that this University has unique capabilities and laboratories. In addition, the way in which the university mixes its resources and capabilities is quite unique.

c. Imperfectly imitable (or costly to imitate) resources: Due to the high level of competition among universities, they always try, according to two interviewees, to imitate each other. University B is impacted by such imitation. However, two interviewees believe that their university's culture cannot be copied because this culture is an integral part of the university's vision, which is shared by the university's leaders, who are very loyal to University B. And also, it is highly impacted by what the communities around expect from this university.

Culture takes a long time to develop. How can you copy a culture unless you have the right people in the place, who share the same vision, because the culture comes from the vision, which comes from the leadership? B1(DN)

Culture isn't a blueprint. You can't just take somebody's culture and put it in another institution. It comes from the leaders, and how they present themselves, and what they do for the community. And, it comes from the people working within an organization. So, culture is one of the hardest things to crack. B4(DR)

d. Organization: Four main complementary actions are taken to exploit the competitive potential offered by resources and capabilities:

- (1) Recruiting the right people who can effectively use the available resources.
- (2) Investing heavily in research and innovation, and therefore establishing a number of research centres.
- (3) Establishing strategic partnerships.
- (4) Mixing expertise, skills and facilities in ways that can help in producing novel ideas, products and services.
- (5) Establishing new ventures.

4.3 Case C

The data collected from University C includes eight interviews, thirty university web pages and five documents (strategy map, services to business, financial statements, research strategy 2011-2020 and a review of business–university collaboration).

a. OpRec determinants

- a.1 Networking
 - a.1.1 Internal networking
 - a.1.2 External networking
 - a.1.2.1 Networking with industry
 - a.1.2.1 Networking with alumni
 - a.1.2.3 Networking with other universities
 - a.1.2.3 Networking with the government
- a.2 Prior knowledge and experience
 - a.2.1 Experience
 - a.2.2 Prior knowledge
 - a.2.2.1 Knowledge about how to run a business (Business knowledge)
 - a.2.2.2 Knowledge about industry
 - a.2.2.3 knowledge about staff
- a.3 Entrepreneurial alertness
 - a.3.1 Being aware of opportunities overlooked by others.
 - a.3.2 Horizon scanning
 - a.3.3 Finding connection between unrelated information
 - a.3.4 Distinguishing between value creation opportunities and non-value creation opportunities
- a.4 Creativity
 - a.4.1 Continuously thinking of new ideas
 - a.4.2 Being different
 - a.4.3 Positive feelings and emotions
 - a.4.4 Teamwork
- a.5 Systematic search vs serendipitous discovery
 - a.5.1 Systematic search
 - a.5.1.1 Market research
 - a.5.1.2 The continuous search for opportunities
 - a.5.2 Serendipitous discovery
 - a.5.3 Both systematic search and serendipitous discovery
- a.6 External environment changes
 - a.6.1 Responding to external environment factors
 - a.6.1.1 Competition
 - a.6.1.2 Political factors
 - a.6.1.3 Technological advances
 - a.6.1.5 Economic factors
 - a.6.2 Being fast
 - a.6.3 Proactiveness
 - a.6.4 Risk taking
 - a.6.5 Meeting stakeholders' needs
 - a.6.5 Creating needs for people

b. EntUni Criteria

- b.1 Supportive environment for entrepreneurship
 - b.2.1 Supporting entrepreneurship by the Chancellor and Vice-Chancellor
 - b.2.2 Encouraging and supporting students to be entrepreneurial
 - b.2.3 Establishing entrepreneurial culture
 - b.2.4 Innovation centres
 - b.2.5 Structures for promoting entrepreneurialism
 - b.2.6 Using entrepreneurialism language within the university
- b.2 Placing enterprise in the university strategy
- b.3 The three missions of universities
 - b.3.1 Being entrepreneurial in teaching
 - b.3.1.1 Teaching with an entrepreneurship flavour
 - b.3.1.2 Teaching with an innovative flavour
 - b.3.2 Being entrepreneurial in research (impactful research)
 - b.3.3 Contribution to socio-economic development (Third mission)
 - b.3.3.1 Contribution to societal development
 - b.3.3.2 Greater impact on the economy
- b.4 Entrepreneurial staff

Figure 4.3 Final version template for University C

Source: Author

4.3.1 Defining entrepreneurial opportunity recognition in University C

University C is well aware of the importance of new entrepreneurial opportunities. Therefore, there is considerable encouragement and support to recognize and search for such opportunities.

The university should recognize the need to recognize entrepreneurial opportunities and perhaps give some support. C4(DN)

If we don't recognize new opportunities that are relevant to where we want to go, we won't be able to grow in the way we want. C4(DN)

Table 4.13 The main focus of the definitions provided by the interviewees for the entrepreneurial OpRec phenomenon in University C

	Responding to external changes	Value creation	Strategic alignment	Recognize unconventional opportunity	Spotting a way to do something new	Spotting a gap	Quick response	Competitive advantage	Market needs	Problem solving	Commercial intent	Using resources effectively	Establishing collaborations
C1(DR)	*	*	*										
C2(DN)		*	*	*									
C3(DN)					*				*		*		
C4(DN)					*				*	*			
C5(DN)		*		*	*								
C6(DN)						*	*	*					
C7(DN)		*									*	*	
D8(DN)		*											*

Source: Author

Table 4.13 demonstrates that there is no complete agreement on the concept of entrepreneurial OpRec. Thirteen features of the definition of entrepreneurial OpRec have been provided. This is because OpRec, according to two interviewees, covers an extensive range of activities and factors.

...it is quite a wide-ranging term - opportunity recognition. C3(DN)

Despite the above, there is fairly good agreement that senior staff at University C aim to create values and find ways of doing new things when they recognize entrepreneurial opportunities. Also, there is some agreement on the importance of considering market needs, commercial purposes, strategic alignment and unconventional-type opportunities when entrepreneurial opportunities are recognized.

Drawing on Table 4.13 and the above discussion, entrepreneurial OpRec can be viewed as a process of perceiving unconventional, commercial and value-added opportunities through doing new things and responding to market needs, as well as aligning strategically with what the university is trying to achieve.

4.3.2 Entrepreneurial opportunity recognition determinants in University C

4.3.2.1 Networking

Networking has been considered markedly by University C. In fact, it is seen as a crucial factor for the entrepreneurial OpRec process. Having a strong network has helped the university in recognizing a good number of opportunities, such as commercial research opportunities, consultancy, spin-in, funding from industry, KTPs and collaborations and partnerships.

Expanding networking of trust is the foundation for being able to build any form of activity that adds value, whether it's in terms of an exchange of services, where there's no money involved, or whether it's commercial. In both cases, relationships and social capital are absolutely essential.
C7(DN)

University C depends on two types of networking to recognize entrepreneurial opportunities:

a. Internal networking: Internal networking, especially networking between senior management team, is considered one of the factors that impact the entrepreneurial OpRec process, because it helps in deciding the facilities and resources required for this process.

b. External networking: External networking has gained significant consideration from University C. Such networking appears in four forms, which are as follows:

(1) Networking with industry: University C pays considerable attention to networking with industry, on the local, national and international levels. This has markedly contributed to recognizing entrepreneurial opportunities. This university aims at engaging with industry a lot more, because this makes it more entrepreneurial and improves its services and activities. Although University C seeks to have networks with a wide range of industries, it pays a little more attention to its networking with SMEs, banks and trade organizations.

Engaging with industry makes us better and it makes the industry better.
C2(DN)

(2) Networking with alumni: Four interviewees believe that keeping strong relationships and networking with alumni, particularly international alumni, can be one of the sources for recognizing entrepreneurial opportunities, because those alumni, when they go back home, quite often are either going to university positions or to businesses. In this regard, the website content shows that this university always seeks to strengthen its relationships with the alumni and it considers them a valuable resource.

(3) Networking with other universities: To learn how to recognize more entrepreneurial opportunities, networking with other universities can be one of the sources to do this. Such networking, according to the website content, benefits the university, especially with regards to partnerships and collaborations.

(4) Networking with the government: Two interviewees believe that networking with the government can be one of the factors that help recognize entrepreneurial opportunities. This is possible because, according to the document secondary data, this university seeks to maintain strong relationships with the government.

University C uses a variety of resources to enhance the networking required for recognizing entrepreneurial opportunities. The most important of these are the relationships and collaborations and partnerships, especially strategic ones, which need a lot of time to be established and continuously need to be strengthened. Recruiting people with potential links can help in accomplishing this. In addition, innovation centres, reputation, and social media can also help in this regard.

It is not enough just to meet somebody, you've got to build a relationship with them and then get on with working with them in one way or another.
C3(DN)

In addition to the above resources, two interviewees believe that conferences and industrial networking events, as external resources, can substantially contribute to boosting networking. However, one of the interviewees claimed that larger conferences are the ones by which networking, which is required for entrepreneurial opportunities, can be enhanced.

In terms of entrepreneurial opportunity recognition and entrepreneurship, this sometimes do not come from tiny niche conferences, because niche conferences are where people network in certain research area, that's very insular. It is more in the context of the wider slightly larger conferences, where industry comes in as well. Then you have the opportunity to exchange ideas and pick things up. C3(DN)

Communication is seen, by four interviewees, as the most important capability required for networking. Three interviewees believe that not only formal communication is used for enhancing networking, but also informal communication.

In terms of collaborations and partnerships, which also are seen as entrepreneurial opportunities, and also as determinants of the entrepreneurial OpRec process, University C seeks to establish pioneering, strategic and value-added business and R&D partnerships and collaborations. These take place in both the public and private sector, on local, national and international levels. University C pays fair attention to its collaborations and partnerships with other universities (through joint research), and with the government. However, it pays greater attention to those in the industry, which takes several forms, such as establishing start-ups and companies, marketing services and manufacturing delivery.

4.3.2.2 Prior knowledge and experience

4.3.2.2.1 Experience

Although one of the interviewees believes that experience is not very helpful for recognizing entrepreneurial opportunity types, three other interviewees believe that experience can be

one of the factors that helps with recognizing those opportunities, because doing things once or twice helps in understanding how what is being done might be applied in a more general sense.

4.3.2.2.2 Prior knowledge

Prior knowledge is viewed as one of the essential factors for recognizing entrepreneurial opportunities. There are three types of knowledge that can contribute to recognizing entrepreneurial opportunity, which are as follows:

a. Knowledge about how to run a business (Business knowledge): Having knowledge about how a business can be run contributes highly to recognizing entrepreneurial opportunities. Four interviewees believe that senior staff need to understand the mindset of the business people and the language of commerce. Such an understanding can help in judging business ideas in terms of whether they are good (or not) and explore more details about them.

A little bit of business knowledge is useful, because if you are thinking about it in the context of how you can apply it, then you need to be able to think like the director of the business to come and ask for something.
C3(DN)

b. Knowledge about industry: Having knowledge about the market and knowing what the main challenges facing industry are can contribute substantially to recognizing entrepreneurial opportunities. In this context, the answers provided by four interviewees focus more on understanding how SMEs work, because the challenges facing them are different to a large organization.

c. Knowledge about staff: Two interviewees believe that knowledge about staff can, to some extent, contribute to recognizing entrepreneurial opportunities. In this regard, these interviewees pointed out that it is important for senior staff to have knowledge about their staff, their interests in research terms, their strengths and weaknesses, and their skills and initiatives.

You need a decent level of knowledge (working knowledge) about what your staff are doing, and what their interests are in research terms.
C3(DN)

Having good prior knowledge and experience has contributed highly to recognizing several entrepreneurial opportunities, such as commercial consultancy, licensing and spin-outs. To keep recognizing such opportunities, University C provides a number of resources and capabilities required to enhance the experience and knowledge of its senior staff. Experts, opinion leaders and champion staff are considered the main resources for enhancing prior knowledge. In addition to the above resources, two main capabilities contribute to enhancing experience and knowledge in University C. First, there is continual critical reflection and re-evaluation beyond thoughts. Second, there is learning to be entrepreneurial through

examining examples (learning from other universities) and attending entrepreneurialism courses, such as ELUP.

4.3.2.3 Entrepreneurial alertness

Entrepreneurial alertness is one of the main factors that contribute to recognizing entrepreneurial opportunities, as well as making University C more entrepreneurial. Commercial research opportunities and collaborations are the opportunities that can be recognized by enhancing entrepreneurial alertness. Four aspects of entrepreneurial alertness can be seen at University C, which are as follows:

a. Being aware of opportunities overlooked by others: Having an awareness of opportunities overlooked by others is one of the factors that contributes to recognizing entrepreneurial opportunities. Two of the interviewees view such an awareness as a key factor, because it helps with discovering opportunities that have not been seen by others. In this context, one of the interviewees believe that the university sometimes recognizes entrepreneurial opportunities through employing the above-mentioned awareness only. One of the areas that University C focuses on to recognize such opportunities, according to two interviewees, is the SMEs.

b. Horizon scanning: Four interviewees emphasize the importance of horizon scanning to help with observing see what other universities are doing, as well as spotting changes in the external environment. Because of the above, the university can be more effective in recognizing entrepreneurial opportunities.

c. Finding connections between unrelated information: Making connections between unrelated pieces of information, according to two interviewees, is one of the ways for recognizing entrepreneurial opportunities. This requires, according to one of the interviewees, *"being able to hover over the whole institution and see, well actually, who took that little bit that's over here and combined it with something that's over there?"* C1(DR).

Universities are perhaps in a better place than industry to see connections where perhaps they're not immediately obvious. C8(DN)

d. Distinguishing between value creation opportunities and non-value creation opportunities: Recognizing entrepreneurial opportunities sometimes requires distinguishing value creation opportunities, including business, profitable and long-term benefit opportunities, from non-value creation opportunities. Two interviewees pointed out that a cost-benefit analysis, both short-term and long-term, can play a considerable role in the same.

I don't think that's the only way that these entrepreneurial opportunities can be profitable. I mean that's what comes back to the philosophical aspect of what a university should be about. So, if you create something new, I mean, if you push the boundaries of technological development, or the boundaries of creativity, or the boundaries of whatever, even though

that may not make a lot of money then that doesn't mean it isn't worth doing in the long run. C8(DN)

Awareness is seen as an indispensable capability for being entrepreneurially alert, and is required for recognizing entrepreneurial opportunities. Special sensitivity is considered another important capability for entrepreneurial alertness. Such a capability contributes to spotting opportunities that can be seen by others, and thus can be one of the main factors that enhances the ability required to find opportunities ignored by other universities.

If you are not aware of what's going on, then you can't spot the opportunities out there. C6(DN)

Information is seen as the main resource for being entrepreneurially alert. University C obtains information from a number of sources, including online resources and social media, other universities websites, periodicals, professional magazines, newspapers, research and the enterprise office, Higher Education Funding Council for England, THE, granting bodies, government initiatives, innovation centres, informal information networks, research development offices, the policy information and being a member of clubs' committees and board.

In addition to information, people who can help in making decisions about costing areas of activity, as well as those who are skilled in distilling information are two other resources employed for enhancing entrepreneurial alertness that is required for entrepreneurial OpRec.

4.3.2.4 Creativity

The answers of the interviewees and website content pay considerable attention to creativity. Two interviewees considered it the most important factor for recognizing entrepreneurial opportunities. Creativity, according to three interviewees, is about not doing the same old things, spotting a way to do something new, or to do things in a new way or in a new setting or in a new context. Commercial research opportunities, collaborations, knowledge selling and innovation are the opportunities that have been recognized as a result of having high levels of creativity.

Creativity is really the currency of society at the moment. Without creativity, it's a downward spiral in terms of the patterns of behaviour, attitudes and the perception that we have of others. So, creativity is very important. C2(DN)

Creativity is about doing something that's new to the context in which you're doing it, and it is appropriate to that problem or issue. C5(DN)

I see in my school that it's all about creativity informing entrepreneurial opportunities. C8(DN)

Three main aspects support creativity required for entrepreneurial OpRec. These factors are:

a. Continuous thinking of new ideas: Analysing the interviews and document secondary data shows that having new ideas is an ongoing process. This helps the university in developing

new models, which, in return, contribute to continuing to recognize entrepreneurial opportunities. Having new ideas requires a constantly supportive environment for creativity and also requires ensuring that these ideas are really new.

b. Being different: University C pays much attention to being different. This, of course, contributes highly to enhancing the creativity required for recognizing opportunities. To be different, the university does not only do things in a different way, but also in different contexts and settings.

I guess what it means to me is that the organizational people within it or who are part of it are able to recognize opportunities that are not just a continuation of their standard practice. C5(DN)

c. Feelings and emotions: Two interviewees believe that feelings and emotions can affect the level of creativity required for recognizing entrepreneurial opportunities. So, if people feel that their work and contribution is appreciated, they will be more creative.

If people are feeling overworked, not valued, they can't manage everything they are juggling. They can just mentally feel like they can't take in something new. C5(DN)

d. Teamwork: For four interviewees, teamwork is considered the main aspect for being creative in recognizing entrepreneurial opportunities. So, having the ability to combine different skills and bring people from humanities, science, engineering, and business together into an interdisciplinary team can significantly contribute to finding creative solutions and develop multi-/interdisciplinary projects.

Creative individuals (around and in the university) are considered the main resource for increasing the level of creativity. These individuals contribute markedly to developing new ideas and creative solutions, which in return help with recognizing entrepreneurial opportunities.

It is always good to have creative individuals around, but I don't think that an organization should be made up entirely of creative individuals. C6(DN)

You do need the people who want to work in that kind of creative way, definitely. C5(DN)

If you don't have these creative people around, you're not going to have entrepreneurial opportunities. They actually are worth having; all universities need them. C8(DN)

Imagination and creative thinking are seen as the main capabilities for enhancing the creativity required for recognizing entrepreneurial opportunities. Having such capabilities helps with understanding where the new ideas could work, how they could work and/or where they could be applied.

4.3.2.5 Systematic search vs serendipitous discovery

4.3.2.5.1 Systematic search

Recognizing entrepreneurial opportunities, according to all of the interviewees, requires actively search for them. Increasing the number of international students, partnerships and commercial research opportunities are seen as the main opportunities that can be recognized from actively searching for opportunities.

Two main activities are practiced in University C to search for opportunities:

- a. Market research: Market research can help in actively searching for entrepreneurial opportunities. However, one of the interviewees pointed out that they only conduct basic market research and there is a need for much market research.
- b. Continuously searching for opportunities: Three interviewees pointed out that senior staff are always searching for entrepreneurial opportunities. They believe that searching for opportunities is an ongoing process in their university and entrepreneurial universities in general.

Research is considered as the main capability required for searching for opportunities in the university. Research development managers are seen as the fundamental resources for such research.

4.3.2.5.2 Serendipitous discovery

According to a good number of interviewees, entrepreneurial opportunities are sometimes recognized accidentally as a result of networking, especially through conferences. Partnerships are opportunities that University C has discovered serendipitously.

...there is a combination of luck. You might be in the right place, right time, not even looking for opportunities, but you hear something, you see something and the idea generates. C6(DN)

4.3.2.5.3 Both systematic search and serendipitous discovery

In some cases, serendipitously discovered opportunities motivate the university to search for more related opportunities, and in other cases, searching for specific opportunities leads to recognizing opportunities which are not planned for. Therefore, one of the interviewees pointed out that there is a third category in this regard. Another interviewee pointed out that *"it is a mix of accidental and deliberate"* C6(DN).

4.3.2.6 External environment changes

The external environment is changing dramatically. This, in return, increases the level of complexity and nervousness. Therefore, the university needs to consider this, not only to keep surviving, but also to recognize opportunities that create value. Increases in the number

of international students and partnerships are considered the main opportunities that can be recognized by responding to the external environment changes.

The external world is a constraint as well as an opportunity. C4(DN)

Changes and complexity in the external environment are dealt with through the following ways:

a. Responding to external environment factors: Such a response is one of the main ways employed to recognize entrepreneurial opportunities.

We try to do all the fundamentals well and improve those fundamentals at the same time. We address external factors. C4(DN)

There are a number of external environment factors have had an impact on the OpRec process. However, four of them have had the greatest impact:

(1) Competition: University C is experiencing strong competition, which impacts many of its activities, including its entrepreneurialism activities. Therefore, five interviewees see competition is the most influential external environment factor on the OpRec process.

...being able to recognize opportunities is extremely important to any university, whether it is (University C) or any other universities, because the higher education sector, both in the UK and internationally, is extremely challenging and extremely competitive. C6(DN)

I've worked in higher education for 30 years and the competition now is huge compared to 30 years ago when I first came in. C6(DN)

But clearly, we are in a competition, because there is a limited number of potential students, there is a limited number of research funders, there is a limited number of organizations who might partner with or whatever. C5(DN)

Three interviewees believe that competition pushes University C to search for those opportunities, which helps gain competitive advantages. Competition, according to the document secondary data, involves several areas, such as number of students, the UK university league table and the reputation.

(2) Political factors: Four interviewees believe that political factors have a great impact on University C's strategy and activities. In fact, political factors, in some cases, facilitate the process of entrepreneurial OpRec. So, it is doubtlessly important to understand these factors and monitor any changes in them. This includes changes in the government, changes in policy (both regionally and nationally), the regional agenda, local authorities, TEF, REF and the potential impact of Brexit. The latter is seen, by four interviewees, as a factor that both positively and negatively impacts the activities of the university, including OpRec. Obviously, it will hinder, to a certain extent, the European collaborations and partnerships, and it will make it somewhat difficult to attract European Union students.

But clearly you know that the extent of these kinds of European opportunities might decline; maybe global opportunities will increase. C7(DN)

I think it's going to make the world a tougher place for us. Well, the obvious thing that will happen after Brexit is that European students will become international students and will have to pay more. And that is an opportunity, but it's also a cost in that the European students can already pick from a whole range of providers that are out there; why would they want to come here and pay more? So, I think it is a real a problem. C4(DN)

(3) Technological advances: Technological advances are seen by four interviewees as a critical factor that impacts many aspects, including entrepreneurial OpRec.

(4) Economic factors: Economic factors are seen as another critical factor that impacts the entrepreneurial OpRec process in University C. The more the economic situation is booming, the more opportunities for different investments are available for different organizations, including universities.

b. Being fast: Analysing the interviewees responses shows that responding quickly to changes in the external environment can contribute highly to recognizing entrepreneurial opportunities. This could include being fast in distinguishing between opportunities and threats, being quick enough with the next idea, being able to make a decision very quickly, sometimes being quick in seeing the strategic value of opportunities. This needs to be agile and flexible, which, in return, helps with recognizing opportunities effectively and efficiently.

If you want to be the best in recognizing entrepreneurial opportunities, then you need to be nimble. C3(DN)

Flexibility is really important. Being able to respond quickly is really important. C1(DR)

The critical element is the ability to act quickly because in industry things happen quickly. C3(DN)

Two interviewees believe that without being fast in responding to the changes and threats in the external environment, it will be difficult to constantly recognize entrepreneurial opportunities.

c. Proactiveness: Being proactive is seen as complementary factor for being fast when recognizing entrepreneurial opportunities. However, one of the interviewees believes that, sometimes, it is better to wait to make sure if the opportunity is suitable for the university, and also learn from others' mistakes. The latter view is not supported by the document secondary data, which shows that University C seeks to take a proactive role in dealing with unexpected changes.

d. Risk taking: Responding to changes in the external environment sometimes requires accepting risk and allowing failure. This, according to two interviewees, is experienced in

University C, in which risk-taking is seen as one of the factors that helps it become more entrepreneurial.

We have to encourage risk-taking. How else will you get change? How will you find better ways of doing things? C4(DN)

e. Meeting stakeholders' needs and/or creating needs for people: Two interviewees believe that entrepreneurial opportunity requires finding gaps in the market. Identifying such a gap helps in either meeting people's needs or creating needs for them.

It's absolutely essential for anybody who's going to be entrepreneurial to really have that view on the application of what you're doing and the opportunity of where the gap is in the market. C1(DR)

Six interviewees believe that their university needs to respond to stakeholders' needs, especially, students and industry needs. In fact, analysing the document secondary data shows that University C strives to meet these needs.

We as an institution tend to be more aligned focusing on a need or a demand. C1(DR)

Two interviewees believe that their university needs to sometimes create needs for people, along with meeting their needs. While meeting those needs, the university can predict what those people also need or accept as a need, and thus recognize entrepreneurial opportunities by creating new needs for those people.

The most important capability for dealing with external environment changes is responsiveness, which needs to be quick and suitable for the main purpose of the university. In terms of resources, cash/the ability to gain financial resources can contribute towards being ready to respond to any critical changes in external environment. In addition to financial resources, one of the interviewees believes that research development managers are the resource that contributes to responding to the above-mentioned changes.

Having presented this section, it can be said that secondary data has helped provide more detail about OpRec determinants and supports many views gained from analysing the interviews (see Table 4.14).

Table 4.14 Support/triangulation from the secondary data for the results of interviews relating to OpRec determinants in University C

			Website content	Documents
Networking	Internal networking			
	External networking	Networking with industry	*	*
		Networking with other universities	*	
		Networking with alumni	*	
		Networking with the government		*
Prior knowledge and experience	Experience			
	Prior knowledge	Knowledge about how to run a business (Business knowledge)		
		Knowledge about industry	*	*
		Knowledge about staff		
Entrepreneurial alertness	Finding connections between unrelated information			
	Horizon scanning			
	Distinguishing between profitable opportunities and non-profitable creation opportunities			
	Being aware of opportunities overlooked by others			
Creativity	Continue thinking of new ideas			*
	Being different			
	Feelings and emotions			
	Teamwork		*	
Systematic search vs serendipitous discovery	Systematic search	Continuously search for opportunities		
		Market research		
	Serendipitous discovery			
	Both systematic search and serendipitous discovery			
External environment changes	Responding to external environment factors	Competition		*
		Political factors	*	
		Technological advances	*	
		Economic factors		
	Being fast			
	Proactiveness			*
	Risk taking			
	Meeting stakeholders' needs			*

Source: Author

4.3.2.7 The relationship between entrepreneurial opportunity recognition determinants in University C

An analysis the data shows that a number of the entrepreneurial OpRec determinants are interacting with each other:

- (1) Entrepreneurial alertness and creativity: Awareness and information from a variety of areas and collaborations, which are considered the main resources and capabilities for entrepreneurial alertness, can significantly enhance the creativity required for recognizing entrepreneurial opportunities.
- (2) Creativity and external environment changes: The more the university is creative the quicker it will respond to changes in the external environment.
- (3) External environment changes and systematic search: Responding to the high level of competition among universities can motivate the university to search for more entrepreneurial opportunities.
- (4) Experience and entrepreneurial alertness: Experience significantly helps in enhancing special sensitivity, which is considered the main capability for entrepreneurial alertness.

- (5) Experience and quick response: The more experience the senior staff have, the quicker they will respond to the external environment changes.
- (6) Networking and knowledge: Knowledge can be enhanced through networking with professional institutions. In addition, learning, which is considered the main capability for obtaining knowledge, can be enhanced through collaborations.
- (7) Networking and systematic search: Having strong networking can enhance the university's ability to search for entrepreneurial opportunities.

Table 4.15 A summary of entrepreneurial OpRec determinants in University C

Determinants	Sources/aspects	Resources	Capabilities	Type of entrepreneurial opportunity
Networking	<ul style="list-style-type: none"> - Internal networking - External networking <ul style="list-style-type: none"> • Networking with industry • Networking with other universities • Networking with alumni • Networking with the government 	<ul style="list-style-type: none"> - Relationships - Innovation centres - Reputation - Social media - Financial resources - Networking events and conferences 	<ul style="list-style-type: none"> - Communication 	<ul style="list-style-type: none"> - Commercial research opportunity - Consultancy - Spin-in - Funding from industry - Knowledge Transfer Partnerships - Collaborations and Partnerships
Prior knowledge and experience	<ul style="list-style-type: none"> - Experience - Prior knowledge: <ul style="list-style-type: none"> • Knowledge about how to run a business (Business knowledge) • Knowledge about industry • Knowledge about staff 	<ul style="list-style-type: none"> - Expertise - Opinions leaders and champions staff 	<ul style="list-style-type: none"> - Critical reflection - Learning 	<ul style="list-style-type: none"> - Consultancy - Licensing - Spin-outs
Entrepreneurial alertness	<ul style="list-style-type: none"> - Finding connection between unrelated information - Horizon scanning - Distinguishing between profitable opportunities and non-profitable creation opportunities. - Being aware of opportunities overlooked by others 	<ul style="list-style-type: none"> - Information - People who make decisions about costing areas of activity - People who distil information 	<ul style="list-style-type: none"> - Awareness - Special sensitivity 	<ul style="list-style-type: none"> - Commercial research opportunity - Collaborations
Creativity	<ul style="list-style-type: none"> - Continue thinking of new ideas - Being different - Feelings and emotions - Teamwork 	Creative individuals	<ul style="list-style-type: none"> - Imagination - Creative thinking 	<ul style="list-style-type: none"> - Commercial research opportunity - Collaborations - Knowledge selling - Innovation
Systematic search vs serendipitous discovery	<ul style="list-style-type: none"> - Systematic search <ul style="list-style-type: none"> • The continuous search for opportunities • Market research 	Research development managers	Researching as a capability	<ul style="list-style-type: none"> - Increase the number of students - Collaborations - Commercial research opportunity
	Serendipitous discovery	Conferences	No evidence	Partnerships
	Both systematic search and serendipitous discovery	No evidence	No evidence	No evidence
External environment changes	<ul style="list-style-type: none"> - Responding to external environment factors <ul style="list-style-type: none"> • Competition • Political factors • Technological advances • Economic factors - Being fast - Proactiveness - Risk taking - Meeting stakeholders' needs and creating needs for people 	<ul style="list-style-type: none"> - Cash/the ability to gain financial resources - Research development managers 	Responsiveness	<ul style="list-style-type: none"> - Partnerships - Increase in the number of students

Source: Author

4.3.3 How the respondents defined the entrepreneurial university (University C)

University C, from the time that it was chosen to be the EntUni of the year, has been maintaining the embodiment of entrepreneurialism within its main activities. This helps it remain being known as an EntUni, thus engaging with non-traditional activities.

There is very much a mindset of being entrepreneurial in everything you do in the university. C1(DR)

Universities, traditionally, have not been considered very entrepreneurial places, and by that we mean that individuals within the university are engaged with non-traditional educational activities, and by that I mean teaching students on undergraduate, postgraduate courses, and PhDs but also in non-traditional research terms, i.e. outside of a research project environment. C2(DN)

Table 4.16 The main focus of the definitions provided by the interviewees for the EntUni phenomenon in University C

	Business oriented	Innovative	Entrepreneurial culture	Ambitious	Strong leadership	Value creation	Looks for opportunities	Doing unconventional things	Making sense of the cost-benefit analysis	Engaging with businesses	Entrepreneurial in teaching	Entrepreneurial in research	Entrepreneurial in the way of interaction	Distinctiveness	Not doing the same old things	Growth	Goal getting university	Maximizes its potential
C1(DR)	*	*	*	*	*	*												
C2(DN)							*	*	*	*								
C3(DN)											*	*	*					
C4(DN)	*	*					*							*	*	*		
C5(DN)	*						*	*										
C6(DN)	*						*										*	
C7(DN)						*	*											
D8(DN)						*				*								*

Source: Author

Table 4.16 shows that the respondents have not agreed on a single definition on the EntUni concept. Sixteen different features have been identified to describe this concept. Despite having such a large number of features, there is considerable agreement that entrepreneurial universities continuously look for opportunities, and also, there is a good agreement that these universities are business orientated. In addition, there is some agreement that entrepreneurial universities are innovative and do unconventional things, as well as engage with businesses and create social and economic value.

Drawing on Table 4.16 and the above discussion, an EntUni can be viewed as a business oriented and innovative university that looks for opportunities that help with engaging with businesses and creating value.

4.3.4 Entrepreneurial university factors

4.3.4.1 Supportive environment for entrepreneurship

All the interviewees believe that creating a supportive environment for entrepreneurship is the most important criteria for judging whether or not a university is entrepreneurial. Having

such an environment fosters entrepreneurial thinking and enables innovations. University C employs a number of activities to create and maintain the above-mentioned environment, which are as follows:

a. Supporting entrepreneurship by the Chancellor and Vice-Chancellor: Analysing the interviews shows that the support provided by the Chancellor and Vice-Chancellor contributes highly to creating a supportive environment for entrepreneurialism. In fact, the Vice-Chancellor creates posts and functions within the university to support this, such as the pro-vice-chancellor for research and enterprise. The Vice-Chancellor himself is seen as a very entrepreneurial, inspiring leader and a business-oriented person, since he truly believes in entrepreneurialism. He pays substantial attention to networking, innovation, enterprise and entrepreneurial opportunities. He desires to make the whole university entrepreneurial; he empowers senior staff to spread and facilitate entrepreneurialism in the university.

The Vice-Chancellor wanted (entrepreneurship) to be a very large part of the university, and in fact, they probably wanted it to be a larger part than it is, because you know things are progressing and they have progressed a lot. C3(DN)

The Vice-Chancellor is very entrepreneurial; he's always looking for deals, he's always looking for the next partnership, he's a real businessman. C1(DR)

When we were awarded Entrepreneurial University of the year in ... that had a big impact on the Vice-Chancellor and he really believes in enterprise and entrepreneurship. So, his leadership is critical. C1(DR)

The Vice-Chancellor has empowered me to implement and drive enterprise and innovation. C1(DR)

There's a very senior academic in charge of enterprising in the university who's close to the Vice-Chancellor and is very widely respected. C7(DN)

Although the focus of most of interviewees was on the role of the Vice-Chancellor in supporting entrepreneurship, two of the interviewees believe that the Chancellor plays a noticeable role in such support.

It goes actually beyond the Vice-Chancellor because the Chancellor is extremely entrepreneurial. C1(DR)

b. Encouraging and supporting students to be entrepreneurial: University C substantially inspires, encourages and supports students from different disciplines to be entrepreneurial through different initiatives and activities. This is done through the following ways:

- (1) Entrepreneurial competition through which a challenge is set for a number of interdisciplinary teams of students, who come together and respond with innovative and entrepreneurial ideas.
- (2) Student enterprise.
- (3) Enterprise placement year.
- (4) Embedding entrepreneurship into the curricula

- (5) A team of staff that support students, who want to set up their own businesses in the enterprise team.
- (6) Providing opportunities for students to network with local businesses.

The above initiatives and activities help students to build an entrepreneurial mindset, to realize how entrepreneurial they are and to practice entrepreneurship while they are studying in the university.

A lot of students don't actually realize they are entrepreneurial. So, being able to work in a non-threatening environment that allows them to see that in themselves is quite important, and suddenly, you start to see things, they see things in themselves they didn't know were there. C1(DR)

c. Establishing an entrepreneurial culture: Three interviewees, supported by the document secondary data, believe that culture plays a considerable role in embedding entrepreneurialism within the university's activities. Therefore, it is important to place entrepreneurship and innovation within the whole culture of the university. This, of course, will help them have some entrepreneurial element in all significant entities within the university.

It is more about the whole culture of the institution, looking at all aspects of the operation, even for the research grants and the research I'm responsible for. I will be entrepreneurial and innovative in how I structured it. I see it as being a part of the whole infrastructure of the institution. So, you might teach someone how to be entrepreneurial, what key skills you need, but actually, it is so important that whatever you do in the institution from the Vice-Chancellor right down to the students. The philosophy is about being innovative and entrepreneurial. C1(DR)

d. Innovation centre: This centre is one of the main factors that promotes entrepreneurialism within the schools of the university. Such a centre plays a remarkable role in engaging with industry, supporting entrepreneurial students and staff and promoting creativity. Two interviewees pointed out that the directors of these centres contribute highly to establishing entrepreneurialism within the university.

Regarding the innovation centre, for example, the whole purpose of that creation was to engage with businesses and become more entrepreneurial and create opportunities. D2 (DN)

e. Structures for promoting entrepreneurialism: These structures are seen by two interviewees as a significant facilitator for creating a supportive environment for entrepreneurship.

So, we have to have structures in place in order to make entrepreneurialism happen. C4(DN)

It is almost like a wardrobe and a coat. If you haven't got a coat hanger to hang the coat on in the wardrobe. It is like the resource could be the clothes, but if you've got no structure on which to hang it, it is not gonna happen. C1(DR)

f. Using entrepreneurialism language within the university: Using such language can contribute, according to three interviewees, to creating a supportive environment for entrepreneurship and seeking entrepreneurial opportunities in different areas. According to one of the interviewees, such language is a common language now among University C's members.

The thing that's interesting about the language of entrepreneurialism is that it is a common language now that people can use to think about what they're doing and how they can do it better. C4(DN)

Despite the importance of using the above-mentioned language, two of the interviewees believe that there is little worry with the word entrepreneurial in the context of universities, because entrepreneurialism *"is not a term that the higher education sector, as a whole, has been particularly comfortable with, because it aligns more with the private sector approach to managing outcomes"* C4(DN). One of the interviewees believes that it is important to clarify that using the word 'entrepreneurialism' within the context of universities is about thinking of how things can be better done in a way that enables the university to build up an academic reputation and enables it to be a successful organization.

Analysing the data shows that creating a supportive environment for entrepreneurship can help with encouraging and supporting creativity, enhancing knowledge, looking for opportunities and strengthening internal and external networks. Therefore, being an EntUni can help with establishing the above-mentioned environment, which, in return, can be an additional source for knowledge, along with the networking and creativity needed for recognizing entrepreneurial opportunities.

4.3.4.2 Placing enterprise in the university strategy

University C's strategy clearly considers enterprising in all essential activities of the university. Doing so helps the university to, according to the secondary data, enhance its reputation as a leader in the enterprise's field. Thus, it is important to seek for entrepreneurial opportunities to achieve the strategies relating to enterprising.

.... but remember, the university might have a vision of what it wants to be underneath. They will be the estate strategy, research strategy and teaching and learning strategy. What I am saying is that the enterprise needs to be embedded in all of those... enterprise is a mindset philosophy about how you do things and how you approach deals, operations, innovative approaches, and what you do in terms of estate strategy around enterprise might be very different from what enterprise looks like within the teaching and learning strategy. C1(DR)

Embedding enterprising into University C's strategy helps strengthen its networking, as well as encourage and support creativity. Therefore, it can be argued that adopting the EntUni mode can help in developing good strategies for enterprising, which, in return, can be an additional source for the networking and creativity needed for recognizing entrepreneurial opportunities.

4.3.4.3 The three missions of universities

4.3.4.3.1 Teaching (first mission) and entrepreneurship

As an entrepreneurial institution, University C is continually developing different methods of high quality teaching. As a result of embedding entrepreneurialism into its strategy and activities, the aspects of entrepreneurship can be seen in the courses of different subject areas. There are two main forms of teaching, as far as entrepreneurialism is concerned, which are as follows:

a. Teaching with an entrepreneurship flavour: Four interviewees, supported by the secondary data, emphasize the importance of embedding entrepreneurship within the curriculum of the different courses. In fact, one of these courses is supported by one of the more famous entrepreneurs in the UK. To consolidate entrepreneurialism in its teaching, this university uses visiting entrepreneurship professors and entrepreneurs. Conducting the above activities leads the students to become engaged with non-traditional educational activities and learn more about entrepreneurship.

We teach students how to be entrepreneurial and embed that in their curriculum or even extra curricula. C1(DR)

Considering entrepreneurialism in the way of delivering teaching has helped University C in achieving an outstanding record for student satisfaction, as well as its world leading five star ratings for teaching. This has contributed highly in being rewarded a gold rating in TEF. The latter is seen by two interviewees as one of the sources for gaining competitive advantage.

The TEF has been one way in which we gain competitive advantage. C4(DN)

b. Teaching with innovative flavour: University C aims at developing innovative courses as well as being creative in their ways of delivering the modules.

Teaching and education in University C can contribute towards gaining a good reputation, which can support both networking and creativity.

4.3.4.3.2 Impactful research (second mission) and entrepreneurship

University C is seen as a growing centre of research, and it intends to maximize their local, national and international impact through conducting high quality research. University C is continually seeking to drive innovative research and be world leading in areas of research. To achieve the above goals, the university follows the below tactics and activities:

- (1) Creating a supportive environment for quality research.
- (2) Engaging individuals within the university in non-traditional research terms.
- (3) Building entrepreneurship into research.
- (4) Continuously encouraging and supporting early-career researchers.

- (5) Increasing academics' time for research and innovation.
- (6) Focusing on real-world issues and applied research.
- (7) Undertaking pioneering and entrepreneurial research.

With respect to the latter, one of the interviewees believes that *"because generally research is new and novel and consequently it can take it out into industry and sell it in some way. Then, it will be entrepreneurial"*. C3(DN)

The above tactics have helped the university to quadruple its research income, which is one of the indicators of the university's success. Those tactics have also helped with achieving outstanding results in REF 2014. These encourage the university to increase both the quantity and quality of its research.

It is definitely how much income they brought in. So, it's an indicator of an academic of their success as researchers. So, research income is good for academics, and is good for the institution because research income is a metric in the institution. C1(DR)

Research has considerably supported creativity in gaining the latest knowledge, as well as in establishing strategic partnerships with industry, in addition to developing the capabilities and gaining the resources required to respond to the changes in the external environment.

4.3.4.3.3 Contribution to socio-economic development

a. Contribution to societal development: Having a positive impact on and contributing to the development of society has gained considerable attention from University C, which, in return, was awarded the THE Outstanding Contribution to the Local Community Award. Such a contribution can be delivered through the below list, which is taken in order of importance:

- (1) Engaging fully with the community.
- (2) Conducting research that adds value to the community.
- (3) Conducting impactful case studies and excellent research with significant benefits for society.
- (4) Embedding an entrepreneurial outlook across the university's activities including research, teaching and collaboration.
- (5) Doing social enterprise.
- (6) Inviting the public to science events.
- (7) Working with the local council *"on issues to do with community engagement, community cohesion, and awareness as the prevention of violent extremes"*. C7(DN).
- (8) Engaging with schools and colleges to lower the expected barriers to higher education.
- (9) Holding public lectures and concerts for the public.
- (10) Embracing the principles of CSR.
- (11) Producing good employees.

- (12) Supporting alumni.
- (13) Impacting the work of other universities and motivating them to be focused more on student enterprise and innovation
- (14) Being a successful part of the city.

They've only been used as local supplier as they possibly could. So, everything has been sourced locally in order to ensure that we are support of the local workforces and local businesses. So, that is a way in which the university behaves in a socially positive manner. C2(DN)

...universities provide opportunity for personal growth, and also for the betterment of society. C2(DN)

Entrepreneurship fits somewhere in between the teaching component, the research component, and also it is the public duty of universities to engage with society and be a benefit to society. C2(DN)

b. Greater impact on the economy: Although one of interviewees believes that all universities in the UK should have a positive impact on the economy, four interviewees consider such an impact as one of the characteristics of entrepreneurial universities.

Universities make a significant contribution to the economy anyway, even if they are not entrepreneurial, because they bring so much capital and opportunities for employability and jobs and cultural richness in where they're located. C2(DN)

If they have a positive impact on the economy, then they are probably entrepreneurial. C3(DN)

It makes sense that you would expect the university to call itself entrepreneurial in order to have a clear economic presence in the broadest economic sense. C5(DN)

Despite the above consideration, two of the interviewees believe that having the above-mentioned impact is insufficient to consider a university as entrepreneurial.

If you are entrepreneurial, then you would expect to have a positive economic impact. But just because you have a positive economic impact, doesn't necessarily mean that you are entrepreneurial. C3(DN)

In fact, two interviewees believe that entrepreneurial universities have a more direct and greater impact on the economy. One of these interviewees believes that it is easier for entrepreneurial universities, than other universities, to demonstrate such an impact. In this regard, the secondary data shows that University C has a significant impact on their regional economy.

I mean, at the end of the day, despite whether the university is entrepreneurial or not, it is receiving public money. So, it's getting fee paying students, but it also receives quite a lot proportion of public sector money as well as from the government. The government is constantly expecting universities to justify the impact of that public-sector investment, and quite rightly too, because it is taxpayer money. Taxpayers should see what the outcome of that is. Now, the EntUni then is in a much

better position to demonstrate the impact and outcomes of investment, because the direct impact on the economy is more evident C1(DR)

University C delivers the above-mentioned impact through the following ways, which are listed in order of importance:

- (1) Full engagement with employers.
- (2) Producing business people and entrepreneurs.
- (3) Employing more people due to its considerable growth. In fact, University C is the third largest employer in its district.
- (4) Supporting graduates to be entrepreneurs.
- (5) Supporting nascent entrepreneurs.
- (6) Establishing spin-out companies.
- (7) Supporting local businesses.
- (8) Obtaining a larger number of international students.
- (9) Increasing research and enterprise activity.
- (10) Having financial sustainability.
- (11) Building short-term and medium-to-long-term Knowledge Transfer Partnerships (KTPs) programmes for SMEs, to improve their performance and competitiveness, and for large companies to help them in dealing with strategic challenges and improve their performance and competitive edge.
- (12) Improving the efficiency and effectiveness.
- (13) Incubations.

We act as a hub, where it is not just a direct benefit for those businesses, but also indirect stuff they need in order to grow. So, we become like an incubator, a little accelerator of a business where non-entrepreneurial universities will not see themselves as part of that equation. They will see themselves as purely student focused with fundamental research and that's it. C1(DR)

The third mission of University C helps in strengthening the university's networking, by responding to changes in the external environment, enhancing entrepreneurial alertness and obtaining knowledge. These can contribute highly to recognizing entrepreneurial opportunities.

4.3.4.4 Entrepreneurial staff

Analysing the interviews, supported by website content, shows that University C has sought to build an entrepreneurial mindset among staff through encouraging and supporting them to try to do new things, be entrepreneurial, and look for and respond to the next opportunities/deals and undertake entrepreneurship training. With respect to the latter, it should not be available to the senior staff, but also for people in the lower levels. However, according to two interviewees, who took the EULP, senior staff (including deans) need to take entrepreneurship training and develop their entrepreneurial skills. This increases the number

of entrepreneurial staff and intrapreneurs in the university, which always tries to obtain more of those.

We could do with more people in the school undertaking entrepreneurship training, and specifically looking at expanding their horizons beyond their day-to-day work towards how can we develop this work for the future, both for our own benefit and that of our partners. C7(DN)

Supporting entrepreneurial staff and motivating the other staff to become more entrepreneurial can greatly impact the six entrepreneurial OpRec determinants. This could be another good indicator for considering University C, which is one of the UK entrepreneurial universities, as one of the best fields for recognizing entrepreneurial opportunities.

Presenting this section has helped to show the contribution of the secondary data to make the views relating to EntUni factors clearer and also supports a number of them (see Table 4.17).

Table 4.17 Support/triangulation from the secondary data for the results of interviews relating to entrepreneurial university factors in University C

			Website content	Documents
Placing enterprise in the university strategy				*
Supportive environment for entrepreneurship		Supporting entrepreneurship by the Chancellor and Vice-Chancellor	*	
		Encouraging and supporting students to be entrepreneurial	*	*
		Establishing entrepreneurial culture		*
		Innovation centres	*	*
		Structures for promoting entrepreneurialism		
		Using entrepreneurialism language within the university		
The three missions of universities	Teaching (first mission) and entrepreneurship	Teaching with entrepreneurship flavour	*	*
		Teaching with innovative flavour		*
	Impactful research (second mission) and entrepreneurship		*	*
	Third mission	Contribution to societal development	*	*
		Greater impact on the economy	*	
Encouraging and supporting staff to be entrepreneurial			*	

Source: Author

Presenting this section also shows that EntUni factors in University C can contribute substantially to the process of entrepreneurial OpRec through their explicit impact on the six entrepreneurial OpRec determinants considered in this study (see Table 4.18).

Table 4.18 The relationship between EntUni factors and entrepreneurial OpRec determinants in University C

		Prior knowledge	Networking	Alertness	Systematic search	Creativity	Environmental changes
	Placing innovation at the university strategy		*			*	
	Supportive environment for entrepreneurship	*	*		*	*	
The three missions of universities	Teaching (first mission) and entrepreneurship		*			*	
	Impactful research (second mission) and entrepreneurship	*	*			*	*
	Contribution to socio-economic development (Third mission)	*	*	*			*
	Entrepreneurial staff	*	*	*	*	*	*

Source: Author

4.3.5 Resources characteristics

To illustrate the contribution of the resources and capabilities to the entrepreneurial OpRec process, this section will present the characteristics of these resources and capabilities

a. Valuable resources: The resources and capabilities available contribute highly to increasing the value of the university's services. Three interviewees believe that the value of that the university wants to increase in line with its reputation. The latter can include the three missions of the universities: teaching, research and contributing to the socio-economic development. This actually increases the university's market and demand for its services, and facilitates accessing companies, with a view to being leaders in particular areas.

Having excellent human and financial resources are seen as the main contributors to carrying out activities that add value. Therefore, the university invests large sums of money into its staff. This is appreciated by those staff who continually attempt to be efficient, effective and creative, and to improve the university's services. Doing so, will definitely help with meeting the expectations of the students and other stakeholders.

b. Rare resources: Although there is no agreement on whether the capabilities and resources available are unique, four interviewees believe that the way that the university brings its resources and capabilities helps it to create 'a unique combination of resources'. Such a combination has helped it gain competitive advantage.

We have a unique combination of resources. It is not that our resources are particularly unique, it is the combination of them all together. C3(DN)

One of the interviewees believes that University C has a unique scheme of enterprise, which benefits both students and university. Such a scheme has a positive impact on the reputation of the university. Another interviewee believes that the university has a unique partnership with certain leading companies.

We do have unique resources because we have partnerships with that would be an example of something that will be difficult for someone else to replicate. C6(DN)

c. Imperfectly imitable (or costly to imitate) resources: Analysing the interviews shows that ideas, building a brand new degree programme and equipment can be easily copied. This is due to the huge competition among universities, as well as the availability of information about their services and activities on their websites. On the other hand, people, culture and some partnerships are difficult to copy.

It is so easy to imitate because all the information about your product have to be on the web, because how else you going to get people to know about it. C6(DN)

It is hard to copy culture. I don't think you can just translate a culture. It comes from the myriad things that people do every day, day in, day out, and how they learn from others. It's a difficult thing, to copy the culture. C4(DN)

People are more difficult to replicate, if not impossible. C2(DN)

d. Organization: To exploit the competitive potential offered by resources and capabilities, University C takes the following actions:

- (1) Offering those resources and capabilities.
- (2) Using the resources and capabilities in many areas, not only one.
- (3) Moving everything into one campus.
- (4) Marketing the services and facilities offered by the resources and capabilities available.
- (5) Working with the innovation and enterprise centres.

4.4 Case D

The data collected from University D involves three interviews, fifty-three university web pages and two documents (strategic plan 2016-2020 and technology and innovation centre).

a. OpRec determinants

- a.1 Networking
 - a.1.1 Internal networking
 - a.1.2 External networking
 - a.1.2.1 Networking with industry
 - a.1.2.1 Networking with other universities
 - a.1.2.3 Networking with the government
- a.2 Prior knowledge and experience
 - a.2.1 Experience
 - a.2.2 Prior knowledge
 - a.2.2.1 Knowledge about competitors
 - a.2.2.2 Knowing how to obtain money
- a.3 Entrepreneurial alertness
 - a.3.1 Distinguishing between profitable opportunities and non-profitable creation opportunities
 - a.3.2 Feelings and moods
 - a.3.3 open-mindedness
- a.4 Creativity
 - a.4.1 Continuous thinking of new/innovative ideas
 - a.4.2 Being different
 - a.4.3 Feelings and emotions
 - a.4.4 Teamwork
- a.5 Systematic search vs serendipitous discovery
 - a.5.1 Systematic search
 - a.5.1.1 The continuous search for opportunities
 - a.5.1.2 Market research
 - a.5.2 Serendipitous discovery
 - a.5.3 Both systematic search and serendipitous discovery
- a.6 External environment changes
 - a.2.1 Responding to external environment factors
 - a.6.1.1 Political factors
 - a.6.1.2 Technological advances
 - a.6.1.3 Economic factors
 - a.6.1.4 Societal factors
 - a.6.2 Being fast
 - a.6.3 Risk taking
 - a.6.4 Meeting stakeholders' needs

b. EntUni Criteria

- b.1 Supportive environment for entrepreneurship
 - b.2.1 Supporting entrepreneurship by the Vice-Chancellor
 - b.2.2 Innovation and entrepreneurship centres
 - b.2.3 Encouraging and supporting students to be entrepreneurial/intrapreneurial
 - b.2.4 Establishing an entrepreneurial culture
 - b.2.5 Structures for promoting entrepreneurialism
 - b.2.6 All faculties should have some of entrepreneurial element
- b.2 Placing enterprise and innovation in the university strategy
- b.3 The three missions of universities
 - b.3.1 Teaching (first mission) and entrepreneurship
 - b.3.2 Impactful research (second mission) and entrepreneurship
 - b.3.3 Contribution to socio-economic development (Third mission)
 - b.3.3.1 Contribution to societal development
 - b.3.3.2 Positive impact on the economy
- b.4 Entrepreneurial staff

Figure 4.4 Final version template for University D

Source: Author

4.1.5.1 Defining entrepreneurial opportunity recognition in University D

Entrepreneurial opportunities have gained much attention from University D, therefore, its senior staff have sought to continuously recognize and exploit such opportunities.

Table 4.19 The main focus of the definitions provided by interviewees for the entrepreneurial OpRec phenomenon in University D

	Quick response	Problem solving	Income generation	Spot the exploitable opportunities	Value creation	Innovative opportunities	Partnership with industry
D1(DN)	*	*	*		*		
D2(DR)			*		*		*
D3(DN)			*	*	*	*	

Source: Author

Table 4.42 demonstrates that consensus on the definition of entrepreneurial OpRec is low. From analysing the answers of the interviewees, seven different features for the definition of entrepreneurial OpRec have been revealed. Despite this, all interviewees agree that senior staff must think about generating income and creating value while recognizing entrepreneurial opportunities. Thus, entrepreneurial OpRec can be viewed as a process of perceiving commercial and value-added opportunities.

4.5.2 Entrepreneurial opportunity recognition determinants in University D

4.5.2.1 Networking

The interviewees believe that the process of OpRec is substantially impacted by the university's networking. Therefore, there is a considerable encouragement and support to maintain, strengthen and expand this networking, locally, nationally and internationally. This is supported by the secondary data, which show that this university pays a great deal of attention to its networks.

The university's networking has helped it understand the needs and desires of individuals/organizations, as well as understanding the issues facing these individuals/organizations. Networking has also helped with being aware of funding bodies. These have contributed to recognizing a wide range of entrepreneurial opportunities, such as spin-outs, funding opportunities, KTPs, executive education, commercial research partnerships, continuous improvement trainings, consultancy, commercialising innovations and licencing. Some of the above opportunities are collaborative opportunity types, which often makes them long-term opportunities.

And then, of course, you need external contacts, partners in industry and the public sector. We are sufficiently engaged to understand what challenges exist for those organizations. We also need to be aware of funding support. So, you need different areas of opportunities to engage with. People you meet can contribute to developing ideas. D1(DN)

Networking could be very important, particularly if you're working in the area of sector that I work; speaking with entrepreneurs at networking events really helps you understand what their needs, their wants and their demands are. D2(DR)

But also, having a strong network is really, really important, if you are willing to be entrepreneurial, because a lot of good ideas will only work if you can pull a bunch of people with different skill sets together. Networking is hugely important in this. D3(DN)

Networking is really important because there's often people you can contact and say: do you know someone you can bring in? Because they're closer to what is actually required, or they themselves might have people you've worked with in the past, and so on. So, networking in modern universities is much, much more important. D3(DN)

Senior staff pay attention to both internal and external networks, while recognizing entrepreneurial opportunities.

a. Internal networking: This is considered one of the factors that impacts the entrepreneurial OpRec process, because it helps with the university's understanding of what other individuals are doing within the university and with being aware of the mechanisms where ideas can be discussed and assessed and perhaps developed.

b. External networking: External networks have gained substantial attention from University D, due to their great importance in recognizing entrepreneurial opportunities. University D uses several networking forms to recognize entrepreneurial opportunities, which are summarised as follows:

(1) Networking with industry: This is one of the most significant factors that impacts the OpRec process. Therefore, individuals at different levels, especially senior staff, are highly encouraged and supported to forge and expand such networking. One of the interviewees claimed, supported by the secondary data, that University D is one of the leading universities in the UK as far as links with industry are concerned. This, in fact, helps the university to snowball industrial collaborative research, which in return has helped with having a clear focus on the needs of industry and businesses. University D seeks to establish strong networking with businesses of different sizes. However, one of the interviewees believes that although networking with SMEs is important for recognizing entrepreneurial opportunities, it is not the same as with large companies.

(2) Networking with other universities: Analysing the interviews shows that networking with other universities, both on national and international levels, has, in some cases, contributed to facilitating the process of OpRec. Such networking has helped the university to learn from

other universities in terms of how to recognize more entrepreneurial opportunities and to be aware of a number of opportunities that have been revealed as a result of networking with those universities. Also, according to the website content, networking with other universities has opened the door for the university to have more commercial collaborative research.

(3) Networking with the government: A strong network with the government has contributed to revealing a number of opportunities for University D and contributed to facilitating the OpRec process. Therefore, according to the secondary data, the triple helix model has been adopted by this university, and considerable effort has been made to strengthen such networking.

Due to the critical importance of networking, University D provides a number of resources required for developing the networking capabilities and forging the current networks. Communication is seen as the main capability required for enhancing internal and external networks. On the other hand, relationships, reputation, innovation and entrepreneurship centres, business development officers, people with industry experience and collaborations and partnerships are the main resources that have been enhancing University D's networking.

Relationships are seen as a valuable resource that facilitates and quickens the process of entrepreneurial OpRec. Therefore, the university pays lots of attention to managing, strengthening and maintaining the current relationships and also to developing and building new relationships with different entities/organizations.

You can facilitate entrepreneurial opportunity recognition through having strong relationships much more quickly. And we do that in different ways.
D1(DN)

The reputation University D has gained in different areas has contributed substantially to attracting different parties, especially industry and businesses, to the University's services. This, in return, has helped with recognizing a wide variety of entrepreneurial opportunities.

Since they have been established, innovation and entrepreneurship centres have played a substantial role in establishing and strengthening the university's networking (both internal and external networks), and thus recognizing more entrepreneurial opportunities, especially unique collaboration opportunities.

Due to the significance of networking with industry, the university has employed business development officers and people with industry experience. These officers have greatly contributed to bridging the gap between senior staff and business people, and thus they acquire more partnerships with industry and businesses. Collaborations and partnerships, as with the other cases, are seen as resources that facilitate the entrepreneurial OpRec process and determinants for this process. In addition, they are also seen as entrepreneurial opportunities, which can have a positive impact not only on the university but also the organizations that the university collaborates with, as well as the local community and economy.

University D has created effective, trusted and strategic collaborations and partnerships, which take place with both the public and private sectors on local, national and international levels. These include collaborations and partnerships with industry and businesses, government and other universities. However, greater attention has been paid to the former. Such collaborations and partnerships have helped with obtaining resources and capabilities that are insufficient at the university and at the same time are required to conduct various activities planned for by the university. They also help with obtaining unique research collaborations, increasing the innovation and knowledge exchange opportunities and growing their reputation for research excellence.

Innovation and entrepreneurship centres have played a great role in establishing and enhancing the university's collaborations and partnerships with the industry and businesses. This is supported by the website content, which shows that the main aim of the University's innovation centre is to motivate and support researchers and academics to partner with industry in order to find the most optimal solutions for issues facing industry.

4.5.2.2 Prior knowledge and experience

4.5.2.2.1 Experience

The interviewees believe that experience has greatly helped them to recognize entrepreneurial opportunities, because having previous successful experiences can help in deciding whether what is recognized is a real opportunity. Having such experience can also help with gaining the confidence required for trying new things which, in return, can help reveal a number of opportunities.

.... as you gain knowledge and develop those experiences in your life, you can easily seek new opportunities. D1(DN)

It's about knowledge and experience. If you've been working in higher education for a long time, you understand how that market works. And because you've got that knowledge and you've got that experience, you're able to understand what is an opportunity and what is not an opportunity. D3(DR)

4.5.2.2.2 Prior knowledge

Two interviewees believe that knowledge fulfils the same purpose as experience regarding recognizing entrepreneurial opportunities. Knowledge helps with deciding whether or not what is recognized is an entrepreneurial opportunity. It also helps the university understand the methods that can be used to deal with different types of entities and organizations. Therefore, it can greatly facilitate the process of recognizing different types of entrepreneurial opportunities. There are two types of knowledge that can contribute to recognizing entrepreneurial opportunities:

a. Knowledge about competitors can be one of the factors that can help with recognizing entrepreneurial opportunities. Such knowledge can help with being proactive and quicker in

spotting opportunities. It also helps with learning how to deal with different types of entrepreneurial opportunities and knowing what the main resources and capabilities are that are required to recognize these opportunities.

b. Knowing how to obtain money: Such a knowledge can have, according to two interviewees, an impact on the OpRec process. This is because ensuring access to cash increases motivation and confidence to gain more opportunities.

The prior knowledge and experience of the senior staff have significantly contributed to recognizing knowledge exchange, problem solving and spin-outs, innovation, and engineering opportunities. Therefore, there have been considerable efforts to develop these capabilities and provide the resources needed to gain the knowledge and experience required for recognizing entrepreneurial opportunities.

Listening and learning are the most important capabilities for gaining knowledge and experience. Senior staff listen carefully to the industry and businesses, as well as listen to the university's stakeholders. They also learn from others, especially from other universities, regarding how to deal with different types of entrepreneurial opportunities available for higher education institutions.

Expertise and organizational knowledge, which according to the website content, are considered the university's most valuable resources, are the main resources used to enhance the knowledge and experience of senior staff. Entrepreneurship and innovation, includes accelerating growth, leadership and innovation in the workplace, commercialising innovation, open innovation and digital innovation, and are considered the main areas of the university's expertise. Having expertise in such areas has greatly contributed towards the university being more entrepreneurial and recognizing more entrepreneurial opportunities.

4.5.2.3 Entrepreneurial alertness

Senior staff are open to opportunities. This has helped them to be entrepreneurially alert to possibilities in the external environment, and thus be more entrepreneurial. Being so helps them to be quicker at seeing opportunities and establishing networks, and thus recognizing a number of entrepreneurial opportunities, such as partnerships and spin-outs. There are three aspects of entrepreneurial alertness:

a. Distinguishing between profitable opportunities and non-profitable opportunities: Two interviewees believe that the ability of senior staff to distinguish between profitable and non-profitable efforts can have a significant impact on the entrepreneurial OpRec process. The University's Commercialization and Enterprise Committee and the university's partners play a remarkable role in such a judgement.

b. Feelings and moods: The level of entrepreneurial alertness can be impacted by the feelings and emotions that individuals are experiencing while doing their activities. This is because the

amount of information that individuals deal with may be influenced by their feelings and emotions.

c. Open-mindedness: Being open-minded can help senior staff to be highly alert to entrepreneurial opportunities and thus recognize different types of them. This, in return, provides a wide range of choices for those staff, who can choose the most appropriate ones.

Awareness and special sensitivity are seen as the capabilities that senior staff need to be entrepreneurially alert. They enhance such capabilities by continuously gaining information from different sources. These sources are social media and marketing people.

4.5.2.4 Creativity

Creativity has hugely contributed to the OpRec process. Therefore, there is considerable encouragement and support for staff at all levels to be more creative. In fact, one of the interviewees sees their university as a hub of creativity. Therefore, the university is full of creative people. Having high levels of creativity has contributed to recognizing a number of entrepreneurial opportunities, such as licensing and engineering opportunities.

There are five main aspects feed creativity required to recognize entrepreneurial opportunities:

a. Continuously thinking of new/innovative ideas: Analysing the interviewees' responses shows that recognizing entrepreneurial opportunities, in many cases, requires being innovative, which helps with producing original ideas. One of the interviewees believes that it is very difficult for people to be innovative while spotting opportunities. However, the other interviewees (as well as the website content) show that it is very important to be innovative and think of new ways of doing things to be able to gain entrepreneurial opportunities. Therefore, individuals are highly encouraged and supported to think creatively and to be continuously open to new ideas.

b. Being different: There have been serious endeavours to make University D a different university. Therefore, a number of individuals who think differently have been employed by this university. This, in return, has contributed to spreading the culture of thinking differently among the university's staff at different levels, and thus boosting the high levels of creativity in the university. Having such a culture has contributed to recognizing a number of innovative entrepreneurial opportunities, such as innovative partnerships.

c. Feelings and emotions: Two interviewees believe that the feelings and emotions that individuals experience while doing their activities can affect the level of creativity they have. If those individuals are experiencing good feelings and are motivated, then they are more likely to be more creative and to be more interested in recognizing entrepreneurial opportunities.

If you're in a happy and in a good mood, then you're more receptive to new ideas. If you're feeling depressed or down or tired or hungry, then you're probably not be thinking about opportunities. D3(DR).

d. Teamwork: Working as a team can contribute substantially to increasing the level of creativity required for recognizing entrepreneurial opportunities. This is because, according to the website content, combining people with different skills and backgrounds together into interdisciplinary teams can greatly contribute to finding creative solutions and doing things in a different way. In this regard, one of the interviewees believes that to make the best out of teamwork, the university has encouraged and supported brainstorming sessions.

e. Continuously supporting creativity: Analysing the interviews and document secondary data shows that University D has created an environment where creativity is continuously and considerably supported. Staff at all levels have access to different types of resources that help them to be more creative, and to turn their creative ideas into entrepreneurial ideas. One of the effective strategies that the university has used to deliver such support is to spread creativity culture into all schools.

The senior staff employ their imagination capabilities to enhance their creativity. On the other hand, creative individuals (around and in the university), world leading experts, leading edge facilities and innovation centres are seen as the main resource for boosting creativity required for recognizing entrepreneurial opportunities.

Creative individuals and world leading experts are seen as precious resources, who provide great support for the senior staff in terms of enhancing creativity required for recognizing entrepreneurial opportunities. As for creative individuals, the university, in some case, has employed people who think differently, in order to continue having creative individuals. The innovation centre and leading edge facilities available in the university have a substantial role in this regard and they are also considered the resources that enhance the creativity capabilities of the senior staff.

4.5.2.5 Systematic search vs serendipitous discovery

4.5.2.5.1 Systematic search

All interviewees agree that recognizing entrepreneurial opportunities often requires active search for the same. Therefore, the university, according to document secondary data, has created teams whose job is to search for opportunities. In addition to those teams, market research is used as one of the main means to actively search for entrepreneurial opportunities. Funding and knowledge exchange opportunities are the main opportunities that have been recognized by University D, through actively searching for opportunities activities.

We do purposely investigate and go out there and seek opportunities... We do have some formal structural approach to search for opportunities. D1(DN)

Analysing the interviews shows that there is encouragement for staff to develop their researching capabilities, which are required for searching actively for entrepreneurial opportunities. This includes senior staff and the teams who support them. Analysing the interviews also shows that time and business development officers are the main resources the university needs to be active in searching for entrepreneurial opportunities.

4.5.2.5.2 Serendipitous discovery

Although entrepreneurial opportunities, in most cases, are recognized as a result of systematic search, a few opportunities are serendipitously discovered. The strong networking of the university has played a significant role in this regard.

4.5.2.5.3 Both systematic search and serendipitous discovery

Two of the interviewees provide a third category regarding searching for or accidentally discovering opportunities. This category suggests that once the university accidentally discover an entrepreneurial opportunity, it will then start to search for more related opportunities, which in some cases, become the areas of interest of the university.

4.5.2.6 External environment changes

Due to the continuous and dramatic changes in the external environment, University D faces different types of challenges and threats. However, these changes provide some opportunities as well. Therefore, the university seeks to continuously gain those opportunities and deal with challenges and threats in a way by which they could be converted into opportunities. Innovation opportunities are seen as the main opportunities that can be recognized by responding to the external environment changes.

You need to be very quick. The external environment at the moment is very, very challenging. So, just because of the environment we operate within is really important to look for potential. D2(DR)

University D deals with the above-mentioned changes through the following ways:

a. Responding to external environment factors: Considering external environment factors has helped senior staff to be more effective in recognizing entrepreneurial opportunities. This is because these factors can highly impact the different activities of the university, including the OpRec process. There are a number of the above-mentioned factors that have had an impact on the OpRec process. However, three of these have had a massive impact, as follows:

(1) Political factors: All interviewees believe that the OpRec process has been significantly impacted by political factors. This includes governmental policies for higher education relating to funding, teaching and research, and also, government initiatives regarding supporting enterprise and entrepreneurship. It is expected that the impact of those factors will be increased. This is because the potential impact of Brexit, which is seen by the aforementioned

interviewees as the main aspect of the political factors that will influence the OpRec process in the coming years.

All the interviewees look at Brexit as a negative factor, and believe it may decrease the number of opportunities with regards to European funding bodies, students, and staff. Actually, Brexit may, according to one of the interviewees, have a negative impact on recruiting international students, not only European ones. This is because doubts may emerge regarding the extent to which UK is a welcoming nation. Therefore, senior staff, according to one of the interviewees, have kept monitoring Brexit, with a view to be able to deal with any negative impact resulting from the process of the departure from the European Union. They have also started looking for other funding sources to compensate for the potential shortfall of European Union funding.

... opportunities may be limited in the future, e.g., all universities are keen to be successfully bound to the European framework. Therefore, there is concern after Brexit regarding being able to find equivalent funding sources that allow us to take on those types of activities. So, regarding external factors relating to Brexit, there are big issues from that perspective and also from the perspective of retaining European staff, who work here and are concerned about their future in UK, and also concerned about how Britain is perceived in terms of being a welcoming nation by external students, who wish to come here from abroad. D1(DN)

The conventional view is that Brexit will likely to lead to economic difficulties for Britain. However, you could just become increasingly even more global, because you can't rely on funding from the EU. D3(DN)

(2) Technological advances: There is universal consensus regarding the importance of keeping pace with technological developments while recognizing opportunities. This is because technology presents new opportunities, and thus it is important to be proactive in seeing those opportunities.

(3) Economic factors: Changes in the economic situation has impacted many activities and processes, including OpRec. The economic situation at present is seen as a facilitator for the process of OpRec.

There is no doubt that economic factors have made the organization do things that we were not able to do twenty years ago. D1(DN)

b. Being fast: All interviewees believe that recognizing entrepreneurial opportunities requires quick responses to the changes in the external environment. This could include being quick in identifying the industry's needs and being able to find quick effective solutions for issues. This may require, according to document secondary data, including agility and flexibility as one of the main values within the university's culture. This is supported by the website content, which shows that University D has been quick and flexible in dealing with factors of the external environment, and thus it takes advantage of entrepreneurial opportunities when they arise.

You have to be quick; you have to take advantages of opportunities and respond quickly. D1(DN)

You have to get out of a traditional university approach, whereby everything runs to a committee timescale. So, what you have to do is try be much more business-like in what you do, and people need to get used to fast turnaround times and then look to move on to the next project very quickly after that. So, you're trying to create an absolute different culture, one that's a completely non-traditional university. D3(DN)

c. Risk taking: Effective and quick responses to the external environment changes may require accepting and managing risks. Being a bold institution helps the university's staff to take risks and manage them effectively, and thus become a pioneer in recognizing entrepreneurial opportunities.

d. Meeting stakeholders' needs: Understanding and meeting industrial, businesses and students needs and wants can be a very good source for recognizing entrepreneurial opportunities. Therefore, the university encourages the activities relating to identifying gaps in market, and it supports filling such gaps.

Responsiveness and flexible thinking are the main capabilities that senior staff need to develop to be able to deal with different types of changes in the external environment. With respect to responsiveness, the university needs to be quick and focus on the opportunities that meet stakeholders' need and create values.

As for resources, the innovation centre, partnerships and leading technological facilities are the main resources that help with responding to the external environment changes quickly and effectively. The above resources, according to the website content, have greatly contributed to achieving competitive advantage and have helped the university to be a leading international technological university.

Having presented this section, it can be said that secondary data has helped provide more detail about OpRec determinants and helped support many views gained from analysing the primary data (see Table 4.20).

Table 4.20 Support/triangulation from the secondary data for the results of interviews relating to OpRec determinants in University D

			Website content	Documents
Networking	Internal networking			
	External networking	Networking with industry	*	*
		Networking with other universities	*	
		Networking with the government	*	*
Prior knowledge and experience	Experience			
	Prior knowledge	Knowledge about competitors		
		Knowing how to obtain money		
Entrepreneurial alertness	Distinguishing between profitable opportunities and non-profitable creation opportunities.			
	Feelings and moods			
	Open-mindedness			
Creativity	Continuously thinking of new/innovative ideas		*	
	Being different			
	Feelings and emotions			
	Teamwork		*	
	Continue supporting creativity			*
Systematic search vs serendipitous discovery	Systematic search	Continuously search for opportunities		*
		Market research		
	Serendipitous discovery			
	Both systematic search and serendipitous discovery			
External environment changes	Responding to external environment factors	Political factors		*
		Economic factors		
		Technological advances		*
	Being fast			*
	Risk taking			*
	Meeting stakeholders' needs		*	

Source: Author

4.5.2.7 The relationship between entrepreneurial opportunity recognition determinants in University D

An analysis of the interviews shows that some of the entrepreneurial OpRec determinants interact with each other. These are listed below:

- (1) Networking and knowledge and experience: Networking, especially with professional institutions and through conferences, has helped senior staff to enhance their experience and gain new knowledge. In addition, learning, which is considered the main source for enhancing experience and obtaining knowledge, can be expanded through networking (especially internally).
- (2) Networking and serendipitous discovery: One of the main reasons behind recognizing entrepreneurial opportunities accidentally is networking, especially through conferences.
- (3) Networking and external environment changes: Having strong networks, both internally and externally, can help with responding to the external environment changes in a quicker and more effective way.
- (4) Networking and creativity: Networking with different parties can considerably help in developing novel ideas, which, in return, can help with being innovative in recognizing opportunities.
- (5) Experience and creativity: having adequate experience can help with gaining confidence to do something new, and thus increase the levels of creativity.

Table 4.21 A summary of entrepreneurial OpRec determinants in University D

Determinants	Sources/aspects	Resources	Capabilities	Type of entrepreneurial opportunity
Networking	<ul style="list-style-type: none"> - Internal networking - External networking <ul style="list-style-type: none"> • Networking with industry • Networking with other universities • Networking with the government 	<ul style="list-style-type: none"> - Relationships - Reputation - innovation and entrepreneurship centres - business development officers - people with industry experience - collaborations and partnerships 	Communication	<ul style="list-style-type: none"> - Spin-outs - Funding opportunities - Knowledge transfers partnerships - executive education - Commercial research partnerships - Continuous improvement training - Consultancy - Commercialising innovations - Licencing
Prior knowledge and experience	<ul style="list-style-type: none"> - Experience - Prior knowledge: <ul style="list-style-type: none"> • Knowledge about competitors • Knowing how to obtain money 	<ul style="list-style-type: none"> - Expertise - Organizational Knowledge 	<ul style="list-style-type: none"> - Listening - Learning 	<ul style="list-style-type: none"> - Innovation - Engineering opportunities - Knowledge exchange - Problem solving - Spin-outs
Entrepreneurial alertness	<ul style="list-style-type: none"> - Distinguishing between profitable opportunities and non-profitable creation opportunities. - Feelings and moods - Open-mindedness 	Information	<ul style="list-style-type: none"> - Awareness - Special sensitivity toward opportunities 	<ul style="list-style-type: none"> - Partnerships - Spin-outs
Creativity	<ul style="list-style-type: none"> - Continuously thinking of new/innovative ideas - Being different - Feelings and emotions - Teamwork - Continuously supporting creativity 	<ul style="list-style-type: none"> - Creative individuals - World leading experts - Leading edge facilities - Innovation centre 	Imagination	<ul style="list-style-type: none"> - Licensing - Engineering opportunities
Systematic search vs serendipitous discovery	<ul style="list-style-type: none"> - Systematic search <ul style="list-style-type: none"> • The continuous search for opportunities • Market research 	<ul style="list-style-type: none"> - Time - Business development officers 	Researching as a capability	<ul style="list-style-type: none"> - Funding - knowledge exchange opportunities
	Serendipitous discovery	No evidence	No evidence	No evidence
	Both systematic search and serendipitous discovery	No evidence	No evidence	No evidence
External environment changes	<ul style="list-style-type: none"> - Responding to external environment factors <ul style="list-style-type: none"> • Political factors • Economic factors • Technological advances - Being fast - Risk taking - Meeting stakeholders' needs 	<ul style="list-style-type: none"> - Innovation centre - Partnerships - Leading technological facilities 	Responsiveness	Innovation

Source: Author

4.5.3 How the respondents defined the entrepreneurial university (University D)

As a winner of THE EntUni of the Year award, University D has sought to have a noticeable impact locally, nationally and internationally, and also maintain the reputation of being a very entrepreneurial university.

Table 4.22 The main focus of the definitions provided by the interviewees for the EntUni phenomenon in University D

	Having the best ways for providing its products/services	Quick response	Developing entrepreneurial opportunities	Being innovative	Having social value	Business oriented	Being open and receptive to industry	Dynamic	Forward-thinking	Being open to new ideas/suggestions
E1(DN)	*	*	*	*	*	*				
E2(DR)						*	*	*	*	
E3(DN)			*	*						*

Source: Author

Table 4.22 shows that there is no consensus on the concept of EntUni among the interviewees. They have provided ten features for the definition of this concept, and there is agreement on only three of these features: developing entrepreneurial opportunities, being innovative, and being business-oriented. Therefore, an EntUni can be viewed as a business-oriented and innovative university that seeks to develop entrepreneurial opportunities.

4.5.4 Entrepreneurial university factors

4.5.4.1 Supportive environment for entrepreneurship

All the interviewees agree that that creating a supportive environment for entrepreneurship is the most important criteria for judging whether or not a university is entrepreneurial. Having such an environment encourages flexibility, interaction and openness, and enhances innovative and enterprising thinking. University D uses a number of activities and means to create and maintain the above-mentioned environment, which are described in detail below.

a. Supporting entrepreneurship by the Vice-Chancellor: The Vice-Chancellor has contributed substantially to disseminating and facilitating entrepreneurialism. The interviewees have described the Vice-Chancellor as a very entrepreneurial person who is very fast at spotting opportunities. He pays great attention to strengthening the university's networking with the government, industry and national partners. In fact, the office of the Vice-Chancellor supports intrapreneurs highly and provides quality resources to make the university more entrepreneurial. This might be the reason why two interviewees believe that supporting entrepreneurship from the top management is one of the main reasons behind winning the THE EntUni of the Year award.

The Vice-Chancellor is a master in this and very quick at identifying opportunities ... Undoubtedly, entrepreneurial successes are very much led from the top of the institution. I think that's why we have an award such as entrepreneurial university of the year, because we are very good at demonstrating our strategic leadership. D1(DN)

Our Vice-Chancellor looks out, which means he spends a lot of his time talking to the government, industry and national partners. So, we are not resourced just by our budget, but it's about maintaining external links at a high level and that's really important. D3(DN)

b. Innovation and entrepreneurship centres: Innovation and entrepreneurship centres have played a substantial role in spreading entrepreneurialism within the university. With respect to the innovation centre, it has contributed in creating a flexible and innovative learning environment for both students and staff and has helped the university to become well-known for being a world-leading innovation university. In addition, this centre has significantly contributed to bringing business and academia together. Therefore, University D has a great number of business partnerships. In fact, having such a centre is one of the most important reasons that has helped the university have a huge impact on the local and national economy.

As for the entrepreneurship centre, which is considered as one of largest entrepreneurship university-based centres in the UK, it has helped the university to establish strong collaborations and partnerships with other universities/organizations, and thus gain a number of entrepreneurship research opportunities. The main research themes that have gained the attention of this centre are entrepreneurial education, entrepreneurial impact, international entrepreneurship, innovative enterprises, social enterprise, entrepreneurial leadership, family businesses and entrepreneurial networking. The research produced by this centre is presented at international entrepreneurship conferences and published in internationally-ranked entrepreneurship research journals.

c. Encouraging and supporting students to be entrepreneurial/intrapreneurial: Students from different disciplines are highly encouraged and supported to be more entrepreneurial/intrapreneurial. This view is supported by the secondary data, which shows that University D works with its students to understand their entrepreneurial potential clearly, and then provides the necessary advice regarding starting a new venture and turning business ideas into reality. In fact, University D runs programmes and training courses to help students develop the entrepreneurial skills required for both creating their own business and being intrapreneurial within existing organisations.

d. Establishing an entrepreneurial culture: Two interviewees believe that establishing an entrepreneurial culture within the university has greatly contributed to moving towards being an EntUni. One of the interviewees believes that having such a culture was one of the main reasons for winning the THE EntUni of the Year award.

... an entrepreneurial culture spanned the university from the executive leadership of the principal to all key leaders across the organisation.
D3(DR)

e. Structures for promoting entrepreneurialism: Embedding entrepreneurialism into the university's structures and processes is seen as one of the facilitators for establishing a supportive environment for entrepreneurship. Such structures are flexible in a way that encourages people to be creative and facilitates communications.

f. All faculties should have some entrepreneurial element: Two interviewees believe that an entrepreneurial spirit needs to be disseminated broadly across all faculties and departments. Therefore, senior staff at all faculties need to demonstrate facets of entrepreneurialism within their faculties' activities, especially when they deal with opportunities available in the external environment. One of the interviewees believes that although entrepreneurialism is important for all faculties, its importance is clearer in the engineering faculty.

A supportive environment for entrepreneurship has greatly and positively impacted the six entrepreneurial OpRec determinants. This is a good indicator for considering University D, as one of the best contexts for studying topics relating to entrepreneurial OpRec.

4.5.4.2 Placing enterprise and innovation at the heart of the university strategy

Innovation and enterprise are at the heart of everything University D does. This includes the university's strategy, in which both innovation and enterprise can be clearly seen. Having such a strong commitment to innovation and enterprise has significantly contributed to progressing the university's entrepreneurial journey, and thus gain competitive advantage. With respect to innovation, University D is seen as a world-leading innovation university and has a very effective commercialisation of the innovation process.

Embedding enterprise and innovation into the university's strategy has contributed significantly to strengthening the university's networks, both internal and external, to encourage and support creativity, to gain novel knowledge, and also to respond to the external environment changes in a more innovative and effective way. Therefore, it can be claimed that in University D there is an extra source for responding to the external environment, creativity, knowledge and networking required for recognizing entrepreneurial opportunities. This source considers innovation and enterprise when looking for such opportunities.

4.5.4.3 The three missions of universities

4.5.4.3.1 Teaching (first mission) and entrepreneurship

As an EntUni, University D has sought to deliver its first mission in the most effective way possible. This has helped in delivering non-traditional, excellent and high-quality teaching,

and thus the university has gained a world-wide reputation for teaching. This, in return, has helped in recruiting a large number of international students, who can see different aspects of entrepreneurship in the methods used to teach them, and also in the different modules they take. Data from interviews shows that the university's entrepreneurship centre has played a considerable role in facilitating and supporting the endeavours relating to embedding entrepreneurialism within teaching methods, as well as the university's curricula.

Teaching and education at University D have contributed significantly to enhancing its reputation, both nationally and internationally. This, in return, has supported its networking. Teaching and education have also have helped with responding to the external environment changes effectively. In addition, they have enhanced and supported creativity.

4.5.4.3.2 Impactful research (second mission) and entrepreneurship

University D has greatly invested in research, believing that research is the most important source for being an EntUni, and further to maximize its local, national and international impact. This university is continually seeking to produce high-quality research and become an internationally-leading research university. To achieve the above goals, the university follows the below actions and tactics:

- (1) Enhancing research capabilities of the current staff.
- (2) Attracting leading researchers and experts.
- (3) Increasing the quality, volume and impact of the university's research across all areas.
- (4) Providing quality physical resources.
- (5) Allocating large sums of money for research.
- (6) Focusing on applied research.
- (7) Embedding entrepreneurship into the university's research.
- (8) Encouraging and supporting multidisciplinary teamwork of researchers.
- (9) Growing the population of high-quality post-graduate researchers.
- (10) Building the university's research with leading academic institutions, industry and the government.

Following the above actions and tactics has helped the university to gain a reputation for high quality research, which has opened the doors to a number of opportunities that have helped with growing and diversifying the university's income streams. Its high quality research was recognized by REF2014, in which the university achieved outstanding results, especially regarding research intensity. In fact, both innovation and entrepreneurship centres have played a remarkable role in gaining such results.

Having such high quality research helps with obtaining the latest knowledge and promotes creativity. In addition, it contributes greatly to enhancing the university's reputation, which, in return, facilitates and strengthens the university's networking.

4.5.4.3.3 Contribution to socio-economic development

a. Contribution to societal development: University D pays much attention to having a positive impact on its society. Such attention can be clearly seen in both the mission and vision of the university, wherein it has delivered this impact through the following ways (the below is listed in order of importance):

- (1) Engaging fully with the public and local community.
- (2) Conducting research that adds value to society
- (3) Addressing complex societal challenges
- (4) Producing high quality graduates who can make a difference to their societies.
- (5) Transforming the way in which the public sector works.
- (6) Embracing the principles of CSR.
- (7) Having social enterprises.
- (8) Supporting social enterprise continually.
- (9) Promoting entrepreneurship within society.
- (10) Impacting the work of other organizations and universities and motivating them to be more entrepreneurial.

b. Positive impact on the economy: University D has a positive impact on the local and national economy. Having such an impact is significant for the university, as an entrepreneurial institution, because according to one of the interviewees, it would be difficult to demonstrate entrepreneurialism without having a positive impact on the economy. University D has the above-mentioned impact through the below list, which again, is in order of importance:

- (1) Employing more people due to its continuous growth.
- (2) Producing business people.
- (3) Engaging with local businesses.
- (4) Supporting alumni to build their businesses.
- (5) Recruiting a larger number of international students.
- (6) Supporting growth-oriented and innovative SMEs.
- (7) Supporting start-ups and entrepreneurs.
- (8) Establishing spin-outs.
- (9) Supporting local businesses.
- (10) Transforming the way industry and businesses work.
- (11) Finding solutions for economy issues through research.
- (12) Incubations.

The third mission of University D has helped strengthen university's networking, enhance the entrepreneurial alertness of the senior staff, and helped it respond to the external environment changes, promote creativity and obtain novel knowledge. This has facilitated the OpRec process and makes it an effective process.

4.5.4.4 Entrepreneurial staff

University D highly encourages and supports its staff to have a non-traditional outlook and be more entrepreneurial and intrapreneurial. This can be achieved by recruiting the most innovative, forward-thinking and high-calibre staff, and also through transforming the way the existing staff work, whilst also working with them and the alumni to realise their entrepreneurial potential and further provide valuable advice with respect to starting a new business and turning business ideas into reality. The university's staff have the opportunity to attend training courses and programmes that help them develop the entrepreneurial skills required for both being intrapreneurial within the university and to establish their own businesses.

The evidence obtained from the interviewees shows that having entrepreneurial staff can greatly impact the networking, alertness, creativity, systematic search and responds to the external environment changes required for recognizing entrepreneurial opportunities. This, again, emphasizes the importance of considering entrepreneurial universities as one of the best fields for recognizing entrepreneurial opportunities.

Presenting this section has helped clarify the contribution of the secondary data, in order to make the views relating to EntUni factors clearer and supporting a number of them (see Table 4.23).

Table 4.23 Support/triangulation from the secondary data for the results of interviews relating to entrepreneurial university factors in University D

		Website content	Documents
Placing enterprise and innovation in the university strategy	Placing enterprise in the university strategy		*
	Placing innovation in the university strategy	*	*
Supportive environment for entrepreneurship	Supporting entrepreneurship by the Vice-Chancellor	*	
	Encouraging and supporting students to be entrepreneurial	*	*
	Establishing entrepreneurial culture		
	Innovation centres	*	*
	Entrepreneurship centres	*	
	Structures for promoting entrepreneurialism		
The three missions of universities	All faculties should have some of entrepreneurial element		
	Teaching (first mission) and entrepreneurship	*	*
	Impactful research (second mission) and entrepreneurship	*	*
	Third mission		
	Contribution to societal development	*	*
	Greater impact on the economy		
Encouraging and supporting staff to be more entrepreneurial		*	

Source: Author

Presenting this section has also demonstrated that EntUni factors in University D can have a significant impact on the process of entrepreneurial OpRec followed by the senior staff (see Table 4.24).

Table 4.24 The relationship between EntUni factors and entrepreneurial OpRec determinants in University D

		Prior knowledge	Networking	Alertness	Systematic search	Creativity	Environmental changes
Placing enterprise and innovation at the university strategy		*	*			*	*
Supportive environment for entrepreneurship		*	*	*	*	*	*
The three missions of universities	Teaching (first mission) and entrepreneurship		*			*	*
	Impactful research (second mission) and entrepreneurship	*	*			*	
	Contribution to socio-economic development (Third mission)	*	*	*		*	*
Entrepreneurial staff			*	*	*	*	*

Source: Author

4.5.5 Resources characteristics

The resources and capabilities available play a considerable role in facilitating the entrepreneurial OpRec process. These resources and capabilities have a number of characteristics, as follows:

a. Valuable resources: University D's resources and capabilities have contributed significantly to increasing the value of the different services provided by the university, thus enhancing the university's reputation. This has greatly contributed to gaining numerous opportunities, especially those relating to increasing the number of international students and partnerships and collaborations.

Although all resources and capabilities are seen as valuable, human and relational resources are considered the most important resources that create value for the university. One of the interviewees believes that financial resources also contribute substantially to providing value-added services. Therefore, he believes that engaging with research and activities that bring in money is crucial.

b. Rare resources: One of the interviewees believes that there are no unique resources and capabilities at University D. However, the other two interviewees, supported by the website content, advise that their university has unique research collaborations, growth programmes and relationships. Also, their innovation centre has a unique physical infrastructure in terms of its large size and research interests.

c. Imperfectly imitable (or costly to imitate) resources: Few clues were obtained regarding the possibility of imitating the ideas, resources and capabilities of University D by other universities. However, the interviewees' answers show that the university's culture "*is difficult to be copied because it is determined by place and heritage*" D1(DN).

d. Organization: Due to the considerable role played by the university's resources and capabilities in providing high quality services, University D seeks to manage these resources and capabilities efficiently and effectively and takes the following actions:

- (1) Focusing on the strategic priorities and using the university's resources and capabilities in a way that helps in achieving these priorities.
- (2) Establishing strategic partnerships.
- (3) Maximising the utilisation of the university's facilities and making them available to be used by businesses and other organizations.
- (4) Investing intensively in research and innovation.
- (5) Finding an optimal mix of those resources and capabilities.

4.5 Case E

The data collected from University E involves four interviews, sixty-seven university web pages and five documents (strategic plan 2015-2020, annual review 2015, entrepreneurial university of the year, entrepreneurship and innovation institute and financial statements).

a. OpRec determinants
a.1 Networking
a.1.1 Internal networking
a.1.2 External networking
a.1.2.1 Networking with industry
a.1.2.1 Networking with alumni
a.2 Prior knowledge and experience
a.2.1 Experience
a.2.2 Prior knowledge
a.2.2.1 Knowledge about industry
a.2.2.2 Knowledge about how to run a business (Business knowledge)
a.2.2.3 Knowledge about students
a.3 Entrepreneurial alertness
a.3.1 Distinguishing between value creation opportunities and non-value creation opportunities
a.3.2 Finding connections between unrelated information/areas
a.3.3 open-mindedness
a.4 Creativity
a.4.1 Continuously thinking of new ideas
a.4.2 Being different
a.4.3 Feelings and emotions
a.4.4 Teamwork
a.4.5 Continuous support for creativity
a.5 Systematic search vs serendipitous discovery
a.5.1 Systematic search
a.5.1.1 Continuously search for opportunities
a.5.1.2 Market research
a.5.2 Serendipitous discovery
a.6 External environment changes
a.6.1 Responding to external environment factors
a.6.1.1 Competition
a.6.1.2 Political factors
a.6.1.3 Societal factors
a.6.1.4 Technological advances
a.6.2 Being fast
a.6.3 Meeting stakeholders' needs
a.6.4 Creating needs for people
b. EntUni Criteria
b.1 Supportive environment for entrepreneurship
b.2.1 Encouraging and supporting students to be entrepreneurial
b.2.2 Establishing entrepreneurial culture
b.2.3 Entrepreneurship, enterprise and innovation centres
b.2.4 Supporting entrepreneurship by the Chancellor and Vice-Chancellor
b.2.5 Inspiring talks and workshops about entrepreneurship
b.2 Placing entrepreneurship, enterprise and innovation in the university strategy
b.3 The three missions of universities
b.3.1 Teaching (first mission) and entrepreneurship
b.3.1.1 Teaching with entrepreneurship flavour
b.3.1.2 Teaching with innovative flavour
b.3.2 Impactful research (second mission) and entrepreneurship
b.3.3 Contribution to socio-economic development (Third mission)
b.3.3.1 Contribution to societal development
b.3.3.2 Robust contribution to the economy
b.4 Entrepreneurial staff
b.4.1 Current entrepreneurial staff
b.4.3 The need for more entrepreneurial staff

Figure 4.5 Final version template for University E

Source: Author

4.4.1 Defining entrepreneurial opportunity recognition in University E

The senior staff have been highly encouraged and supported to become more entrepreneurial. This has resulted in recognizing a number of entrepreneurial opportunities by those staff and making that part of their job.

Table 4.25 The main focus of the definitions provided by the interviewees for the entrepreneurial OpRec phenomenon in University E

	Commercial intent	Ethical considerations	Engagement with business	Partnership with industry	Value creation	Spotting a gap in marketplace	Identifying a problem	Opportunities for enterprise
D1(DN)	*	*	*					
D2(DN)	*			*	*			
D3(DR)					*	*	*	
D4(DN)								*

Source: Author

Table 4.25 shows that there is no consensus regarding the definition of entrepreneurial OpRec. They have provided eight features for the definition of this concept; there is agreement on only two of these features: commercial intent and value creation. Therefore, entrepreneurial OpRec can be viewed as a process of perceiving commercial and value-added opportunities.

4.4.2 Entrepreneurial opportunity recognition determinants in University E

4.4.2.1 Networking

Networking is considered a crucial factor for recognizing entrepreneurial opportunities. Therefore, the senior staff are highly encouraged to expand their networks both locally and nationally, and also internationally. This has resulted in the university being part of a number of professional networks.

You certainly need to be part of professional networks; you need to network with professional bodies, you need to be networked with organizations that understand the market. E1(DN)

Analysing the interviews shows that the more networking the university has, the more entrepreneurial opportunities it will recognize. One of the interviewees pointed out that networking is like a spider's web that increases rapidly in size, intensity and/or importance.

There's a snowballing effect, I suspect. You may plug yourself into a particular network and that network also has networks that snowball out from that network, so largely, a snowballing effect could happen by joining one network and expressing an interest in another network, then that's a whole snowball effect of potential networks, because each individual and each network will have their own reticulated network. So, it's like a spider's web, it just gets bigger and bigger. E4(DN)

A number of opportunities have been recognized as a result of strong networking, such as commercial research partnerships, KTPs, spin-outs, creating new business, coaching and mentoring opportunities, funding opportunities, transnational education TNE income and increasing the number of international students. Two main types of networking are practiced by University E:

a. Internal networking: Two interviewees believe that internal networking facilitates the process of entrepreneurial OpRec. Such networking takes place between the university's schools, and also between these schools and the enterprise centre. The importance of internal networking is also shown in the document secondary data, which demonstrates that the university holds internal colloquiums in order to foster internal networking.

b. External networking: External networking plays an explicit significant role in recognizing entrepreneurial opportunities. Such networking takes three forms in this university, which are as follows:

(1) Networking with industry: University E pays huge attention to networking with industry. Therefore, senior people at the university are encouraged to network with different sized companies, entrepreneurs and start-up experts, and also social entrepreneurship organisations. This has helped the university to recognize different types of opportunities, which have contributed to maximising the university's financial returns on investment. In addition, networking with entrepreneurs can help with increasing the knowledge and understanding required to deal with different possibilities available in the external environment.

(2) Networking with alumni: Two interviewees believe that maintaining networks with alumni can help with recognizing more entrepreneurial opportunities, because those alumni, according to these interviewees and the document secondary data, are a source of inspiration; some of them are working in the industry or starting their own businesses.

Communications are considered the most important capability required for enhancing networking. Furthermore, University E has employed six resources to enhance the networking required for recognizing entrepreneurial opportunities: relationships, reputation, location, social media, enterprise centres and collaborations and partnerships.

With regards to collaborations and partnerships, they are not just seen as resources, but also as entrepreneurial opportunities, as well as determinants of and for entrepreneurial OpRec. Therefore, there has been much attention to developing strategic and value-added collaborations and partnerships on regional, national and international levels. These help in finding creative solutions, creating new businesses and gaining novel knowledge. Also, they help with making the university more entrepreneurial.

The first thing we do as deans is establishing a complete list of documents of partnerships, and we maintain that and we ask colleagues to constantly update it. E2(DN)

In addition to the above resources, one of the interviewees believes that networking events and conferences, as external resources, can contribute highly to boosting networking and thus be aware of different types of possibilities.

4.4.2.2 Prior knowledge and experience

4.4.2.2.1 Experience

The interviewees believe that people with experience, especially around commercial and industry, are very likely to recognize entrepreneurial opportunities, because they understand how to manage the processes. However, one of the interviewees believes that some people with the above-mentioned experiences come to the university to focus on academic research and teaching, rather than conducting commercial activities. Thus, such experiences cannot be employed towards recognizing entrepreneurial opportunities.

They might come from a commercial background, but the reason they are coming to university is because they want to get away from it. Because as soon as they arrive, the university says 'oh you've got commercial background, can you do this for us?' And they don't want to. E1(DN)

4.4.2.2.2 Prior knowledge

The prior knowledge of the senior staff is viewed as one of the fundamental factors for recognizing entrepreneurial opportunities, because it provides an adequate understanding of how to deal with different types of opportunities, entities and organizations. Three main types of knowledge have contributed to recognizing entrepreneurial opportunities:

a. Knowledge about industry: Having good knowledge about industry and the issues facing it can greatly contribute to recognizing entrepreneurial opportunities. Such knowledge, according to the interviews, has gained considerable attention from the university. It provides lots of resources to establish and strengthen networking with the industry. Doing so makes businesses and organisations come to the university and ask for solutions for the different types of issues facing them. This, in return, opens many doors for the university to recognize more entrepreneurial opportunities, in addition to problem solving.

You need to have knowledge of industry, different industries, how many different industries there are: biotechnology, technology, electronic, information technology, etc., in addition to knowledge of what those industries actually do, and the possibilities of how those industries can view your initial endeavour. E4(DN)

b. Business Knowledge: To recognize entrepreneurial opportunities, senior staff need to have sound knowledge of businesses as well as some understanding about the commercial side of things.

You need to have business knowledge - what does business actually mean? And how does business operate? You need to have commercial knowledge. E4(DN)

c. Knowledge about students: Having knowledge about the needs and expectations of students is considered an additional factor that helps with recognizing entrepreneurial opportunities. This requires learning from other universities and also from previous experiences.

The prior knowledge and experience of the senior staff has greatly contributed to recognizing KTPs, commercial consultancy, coaching and mentoring, problem solving and collaboration opportunities. To keep recognizing such opportunities, University E provides a number of resources and capabilities required to enhance the experience and knowledge of its senior staff. Learning is seen as the main capability required for obtaining knowledge and experience. University E learns from other universities and also from businesses and organizations that it is collaborating with. On the other hand, expertise, experts, commercial managers and organizational knowledge are seen as the main resources required for enhancing the above-mentioned types of knowledge.

4.4.2.3 Entrepreneurial alertness

Being entrepreneurially alert has helped increase both the number and quality of entrepreneurial opportunities recognized by the university. The most important of these opportunities is the KTPs. Two main aspects of entrepreneurial alertness can be observed at University E:

a. Finding connections between unrelated information/areas: Finding connections between unconnected areas or pieces of information can highly enhance the ability of senior staff to be entrepreneurially alert to different types of opportunities. University E can be one of the best contexts for such a finding, due to it having a wide range of subject areas as well as it producing a huge amount of knowledge.

b. Open-mindedness: One of the characteristics that help senior staff at University E to be entrepreneurially alert is being open-minded and "willing to explore anything, rather than being dismissive at the outset" E3(DR). Being this way helps with recognizing a large number of entrepreneurial opportunities and thus allows them to choose the most suitable opportunities for the university.

Awareness is the main capability that senior staff possess and use to recognize different types entrepreneurial opportunities. Such a capability has, in some cases, led them to opportunities that they were not looking for. The awareness capability is enhanced by information, which is seen by the interviewees as the main resource required for being entrepreneurial alert. The main sources for senior staff to obtain information searching for opportunities are social media, digests, newsletters, conferences and partnerships and collaborations.

4.4.2.4 Creativity

Creativity greatly impact many aspects of the university, including OpRec. It helps with employing the available resources in a more effective way, and also in seeing possibilities as well as solutions for different types of issues. Problem solving, innovation and creating new products/services are the opportunities that have been recognized as a result of having high levels of creativity in this university.

Creativity is important in the sense that you've got to look at how you can use your resources to meet a particular need. E1(DN)

Four main aspects that feed into creativity are required for entrepreneurial OpRec:

- a. Continuously thinking of new ideas: Analysing the interviews and website content shows that generating new ideas and thinking of new ways of doing things are ongoing processes. In fact, the university's culture encourages and supports novel and innovative thinking.
- b. Being different: Being different is seen by all interviewees, supported by the document secondary data, as a most essential part of their university's mission. This helps them to be more entrepreneurial and creative, and thus recognize more entrepreneurial opportunities. One of the interviewees pointed out that when they appoint new staff, they look for who has the spark of trying things differently.
- c. Feelings and emotions: The level of creativity and the ways of looking at things, according to two interviewees, is impacted by the feelings and emotions that individuals are experiencing while doing their activities. Therefore, one of the interviewees believes that they, as senior staff, need to manage and find a balance regarding those feelings and emotions and to ensure that their personal circumstances will not hamper their ability to be creative.
- d. Teamwork: Being creative requires working as team. therefore, the university combines people with different talents, skills and backgrounds together into interdisciplinary teams, who can substantially contribute to recognizing entrepreneurial opportunities through finding creative solutions and do things in a different way.

Creativity itself is seen as a capability. To enhance this capability, entrepreneurial opportunity recognizers need to use their innovative thinking capability, and also need to be surrounded by creative individuals (around and in the university), who are seen as the main resource for increasing levels of creativity.

You need to have people who think out of the box and look at all options. If you look at, you know, creative brainstorming techniques and you look at quite divergent approaches first, then the coverage of a lot of thinking tends to be quite narrow and convergent. E3(DR)

One of the interviewees pointed out that the importance of creative individuals lies in having the chance to check their ideas with these same individuals and learn how to look at things differently. Also, in some cases, it requires putting their ideas into practice, especially the

ideas of those who are creative, but not entrepreneurial.

4.4.2.5 Systematic search vs serendipitous discovery

Although all interviewees believe that opportunities should be actively searched for, two interviewees believe that opportunities, in some times, can be discovered accidentally. However, no one believes that opportunities are only serendipitously discovered. Therefore, there is encouragement and support for continuously looking for opportunities. In fact, such a search is considered an ongoing process. In this regard, market research, which according to document secondary data is practised in this university, is seen as one of the main means used to actively search for entrepreneurial opportunities. Partnerships and collaborations are the opportunities that University E discovers serendipitously, whilst also continuously searching for them.

So, we are always looking for opportunities where we can help deal with a particular challenge, problem, or issue that is faced by either a company or members of the community. E3(DR)

I tend to systematically search for opportunities around particular projects that I may have in mind. So, I have an idea, I have a project, and then I seek advice on opportunities to realize (or otherwise) the project, and sometimes I stumble across an opportunity serendipitously. E4(DN)

I try to find the market research to see what possibilities there would be as well as any potential pitfalls. I use market research a great deal in my work. E4(DN)

Researching is seen as the essential capability required for searching for opportunities. Time and enterprise centres are considered the main resources for such a search. On the other hand, conferences and networking events are seen as the main resources that can help with discovering opportunities serendipitously, while awareness is the main capability that can help with such a discovery.

4.4.2.6 External environment changes

The continuous and dramatic changes in the external environment have greatly impacted the OpRec process. Therefore, such changes are seen as one of the major determiners of the above-mentioned process. Obtaining grants and partnerships are seen as the main opportunities that can be recognized by responding to changes in external environment.

University E has always been very well connected to the outside environment. This helps it to effectively deal with the changes happening in this environment. Such a connection is seen in the following actions and aspects:

a. Responding to external environment factors: University E has recognized many opportunities by responding to changes in the external environment factors, which have

impacted many aspects of the university. four of these, however, have had an impact on the process of OpRec itself.

(1) Competition: Competition is considered one of the factors that has had a profound impact on the OpRec process. In fact, the high level of competition between universities pushes University E to become more entrepreneurial and look for more entrepreneurial opportunities, especially, according to the document secondary data, those related to teaching and gaining more students.

It is a bit more difficult, because everyone is striving to get as many students as possible, but we, from an enterprising point of view, will certainly be encouraged to do a lot more collaborations. E3(DR)

(2) Political factors: Political factors have greatly impacted University E's activities and processes, including the entrepreneurial OpRec process. The potential impact of Brexit is seen as the main aspect of the political factors that has a potential impact on the OpRec process. Such an impact is seen by one of the interviewees as an ambiguous factor, which may bring both opportunities and threats. However, the other interviewees see such an impact as a negative factor that can, at least in the short term, decrease the number of European students and staff at UK universities as well as the funding that can be obtained from European Union. Moreover, collaboration with European universities in terms of research or enterprise activities will probably be more difficult. This is supported by the website content, which shows that although the outcomes of Brexit are currently unknown, it is expected that it will negatively impact the number of students and the recruitment of staff from European Union countries. Also, it is likely to have a negative impact on investment performance, research opportunities and research funding relating to those countries.

It (Brexit) impacts so many different areas. So, you have things like horizon 2020, which is a massive funder of UK research. You have European structural investment plans and a large number of business support programs running out of universities. You have things like plasmas that provides molecule IOC's and student exchange possibilities. You have European students that come to universities, and they don't know how they will be treated. You have academics from all across Europe in the UK or collaborating with UK universities on research or enterprise activities. E3(DR)

To deal with the above negative potential impact, University E follows the below strategies and tactics:

- Thinking creatively to find other different alternative income sources.
- Finding more national and international support agencies.
- Hosting evidence-gathering sessions to find out more about the potential impact of Brexit on higher education institutions.
- Reassuring the EU and international students and staff that the university will continue to be a welcoming and diverse international community.

(3) Societal factors: Due to population growth and the increased demand for studying in UK universities, including University E, the OpRec process has been greatly impacted by societal factors. These include the different cultures, perspectives and backgrounds of those who are involved in this process.

(4) Technological advances: University E pays huge attention to technological advances. Therefore, many aspects of the university, including the OpRec process, are impacted by the changes in the external environment and technological factors. In fact, keeping pace with technological developments can help universities be proactive and gain many entrepreneurial opportunities.

Technology seems to be changing quite rapidly and this changing dynamic throws up more opportunities and more possibilities that you perhaps had not thought could be a possibility. E4(DN)

b. Being fast: Despite the fact that the interviewees believe in the importance of responding quickly to the external environment changes, two of them believe that their university does not respond very quickly to those changes, because it is difficult for the universities to do this due to their size and limited capacity. This is in contrast with the document secondary data, which shows that the university responds quickly to changes in the external environment. Regardless, being fast requires flexibility, which is considered, by one of the interviewees, as a difficult thing to follow.

c. Meeting stakeholders' needs and/or creating needs for people: Understanding and responding to the needs and wants of students, businesses and society is seen as an essential activity for recognizing entrepreneurial opportunities. This, certainly, implies that the university needs to be well-connected and able to identify the issues facing them. So, the university needs to adapt its activities to meet those needs and wants. In this regard, it is worth mentioning that because of the university's mission, the ethical element needs be considered when responding to the above-mentioned needs and wants. Therefore, University E, according to the document secondary data, responds only to those needs that contribute to the development of societies.

If our prime motive is just increasing profits, what we are actually doing is setting up online gambling websites. That's not a joke, we've got people who design websites in university, we've got mathematicians, we've got statisticians and we've got people who can put the maths behind gambling websites. I don't think you can imagine that you will lose money on the gambling website. So, do you get my point? We can set up lots of gambling websites and we can generate lots of income; I don't think it is the sort of business we should really be in. If you want to take this to the extreme, we can probably set up a pornography website, you see my point? It would be a commercial venture and would probably be very profitable. So, I am saying, it is not just about doing something commercial and not just about making money. The reason we don't do these things is because we are meeting a need; if business schools suggested to engage in commercial activity or entrepreneurial activity, my first question is always, where is the need? Because quite often, academics have ideas and they think 'oh this is a good idea, let's do this, let's offer this', but sometimes they are

not very good in terms of researching the need. So, academics can be very supplier focused, so they cosplay what can they offer, but none of this can make sense unless they identify a real market need for something.
E1(DN)

Although meeting people's needs is crucial, one of the interviewees believes that the university, in some cases, has tried to create needs for people in order to create more entrepreneurial opportunities for the university.

Responsiveness is seen as the main capability required to deal with changes in the external environment. Such responsiveness needs to be strategic and effective and deal with real world challenges. In fact, the way that the university responds to changes and needs in the external environment helps with creating value, and thus, gain and sustain a competitive advantage. The above-mentioned responsiveness is enhanced by a number of resources, such as financial resources, cutting edge technology and time.

Having presented this section, it can be said that secondary data has helped provide more detail about OpRec determinants and supports many views gained from analysing the primary data (see Table 4.26).

Table 4.26 Support/triangulation from the secondary data for the results of interviews relating to OpRec determinants in University E

			Website content	Documents
Networking	Internal networking			*
	External networking	Networking with industry	*	*
		Networking with alumni		*
Prior knowledge and experience	Experience			*
	Prior knowledge	Knowledge about industry		
		Knowledge about students		*
Entrepreneurial alertness	Finding connection between unrelated information/areas			
	Distinguishing between profitable opportunities and non-profitable opportunities.			
	Open-mindedness			
Creativity	Continue thinking of new ideas		*	
	Being different			*
	Feelings and emotions			
	Teamwork			*
Systematic search vs serendipitous discovery	Systematic search	Market research		*
	Serendipitous discovery			
External environment changes	Responding to external environment factors	Competition		*
		Political factors		*
		Technological advances	*	*
		Societal factors		
	Being fast			*
	Meeting stakeholders' needs			*

Source: Author

4.4.2.7 The relationship between entrepreneurial opportunity recognition determinants in University E

Analysis the interviews shows that some of the entrepreneurial OpRec determinants interact with each other. These determinants are listed below.

- (1) Networking and knowledge and experience: Senior staff employ their networks to gain valuable knowledge and experience, especially those relating to commercial activities. This has greatly contributed to recognizing entrepreneurial opportunities.
- (2) Networking and serendipitous discovery: Networking, especially with industry, has been one of the main sources for serendipitously recognizing opportunities.
- (3) Experience and entrepreneurial alertness: Experience significantly helps with being more alert to different types of possibilities and opportunities.

Table 4.27 A summary of entrepreneurial OpRec determinants in University E

Determinants	Sources/aspects	Resources	Capabilities	Type of entrepreneurial opportunity
Networking	<ul style="list-style-type: none"> - Internal networking - External networking <ul style="list-style-type: none"> • Networking with industry • Networking with alumni 	<ul style="list-style-type: none"> - Relationships - Reputation - Location - Social media - Enterprise centres - Collaborations and partnerships - Conferences - Networking events 	Communication	<ul style="list-style-type: none"> - Commercial research partnerships - Knowledge transfer partnerships - Spin-outs - Create new business - Coaching and mentoring opportunities - Transnational education (TNE) income - Increase the number of international students
Prior knowledge and experience	<ul style="list-style-type: none"> - Experience - Prior knowledge: <ul style="list-style-type: none"> • Knowledge about industry • Knowledge about students 	<ul style="list-style-type: none"> - expertise - experts - commercial manager - organizational knowledge 	Learning	<ul style="list-style-type: none"> - Knowledge Transfer Partnerships - Commercial consultancy - Coaching and mentoring - Collaboration opportunities
Entrepreneurial alertness	<ul style="list-style-type: none"> - Finding connection between unrelated information/areas - Distinguishing between profitable opportunities and non-profitable opportunities. - Open-mindedness 	Information	Awareness	KTPs
Creativity	<ul style="list-style-type: none"> - Continue thinking of new ideas - Being different - Feelings and emotions - Teamwork 	Creative individuals	innovative thinking	<ul style="list-style-type: none"> - Problem solving opportunities - Innovation - Creating new product/services
Systematic search vs serendipitous discovery	<ul style="list-style-type: none"> - Systematic search <ul style="list-style-type: none"> • Market research 	<ul style="list-style-type: none"> - Time - enterprise centre 	Researching as a capability	<ul style="list-style-type: none"> - Partnerships and collaborations - Commercial research opportunity
	Serendipitous discovery	<ul style="list-style-type: none"> - Conferences - Networking events 	Awareness	Partnerships and collaborations
External environment changes	<ul style="list-style-type: none"> - Responding to external environment factors <ul style="list-style-type: none"> • Competition • Political factors • Technological advances • Societal factors - Being fast - Meeting stakeholders' needs and/or creating needs for people 	<ul style="list-style-type: none"> - Financial resources - Cutting edge technology - Time 	Responsiveness	<ul style="list-style-type: none"> - Gaining grants - Partnerships and collaborations

Source: Author

4.4.3 How the respondents defined the entrepreneurial university (University E)

Entrepreneurial efforts and endeavours made by University E have been appreciated by the NCEE, who chose this university as one of the winners of the THE EntUni of the Year award. Winning such an award has had a significant impact on the university's reputation, and thus it has gained a number of opportunities wherein it has become more engaged with industry and has gained more funding from different parties. It also attracts more students, especially international ones.

Table 4.28 The main focus of the definitions provided by the interviewees for the EntUni phenomenon in University E

	Business oriented	Open and receptive to local business community	Innovative	Lead innovation	Value creation	Enterprise and entrepreneurship are one of the priorities	Develop the cultural enterprise within institution	Develop the cultural enterprise within institution community	Develop the cultural enterprise within partners	Pioneering	Distinctive in enterprise
D1(DN)	*	*									
D2(DN)	*		*	*	*						
D3(DR)	*	*			*	*	*	*	*		
D4(DN)	*		*			*	*			*	*

Source: Author

Table 4.28 shows that there is no universal agreement on the EntUni concept. Eleven features have been identified by the four interviewees to describe this concept. Despite having such a large number of features, all interviewees agree that entrepreneurial universities are business-oriented institutions. There is also fairly good agreement that these universities are innovative, open and receptive to local business community and that they create values and consider enterprise and entrepreneurship as a strategic priority. Thus, an EntUni can be viewed as a business oriented and innovative university, which creates value through engaging with the business community and considering enterprise and entrepreneurship as one of its strategic priorities.

4.4.4 Entrepreneurial university factors

4.4.4.1 Supportive environment for entrepreneurship

University E has made huge efforts to provide a supportive environment for entrepreneurship. Such an environment has significantly impacted the six entrepreneurial OpRec. One of the interviewees claims that creating such an environment is the most important factor for being EntUni; without this environment, universities will fail to be entrepreneurial.

If you don't have an environment that supports it, it is not going to happen, because these things don't happen unless people believe you need it. They will listen to what you say, but they also watch what you do, and you have to be consistent. E1(DN)

A number activities and means are used by the university to create such an environment:

a. Encouraging and supporting students to be entrepreneurial: The interviewees believe, supported by the secondary data, that students from different disciplines are substantially encouraged and supported to be more entrepreneurial and engage in enterprising activity. This view is highly supported by the university's website content, which contains much information regarding how the university practices the above-mentioned encouragement and support. In fact, according to the website content, the number of students engaged in enterprising activity was one of the main reasons behind winning the THE EntUni of the Year award.

A number initiatives and activities are employed to ensure that the students have the opportunity to be more entrepreneurial and experience enterprise:

- (1) Organising workshops, events and start-up schemes that help students in developing enterprise skills.
- (2) Embedding entrepreneurship and enterprise into the curricula.
- (3) Organizing challenges and competitions by which students can test their enterprising ideas and skills and have the opportunity to gain funding and support to put their ideas into practice.
- (4) Providing advice and guidance regarding student start-ups.
- (5) Nurturing the networks of student entrepreneurs.
- (6) Connecting students' growing businesses to pertinent expertise and entrepreneurs.
- (7) Fostering student businesses and business ideas as well as social enterprise ideas.

The above initiatives and activities have helped the university to be recognized, at a national level, for student enterprise and start-ups. This has motivated a large number of employers to choose University E to educate their staff through 'employer-sponsored courses'.

b. Establishing an entrepreneurial culture: One of the essential parts of creating the above-mentioned environment is establishing and supporting an entrepreneurial culture, not only within the university, but also within the community they are based in, as well as with their partners. Such a culture is enhanced by embracing the entrepreneurial spirit and their high levels of empowerment and freedom. In fact, the enterprise and innovation centre has played a great role in promoting the above-mentioned culture.

c. Enterprise centres: The enterprise centre has played a substantial role in spreading entrepreneurialism within the university. The effective internal networks between the director of enterprise centre and the deans of the schools have contributed highly to practicing this role.

d. Supporting entrepreneurship by the Chancellor and Vice-Chancellor: The Chancellor, who is an entrepreneur, and the Vice-Chancellor, are very supportive of entrepreneurship. The Vice-Chancellor has encouraged and supported the idea of including entrepreneurship,

enterprise and innovation within their corporate strategy and has offered adequate resources to support such an idea.

The office of Vice-Chancellor sets the tone, sets the strategy with everyone, and role models set the culture (to a large extent), and follows that through with appropriate investment, enabling entrepreneurship to occur by investing at different levels of the university. E4(DN)

e. Inspiring talks and workshops about entrepreneurship: Students, graduates and staff have had the opportunity to hear from successful entrepreneurs from all over the UK. They also have had the opportunity to develop and grow workshops, seminars and training that helps with developing their entrepreneurial mindset and enterprising and networking skills.

4.4.4.2 Placing enterprise, entrepreneurship and innovation in the university strategy

The interviewees believe that the strategy of their university pays great attention to enterprise, entrepreneurship and innovation, which impacts different activities of the university, including teaching and research. This can be clearly seen in the university's mission. Such consideration has helped the university make enterprise experienced by most of the university's members. It has also helped the university to become known for doing outstanding enterprise locally, nationally and internationally. This, in return, has helped in growing and diversifying their income streams, including traditional and non-traditional enterprise income, such as consultancy, CPD training, commercialisation of IP (including spin-outs) and KTPs.

Enterprise, entrepreneurship and innovation are core of what we do as our business and it underpins our teaching, our learning and our research activities. E3(DR)

It means we don't regard enterprise and entrepreneurship as something extra that we have to do in addition to everything else. We very much brought it into the mainstream, and as the dean of the business school, I am putting enterprise and entrepreneurship right at the heart of our programmes. E1(DN)

For the university to be successful with enterprise and entrepreneurship, it has to come from very top; it has to be a very clear mission and vision from the top. It needs visible leadership and investment and it needs consistency. E1(DN)

For me, it is about a university that is distinctive in enterprise in that it's a key part of its instincts. It's about a systematic way of exploiting enterprise. It invests in enterprise, a system for enterprise. It makes enterprise a key part of its strategic objectives. You can feel the enterprise when you're in there, in the place. You can see evidence, visible evidence, of the enterprise. It seems to breathe it. It's something that you ensure when you're around, you see the visible presence of other people doing it routinely. It's instinctive. E4(DN)

One of the interviewees believes that the enterprise strategy drives the organizational strategy of University E, which helps with utilizing the resources and capabilities available in the university in a more effective way. This greatly contributes to gaining and sustaining a competitive advantage in various areas, as well as with being more entrepreneurial when searching for opportunities.

Embedding enterprise, entrepreneurship and innovation into University E's strategy has helped promote creativity, strengthen networking, support the activities of searching for opportunities, helped it effectively respond to external environment changes and gain novel knowledge. Therefore, it can be claimed that in University E, there is an extra source for networking, creativity, systematic search and knowledge required for recognizing entrepreneurial opportunities and also in responding to the external environment changes. This aforementioned source is considering enterprise, entrepreneurship and innovation when searching for such opportunities.

4.4.4.3 The three missions of universities

4.4.4.3.1 Teaching (first mission) and entrepreneurship

As a result of entrepreneurial endeavours, different aspects of entrepreneurship are seen in the teaching methods of some academics, as well as the courses of various subject areas. This, in return, results in delivering high quality, outstanding and innovative teaching. In fact, two forms of teaching can be seen in University E as far as entrepreneurialism is concerned, which are explained below.

You can look at how much of their curriculum is entrepreneurial: what are they teaching? And are they teaching it entrepreneurially? E3(DR)

a. Teaching with an entrepreneurship flavour: There is a strong emphasis on embedding entrepreneurialism within the curricula of the various modules being delivered. This has motivated academics to be more entrepreneurial in their teaching methods, and thus, according to the document secondary data, provide an environment for students to be entrepreneurial. The above initiatives are considered one of the factors that have contributed to establishing a strong student enterprise.

In its extreme form, one of the interviews pointed out that if academics are entrepreneurial, hold spin-off companies, have patents/licence and/or are actively engaged with industry as a part of their teaching strategy, then they will be more likely to deliver effective entrepreneurial teaching.

b. Teaching with an innovative flavour: There is also great encouragement for following innovative approaches in teaching. This includes both developing innovative curricula and delivering lectures, seminars and workshops in an innovative way.

Teaching and education in University E have contributed markedly towards strengthening the university's networking, especially with industry and towards enhancing creativity in the university.

4.4.4.3.2 Impactful research (second mission) and entrepreneurship

Research has gained huge attention from University E, which seeks to attract active researchers with publications, and provides high quality facilities for research activity. In fact, the university aims at maximising its research impact, both nationally and internationally. To achieve this goal, the university has followed a number of actions and tactics, which are listed below in order of importance:

- (1) Embedding entrepreneurship into its research.
- (2) Addressing the main issues facing society and businesses in an innovative way.
- (3) Enhancing the quality and volume of impactful case studies.
- (4) Developing the research capabilities of the current staff.
- (5) Attracting staff who are active, experienced and skilful in both conducting and applying research.
- (6) Establishing an environment and culture that helps with developing active researchers, as well as demonstrating research impact in preparation for REF 2020.
- (7) Providing opportunities for the staff to engage with businesses, possibly through applied research.
- (8) Developing applied research in partnership with different types of external organisations.
- (9) Connecting postgraduate and early career researchers with funders and external organisations.

The above actions and tactics have helped the university to produce high impact and quality research, which, in return, contributes to the growth and diversification of the university's income streams. The above has also helped the university to become internationally recognized for its research, especially its engineering research, which has a high rank in the UK context. In fact, research in University E achieved outstanding results in REF 2014, which considered it as world leading and internationally excellent.

Research conducted by University E's staff has significantly contributed to promoting creativity, strengthening the university's networking, especially with industry and gaining the most recent knowledge.

4.4.4.3.3 Contribution to socio-economic development

a. Contribution to societal development: University E pays much attention to the development of and spread of entrepreneurialism within societies. Such attention has contributed to transforming these societies and establishing better communities. In fact, one of the main reasons for winning the THE EntUni of the Year award was its considerable contribution

towards the development of society. Such a contribution has been delivered through the following actions and tactics (the below is listed in order of importance):

- (1) Building and strengthening relationships between the university and the local community.
- (2) Developing students' skills required for being successful and making a positive contribution to society.
- (3) Having social enterprises.
- (4) Establishing partnerships with entrepreneurial organisations to tackle issues facing society.
- (5) Conducting impact case studies relating to issues facing society.
- (6) Establishing an entrepreneurial culture within the community.
- (7) Producing high quality graduates.
- (8) Strengthening networking with alumni.
- (9) Influencing the work of other universities through motivating them to be more entrepreneurial.

Universities have an obligation to look at their local place, and investigate how they can support their local place. They're often very significant employers. E3(DR)

We are trying to make sure that our research and enterprise activities are aligned with the needs of society. E3(DR)

b. Robust contribution to the economy: University E aims at delivering outstanding economic benefits to the region in which it operates, and therefore to the UK economy as a whole. This contribution can be seen in the below list, which is taken in order of importance:

- (1) Linking research and teaching to the real-world through commercialisation.
- (2) Supporting a large number of local businesses, which, in return, inject a large amount of money into the local economy and create a good number of new jobs.
- (3) Developing and fostering SMEs and start-ups and finding solutions for the different types of challenges facing them.
- (4) Commercialising intellectual property, including spin-out businesses.
- (5) Producing entrepreneurs and job creator graduates.
- (6) Employing a large number of individuals.
- (7) Obtaining larger number of international students.
- (8) Business incubations.
- (9) Industrial partnerships.

I'll put it as a challenge to colleagues, and that is, if the university or the business school would disappear, would the local economy and local community and local businesses miss us? If the answer is no, then we are not particularly engaged and we are not very useful. So, my ambition is that the answer to that question has to be yes, because we add value, and

we're useful, and we're engaged. They regard us as a vital resource that is an important part of entrepreneurial universities. E1(DN)

So, for example we've run up an investment escalator project, which is designed to help local businesses access finance. So, they can grow the business, and at the end we had over 500 different business working with us, and we were supporting them. So, I guess it is about developing a reputation for understanding these business; it is also about developing a space where you can work close to businesses. E1(DN)

Although the interviewees believe that it is expected that all UK universities should have an impact on the economy, the impact of entrepreneurial universities is greater and is accompanied by robust evidence.

... the difference is that when they (entrepreneurial universities) choose to make it visible, they have robust evidence of doing so, and they can directly link the evidence to things that they're doing as an institution. E1(DN)

The third mission of the university has helped with enhancing its entrepreneurial alertness, responding effectively to the changes in the external environment, strengthening its external networking and gaining novel knowledge. Therefore, it can be claimed that the willingness to deliver the above-mentioned mission has facilitated the entrepreneurial OpRec process and kept it ongoing.

4.4.4.4 Entrepreneurial staff

Analysing the data shows that one of the clear indicators of being an EntUni is to view entrepreneurial individuals in such a university. One of the interviewees believes that the level of entrepreneurialism that the staff have was the main reason for winning the THE EntUni of the Year award. Therefore, the university continues to promote entrepreneurialism among its staff.

a. Current entrepreneurial staff: University E has made remarkable efforts to inspire, encourage and support its staff to be more entrepreneurial. These efforts include, but are not limited to, the following:

- (1) Providing high quality resources that facilitate being entrepreneurial.
- (2) Involving these staff in commercial activity.
- (3) Providing staff with opportunity to engage with SMEs and start-up communities.
- (4) Connecting them with funders and external organisations.

As a result of the above efforts, a good number of staff, who have enterprising skills, realize the importance of being engaged with industry and are involved in spin-outs, looking for opportunities and understanding the commercial side of things.

b. The need for more entrepreneurial staff: University E does is not satisfied with the entrepreneurial staff it has, it also continuously seeks to attract and recruit more

entrepreneurial staff. However, one of the interviewees believes that it is rare to recruit such staff. This is because most universities recruit academic staff because of their research and teaching experience, then they hope that their research has some commercial application. Another interviewee believes that *“it takes time to replace staff and recruit new staff who have a more entrepreneurial focus, that is just something that happens over time”*. E1(DN)

Having entrepreneurial staff has significantly impacted the six entrepreneurial OpRec determinants. This, again, ensures that entrepreneurial universities are one of the best fields for recognizing entrepreneurial opportunities.

Presenting this section has helped with showing the contribution of the secondary data to making the views relating to EntUni factors clearer and supporting a number of them (see Table 29).

Table 4.29 Support/triangulation from the secondary data for the results of interviews relating to entrepreneurial university factors in University E

			Website content	Documents
Placing enterprise and innovation in the university strategy	Placing enterprise in the university strategy			*
	Placing entrepreneurship in the university strategy			*
	Placing innovation in the university strategy			*
Supportive environment for entrepreneurship	Supporting entrepreneurship by the Chancellor and Vice-Chancellor		*	
	Encouraging and supporting students to be entrepreneurial		*	*
	Establishing entrepreneurial culture		*	*
	Enterprise centres		*	*
The three missions of universities	Teaching (first mission) and entrepreneurship	Teaching with an entrepreneurship flavour		*
		Teaching with an innovative flavour		
	Impactful research (second mission) and entrepreneurship		*	*
	Third mission	Contribution to societal development	*	*
		Greater impact on the economy		*
Entrepreneurial staff	Current entrepreneurial staff			
	The need for more entrepreneurial staff		*	*

Source: Author

Presenting this section also demonstrates that that EntUni factors can clearly contribute to developing the process of entrepreneurial OpRec followed by the staff responsible for such a process (see Table 4.29).

Table 4.30 The relationship between EntUni factors and entrepreneurial OpRec determinants in University E

		Prior knowledge	Networking	Entrepreneurial alertness	Systematic search	Creativity	Environmental changes
Placing enterprise and innovation in the university strategy		*	*		*	*	*
Supportive environment for entrepreneurship		*	*	*	*	*	*
The three missions of universities	Teaching (first mission) and entrepreneurship		*			*	
	Impactful research (second mission) and entrepreneurship	*	*			*	
	Contribution to socio-economic development (Third mission)	*	*	*			*
Entrepreneurial staff		*	*		*	*	*

Source: Author

4.4.5 Resources characteristics

Discussing the previous sections in this case has demonstrated the significance of resources and capabilities in the process of entrepreneurial OpRec. Therefore, this section focuses on showing the characteristics of these resources and capabilities.

a. Valuable resources: The available resources and capabilities play a considerable role in increasing the value of the university's services, which attracts others, including industry and students, to these services. Excellent human, financial resources, location and enterprise centre are seen as the main contributors to carrying out value-added activities. Therefore, the university has invested large sums of money into developing its human resources, infrastructure and enterprise centre. The above discussion justifies the considerable number of industrial partnerships, international students and commercial consultancy.

The resources are what typifies the value of the services. We put them at the disposal of different stakeholders, different groups, and they are sort of assets of the institution. E4(DN)

b. Rare resources: Analysing the interviewees' answers shows that there is no universal agreement on whether or not University E's resources and capabilities are unique. However, one of the interviewees believes, supported by the website content, that one of programmes relating to enterprise is relatively unique.

c. Imperfectly imitable (or costly to imitate) resources: All the interviewees believe that ideas can always be imitated. Therefore, generating new and innovative ideas is an ongoing process. Such ideas have helped the university to become well-known for creativity and helped it gain and sustain competitive advantages. Despite the above view, one of the interviewees believes that University E's culture is difficult to be copied, because it is greatly associated with the values and visions of the loyal and senior staff of the university

d. Organization: Due to the substantial role played by the university's resources and capabilities for achieving the strategic goals and gaining and sustaining competitive advantage, University E takes the following actions to exploit the competitive potential offered by these resources and capabilities:

- (1) Making these resources and capabilities available to be used by businesses and other organizations.
- (2) Establishing spin-outs.
- (3) Using the resources and capabilities according to the university's priorities.
- (4) Taking risks and trying things out.

4.6 Chapter Summary

This chapter has presented a case-by case analysis. In doing so, the results of five case studies have been presented through the previous five main sections. Each section included five sub-sections: the first considered how the respondents defined entrepreneurial OpRec. Then, the determinants of entrepreneurial OpRec process were addressed. The third sub-section dealt with the definitions provided by the respondents for the EntUni. In the fourth sub-section, the contextual factors have been considered. Finally, details about resources characteristics have been provided.

With respect to the fourth sub-section, the main themes included in the conceptual framework relating to EntUni have been replaced with those gained from analysing the primary data. The reason for such a replacement is that the themes included in conceptual framework are very general and unclear. So, using TA helps with finding alternative titles and categories for them and making them clearer.

Chapter Five: Findings from Cross-Case Analysis

In this chapter, the results gained from the case-by-case analysis will be compared in order to provide deeper interpretations than those that have been obtained from each case in the previous chapter. The main aim of this chapter is to present in-depth findings of integration across the five entrepreneurial universities under study. To ensure the effective presentation of those findings, the assumptions of RBT will be considered while interpreting the results. Also, the RBT-VRIO framework will be employed to examine whether or not the resources and capabilities at the universities under study can contribute to both gaining and sustaining competitive advantages.

Accordingly, this chapter will include five main sections. The first will deal with the views of the interviewees on the entrepreneurial OpRec concept. This section aims at producing a definition that makes the entrepreneurial OpRec phenomenon clearer for the staff of entrepreneurial universities. The second section will present the findings relating to entrepreneurial OpRec determinants. Next, the characteristics of resources in entrepreneurial universities will be addressed. In the fourth section, a definition of EntUni will be developed. Finally, the results relating to EntUni factors (contextual factors) will be presented.

5.1 Defining the Entrepreneurial Opportunity Recognition

Entrepreneurial opportunities have gained much attention from the universities under study. Therefore, there are serious endeavours to search for and recognize such opportunities, especially by the senior staff at these universities. This is because entrepreneurial opportunities can help grow and diversify income streams and can help with gaining and sustaining competitive advantage; they also create social and economic values for their respective regions.

Table 5.1 The main focus of the definitions of entrepreneurial OpRec, provided by the universities under study

University		Ethical considerations	Value creation	Commercial intent	New area of activity	Gaps in the market	Doing new things	Strategic alignment	Recognize unconventional opportunity
University	A	*	*	*	*	*			
	B		*	*			*		
	C		*	*		*	*	*	*
	D		*	*					
	E		*	*					

Source: Author

Table 5.1 demonstrates that there is no universal agreement on the concept of entrepreneurial OpRec among the universities under study. Despite such a lack of agreement, there is a belief that commercial benefits and value creation need to be considered while

senior staff recognize entrepreneurial opportunities. Also, there is an agreement between the senior staff at University A and University C that identifying gaps in the market can be one of the main aspects of entrepreneurial OpRec, which also, according to the senior staff at University B and University C, may involve doing new things. Therefore, entrepreneurial OpRec can be defined as a process of perceiving commercial and value-added opportunities through finding gaps in the market and spotting a way to do something new.

5.2 Entrepreneurial Opportunity Recognition Determinants in the Universities under Study

Six main themes for recognizing entrepreneurial opportunities in the five universities under study have been considered in this section. These themes are tied together, with some overlap between some of them.

5.2.1 Networking

Networking has been the most significant factor in recognizing entrepreneurial opportunities in the sample. Therefore, the senior staff at these universities have strengthened and expanded their networks, not only at local and national levels, but also at an international level. Returning to the five cases shows that senior staff need to consider three activities when they use their networks to recognize entrepreneurial opportunities: (1) managing those networks professionally; (2) strengthening and expanding those networks needs to be an ongoing process; and (3) hiring individuals with networking talent who can support the above-mentioned process.

In addition to the above activities, senior staff at the five universities are required to have strong internal and external communication capabilities, because these are seen by those staff as the essential capabilities for having effective networking. Internally, the structures in the universities under study facilitate and quicken the communication process. This is what develops their communication skills at these universities. Having strong communication skills help in delivering ideas quickly to the most senior level at the university, and immediately facilitates the consideration of these ideas.

Externally, having strong communication skills help in facilitating connections with other organizations, along with governments and industry, which might help with recognizing more entrepreneurial opportunities.

Due to the huge importance of networking, universities provide a number of resources that enhance the networking of their senior staff. Looking back at the five cases under study reveals the following:

- (1) The most important of these resources available in the five universities are collaborations, partnerships and relationships. With respect to the latter, it is worth mentioning that the universities focus more on weak-tie relationships when trying to

gain entrepreneurial opportunities. Nothing has been mentioned about strong-tie relationships, neither by interviewees, nor on the website content and document secondary data. As for collaborations and partnerships, there is a great interest by the universities under study to establish strategic ones. Also, some of the universities' partnerships are seen as relatively unique, especially those with large multinational companies.

- (2) Innovation/entrepreneurship centres have helped Universities C, D and E in both strengthening and expanding the University's networking capabilities.
- (3) The reputations that universities A, C, D and E have built have played a substantial role in attracting others to the university's services, thus facilitating numerous entrepreneurial opportunities.
- (4) The senior staff at Universities B, C and E have benefited significantly from the conferences and industrial networking events they attended in order to strengthen and expand their networking capabilities.
- (5) Social media has, to some extent, contributed to strengthening the networking of universities A, C and E.
- (6) University A, C and E have sought to recruit individuals with potential links. This includes both senior staff and individuals who can support those staff in this regard.
- (7) The location of universities B and E has a considerable role in attracting others, and thus facilitating the process of networking.

The above resources have contributed highly to adding value to the services provided by these universities. Therefore, they can be considered sources that feed their competitive advantage. Despite this, most of these resources can be found in some other universities and can also be easily imitated. Therefore, there are continuous endeavours to find new ways to employ these resources in a way that helps universities expand their networking to encompass new and different areas.

Table 5.2 The relevance of RBV-VRIO to networking across the cases

Networking	
V	Resources required for enhancing universities' networking are considered very valuable, not only for networking, but also for different activities within those universities, as they directly contribute to attracting others to the universities' services.
R	Some of the universities' partnerships are seen as unique or relatively unique.
I	Some of the universities' partnerships are difficult to imitate. However, their other resources are easy to copy.
O	Having partnerships and collaborations in different areas and with various parties, and also establishing strategic partnerships. Aiming at expanding the university's networking continuously by employing the available resources.
VRIO	The resources required for enhancing the universities' networking can be one of the sources that help universities gain and sustain competitive advantage.

Source: Author

With respect to the various types of networking, Table 5.3 demonstrates that senior staff at the five universities believe that internal networking facilitates the OpRec process in their

universities. However, they also believe that external networking, especially with industry and businesses, is more important than internal networking in terms of recognizing entrepreneurial opportunities. In fact, networking with industry has contributed towards recognizing a number of opportunities that help maximise the University's financial returns on investment.

Networking with other universities has contributed to making the process of OpRec more effective at Universities A, B, C and D, because such networking can offer help these Universities by learning from other universities who have success stories regarding recognizing entrepreneurial opportunities. Such networking has translated, in many cases, into collaborations and partnerships. To obtain funding opportunities and gain the support that facilitates the process of OpRec, Universities A, C and D have sought to strength their network with the government, which already supports entrepreneurial initiatives.

All five universities under study seek to keep connecting with their alumni. However, only University C and E consider such a connection as a source for recognizing entrepreneurial opportunities.

Having strong networking has contributed to recognizing a considerable number of opportunities in the universities under study. The most important of these are the commercial research opportunities/partnerships. This is followed by the importance of commercial consultancy, funding opportunities (especially from industry) and spin-outs. Strong networking has also contributed to an increase in the number of international students in Universities A and E and has helped create new businesses in Universities B and E. Also, such networking has contributed to gaining spin-in opportunities in University C, along with transnational education (TNE), income and coaching and mentoring opportunities in University E, and executive education and continuous improvement training opportunities in University D.

Table 5.3 Networking aspects at the universities under study

		University				
		A	B	C	D	E
Internal networking		*	*	*	*	*
External networking	Networking with the government	*		*	*	
	Networking with industry	*	*	*	*	*
	Networking with other universities	*	*	*	*	
	Networking with alumni			*		*

Source: Author

In summary, networking is one of the most important, if not the most important, factors that that can help entrepreneurial universities recognize a large number of entrepreneurial opportunities. Not surprisingly, networking with industry is the most important type of networking. However, networking with other universities, government and alumni, as well as

internal networking, is significant when recognizing entrepreneurial opportunities in the universities context.

5.2.2 Prior knowledge and experience

The experience of senior staff at the five universities has played a significant role in facilitating OpRec. This is because those people with experience can decide whether or not what is recognized is a real opportunity, and are confident about what needs to be done. Thus, they understand the steps that need to be taken towards recognizing entrepreneurial opportunities; they are able to repeat this process and recognize more entrepreneurial opportunities. They also recognize when it is appropriate to stop and abandon an activity. This, actually, reduces the error rate while recognizing entrepreneurial opportunity, and as result, it helps increase the desire to recognize more opportunities, and of course, employ efforts and resources in a more effective way.

With respect to prior knowledge, it can be observed in Universities A, B and D as a complement to experience, as far as entrepreneurial OpRec is concerned. In fact, knowledge gained by the senior staff has greatly contributed towards recognizing entrepreneurial opportunities. Therefore, the senior staff at the five universities have been developing their learning capabilities. In addition to learning, senior staff at University C use their critical reflection capabilities when they recognize opportunities. Also, senior staff at University D aim at developing their listing capabilities to obtain more knowledge required for recognizing entrepreneurial opportunities.

With regards to the resources that the universities provide to enhance the knowledge and experience of their senior staff, the universities' expertise and experts, as well as the knowledge produced and available at those universities, are the most important resources in this regard; they are valuable to the universities, as they contribute substantially to gaining and sustaining competitive advantage. Therefore, the universities invest intensively in research and producing knowledge.

Due to the huge importance of knowledge and expertise, UK universities have sought to produce novel knowledge. Therefore, similar knowledge can be found in other universities. As part of their entrepreneurial identity, the universities under study ensure that producing novel knowledge is an ongoing process. This makes knowledge unique, at least for a short period of time. They can also mix their knowledge and expertise with other resources in a way that helps produce more novel ideas and knowledge.

There are also other resources in each of the five universities that are used to enhance the above-mentioned knowledge and experience, such as business people, project planners and non-academic entrepreneurs in University A; knowledge brokers and supporter qualified and

experienced staff in University B; and opinion leaders, staff champions and commercial managers in University D.

Table 5.4 The relevance of RBV-VRIO to the prior knowledge and experience across the cases

Prior knowledge and experience	
V	The high quality knowledge produced by research and the universities' expertise have greatly contributed to achieving financial sustainability and enhancing the universities' reputation, thus creating values for the universities and their stakeholders.
R	There are continuous endeavours to produce novel knowledge, which can be unique for a short time due to the fact that other universities have similar endeavours with respect to producing novel knowledge.
I	Due to huge competition between universities in terms of research, they may gain similar knowledge at the end.
O	Mixing the university's expertise and knowledge with other resources can help with producing innovate ideas and novel knowledge. Also, investing intensively in research, especially in areas that can be difficult for others to invest in, can also contribute in the same way.
VRIO	Knowledge is considered one of the main sources for gaining and sustaining competitive advantages.

Source: Author

With respect to the various types of knowledge, Table 5.5 shows that knowledge of the industry is more important than other types of knowledge, as far as entrepreneurial opportunities are concerned. In addition to knowledge about the industry, business knowledge plays a considerable role in recognizing entrepreneurial opportunities in Universities A, C and E. As for knowledge about students, this has contributed to recognizing a number of opportunities for universities A, C and E.

The general knowledge of the senior staff has contributed to recognizing entrepreneurial opportunities in University B only. Knowledge about enterprising and entrepreneurship was considered significant towards recognizing entrepreneurial opportunities only in University A. The justification for the latter consideration is that knowledge about enterprise and entrepreneurship may have been considered part of their business knowledge. If so, enterprise and entrepreneurship knowledge can be considered important for recognizing entrepreneurial opportunities in three of the five universities.

With respect to knowledge about staff and knowledge about internal regulations and processes, they have contributed to facilitating the OpRec in University C, while knowledge about competitors and knowing how to obtain money have helped in increasing the possibility of recognizing entrepreneurial opportunities in University D.

The knowledge and experience of the senior staff have contributed to recognizing a number of opportunities for the five universities. The most important of these are commercial consultancy, followed by the importance of spin-outs, licencing and KTPs. The above-mentioned knowledge and experience have also contributed to recognizing engineering opportunities in universities A and D, partnerships and collaborations opportunities in universities B and E, commercial research opportunities in University B and coaching and mentoring in University D. In addition, they have contributed to recognizing opportunities

relating to creating new business in universities A and B, and establishing new campuses in University A.

Table 5.5 Prior knowledge and experience at the universities under study

		University				
		A	B	C	D	E
Experience		*	*	*	*	*
Knowledge	Business knowledge	*		*		*
	Knowledge about enterprising and entrepreneurship	*				
	Knowledge about industry	*	*	*		*
	Knowledge about students	*	*			*
	General knowledge		*			
	Knowledge about staff			*		
	Knowledge about competitors				*	
	Knowing how to obtain money				*	

Source: Author

In summary, it is clear that having sufficient experience can feed the appetite of the senior staff in the universities, with a view to recognize more entrepreneurial opportunities. Such an appetite increases more when those staff have good knowledge about industry and students, as well as how to run businesses.

5.2.3 Creativity

Creativity is seen as the ability to produce new ideas, identify a way to do things in a new way, and look at things from a different perspective. Such an ability has played a great role in recognizing entrepreneurial opportunities in the five universities. This explains including the features of creativity in the definition developed by this thesis for entrepreneurial OpRec. To enhance their creativity, senior staff at the universities under study use their imagination capabilities, except those in University E, who only use their creative/innovative thinking for this purpose. With respect to the latter way of thinking, this is also used by senior staff at Universities A and C as an additional capability to enhance their creativity.

In addition to the above capabilities, senior staff at the five universities are surrounded by creative individuals, who are seen as a very precious resource. In this regard, it is worth mentioning that being surrounded by these individuals can also, in some cases, be considered one of the aspects of creativity required for recognizing entrepreneurial opportunities.

The importance of creative individuals in recognizing entrepreneurial opportunities lies in providing creative solutions, challenging the internal processes as a way of thinking, and producing innovative ideas, which, in some cases, can be put into practice. In addition, being surrounded by creative individuals help senior staff learn how to look at things differently and compare their innovative ideas with the ideas of those individuals. All that can be offered by those individuals can be translated into competitive advantage.

In terms of rareness and imitability, creative individuals are seen as unique in each university, as they are different from each other. Their ideas can be imitated; but what cannot be imitated is those individuals themselves.

Table 5.6 The relevance of RBV-VRIO to creativity across the cases

Creativity	
V	Creative individuals are a precious resource that can make a university different from other universities, thus gaining a reputation for being an innovative university.
R	Human resources, especially creative ones, can be one of the more unique resources in the universities context.
I	Although innovative ideas can be easily copied, having creative individuals who continuously produce novel ideas can make such imitation costly.
O	Creating interdisciplinary teams, as well taking risks and trying out new and different things.
VRIO	Being innovative and different can be considered one of main aspects of competitive advantage in the universities context.

Source: Author

In the sample, teamwork is seen as one the most important sources of creativity required for recognizing entrepreneurial opportunities. This is because combining individuals with different talents, skills and backgrounds together in one interdisciplinary team can significantly contribute towards recognizing entrepreneurial opportunities, by producing innovative ideas and addressing complex issues, as well as responding creatively to external environment changes, and also in developing multi/interdisciplinary projects.

Being different, feelings and emotions, in universities A, C, D and E are seen as significant sources for the above mentioned creativity. Being different involves doing things in different ways, contexts and settings, and responding differently to external environment changes. As for feelings and emotions, the more the senior staff experience positive feelings and are motivated, the more likely they are to be creative and enthusiastic towards gaining opportunities.

Thinking of new ideas in universities C, D and E, and supporting creativity in universities B and D, are seen as ongoing processes, which have greatly contributed to increasing the level of creativity in those universities. On the other hand, non-linear thinking is seen as one of the sources of creativity only in University B. The author justifies that by claiming that non-linear thinking can be considered alternate terminology to describe thinking of new ideas, which is, as mentioned earlier, one of the sources of creativity in Universities C, D and E.

Table 5.7 Creativity aspects of the universities under study

	University				
	A	B	C	D	E
Being different	*		*	*	*
Teamwork	*	*	*	*	*
Feelings and emotions	*		*	*	*
Continuous support for creativity		*		*	
Non-linear thinking		*			
Continuous thinking of new ideas			*	*	*

Source: Author

Having high levels of creativity has contributed to recognizing a number of opportunities in the five universities. The most important of these are licencing, developing new products, and

developing new businesses. Creativity also contributed to recognizing commercial research opportunities, spin-outs, innovations, establishing new campuses, consultancies, collaborations and engineering opportunities.

In general, it seems that creativity is an indispensable element of the entrepreneurial OpRec process. This is because creativity reflects a very important part of the entrepreneurial opportunity type, which relates to doing new things. This is in line with the definition of entrepreneurial OpRec generated by analysing the interviewees' responses of the present study. The creativity required for recognizing entrepreneurial opportunities requires interdisciplinary teamwork. Also, there is a need to think differently and to manage feelings and emotions, while doing the everyday activities and thinking of opportunities. In addition, thinking of new ideas and supporting creative initiatives needs to be an ongoing activity of the universities' senior staff.

5.2.4 External environment changes

The environment, in which the five universities operate, is changing continuously and rapidly. This creates high levels of complexity and nervousness in this environment. Thus, these universities face different types of challenges and threats. However, dealing with these challenges and threats can effectively convert them into opportunities. Also, external environment changes provide a number of opportunities for UK universities. Therefore, senior staff at the five universities have been developing their responsiveness capabilities, and those in University A have also sought to develop their business development capabilities, with a view to effectively capture and exploit these opportunities.

In addition to the above capabilities, a number of resources have been provided to effectively respond to the above-mentioned changes. The most important of these are financial resources. This is followed by the importance of cutting edge technology and time. Also, reputation, research development managers, innovation centres and partnerships can also contribute to effectively dealing with external environment changes. The above resources have helped the universities under study to become more effective and create values for both themselves and their stakeholders, thus gaining and sustaining competitive advantages. Partnerships, some of which are relatively unique and difficult to copy, have played a special role in this regard.

Despite the great value of the resources offered to deal with the rapid, dramatic and continuous changes, most of these resources are prone to imitation. Also, similar resources can be found in other universities. Therefore, it is important to use the available resources effectively. This includes being proactive, quick and innovative, when dealing with changes in the external environment.

Table 5.8 The relevance of RBV-VRIO when dealing with external environment changes across the cases

External environment changes	
V	The resources offered to deal with changes are very valuable, as they help in responding to the people's needs and create values.
R	Some of the universities' partnerships are seen as relatively unique.
I	Some of the universities' partnerships are difficult to imitate. However, the other resources are easy to copy due to the high level of competition.
O	Being proactive, quick and innovative in responding to the changes when compared with the other universities.
VRIO	Resources provided to respond the external environment changes can contribute to gaining and sustaining competitive advantages.

Source: Author

Responding to the changes in the factors of both the micro and macro environment is one of the main skills used by the universities under study to recognize entrepreneurial opportunities. This is because of the great impact of some of the factors on the activities of these universities, including the OpRec process. Although the latter is impacted by a number of these factors, five of them have had the greatest impact on this process. With respect to micro environment factors, the competitors have significantly and continuously impacted the process of OpRec. This may be due to intense competition between universities around their number of students, especially international students, teaching and research quality and the university league. In this context, it is worth mentioning that the high level of competition between universities is one of the main reasons that motivates these universities to be more entrepreneurial and consider entrepreneurial opportunities, especially those that help with gaining and sustaining competitive advantages.

With regards to the macro environment factors, political variables have significantly impacted the process of OpRec in the universities under study. Although these variables represent threats sometimes, in many cases they provide opportunities and support. The most significant political variables that have had the above-mentioned impact are government policies on higher education, REF and TEF, local authorities, government grants and government support for entrepreneurship, government initiatives and the potential impact of Brexit. The latter may bring more threats than opportunities, because it may decrease the number of opportunities relating to European funding bodies, partnerships, students and staff. But, at the same time, it could motivate UK universities to be more entrepreneurial in finding alternatives to European Union opportunities.

Technological advances have also significantly impacted the OpRec process in these universities. This is because technological variables continuously present new opportunities. Thus, keeping pace with technological developments can help with being proactive and entrepreneurial when dealing with those opportunities. Also, economic and societal factors can impact the above-mentioned process. Both are seen as a facilitator of the OpRec process in the universities context, due to fact that the current changes in these factors pose a number of opportunities for different types of organizations, including universities.

Another main activity used by the five universities when recognizing entrepreneurial opportunities is meeting the needs and desires of students, industry, businesses and society, which are changing continuously. Therefore, activities relating to identifying gaps in the market are appreciated in these universities. In addition, Universities B, C and E have sought to create needs for people, as the senior staff believe that being entrepreneurial requires not only meeting people's needs, but also creating needs for them.

A quick response to the changes and needs, and being fast in distinguishing between opportunities and threats and making decisions can greatly contribute to taking advantage of entrepreneurial opportunities when they arise. Doing so requires building strong internal networks, as well as being flexible and proactive. With respect to the latter, it is seen in Universities A, B and C as complementary to reacting quickly. Despite the importance of employing a rapid response, sometimes it is difficult for some universities to respond quickly due to their size and limited capacity.

The above-mentioned response has made the senior staff at Universities A, B, C and D accept risk and allow for potential failure. This includes being bold and brave, having no fear to try things out, being positive towards external environment changes and seeing each failure as a step on the path to success.

Table 5.9 Dealing with external environment changes by the universities under study

		University				
		A	B	C	D	E
Being fast		*	*	*	*	*
Proactiveness		*	*	*		
Risk taking		*	*	*	*	
Meeting stakeholders' needs		*	*	*	*	*
Creating needs for people			*	*		*
Responding to external environment factors	Competition	*	*	*		*
	Political factors	*	*	*	*	*
	Technological advances	*	*	*	*	*
	Societal factors		*			*
	Economic factors			*	*	

Source: Author

Responding to changes and meeting needs have contributed to recognizing a number of opportunities in the sample. The most important of these are partnerships, gaining grants and recruiting more international students. They have also contributed to recognizing opportunities relating to establishing new campuses, commercial consultancy and innovation.

Based on the previous discussion, it can be argued that considering changes in the external environment is crucial when recognizing entrepreneurial opportunities. The effectiveness of such consideration depends heavily on responding to the external environment factors that have the greatest impact on the universities' activities and processes. Such a response needs to be quick and proactive. Also, it requires taking risks and considering stakeholders' needs, as well as, in some cases, creating needs for people.

5.2.5 Entrepreneurial alertness

The entrepreneurial alertness of the senior staff has significantly contributed to making these universities more entrepreneurial and contributed towards them recognizing more entrepreneurial opportunities. This is because having such an alertness helps in seeing potential more easily and helps them respond to external environment changes quickly and proactively.

Due to the significance of the entrepreneurial alertness, the senior staff at the five universities have made significant effort to develop their awareness capabilities to become highly alert to entrepreneurial opportunities. Also, those in universities A, B, C and D have sought to develop their capabilities regarding their special sensitivity towards opportunities. The main resource the staff depend on to develop the above-mentioned capabilities is information, which they obtain from different sources, such as other university websites, online resources and social media, periodicals (professional magazines, newspapers), HEFCE, THE and networking (especially through conferences, partnerships and collaborations. The other sources of the above-mentioned information are government data, research and enterprise office, granting bodies, innovation centres, informal information networks, research development offices and policy information.

Table 5.10 The relevance of RBV-VRIO to entrepreneurial alertness across the cases

Entrepreneurial alertness	
V	Information is a valuable resource in the universities context. However, the value of the information can be greater when integration between different sources of information is found.
R	No evidence has been found for the rareness of information in the universities context.
I	The information available in a university can be easily obtained by other universities because of their availability, as well as the universities' openness and transparency.
O	Finding links between different and unconnected pieces of information.
VRIO	Gaining novel and up-to-date information can contribute to keeping pace with developments in various areas, which, in return, can help in being a strong competitor.

Source: Author

Information, in fact, is another significant resource for the various activities of the universities, including OpRec. However, such a resource is available for all universities. Therefore, these universities pay a great deal of attention to using it in the most effective way, such as being quick to gain information and find links between this information, even when there are seemingly no connections between them. Doing so can help the universities keep abreast of developments, which in return, can help with gaining competitive advantage.

Horizon scanning and being aware of opportunities overlooked by others are two of the main characteristics of the senior staff at universities A, B and C. These have contributed substantially to increasing the level of their entrepreneurial alertness, and thus recognize entrepreneurial opportunities, especially unique ones. However, such a characteristic has gained little attention from the senior staff at universities D and E, who instead pay more attention to being open-minded when they deal with opportunities, which has helped those staff to become highly alert to and open their eyes to more entrepreneurial opportunities.

Distinguishing between different types of opportunities in terms of both those that generate profit or create values is considered a critical characteristic that increases the likelihood of being entrepreneurially alert to opportunities that contribute to financial sustainability. The main focus of universities A and C is on distinguishing opportunities that create values from those which achieve benefits over short terms. However, in universities B and D the focus is on distinguishing between profitable and non-profitable opportunities, where such a distinguishment is considered one of the aspects that reflect the level of entrepreneurial alertness in these universities. Actually, the ability to distinguish between the above mentioned opportunities is significant for OpRec. The proof of this is that the definition developed by this thesis for entrepreneurial OpRec focuses on both commercial and value-added opportunities. Distinguishing between value creation opportunities and non-value creation opportunities will be considered in the ultimate template. This is because seeking value creation opportunities involves a set of aspects, including profitability.

Another aspect of entrepreneurial alertness in Universities B, C and E is finding a connection between unrelated information or subject areas. This, in fact, can be achieved due to the fact that universities produce a huge amount of knowledge and have various expertise. Finding such a connection can be translated into recognizing innovative and unique entrepreneurial opportunities.

Table 5.11 Entrepreneurial alertness aspects of the universities under study

	University				
	A	B	C	D	E
Being aware of opportunities overlooked by others	*	*	*		
Distinguishing between value creation opportunities and non-value creation opportunities	*		*		
Distinguishing between profitable opportunities and non-profitable opportunities		*		*	
Finding connections between unrelated information/areas		*	*		*
Horizon scanning	*	*	*		
Open-mindedness				*	*

Source: Author

The entrepreneurial alertness of senior staff has contributed to recognizing different types of opportunities in the universities under study, such as spin-outs, establishing new campuses, KTPs, creating new ventures, subsidiaries, licencing, commercial research opportunities and collaborations and partnerships.

Taken together, the results of this study suggest that in order to see opportunities in an easier and quicker way, senior staff need to have greater entrepreneurial alertness ability, which, in return, requires being open-minded and aware of opportunities overlooked by others. It also requires horizon scanning and finding links between unconnected information/areas, as well as distinguishing between value creation/profitable opportunities and non-value creation/non-profitable opportunities.

5.2.6 Systematic search vs serendipitous discovery

Most of the entrepreneurial opportunities recognized by the five universities under study have been searched for. However, few of these opportunities have been recognized serendipitously. Interestingly, some of opportunities in Universities C and D have been recognized as a result of simultaneous systematic searches and serendipitous discovery. Thus, it can be said that there are three categories as far as systematic search vs serendipitous discovery are concerned, which are as follows:

a. A systematic search requires market research and making the search for opportunities an ongoing process. It may also require senior staff to be enthusiastic when they conduct such a search. In fact, due to the importance of searching for opportunities, the senior staff at the five universities have been seeking to develop their research in terms of their opportunities capabilities. To enhance such capabilities, different resources have been allocated in this regard, such as cash, time, research development managers and entrepreneurship and enterprise centres. With respect to the latter, they are seen as very valuable resources, which the universities invest in considerably. Some schemes developed by these centres are relatively unique, however they can be easily copied. As for money and time, they have greatly contributed towards capturing value from systematic search activities. Therefore, searching deliberately for opportunities is an essential activity in all five of these universities. Such activities have contributed towards realizing opportunities that directly contribute towards gaining competitive advantage.

Having a systematic search for opportunities has contributed to recognizing a number of opportunities for the universities, such as establishing new campuses, recruiting a significant number of international students, commercial research opportunities, partnerships and collaborations, gaining more funding and KTPs.

Table 5.12 The relevance of RBV-VRIO to systematic search across the cases

Systematic search	
V	Entrepreneurship and enterprise centres are seen as a valuable resource that contributes to improving many services and activities (including systematic search) of the universities under study.
R	Some of schemes of enterprise of the entrepreneurship and enterprise centres can be relatively unique. However, the other resources, that are allocated to enhance the ability to search for entrepreneurial opportunities, are available at all universities.
I	The schemes of enterprise are easily copied.
O	Allocating enough time and money to activities relating to searching for entrepreneurial opportunities.
VRIO	Having a systematic search mechanism can directly contribute to gaining and sustaining a competitive advantage, because such a mechanism is used by entrepreneurial universities to search for opportunities that help universities achieve outstanding performance, and thus to be at the top in some areas.

Source: Author

b. Serendipitous discovery results from strong networking, especially through attending conferences and industry events. Such discovery can help with recognizing partnerships and collaborations opportunities.

c. Deliberate and accidental recognition of opportunities has two forms. First, the search for a certain opportunity can sometimes lead to recognizing more opportunities which had not been taken into account before (deliberate-accidental approach). Second, when universities accidentally recognize an effective opportunity, they may search for more similar opportunities (accidental-deliberate approach).

Table 5.13 Systematic search vs serendipitous discovery at the universities under study

		University				
		A	B	C	D	E
Systematic search	The continuous search for opportunities	*	*	*		*
	Market research	*	*	*	*	*
	Enthusiasm		*			
Serendipitous discovery		*	*	*	*	*
Both systematic search and serendipitous discovery				*	*	

Source: Author

A comparison of these results reveals that recognizing entrepreneurial opportunities requires, in many cases, to be searched for, which in return requires market research and ensuring such a search is an ongoing activity. Despite the importance of a deliberate search, the universities are open to opportunities that are recognized fortuitously. This is what makes some universities adopt an approach that finds connections between opportunities recognized as a result of the deliberate search for those opportunities recognized serendipitously.

Having discussed the six entrepreneurial OpRec determinants, it is worth mentioning that there is some interaction among a number of them, which are as follows:

- (1) There is an interaction between networking and the other entrepreneurial OpRec determinants.
- (2) Responding to external environment changes interacts with the other entrepreneurial OpRec determinants, except serendipitous discovery.
- (3) In addition to networking and responding to the external environment changes, knowledge and experience interact with entrepreneurial alertness and creativity.
- (4) In addition to responding to the external environment changes, entrepreneurial alertness interacts with creativity.

Table 5.14 The relationship between entrepreneurial OpRec determinants in the universities under study

	Prior knowledge and experience	Networking	Entrepreneurial alertness	Environmental changes	Systematic search	Serendipitous discovery	Creativity
Prior knowledge and experience							
Networking	A, B, C, D, E						
Entrepreneurial alertness	C, E	A, C					
Environmental changes	A, C	A, B, D	C				
Systematic search		C		C			
Serendipitous discovery		A, D, E					
Creativity	B, D	B, D	A, C	B, C			

Source: Author

5.3 Resources Characteristics

Resources have played a considerable role in recognizing entrepreneurial opportunities in the five universities, as they have enhanced the factors that determine the process of entrepreneurial OpRec. The above-mentioned resources have a number of characteristics in the universities context. By employing the RBT-VRIO framework, these resources can be distributed over four categories, as follows:

Table 5.15 The relevance of the RBT to the findings from across the cases

	V	R	I	O	VRIO
Networking	Conditions are met	Conditions are partially met	Conditions are partially met	Conditions are met	Relatively high contribution to gaining and sustaining competitive advantage.
Prior knowledge and experience	Conditions are met	Conditions are partially met	Conditions are not met	Conditions are met	Moderate-high contribution to gaining and sustaining competitive advantage.
Creativity	Conditions are met	Conditions are met	conditions are met	Conditions are met	High contribution to gaining and sustaining competitive advantage.
Environmental changes	Conditions are met	Conditions are partially met	Conditions are partially met	Conditions are met	Relatively high contribution to gaining and sustaining competitive advantage.
Entrepreneurial alertness	Conditions are met	Conditions are not met	Conditions are not met	Conditions are met	Moderate contribution to gaining and sustaining competitive advantage.
Systematic search	Conditions are met	Conditions are partially met	Conditions are not met	Conditions are met	Moderate-high contribution to gaining and sustaining competitive advantage.

Note: The order of the six factors listed in this table is the same as the order in the ultimate template.

Source: Author

a. Valuable resources: Resources and capabilities available at the universities under study have helped them to become more dynamic, bold and strategic; they have significantly contributed to increasing the worth of the universities' services, which have created value for those universities and have enhanced their reputation, and also increased the value offered to the stakeholders. This has greatly contributed to securing numerous entrepreneurial opportunities, which, in return, have brought more valuable resources and capabilities for the above-mentioned universities.

Although all resources and capabilities at the universities under study are seen as very useful, human resources are considered the most valuable resource that can make a difference to the various activities of the university, including the OpRec process. Therefore, large sums of money have been invested to develop the capabilities of individuals at the universities under study, and to further attract key individuals.

b. Rare resources: The evidence from this study suggests that having unique resources and maintaining them can be difficult in the universities context. At least, it can be difficult to possess a number of unique resources in a university, but what can be considered unique in a university is how the resources are mixed. Actually, such a mix can help in gaining competitive advantage. In this regard, it is worth mentioning that most of the resources that could be unique or relatively unique in the universities context are partnerships, enterprise

activity, human resources, learning and teaching facilities, laboratories and growth programmes.

c. Imperfectly imitable (or costly to imitate) resource: New ideas produced by a university can be easily imitated due to huge competition among universities and the availability of information in terms of their services and activities on their websites. This can be one of the motives for being more creative, due the continuous need for new and innovative ideas that contribute to strengthen a university's competitiveness. Then, it can be said that the ease of copying ideas can be one of main determinants that make producing new ideas an ongoing process.

In addition to new ideas, equipment, buildings and brand new degree programmes can also be copied easily. But what cannot/is difficult to be copied is the culture, because it is considerably integrated in the values and vision of the university. The culture is also impacted by the values of the university's senior leaders, who are very loyal to their institution, and also by the values of the surrounding society. Therefore, it can be claimed that in addition to the values of the loyal senior leaders, the social and geographical context can be one of the main reasons for the difficulty in imitating culture. In this regard, it is worth mentioning that culture, as a resource, indirectly enhances the capabilities required to deal with the six entrepreneurial OpRec determinants. This is because culture in the universities under study promotes entrepreneurialism, and any creativity and activities relating to them. In addition to culture, human resources (especially creative individuals) and some types of partnerships are also difficult to imitate. Therefore, the universities under study pay great attention to these factors and invest a lot of money and time to develop the former and have more of the latter.

d. Organization: Due to the significant contribution of the resources and capabilities in providing high quality services, the universities under study have sought to employ and manage these resources and capabilities in the best possible way. Therefore, a number of actions have been taken to exploit the competitive potential offered by these resources and capabilities, which in return helps them gain a number of entrepreneurial opportunities. The most important of these activities are:

- (1) Mixing the different types of resources, skills and expertise available in the university in a way that results in generating innovative and novel ideas and provide high quality products and services.
- (2) Employing resources according to the university's strategic priorities.
- (3) Maximising the utilisation of the university's resources by making them available to be used by businesses and other organizations.
- (4) Investing intensively in research and innovation.
- (5) Establishing strategic partnerships, new ventures and spin-outs.
- (6) Taking risks and trying out new and different things.

(7) Using the university's resources and capabilities in various areas not just one area.

Taken together, the results suggest that the resources provided for, and capabilities employed towards recognizing entrepreneurial opportunities, contribute (to a relatively large extent) towards gaining and sustaining competitive advantage. This seems to indicate that competitive advantages gained by the entrepreneurial universities depends not only on entrepreneurial activities, but also on some other non-entrepreneurial activities. One possible reason for this is the uniqueness of the entrepreneurial universities mission, which may differ from those in other entrepreneurial organizations.

5.4 Defining the Entrepreneurial University

Winning the THE EntUni of the Year award has had a profound impact on different activities and the reputation of the universities under study, thus gaining a number of opportunities, especially those relating to having more partnerships with industry and recruiting more international students.

Table 5.16 The main focus of the definitions of the EntUni phenomenon provided by the universities under study

University		Business oriented														
		A	B	C	D	E	A	B	C	D	E	A	B	C	D	E
		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		*					*	*			*					
		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		*					*	*			*	*				
		*						*	*				*	*		*
										*						
							*	*			*					
							*	*	*							
											*	*				
													*	*		*

Source: Author

Table 5.16 demonstrates that there is no consensus on the features of the EntUni among the universities under study, except on having a business orientation and having innovative features. There is also an agreement between universities A, B, C and D on the importance of looking for entrepreneurial opportunities in entrepreneurial universities, which also, according to universities A, B and C, creates values for themselves and the surrounding societies. Thus, an EntUni can be defined as a business-oriented and innovative university that develops entrepreneurial opportunities in ways that help in creating values.

5.5 Entrepreneurial University Factors

In addition to the six factors discussed in section 7.2, the entrepreneurial opportunities recognition process is also impacted indirectly by a number of factors that are associated with the EntUni mode. These factors are distributed over four groups, which are as detailed in the forthcoming sections.

5.5.1 Supportive environment for entrepreneurship

The five universities in the study have made a huge effort to provide a supportive environment for entrepreneurship, which brings together students, alumni, start-ups and well-established businesses, which encourages interaction between the universities teaching, research and enterprise; and supports, inspires and enables engaged individuals to realise their potential. The above actions help in creating an energetic community of enterprise at those universities. Such a community has attracted and retained the highest quality individuals, as well as helped with gaining resources required for being especially enterprising. A number activities and means are used by the universities to create such an environment, which are as follows:

a. Supporting and practicing entrepreneurship by the Chancellor and Vice-Chancellor: Encouraging and supporting entrepreneurial initiatives, as well as practicing entrepreneurship by the Vice-Chancellor and, sometimes by the Chancellor, are seen as the most significant enablers for establishing a supportive environment for entrepreneurship at the universities under study. The main activities that the Vice-Chancellors have done to encourage, support and practice entrepreneurship at the universities under study are:

- (1) Being an example in practicing entrepreneurship, especially in taking advantage of opportunities.
- (2) Creating posts within the university that support entrepreneurialism, such as a pro-vice-chancellor for enterprise.
- (3) Promoting innovative ideas.
- (4) Having the desire to make the whole university entrepreneurial.
- (5) Offering adequate resources for entrepreneurial activities.
- (6) Strengthening the University's networking, especially with government and industry.
- (7) Being empowering leaders.

b. Establishing an entrepreneurial culture: One of the significant enablers for creating a supportive environment for entrepreneurship at the five universities is the embedding of entrepreneurialism throughout the university's culture. Doing so has contributed to establishing an entrepreneurial culture within the whole university. Such a culture is reflected through the high levels of entrepreneurial spirit, independency, proactiveness, boldness, rapid responsiveness, empowerment and transparency that can be seen within different activities of the universities.

c. Encouraging and supporting students to be entrepreneurial: Students from different disciplines (at the universities under study) are substantially encouraged and supported to be entrepreneurial and practice entrepreneurship while they are studying at the university. The universities provide such encouragement and support through the following initiatives and activities:

- (1) Running programmes, training courses, and degrees that provide opportunities to help students realize their entrepreneurial potential and develop the entrepreneurial skills required for establishing their own businesses and being intrapreneurial within larger organizations.
- (2) Embedding entrepreneurialism into the curricula.
- (3) Supporting entrepreneurial ideas and initiatives offered by students.
- (4) Enabling students to network with local businesses.
- (5) Placing students into different types of companies.
- (6) Running competitions that provide an opportunity for students to test their entrepreneurial skills and ideas, as well as to gain the support needed to turn these ideas into reality.

d. Structures for promoting entrepreneurship: Structures that facilitate entrepreneurship are seen as one of the significant enablers for establishing a supportive environment for entrepreneurship at universities. Such structures need to be flexible, especially with regards to the facilitation of creativity and communication.

e. Entrepreneurship, enterprise and innovation centres: Centres concerned with innovation and entrepreneurialism have greatly contributed to the establishment of a supportive environment for entrepreneurship at the five universities. Each of these has two of the above-mentioned centres, except University A, which has three of these centres.

Innovation centres are available at the five universities under study. This suggests that it is difficult to imagine an EntUni without an innovation centre. The evidence shows that innovation centres can contribute towards establishing an innovative learning environment and thus help universities to become well-known for innovation locally, nationally and internationally. They also can help with establishing and strengthening the networking with industry, and further help to support entrepreneurial students and staff and promote creativity.

In addition to innovation centres, universities A, B, C and D have established entrepreneurship centres, which support research into enterprise and entrepreneurship and provide resources and training courses to students and staff, with a view to develop their entrepreneurial skills. Some of them also support a few leading organizations concerned with entrepreneurial education. As for enterprise centres, they can significantly help in disseminating entrepreneurialism within the university. They also provide different types of services that support SMEs and are responsible for the commercial activities of the universities, and, some case, are responsible for establishing industrial partnerships.

f. All faculties should have some kind of entrepreneurial element: Encouraging all faculties/schools within the university to be entrepreneurial, or at least to have some entrepreneurial elements within their activities, can contribute highly to the moving towards

an EntUni mode, and thus provides an environment that supports entrepreneurial initiatives within different disciplines.

Table 5.17 Activities and means for creating a supportive environment for entrepreneurship used by the five universities under study

	University				
	A	B	C	D	E
Support of entrepreneurship from the Vice-Chancellor office	*	*	*	*	*
Establishing an entrepreneurial culture	*	*	*	*	*
Encouraging and supporting students to be entrepreneurial	*	*	*	*	*
Innovation centres	*	*	*	*	*
Entrepreneurship centres	*	*	*	*	
Enterprise centre	*				*
Structures for promoting entrepreneurship	*	*	*	*	
All faculties should have some entrepreneurial element	*			*	
Using entrepreneurialism language within the University			*		
Inspiring talks and workshops about entrepreneurship					*

Source: Author

In addition to the above activities and means, using entrepreneurialism language within University C and having inspiring talks and workshops about entrepreneurship in University E, have both contributed to enhance the supportive environment for entrepreneurship in those respective universities.

Taken together, the evidence from this study suggests that providing a supportive environment for entrepreneurship can significantly enhance the six entrepreneurial OpRec determinants under study.

5.5.2 Placing enterprise, entrepreneurship and innovation in the university strategy

Enterprise has gained considerable attention in the strategies of the universities under study. Also, innovation has received the same attention within the strategies of universities A, B, D and E. However, entrepreneurship has obtained such attention through the strategies of universities B and E only. Considering enterprise, innovation and entrepreneurship within the university's strategy can have a number of implications, such as:

- (1) Contributing to gaining and sustaining competitive advantage.
- (2) Having a strong track record of innovation and enterprise.
- (3) Growing and diversifying the income streams.
- (4) Utilizing the resources and capabilities available in the universities in a more effective way.
- (5) Establishing a number of strategic partnerships.
- (6) Encouraging the activities of searching for (and gaining) entrepreneurial opportunities.

With respect to the latter, the evidence shows that embedding enterprise, innovation and entrepreneurship in the university strategy can enhance the six entrepreneurial OpRec determinants under study.

The above discussion can justify the reasons behinds considering the placement of enterprise, innovation and entrepreneurship in the university strategy as one of the main criteria for judging whether a university is entrepreneurial or not.

Table 5.18 Placing enterprise, entrepreneurship and innovation in the strategies of the universities under study.

	University				
	A	B	C	D	E
Placing enterprise in the university strategy	*	*	*	*	*
Placing innovation in the university strategy	*	*		*	*
Placing entrepreneurship in the university strategy		*			*

Source: Author

5.5.3 The three missions of universities

Entrepreneurial universities are not only interested in having commercial activities, but also in embedding entrepreneurship into their teaching and research in order to deliver their three missions in a more effective way.

5.5.3.1 Teaching (first mission) and entrepreneurship

As entrepreneurial institutions, a number of entrepreneurship and enterprising aspects can be seen in the teaching methods of some academics, as well as the courses of various subject areas in the universities under study. There are two main forms of teaching in the universities under study, as far as entrepreneurialism is concerned, which are as follows:

- a. Teaching with an entrepreneurship flavour: In entrepreneurial universities, enterprise and entrepreneurship are embedded in a number of the courses of different subject areas. This has motivated some academics to become entrepreneurial in the way that they design and deliver their modules. To enhance entrepreneurialism in their teaching, some of the academics in those universities have attempted to become engaged with industry. Also, these universities use visiting entrepreneurship professors and entrepreneurs to deliver some lectures and workshops relating to entrepreneurship.
- b. Teaching with an innovative flavour: As part of being entrepreneurial in teaching, the elements of innovativeness can be clearly seen in the teaching methods, as well as the courses of different subject areas in the universities under study. Teaching and education in entrepreneurial universities, according to the evidence gained by the present study, can enhance three entrepreneurial OpRec determinants under study: networking, creativity and responding to external environment changes.

5.5.3.2 Impactful research (second mission) and entrepreneurship

Research in the universities under study has been viewed as the primary means that can be used to make a difference to the university and have a positive impact on societies, both locally, nationally and internationally. Therefore, these universities seek to produce

innovative, high-quality world leading research. To do so, a number of tactics and activities can be followed. The most important of these are as follows:

- (1) Undertaking innovative, value-added, applied and international excellent research.
- (2) Boosting research through collaborations and partnerships with leading academic institutions, industry and government.
- (3) Allocating a lot of time and money, as well as recruiting a significant number of individuals for research.
- (4) Creating multidisciplinary teams from different fields of study for research purposes.
- (5) Maintaining a supportive environment and culture for quality research.
- (6) Conducting impact case studies.
- (7) Recruiting leading researchers and experts.
- (8) Embedding entrepreneurship into the research.
- (9) Continuously encouraging and supporting post-graduate and early-career researchers.
- (10) Developing the research capabilities of the current staff.
- (11) Providing cutting-edge equipment and quality physical resources for research.

The above activities and tactics have helped these universities increase the volume, quality and impact of their research. This has contributed towards the growth and diversification of the university's income streams. They also helped in achieving outstanding results in REF 2014.

Impactful research in entrepreneurial universities, according to the evidence from the present study, can enhance four entrepreneurial OpRec determinants: creativity, knowledge, networking and responding to the external environment changes.

5.5.3.3 Contribution to socio-economic development

To deliver their third mission, the universities under study have been contributing to the socio-economic environment, locally and nationally, and sometimes internationally. In fact, these universities are seeking to maximize such a contribution, because it can have significant reciprocal benefits for both the university and the surrounding society.

a. Contribution to societal development: The universities under study pay huge attention to their impact on society and how they make a difference to their surrounding societies, and also seek to spread entrepreneurialism within these societies. This has resulted in transforming these societies and establishing better communities. The positive impact of the universities can be seen through a number of activities. The most important of these are as follow:

- (1) Engaging fully with and working hand-in-hand with the public and local community.
- (2) Impacting the work of other organizations and universities and motivating them to become more entrepreneurial.
- (3) Producing high quality graduates who can contribute to transform their societies.

- (4) Supporting alumni in their initiatives regarding contributing to developing their societies.
- (5) Owning and supporting social enterprises.
- (6) Tackling complex societal issues.
- (7) Undertaking research that contributes to minimising negative impact on the environment and adding value to society.
- (8) Embracing the principles of CSR.

b. Greater/positive impact on the economy: Although the five universities under study have sought to have an outstanding impact on the local and national economy, universities A, B and C aim at maximizing such an impact. This is because their senior staff believe that entrepreneurial universities have a greater impact on the economy than non-entrepreneurial universities. In this regard, it can be argued that although all UK universities have a positive impact on the local regional economy, it is easier for entrepreneurial universities to demonstrate the above-mentioned impact through various entrepreneurial and value-added activities. Therefore, in many cases, entrepreneurial universities can have a greater and more evident impact on the economy compared to other universities.

Universities can deliver the above-mentioned impact through a number of activities and means. The most important of these are:

- (1) Establishing new ventures, spin-outs and subsidiaries.
- (2) Supporting and developing innovative and high growth SMEs through finding solutions for different types of changes facing them and improving their performance and competitiveness through building short-term and medium-to-long-term KTPs programmes for them.
- (3) Employing a considerable number of individuals due to their continuous growth.
- (4) Helping the businesses to improve their performance.
- (5) Engaging widely with and supporting a large number of local industries or businesses.
- (6) Producing entrepreneurs and business people.
- (7) Recruiting larger number of international students.
- (8) Incubations.

Delivering the third mission of the universities can enhance five entrepreneurial OpRec determinants: knowledge, networking, entrepreneurial alertness, responding to the external environment changes and creativity.

Table 5.19 The three missions of universities under study

		University				
		A	B	C	D	E
Teaching (first mission) and entrepreneurship	Teaching with an entrepreneurship flavour	*	*	*	*	*
	Teaching with an innovative flavour	*		*		*
Impactful research (second mission) and entrepreneurship		*	*	*	*	*
Third mission	Contribution to societal development	*	*	*	*	*
	Greater impact on the economy	*	*	*		
	Positive impact on the economy				*	*

Source: Author

5.5.4 Entrepreneurial staff

Having entrepreneurial staff can be one of the significant indicators for being an EntUni. The latter needs to recognize those staff and provide them with opportunities to develop their entrepreneurial skills in a way that enables them to have entrepreneurial activities that maintain the university as an entrepreneurial institution. This applies not only to the current staff, but also to the staff who will be recruited.

Table 5.20 Entrepreneurial staff at the universities under study

	University				
	A	B	C	D	E
Current entrepreneurial staff	*	*	*	*	*
The need for more entrepreneurial staff	*				*

Source: Author

a. Current entrepreneurial staff: The five universities under study have a number of entrepreneurial staff, who have the capacity to deal with entrepreneurial opportunities and understand the commercial context. Having entrepreneurial staff in those universities is the result of the high level of encouragement and support that they have provided to their staff to have a non-traditional outlook and to be more entrepreneurial. This has included providing them with the resources required for facilitating entrepreneurial and commercial activities and connecting them to the SMEs communities and funding bodies. It also involves providing them with the opportunity to attend training courses and programmes that have helped them to develop their entrepreneurial skills.

b. The need for more entrepreneurial staff: Universities A and E are not satisfied with the number of entrepreneurial staff they have, rather they continuously seek to increase the number of them. Two approaches can be used: First, the universities can attract and recruit the most innovative, forward-thinking, high-calibre and business-minded individuals who are already willing to be part of an EntUni, rather than non-entrepreneurial ones. Second, they can keep encouraging and supporting the existing staff to be more entrepreneurial. This may require a number of actions, as follows:

- (1) Enabling them to undertake entrepreneurship training.
- (2) Encouraging them to take risks and to try new things.
- (3) Encouraging them to look for and respond to the next opportunities/deals.
- (4) Supporting entrepreneurial initiatives that are aligned with the university's mission and vision.
- (5) Rewarding them for developing excellence in enterprise and entrepreneurship practice.
- (6) Providing them with the resources required for developing entrepreneurial and commercial activities.
- (7) Engaging them in business communities and with funding bodies.

Having entrepreneurial staff in the university, according to the evidence gained by the present study, can enhance the six entrepreneurial OpRec determinants under study.

Table 5.21 The relationship between EntUni factors and entrepreneurial OpRec determinants in the universities under study

		Prior knowledge and experience	Networking	Alertness	Systematic search	Creativity	Environmental changes
Placing enterprise, entrepreneurship and innovation at the university strategy		*	*	*	*	*	*
Supportive environment for entrepreneurship		*	*	*	*	*	*
The three missions of universities	Teaching (first mission) and entrepreneurship		*			*	*
	Impactful research (second mission) and entrepreneurship	*	*			*	*
	Contribution to socio-economic development (Third mission)	*	*	*		*	*
Entrepreneurial staff		*	*	*	*	*	*

Source: Author

Table 5.21 illustrates that EntUni factors can significantly facilitate activities related to the six entrepreneurial OpRec determinants considered in this study. This is logical, since entrepreneurial universities provide a substantial continuous support for entrepreneurial initiatives. Thus, it can be argued that entrepreneurial universities can be one of the best contexts for recognizing entrepreneurial opportunities.

5.6 Ultimate Template

Comparing the five final templates developed through case-by-case analysis has produced the ultimate template, which will be used as a guide for the empirical model that will be developed for the OpRec process in the entrepreneurial university context. It will also contribute to presenting Chapter Six in an organized and flowing manner. The ultimate template is shown in Figure 5.1.

a. OpRec determinants

- a.1 Networking
 - a.1.1 Internal networking
 - a.1.2 External networking
 - a.1.2.1 Networking with industry
 - a.1.2.1 Networking with other universities
 - a.1.2.3 Networking with the government
 - a.1.2.3 Networking with alumni
- a.2 Prior knowledge and experience
 - a.2.1 Experience
 - a.2.2 Prior knowledge
 - a.2.2.1 Knowledge about industry
 - a.2.2.2 Knowledge about how to run a business (Business knowledge)
 - a.2.2.3 Knowledge about students
- a.3 Creativity
 - a.3.1 Teamwork
 - a.3.2 Being different
 - a.3.3 Positive feelings and emotions
 - a.3.4 Continuous thinking of new ideas
 - a.3.5 Continuous support for creativity
- a.4 External environment changes
 - a.4.1 Responding to external environment factors
 - a.4.1.1 Competition
 - a.4.1.2 Political factors
 - a.4.1.3 Technological advances
 - a.4.1.4 Societal factors
 - a.4.1.5 Economic factors
 - a.4.2 Being fast
 - a.4.3 Proactiveness
 - a.4.4 Risk taking
 - a.4.5 Meeting stakeholders' needs
 - a.4.5 Creating needs for people
- a.5 Entrepreneurial alertness
 - a.5.1 Distinguishing between value creation/profitable opportunities and non-value creation/non-profitable opportunities
 - a.5.2 Finding connections between unrelated information/areas
 - a.5.3 Being aware of opportunities overlooked by others
 - a.5.4 Horizon scanning
 - a.5.5 open-mindedness
- a.6 Systematic search vs serendipitous discovery
 - a.6.1 Systematic search
 - a.6.1.1 Market research
 - a.6.1.2 The continuous search for opportunities
 - a.6.2 Serendipitous discovery
 - a.6.3 Both systematic search and serendipitous discovery

b. EntUni Criteria

- b.1 Supportive environment for entrepreneurship
 - b.2.1 Supporting and practicing entrepreneurship by the Chancellor and Vice-Chancellor
 - b.2.2 Establishing an entrepreneurial culture
 - b.2.3 Encouraging and supporting students to be entrepreneurial
 - b.2.4 Entrepreneurship, enterprise and innovation centres
 - b.2.5 Structures for promoting entrepreneurship
 - b.2.6 All faculties should have some kind of entrepreneurial element
- b.2 Placing entrepreneurship, enterprise and innovation at the university strategy
- b.3 The three missions of universities
 - b.3.1 Teaching (first mission) and entrepreneurship
 - b.3.1.1 Teaching with an entrepreneurship flavour
 - b.3.1.2 Teaching with an innovative flavour
 - b.3.2 Impactful research (second mission) and entrepreneurship
 - b.3.3 Contribution to socio-economic development (Third mission)
 - b.3.3.1 Contribution to societal development
 - b.3.3.2 Greater impact on the economy
- b.4 Entrepreneurial staff
 - b.4.1 Current entrepreneurial staff
 - b.4.3 The need for more entrepreneurial staff

Figure 5.1 Ultimate template

Source: Author

5.7 Chapter Summary

This chapter has presented the findings from a cross-case analysis of the five case studies. These findings consider five topics - two of them are related to the two main phenomena considered by the present thesis: entrepreneurial OpRec and EntUni. Although there was no universal agreement on all of the features of these phenomena, this thesis will contribute to a better understanding of them for those who are interested. This is because this thesis has produced definitions for these two phenomena based on common themes obtained from a comparison between the five universities under study. This makes them valid for the universities context, especially for those who are interested in entrepreneurialism.

The third topic is associated with the factors that determine the OpRec process, which, according to this thesis are: networking, external environment changes, experience and prior knowledge, creativity, entrepreneurial alertness and systematic search for opportunities. On the other hand, the fourth topic considers the factors associated with the EntUni mode, which have an indirect impact on the entrepreneurial OpRec. These factors are related to the consideration of enterprise, entrepreneurship and innovation by the university strategy, supportive environment for entrepreneurship, the three missions of entrepreneurial universities and entrepreneurial staff.

Each of the above-mentioned factors (both OpRec and EntUni factors) encompass a number of sub-factors (as summarized in the final version template in Figure 5.2). These sub-factors are decided based on the commonalities between them in the five cases under study. Therefore, the developed model only includes the factors that have been agreed upon by at least two of the five universities under study.

The fifth topic is linked to the resources and capabilities offered by recognizing entrepreneurial opportunities. In this regard, this thesis finds that these resources and capabilities can contribute substantially to the entrepreneurial OpRec process, and they can, to a relatively large extent, contribute towards gaining and sustaining competitive advantage.

Chapter Six: Discussion

In this chapter, the major findings from the multiple case studies will be discussed within the context of the literature of both entrepreneurial OpRec and EntUni. Then, the definitions developed by this thesis for these two phenomena, as well as the findings relating to the factors that determine OpRec and entrepreneurial university criteria, will be compared with previous studies to find the similarities and differences between them. Doing so will potentially pave the way to show the importance of the present thesis and its contribution to fill current gaps presumably both in OpRec and entrepreneurial universities. After discussing all the findings, this chapter will provide details about the developed empirical model.

6.1 Defining the Entrepreneurial Opportunity Recognition

In line with Siegel and Renko (2012) and Glavas et al. (2017), the findings of this thesis show that there is weak agreement on the definition of entrepreneurial OpRec among entrepreneurship scholars. There are three reasons for this. Firstly, there are various and contradictory definitions for entrepreneurial opportunity itself (Renko, 2008). Secondly, there is a lack of agreement on what determines the OpRec process (Glavas et al., 2017; Siegel & Renko, 2012) as shown earlier in the Chapter Two (also see Table 2.2). Thirdly, having no single definition for entrepreneurship (Day et al., 2006; Gartner, 1994; Hatt, 2018) raises similar issues in terms of understanding OpRec.

Despite the weak agreement on all aspects of the OpRec concept, two of these aspects (commercial intent and value creation) gained the consensus of all five universities under study. In addition, two other aspects (doing new things and finding gaps in the market) gained the consensus of two of the universities under study. There is support in the literature for considering the above four aspects in the OpRec definition. With respect to commercial intent, it is one of the main features that has been considered by Hills and Singh (2004), Lumpkin and Lichtenstein (2005), Barringer and Ireland (2016) and Kuckertz et al. (2017) when they defined the OpRec phenomenon. For value creation, this is considered only by the definition of Lumpkin and Lichtenstein (2005) for OpRec. As for doing new things, this is supported, to some extent, by the definitions of Hills and Singh (2004) and Barringer and Ireland (2016) for OpRec. Concerning finding gaps in the market, this is somewhat supported by the definitions of Sarasvathy et al. (2010) for OpRec.

By comparing the preliminary definition²¹ and final definition²² of entrepreneurial OpRec, it can be noted that although there is no contradiction between them, commercial intent is the only common point between the two definitions. Thus, it can be said that the language that has been used by entrepreneurship scholars is slightly different from that used by the

²¹ This definition has resulted from discussing and evaluating the definitions available in the literature.

²² This definition has been produced by analysing the data of the present thesis.

respondents of this thesis. This may be due to the fact that most of entrepreneurial OpRec definitions available in the literature are either related to SMEs or developed in text books. There is no definition of entrepreneurial OpRec within the universities context in the literature. Therefore, the final definition developed by the thesis for the entrepreneurial OpRec makes a strong contribution to a better understanding of this phenomenon.

6.2 Entrepreneurial Opportunity Recognition Determinants

6.2.1 Networking

Much of the entrepreneurship literature suggests that networking plays a considerable role in recognizing entrepreneurial opportunities (Ardichvili et al., 2003; Ardichvili & Cardozo, 2000; Arenius & De Clercq, 2005; Baron, 2006; Barringer & Ireland, 2016; Bhagavatula et al., 2010; Davidsson & Honig, 2003; Franzoni, 2007; George et al., 2016; Lim & Xavier, 2015; Lumpkin et al., 2004; Nicolaou et al., 2009; Ramos-Rodríguez et al., 2010; Shu, Ren, & Zheng, 2018; Tang, 2010; Veilleux et al., 2018; Wang et al., 2013; Webb et al., 2011). This view is fully supported by the present thesis, which finds that networking is one of the most important, if not the most important, factors that can help entrepreneurial universities in recognizing entrepreneurial opportunities. The findings of this thesis stress the importance of both keeping and strengthening the existing networks and building new ones. In this regard, the findings show that entrepreneurial universities focus more on weak-tie networks. This may be due to the great importance of weak ties when accessing novel resources (Aral, 2016) and when searching for possible opportunities in the market (Rasmussen et al., 2015).

Five strong-tie networks play a considerable role in recognizing entrepreneurial opportunities in entrepreneurial universities. The most important of these is networking with industry, which has gained much attention in the entrepreneurial university literature (e.g. Bramwell & Wolfe, 2008; Clark, 2001; Culkin, 2016; Guerrero & Urbano, 2012; Guerrero, Urbano, Cunningham, et al., 2014; Jacob et al., 2003; Lazzeroni & Piccaluga, 2003; O'shea et al., 2005; Philpott et al., 2011; Wong et al., 2007). In fact, one of the most well-known models for entrepreneurial university is the triple helix (Etzkowitz, 2002, 2012; Etzkowitz & Leydesdorff, 1995, 2000; Leydesdorff & Etzkowitz, 2003). This model is based on the interactions between university (the originator of the novel knowledge/technology), industry (the production locus) and the government (the contractual source). This demonstrates the importance of having strong networks with industry and also with government when seeking opportunities.

With respect to networking with the government, the findings from this thesis supports, to some extent, the above argument by showing that such networking can be significant when recognizing entrepreneurial opportunities. This is because networking with the government helps with gaining access to scarce resources (Le & Nguyen, 2009), information and funds (Yiu & Lau, 2008). In this regard, in the UK, networking with the government can have a

significant impact on the OpRec process of entrepreneurial universities, due to the huge support provided by the UK government for entrepreneurial initiatives (Clarysse et al., 2011; Gibb & Hannon, 2006; Kirby, 2006).

Networking with other universities can also, according to the findings of this thesis, play a role in recognizing entrepreneurial opportunities. This view is partially supported by Ankrah et al. (2013), who conclude that the main beneficial outcome of having greater links with other universities is gaining greater research potential. Such research can be commercial in nature. Bosetti and Walker (2010) also stressed the importance of networking between universities, because this will generate opportunities for both networked universities. However, the focus of Bosetti and Walker (2010) was on universities in other countries, not in the same country.

Alumni, according to the findings from this thesis, is another party with whom networking with can help, in some cases, with recognizing entrepreneurial opportunities. Few studies pay attention to such networking. For example, Hare (1999) concludes that many UK universities maintain links with their alumni due to the support provided by these alumni to those universities. In this regard, the studies of Prince (2007) and Prince and Beaver (2007) show that networking with alumni is one of the main factors that determines the mix and scale of the universities' third stream activity. The latter includes all income generating/commercial activities, such as KTPs, enterprises and SMEs support, consultancy, training programmes, contract research and accreditation (Prince, 2007). Networking with alumni also helps to attract new students (Mitchell, 2015).

In addition to the above four types of networking, the present thesis finds that internal networking can impact the process of OpRec. In this regard, Miller (1983) concludes that internal networking influences entrepreneurial activities, because it helps to connect individuals with different skills in a way that enables them to collaborate and produce innovative ideas and find creative solutions to different types of issues. In addition, Walter et al. (2006) and Rasmussen et al. (2011) finds that internal networks contribute greatly to university spin-off success.

6.2.2 Prior knowledge

The findings from this thesis reveal that having sufficient knowledge and experience can contribute highly towards recognizing entrepreneurial opportunities. There is substantial evidence to support this view (e.g. Ardichvili et al., 2003; Ardichvili & Cardozo, 2000; Arentz et al., 2013; Baron, 2006; Barringer & Ireland, 2016; Bloodgood et al., 2015; Felin & Zenger, 2009; Franzoni, 2007; Gaglio, 2004; Gaglio & Katz, 2001; García-Cabrera & García-Soto, 2009; George et al., 2016; Hulbert et al., 2015; Kohlbacher et al., 2015; Kuckertz et al., 2017; Lim & Xavier, 2015; Macpherson et al., 2004; Marvel & Droege, 2010; McMullen & Shepherd, 2006; B. Mueller & Shepherd, 2012; Park, 2005; Patzelt & Shepherd, 2011; Pech

& Cameron, 2006; Ramos-Rodríguez et al., 2010; Sambasivan et al., 2009; Shane, 2000; Shane & Venkataraman, 2000; Shepherd & DeTienne, 2005; Tang, 2010; Veilleux et al., 2018; Wang et al., 2013; Webb et al., 2011).

With respect to the various types of knowledge, three of them play a key role in recognizing entrepreneurial opportunities. The first and most important is knowledge about the industry. In this regard, Shane (2000) finds that prior knowledge about markets, as well as prior knowledge about the methods of serving markets, are one of the most important types of knowledge required for recognizing entrepreneurial opportunities. A similar pattern of results was obtained in the study of Westhead et al. (2011), who conclude that specific industry know-how is the main type of human capital required for entrepreneurship.

The above view is also supported by Ko (2004), who finds that having knowledge about how to serve the market can greatly help those who recognize opportunities. However, the OpRec literature does provide some views that are inconsistent with the findings of Ko (2004) and the three above-mentioned views. For instance, the opponents to this view believe that individuals from outside the industry may look at things with a different lens, in a way that helps them to become more innovative than individuals with prior industry experience (e.g. Barringer & Ireland, 2016). Despite such opposition to the importance of prior knowledge and experience, there is literature that supports such importance for entrepreneurship, and for OpRec in particular, and also support for being innovative (Darroch, 2005; Du Plessis, 2007; McAdam, 2000).

The second type is knowledge about how to run businesses (business knowledge). Very little evidence has been found in the literature to support this view. This may be due to the fact that the OpRec phenomenon has been studied more within the context of commercial organizations. The only study that is directly consistent with these findings was conducted by Westhead et al. (2011), who find that prior business ownership experience is one of the main types of human capital required for entrepreneurship. Thus, having business knowledge is a matter of course. This does not universally apply to the universities context. Therefore, Kirby (2006) concludes that entrepreneurial universities are those who provide programmes and training that equip their staff with the knowledge and skills that help them when conducting commercial activities.

The third type is knowledge about students. Considering that students are customers, Shane (2000) and Shepherd and DeTienne (2005) conclude that knowledge about customers can greatly contribute towards the recognition of entrepreneurial opportunities. This is because a large proportion of university services are offered to students.

6.2.3 Creativity

The findings from this thesis show that creativity is an indispensable element in the entrepreneurial OpRec process. These findings are directly in line with previous findings

(Ardichvili et al., 2003; Barringer & Ireland, 2016; de Jong & Marsili, 2015; García-Cabrera & García-Soto, 2009; Hulbert et al., 2015; Kuckertz et al., 2017; Lumpkin et al., 2004; Nicolaou et al., 2009; Webb et al., 2011). In fact, entrepreneurial OpRec, or part thereof, is seen as a creative process (Barringer & Ireland, 2016) or an innovative action (Lumpkin et al., 2004; O'Connor & Rice, 2001), and is expected more from creative individuals (Shane & Nicolaou, 2015).

The findings from this thesis also show that there are three sources of creativity required for OpRec: teamwork, positive feelings and emotions and continuously thinking of new ideas. With respect to teamwork, the findings of this thesis show that having a team of creative individuals (or at least working as a team) can contribute substantially to recognizing entrepreneurial opportunities. In this regard, Robinson (2011) shows that creativity is not only a product of an individual performance, it emerges as a result of the interaction with the others' ideas and accomplishments. Folkestad and Gonzalez (2010) support the above view by arguing that effectual teambuilding is a significant element of creativity and innovation.

In terms of the importance of positive feelings and emotions for OpRec, Baron (2008) fully supports as such by showing that this positive affect enhances the creativity required for OpRec. Kuckertz et al. (2017) also show that a positive affect is significantly associated with OpRec. In addition, Lerner et al. (2015) conclude that emotions have an impact on the way that individuals address problems and deal with opportunities.

As for the continuously thinking about new ideas, the literature shows that the creativity required for OpRec produces new ideas that have the potential to become businesses (Barringer & Ireland, 2016; Hansen, Lumpkin, et al., 2011; Heinonen et al., 2011). However, the findings from this thesis show that producing such ideas needs to be an ongoing process. This view is supported by Koch et al. (2018), who conclude that organizational creativity is an ongoing, risky and interactive process.

6.2.4 External environment changes

In line with previous studies (Charles, 2003; Coyle et al., 2013; Dill, 2001; Navarro & Gallardo, 2003; Vohora et al., 2004), the findings from the present thesis show that there are continuous, rapid and dramatic changes in the external environment in which UK universities operate. These changes produce complexity, nervousness and threats, but also opportunities. Therefore, these universities must deal with these changes in a way that helps them gain relevant opportunities and convert those threats into opportunities. To do so, universities need to respond to external environment factors.

The present thesis shows that although there are a number of these factors, five of them have the greatest impact on the activities and processes (including the OpRec process) of those universities. The first factor is the competitors (the other universities), which belong to

the micro environment. The findings from this thesis, in this regard, show that UK universities experience strong competition. The studies of De Fraja and Iossa (2002) and Chapleo (2007) support this view. With respect to OpRec, Veilleux et al. (2018) show the importance of considering competitors while thinking of opportunities, because failing to gain an opportunity may allow competitors to gain that same advantage.

The second factor is the political variables, with a focus on government initiatives towards entrepreneurship and its policies relating to higher education. This ties well with the studies of Dill (2001), Charles (2003), Gibb and Hannon (2006), Todorovic et al. (2011), Williams and Kluev (2014). In this regard, it is worth mentioning that the potential impact of Brexit has had much attention from the senior staff of UK universities when considering opportunities. In fact, the findings from this thesis show that Brexit may bring, for universities, more threats than opportunities. On the other hand, it may motivate these universities to think of other opportunities, albeit little evidence has been found in the literature in support of the above view. This may be due to the fact that the implications of Brexit are not yet fully realised. Mayhew (2017) offers the only study that directly touches on the potential impact of Brexit for UK universities, and partially supports the findings from the present thesis regarding Brexit, because they view Brexit as a threat only.

The third factor is technological advances, which keeping pace with can help with being proactive and entrepreneurial when dealing with opportunities. This is consistent with what has been found by de Jong and Marsili (2015), who conclude that rapid technological advances present new opportunities for entrepreneurs. Furthermore, keeping pace with such advances can help them find new ideas and solutions in a more effective and quick way. Baron and Ensley (2006) and Baron (2006) also support the idea of considering the technological advances while thinking of entrepreneurial opportunities. They conclude that OpRec is the result of finding connections between independent events. One of these events is advancements in technology.

The fourth and fifth factors are the economic and social variables. These two factors are discussed together under the term 'socio-economic' in many studies, which includes OpRec ones (e.g. Arentz et al., 2013; Charles, 2003). Changes in these two factors, according the above-mentioned studies, can be the reason for the emergence of different types of opportunities, including entrepreneurial ones.

The importance of the above four macro environment factors for OpRec is fully supported by Baron (2006), Hulbert, et al. (2013) and Kohlbacher et al. (2015). In this regard, Baron (2006) concludes that changes in technology, political, economic, social and demographic factors result in emerging new business opportunities, which can be recognized by using cognitive frameworks that help with finding connections between these changes.

The findings from this thesis also show that responding to the above-mentioned changes requires a university to be fast and proactive when aiming at gaining entrepreneurial opportunities. The importance of being fast when responding to the opportunities that emerged from the external environment is supported by Fiet (2007), who concludes that responding quickly to environmental changes is one of the main means used to obtain venturing opportunities. Zaheer and Zaheer (1997) also support the above view, as they believe that responding quickly to the changing environmental signals helps when obtaining relatively unique information, which can contribute to the process of OpRec.

With respect to proactiveness, Navarro and Gallardo (2003) find that due to the considerable changes in the university environment, there is a demand for universities to conduct new activities and provide new services. This requires being entrepreneurial and proactive when responding to these changes. Despite the importance of being quick and proactive when responding to changes, the findings from this thesis show that in some cases it is difficult for universities to have such a response. This may be due to the bureaucracy that still (to some extent) exists in UK universities, despite serious attempts to reducing its levels by the senior leaders of these universities (Bosetti & Walker, 2010; Martin, 2016).

Dealing with the above-mentioned environment requires, according to the findings from this thesis, risk taking and allowing for failure. This is fully supported by Neill et al. (2017), who find that risk propensity is one of the factors that determines the process of entrepreneurial OpRec. This is logical because OpRec is a fundamental phase of the entrepreneurship process (Baron, 2004a; Churchill & Muzyka, 1994; Hisrich et al., 2013; Ozgen & Baron, 2007), and risk taking is considered one of the most important factors for entrepreneurship to emerge (Churchill & Muzyka, 1994). Moreover, risk-taking is seen as one of the main characteristics of entrepreneurs (Djankov et al., 2006; Hatt, 2018; Hébert & Link, 2006; Mordi et al., 2010). In fact, risk-taking is also important in the context of entrepreneurial universities, who are both able and willing to operate within risky circumstances in a changing business environment (Burykhina, 2009; Etzkowitz, 2013; Kirby, 2002).

Responding to the changes in the external environment helps, according to findings from this thesis, to identify the unmet needs of students, industry, businesses and society. This, in turn, can contribute highly to recognizing entrepreneurial opportunities. Similar results were obtained in the studies of Marvel and Lumpkin (2017) and Shaw and Carter (2007), who show that unmet needs are one of the main motives of OpRec.

6.2.5 Entrepreneurial alertness

The findings from this thesis show that being entrepreneurially alert contributes towards spotting opportunities in a faster and easier way. Therefore, entrepreneurial alertness can be considered one of the main factors in the OpRec process. Overall, these findings are in accordance with those reported by various authors (Ardichvili et al., 2003; Ardichvili &

Cardozo, 2000; Baron, 2006; Barringer & Ireland, 2016; de Jong & Marsili, 2015; Gaglio, 2004; Gaglio & Katz, 2001; García-Cabrera & García-Soto, 2009; George et al., 2016; Hulbert et al., 2015; Kohlbacher et al., 2015; Kuckertz et al., 2017; Lim & Xavier, 2015; Sambasivan et al., 2009; Veilleux et al., 2018; Webb et al., 2011). The great importance of alertness for OpRec is due to the fact that alertness is a significant dimension of entrepreneurship and is seen as the 'sixth sense' of entrepreneurs (Barringer & Ireland, 2016).

The findings also show that there are five sources for being entrepreneurially alert to opportunities in the universities context. The first source is horizon scanning activities, which can help in exploring future changes in the external environment. This is fully supported by both Van Rij (2010) and Amanatidou et al. (2012), who consider horizon scanning as a relevant tool for being aware of potential (future) opportunities and threats. Other support comes from Kirzner (1997), who claims that entrepreneurs scan the horizon continuously. Therefore, they are always alert to entrepreneurial opportunities and ready to discover new ones. In addition, Tang et al. (2012) and Kuckertz et al. (2017) conclude that environmental scanning and searching for information is an essential phase of entrepreneurial alertness.

The second source is finding a connection between unrelated information/areas. This view is fully supported by a number of authors (e.g. Campos, 2017; Kuckertz et al., 2017; Obschonka et al., 2017; Tang et al., 2012). In this regard, Baron (2006) and Baron and Ensley (2006) conclude that employing cognitive frameworks help with "connecting the dots" between seemingly uncorrelated events and trends in the external environment, which in turn results in recognizing entrepreneurial opportunities.

The third source is distinguishing between value creation/profitable opportunities and non-value creation/non-profitable opportunities. In this regard, it is worth mentioning that the findings from this thesis show that distinguishing both value creation opportunities and profitable opportunities from other types of opportunities can help with being entrepreneurially alert. However, by considering the definition developed by this thesis for entrepreneurial OpRec, it can be claimed that it is more concerned with value creation. Yet, the literature focusses more on distinguishing profitable opportunities from non-profitable ones (Campos, 2017; Kuckertz et al., 2017; Obschonka et al., 2017; Tang et al., 2012).

The fourth source is being aware of those opportunities overlooked by others. This view is directly in line with the ideas of Kirzner (1979) for entrepreneurial alertness, which is seen as the ability to be aware of opportunities that have been overlooked. In the same vein, Tang et al. (2012) concludes that there is a need to develop insights into the value of certain information that is overlooked by others in order to be entrepreneurially alert.

The fifth source for entrepreneurial alertness is being open-minded. This is consistent with what has been found by Gaglio and Katz (2001), who conclude that the more individuals are open-minded, the more they will be entrepreneurially alert to opportunities. Corbett (2007)

also supports the idea of the importance of being open-minded when recognizing entrepreneurial opportunities.

6.2.6 Systematic search vs serendipitous discovery

The findings from this thesis show that recognizing entrepreneurial opportunities depends heavily on the activities of a systematic search for opportunities. However, in some cases, these opportunities are recognized serendipitously, and in some other cases, they are recognized as a result of both random chance and systematic search.

With respect to the recognition of opportunities through searching for them deliberately, the literature strongly supports this view (e.g. Ardichvili et al., 2003; Baron, 2006; García-Cabrera & García-Soto, 2009; George et al., 2016; Hsieh et al., 2007; Hulbert et al., 2015; Pech & Cameron, 2006; Sambasivan et al., 2009; Sinclair & D'Souza, 2011; Veilleux et al., 2018). Such a search, according to the findings of this thesis, needs to be an ongoing activity, and also needs to involve market research.

For the former, Shoham, Baruchson-Arbib, and Gouri-Oren (2006) conclude that the main motivation behind the continuous searching for opportunities is the uncertain situation faced by today's organizations, as well as an insufficiency of information. On the other hand, De Clercq, Sapienza, and Crijns (2005) conclude that proactiveness is the main reason behind engaging in continuous searching for opportunities activities. In fact, both uncertainty and proactiveness play a considerable role in thinking seriously about recognizing entrepreneurial opportunities. Therefore, both of the above arguments can be considered valid support for the findings of this thesis. As for market research, Hulbert et al. (2013) and Macpherson, et al. (2004) consider it as one of the factors that determine OpRec; and Sambasivan et al. (2009) view it as one of the skills of OpRec. Also, Renko et al. (2012) consider market research along with business planning as significant tools for entrepreneurs, while spotting sizeable opportunities. This somehow supports the above findings regarding market research.

As mentioned earlier, some entrepreneurial opportunities are recognized serendipitously. This view is supported by a number of scholars (e.g. Ardichvili et al., 2003; Ardichvili & Cardozo, 2000; Hulbert et al., 2015; Spence, 2003; Veilleux et al., 2018). However, the third approach (recognizing opportunities through both luck and systematic search) found by this thesis has not been supported by the literature. This may be due to the fact that this approach represents the other two approaches. However, this thesis suggests that the third approach is a mix of both of them, which is different from considering each one separately.

6.3 Interactions Between Opportunity Recognition Determinants

The findings of this thesis show that there is some interaction between a number of OpRec determinants. The first interaction is between networking and the other entrepreneurial

OpRec determinants. This is consistent with what has been found in previous studies, which show that there is an interaction between networking and dealing with external environment changes (Barringer & Ireland, 2016), networking and prior knowledge (Hisrich et al., 2013), networking and creativity (Ardichvili et al., 2003), networking and entrepreneurial alertness (Adomako et al., 2018; Khare & Joshi, 2018), networking and systematic search (Ozgen & Baron, 2007) and networking and serendipitous discovery (Dew, 2009).

The second interaction is between dealing with external environment changes and how it interacts with the other entrepreneurial OpRec determinants considered by the present research, except for serendipitous discovery. The findings are directly in line with previous findings that show that there is an interaction between dealing with the external environment changes and prior knowledge, entrepreneurial alertness, creativity, networking (Barringer & Ireland, 2016) and systematic search for opportunities (Brouthers et al., 2015).

The third interaction is between prior knowledge and entrepreneurial alertness and creativity. These findings tie in well with previous studies, which show that the prior knowledge required for OpRec interacts with both creativity (Shepherd & DeTienne, 2005) and entrepreneurial alertness (Ardichvili & Cardozo, 2000; Hulbert et al., 2015). The fourth interaction is between entrepreneurial alertness and creativity. This view is supported by both Campos (2017) and Obschonka et al. (2017), who focus on the important role played by creativity for being entrepreneurially alert.

6.4 Resources Characteristics

The findings from this thesis show that resources can play a great role in recognizing entrepreneurial opportunities in the universities context, through enhancing the six considered factors that determine the process of entrepreneurial OpRec in those universities. These resources, or some of them, have a number of characteristics in the universities context. The first characteristic is that they are valuable and contribute towards increasing the worth of the universities' services and enhance their reputation, thus gaining entrepreneurial opportunities. In this regard, Li et al. (2014) conclude that having valuable resources can benefit firms in several areas, including in gaining opportunities. With respect to the universities context, the findings from this thesis reveal that the most valuable resources are human resources. This, to some extent, is supported by Leitner (2004) who conclude that the researchers, students and their networks are the most valuable resources in universities.

The second characteristic is that most of these resources are available in/for other universities, but they are flexible and can be mixed in a way that helps with producing a unique mix. In fact, bringing resources together and finding an integration between them is the foundation that can distinguish an organization from others, and thus helps with gaining and achieving a competitive advantage. Along these lines, Ramachandran and Ray (2006)

conclude that what makes such a mix unique is being 'dynamic and evolving'; the items in it can be changed in a way that means a new combination can be created. This makes this mix complicated and difficult to copy.

The findings from this thesis also show that some entrepreneurial universities' resources can be unique, or are in some aspects unique. Examples of these are partnerships include human resources, schemes of enterprises, learning and teaching facilities, laboratories and growth programmes. With respect to partnerships, Clauss (2017) concludes that unique partnerships are external resources that help firms to become more innovative. For human resources, Cassanelli et al. (2017) conclude that universities usually have unique human resources, especially in R&D units. As for the other four examples (schemes of enterprise, learning and teaching facilities, laboratories and growth programmes), no direct evidence has been found to support them.

The third characteristic is that most of these resources are easy to imitate, but what cannot be copied (or is difficult to be copied) is the culture. The latter view is supported by both Ip (2003) and Panda, Gupta, and Kalra (2012) who conclude that cultures cannot be replicated or imitated, because they need time to evolve and are also determined by the context.

The findings from the present thesis also show that a unique resource mix and human resources, in some cases, is difficult to imitate. Morgan et al. (2006) support the view of the difficulty of imitating others' resource mix by arguing that such a mix is one of the sources of inimitability. As for human resources, Gannon, Flood, and Paauwe (1999) conclude that nurturing these resources properly make them useful, unique and difficult/costly to imitate and therefore contributes to achieving competitive advantage.

The fourth characteristic is that most of these resources are managed effectively in a way that helps with exploiting the competitive potential offered by them; there is substantial evidence to support this view (Lockett & Wright, 2005; O'shea et al., 2005; Powers & McDougall, 2005). These studies focus more on employing the university resources for developing commercial activities.

6.5 Defining the Entrepreneurial University

The findings from this thesis indicate that a strong agreement on the definition of entrepreneurial university has not been found. This is consistent, to some extent, with the work of Kirby et al. (2011), in which a lack of unanimity regarding the entrepreneurial university definition was found. Such a view is also supported by Jaminki (2017), who argues that EntUni lacks a single definition and meaning. One possible reason for this could be the third reason discussed earlier, when the discussion was related to the OpRec definition. This reason is related to the fact that entrepreneurship scholars have found no single definition of

entrepreneurship (Day et al., 2006; Gartner, 1994; Hatt, 2018). Then, when the latter is considered by any contexts, it may face the same issue.

Despite not having a complete agreement on all aspects of the entrepreneurial university concept, four of these aspects have gained considerable agreement by the universities under study. In fact, two of them have gained the consensus of all five universities under study. These aspects are business orientation and being innovative. With respect to the former, it is one of the main aspects that have been considered in the entrepreneurial university definitions of Etzkowitz (1983), Jacob et al. (2003) and Burykhina (2009). As for the latter, it has gained considerable attention in the definitions of a number of scholars for entrepreneurial universities, such as Clark (1998), Kirby (2002), Burykhina (2009) and Sam and van der Sijde (2014). The third aspect, which has gained the attention of four of the above-mentioned universities, is being good at spotting opportunities. This is supported by the definition of Kirby (2002), which shows that entrepreneurial universities are capable of recognizing and creating opportunities. As for the fourth aspect, this is related to value creation. The definitions of Zhou and Peng (2008), Salamzadeh et al. (2011) and Sam and van der Sijde (2014) partially support this aspect as part of the entrepreneurial university definition, since they focus on the value that is created for society and the economy.

The above discussion seems to indicate that the definition of the EntUni produced by this thesis can contribute to a comprehensive understanding of this phenomenon, since its aspects have gained the agreement of almost all universities.

6.6 Entrepreneurial University Factors

6.6.1 Supportive environment for entrepreneurship

The findings from the thesis show that establishing a supportive environment for entrepreneurship is a crucial factor behind being an entrepreneurial university. This view is supported by Kalar and Antoncic (2015), who conclude that entrepreneurial universities invest considerably into developing an environment that promotes entrepreneurship and knowledge transfer. This thesis shows that universities can use six activities and means as enablers for establishing the above-mentioned environment. First, supporting and practicing entrepreneurship by the Chancellor and Vice-Chancellor is one such activity. This view is somewhat supported by Sporn (2001), Nelles and Vorley (2010) and Aranha and Garcia (2014), who consider leadership as the main element in their models developed for entrepreneurial universities. Kirby (2006) concludes that Vice-Chancellors play a considerable role in endorsing a university's entrepreneurial activities.

The second enabler is establishing an entrepreneurial culture. This is in line with some previous studies (e.g. Aranha & Garcia, 2014; Clark, 1998; Farsi et al., 2012; Nelles & Vorley, 2010; Rothaermel et al., 2007; Sporn, 2001), in which culture is considered the main element

in the models they developed for the entrepreneurial university phenomenon. In addition to the above models, Kirby (2002), Kirby et al. (2011), Kalar and Antoncic (2015) and Guerrero et al. (2015) show that entrepreneurial universities promote an entrepreneurial culture that, in turn, helps with embedding entrepreneurialism into teaching and research, and facilitates entrepreneurial activities in the universities.

The third enabler is encouraging and supporting students to be entrepreneurial. This view is supported by a great number of studies (e.g. Bergmann, Hundt, & Sternberg, 2016; Fayolle & Gailly, 2015; Gielnik et al., 2015; Grimaldi, Kenney, Siegel, & Wright, 2011; Jansen, van de Zande, Brinkkemper, Stam, & Varma, 2015; Nabi, Liñán, Fayolle, Krueger, & Walmsley, 2017; Zhang, Duysters, & Cloudt, 2014). In this regard, Guerrero, Urbano, Cunningham, et al. (2014) conclude that the students' entrepreneurial orientation is one of the key indicators of entrepreneurial universities.

The fourth enabler is flexible structures that facilitate entrepreneurship. In this regard, Sporn (2001) and Guerrero and Urbano (2012) conclude that structures are one of the main factors that contribute to the shift towards an entrepreneurial university mode. Moreover, Nelles and Vorley (2010) conclude that structures assist in implementing the third mission of entrepreneurial universities.

The fifth enabler is the establishment of entrepreneurship, enterprise and innovation centres. Very little evidence has been found in the literature in support of the ideas of establishing centres concerned with entrepreneurialism in entrepreneurial universities. This may be due to the fact that it is natural for any university with an entrepreneurial orientation to have such centres. Two studies directly touch on the importance of the above-mentioned centres. The first was by Kirby (2006), who concludes that entrepreneurship centres help in co-ordinating and integrating the entrepreneurship approaches of academics and practitioners across the university. The second study was by Boh, De-Haan, and Strom (2016), who show that entrepreneurship centres contribute to the development and management of entrepreneurship courses. They also promote entrepreneurship within the university. In addition, they facilitate technology transfer through collaboration with a technology transfer office (TTO). With respect to innovation centres, Lazzeroni and Piccaluga (2003) and Gibb and Hannon (2006) conclude that entrepreneurial universities use these centres to establish bridges with industry. These conclusions are consistent with the findings of the present thesis. Taking the same line, Etzkowitz et al. (2000) believe that entrepreneurial universities establish innovation centres as a result of responding to government policies.

The sixth enabler is encouraging and enabling all faculties/schools to possess some entrepreneurial element. Little evidence has been found in the literature in support of this view. The only study that is directly in line with this finding is by Robertson and Collins (2003), who conclude that there is a real need to develop staff across all faculties in a way that helps them facilitate activities related to enterprising and entrepreneurship across the university.

6.6.2 Placing enterprise, entrepreneurship and innovation in the university strategy

The findings from this thesis suggest that the university strategy can contribute significantly to facilitating entrepreneurial activity within the university. This result ties well with Gibb (2012), wherein strategy is considered one of the key areas of university entrepreneurial potential. Therefore, it is significant to consider the aspects relating to entrepreneurialism within the university strategy. According to the findings from this thesis, these aspects are enterprising, entrepreneurship and innovation.

The findings show that placing enterprising in the university strategy was evident in all cases. On the other hand, incorporating entrepreneurship into this strategy was evident in only two cases. One possible reason for the latter is that, in some case, the words enterprise and entrepreneurship are used interchangeably (Khare & Joshi, 2018). This applies to the universities context. However, Gibb (2012) disagrees with the above view by defining these two phenomena separately and by showing that they are complementary to each other, but not synonyms. On the other hand, Gibb (2012) supports the idea of universities embracing enterprise and entrepreneurship. However, he calls for considering the challenges and issues that may emerge as a result of such incorporation. Kirby (2006) also supports incorporating enterprise into university strategy, with a view to actively promote enterprising activities.

As for innovation, the findings show that it has gained considerable attention by the five universities under study; four of them placed innovation in their organizational strategy. This is logical due to the importance of innovation for universities in general and for entrepreneurial universities in particular. There is substantial evidence to support the latter view. For instance, Clark (1998), Kirby et al. (2011) and Sam and van der Sijde (2014) show that innovation is one of the main dimensions of entrepreneurial universities. In addition, Zhou and Peng (2008) show that one of the main characteristics of entrepreneurial universities is that their substantial innovations facilitate the process of knowledge spillover.

6.6.3 The three missions of universities

6.6.3.1 Teaching (first mission) and entrepreneurship

The findings from this thesis suggest that enterprise, entrepreneurship and innovativeness can be observed in the teaching methods of certain academics, as well as in the modules of various subject areas in entrepreneurial universities. With respect to enterprise and entrepreneurship in teaching, a huge amount of literature can be found relating to entrepreneurship education and enterprising education. These two words are often used interchangeably, however, the present thesis will use the term proposed by Erkkilä (2000), which is entrepreneurial education. This is because this term covers both enterprise education

and entrepreneurship education. The latter is considered by some models to describe how to be an entrepreneurial university. For example, Guerrero and Urbano (2012) view entrepreneurship education as one of the environmental conditioning factors in their model for transformation towards an entrepreneurial university. Also, Gibb (2012) considers entrepreneurship education as one of strategic factors for the development of an entrepreneurial university.

As discussed above, teaching in entrepreneurial universities includes, in some courses, using entrepreneurship principles while delivering them, as well as embedding entrepreneurship within these courses. These findings tie in well with Laukkanen (2000) and Co and Mitchell (2006), wherein entrepreneurial education includes two approaches: education 'about' and 'for' entrepreneurship. However, this ties in better with Johnson (1988), Caird (1990) and Mwasalwiba (2010), in which three main approaches of entrepreneurial education have been identified: education 'about', 'for' and 'through' entrepreneurship/enterprise. More importantly, the above-mentioned result is fully supported by Heinonen and Hytti (2010), who show the important role played by teaching in developing entrepreneurial universities. They rely on the above-mentioned three approaches to reveal this role. Then, they confirmed that teaching 'about', 'for' and 'through' entrepreneurship is one of the factors that helps with being an entrepreneurial university.

6.6.3.2 Impactful research (second mission) and entrepreneurship

The findings from this thesis show that research in entrepreneurial universities makes a difference to the university and has a positive impact on societies, both nationally and internationally. The findings are directly in line with previous studies, which show that the great importance of research in entrepreneurial universities lies in the commercial outcomes of the university research. Examples of these outcomes include academic spin-offs, patenting, trademarks and licensing of innovations (Clauss, Moussa, & Kesting, 2018; Czarnitzki, Grimpe, & Pellens, 2015; Etzkowitz, 2017; Lundqvist & Williams-Middleton, 2008; Williams & Kluev, 2014).

The findings from this thesis also show that the high quality research produced by entrepreneurial universities is impacted by their strong relationships with industry. This is consistent with what has been found in previous studies, which show that the sturdy relationships between industry and entrepreneurial universities (Culkin, 2016; Etzkowitz, 1998; Etzkowitz & Leydesdorff, 1995; Mueller, 2006) leads to significant joint work and research with industry (Czarnitzki et al., 2015; Etzkowitz, 2003, 2017) and conducting applied research (Farsi et al., 2012; Kalar & Antoncic, 2015). Given the importance of research for entrepreneurial universities, researchers are considered key actors (Clauss et al., 2018); multiple resources are allocated for research in these universities, with a view to ensure that

their research adds value to both themselves and to the development of societies (Etzkowitz, 2017).

Despite the above support for the findings from this thesis regarding research in entrepreneurial universities, there are other studies that provide different findings. For example, Czarnitzki et al. (2015) conclude that scholars have some concerns regarding adopting the entrepreneurial university mode, because doing so can have negative implications relating to the quantity and direction of the university research. Examples of these implications involve reducing the focus on noncommercialisable research (Subotzky, 1999) and the trade-off between patenting and publishing (Czarnitzki et al., 2015).

6.6.3.3 Contribution to socio-economic development (Third Mission)

The empirical findings show that entrepreneurial universities play a remarkable role in developing society and the economy. There is substantial evidence to support this view in the literature (e.g. Charles, 2003; Etzkowitz, 2013; Guerrero et al., 2015; Urbano & Guerrero, 2013; Zhou & Peng, 2008). In fact, a number of scholars believe that entrepreneurial universities have emerged because of the “second academic revolution” and the “third mission of the universities”, which called universities to contribute to development of society and the economy, rather than being insular academic institutions (Etzkowitz, 2013; Guerrero & Urbano, 2012; Philpott et al., 2011; Sam & van der Sijde, 2014).

a. Contributions to society development: In line with previous studies (e.g. Audretsch, 2014; Gibb & Hannon, 2006; Leih & Teece, 2016; Rómulo Pinheiro & Stensaker, 2014), this thesis finds that entrepreneurial universities make a difference to their societies and establish better communities. Therefore, when they defined the entrepreneurial university phenomenon, Sam and van der Sijde (2014) stressed the significant role played by such a university in the development of societies. Such a development includes finding solutions for societal problems (Leih & Teece, 2016; Rómulo Pinheiro & Stensaker, 2014), producing high quality graduates who contribute to society’s development (Astebro, Bazzazian, & Braguinsky, 2012) and networking with alumni (Brown, 2016; Krabel, 2017; Ratten, 2017).

Overall, the above views on the role of the EntUni in society are in accordance with the findings from this thesis. However, what has not been directly touched on by the literature is those findings relating to the impact of entrepreneurial universities on the work of other universities, and collaborating organizations and motivating them to become more entrepreneurial. One possible reason for this is that such an impact focuses more on SMEs and not on other types of organizations. This will be discussed in the next section, because findings from this thesis show that the impact of the five entrepreneurial universities (considered by this research) on SMEs is related more to local/regional economic development.

b. Greater/positive impact on the economy: The literature shows that that all entrepreneurial universities have a positive impact on the regional economy (e.g. Etzkowitz, 2013; Etzkowitz & Zhou, 2008; Farsi et al., 2012; Gibb, 2009; Guerrero et al., 2015; Guerrero, Urbano, Cunningham, et al., 2014; Guerrero, Urbano, & Salamzadeh, 2014; Nelles & Vorley, 2010; Rómulo Pinheiro & Stensaker, 2014; Salamzadeh et al., 2011; Sam & van der Sijde, 2014; Urbano & Guerrero, 2013; Zhou & Peng, 2008). The results from this thesis fully support the literature, but at the same time these results provide a modified view, which is that all UK universities (both entrepreneurial and non-entrepreneurial) are expected to have a positive impact on the economy. Therefore, having only a positive impact on the economy cannot be considered one of the main criteria to decide whether or not a university is entrepreneurial, rather entrepreneurial universities are those who have a differential impact on the economy. This can be justified by considering other results from the present thesis, which show that it is easier for entrepreneurial universities to demonstrate their impact through various entrepreneurial and value-added activities, and therefore, they have a greater or more evident impact on the economy.

Regarding the positive impact on the economy, Bramwell and Wolfe (2008), Sam and van der Sijde (2014) and Guerrero et al. (2015) conclude that such an impact comes not only from the entrepreneurial activity of universities, but also from their research and teaching. However, Guerrero et al. (2015) also conclude that the highest impact comes from research and knowledge transfer. With respect to teaching, this thesis supports the findings from the above two studies, since it shows that entrepreneurial universities, through entrepreneurial teaching activities, produce entrepreneurs and business people who can contribute to the economy by creating new businesses. This result also ties in well with Guerrero, Urbano, Cunningham, et al. (2014), who show that entrepreneurial universities encourage their students to be job-creators, not only job-seekers.

As for research, again, this thesis supports the findings of Guerrero et al. (2015) and Sam and van der Sijde (2014), as research in entrepreneurial universities contribute greatly to innovation, improving businesses' performance and establishing entrepreneurial entities. All of these factors can have a positive impact on the economy.

The results from this thesis show that establishing new ventures, spin-outs subsidiaries, and incubations are the main activities that entrepreneurial universities used to create values for themselves, and to contribute to the development of the economy. Jacob et al. (2003), Burykhina (2009), Salamzadeh et al. (2011) and Etzkowitz (2013) support the role played by new ventures created by universities in developing the economy. With respect to spin-offs, there is substantial evidence to support this view. For instance, Mian (1997), Steffensen, Rogers, and Speakman (2000) and Bercovitz and Feldman (2006) consider spin-offs as one of the mechanisms of university technology transfer that contribute to economic growth and prosperity.

In the same vein, Pirnay, Surlemont, and Nlemvo (2003) conclude that one of the main reasons why spin-offs gain the attention of the political and academic authorities is the role they play in helping universities to have a more proactive involvement in the development of their regional economy. The importance of spin-offs lies in creating jobs and taxable wealth, as well as providing role models for local entrepreneurs (Steffensen et al., 2000).

For incubations, Gibb (2009) supports the above finding by arguing that entrepreneurial universities are known for establishing incubators and science parks, which contribute to activating the links between the university and the industry. In this regard, the findings from this thesis show that engaging with and supporting local industry or businesses has a huge impact on the economy. This view is fully supported, in the UK universities context, by the work of Mueller (2006) and Culkin (2016). It is also supported by Etzkowitz (1998) and Etzkowitz and Leydesdorff (1995), who show that university–industry relationships result in multiplying resources and participating in ‘capital formation projects’, which in turn contribute to the development of the regional economy.

The findings from the present thesis stress the importance of the support provided by entrepreneurial universities for the SME sector, which in turn contributes significantly to the development of the economy. Etzkowitz et al. (2000) and Etzkowitz et al. (2008) also stress this importance and encourage this interaction between universities and SMEs. In this regard, Culkin (2016) finds that entrepreneurial universities seek to promote a ‘strategic entrepreneurial mind-set’ among SMEs. One of the other ways for entrepreneurial universities to support the SME sector, according to Edwards and Muir (2005), is by developing individuals with entrepreneurial skills, which can be used for creating SMEs. They find that teaching ‘about’ and ‘for’ entrepreneurship can contribute substantially towards developing these skills.

One of the other contributions of entrepreneurial universities to the economy is that they employ a large number of individuals. This is because they are growing continuously. This argument is supported highly by Hannon (2013) who finds that entrepreneurial universities contribute greatly to finding solutions to unemployment issues. Also, this is supported by Steffensen et al. (2000), who conclude that as a result of conducting various entrepreneurial activities, especially spin-offs, entrepreneurial universities provide a large number of job opportunities for individuals.

The findings from this thesis show that recruiting a larger number of international students is one of the means entrepreneurial universities use to contribute to the economy. This is fully supported by Wong et al. (2007), who consider the recruitment of foreign students as one of the indicators used by many entrepreneurial universities in the UK, Canada, Australia and the United States, for supporting knowledge-based economic development.

6.6.4 Entrepreneurial staff

The findings from the thesis suggest that having and recruiting entrepreneurial staff can be seen as one of the more significant indicators of being an entrepreneurial university. The findings also suggest that entrepreneurial universities are not satisfied with the number of entrepreneurial staff they have; they are always trying to obtain more. Overall, these findings are in accordance with previous findings. For example, Williams and Kluev (2014) conclude that it is significant to build awareness among the staff regarding the importance of entrepreneurship for the university; it is important in entrepreneurial universities that all staff have access to entrepreneurial training.

They also conclude that recruiting those staff with a robust entrepreneurial background can contribute greatly to the establishment of an entrepreneurial culture within the university. A similar conclusion was reached by Meyers and Pruthi (2011), who also conclude that such universities encourage and support their staff to enhance their networking as a way of becoming more entrepreneurial.

Within the same context, Guerrero and Urbano (2012) point out that staff and their favourable attitudes towards entrepreneurship can be one of the main informal factors that helps in being an entrepreneurial university. Also, Gibb and Hannon (2006) conclude that shifting towards an entrepreneurial university mode requires recruiting entrepreneurial staff and leaders.

6.7 The Developed Empirical Model

Since the aim of the present thesis is to grasp how entrepreneurial opportunities can be recognized in the context of entrepreneurial universities through an RBT lens, the developed empirical model considers the most significant factors, resources and capabilities related to them, which determine entrepreneurial OpRec, as well as the factors associated with the EntUni mode. The developed model looks at entrepreneurial OpRec as a process, which needs six steps to be completed, as follows:

a. Identifying the factors that determine OpRec activities: In this step, there is a need to identify the factors and their sources/aspects, which have a profound impact on OpRec activities. Such identification is considered a fundamental step on which the other steps are significantly based. According to this thesis, these factors are as follows:

- (1) Networking, especially with industry, other universities, the government and alumni; also internal networking.
- (2) External environment changes are required to be dealt with quickly and proactively, through responding to the most significant factors that impact the main activities of the university. This may require being ready to take risks, considering people's needs and, in some cases, creating needs for those people.

- (3) Experience and prior knowledge about industry and students, as well as how to run businesses.
- (4) Creativity has a number of sources in the universities context, such as interdisciplinary teamwork, thinking differently, along with positive feelings and emotions. In this regard, it is worth mentioning that creativity requires the continuous thinking of new ideas in addition to constant support.
- (5) Entrepreneurial alertness results from being open-minded, horizon scanning, being aware of opportunities overlooked by others, finding connections between unrelated information/areas and distinguishing between value creation/profitable opportunities and non-value creation/non-profitable opportunities.
- (6) The systematic search for opportunities takes into account that some opportunities can be recognized serendipitously, and thus some other opportunities can be recognized as a result of both a deliberate search for opportunities and luck. With respect to the systematic search for opportunities, this needs to be an ongoing activity. Also, it needs, in some cases, market research.

b. Spotting the interactions between OpRec determinants: There is an interaction between some of the OpRec determinants where one leads to another. Having a clear understanding about such interactions can have a significant impact on the forthcoming steps.

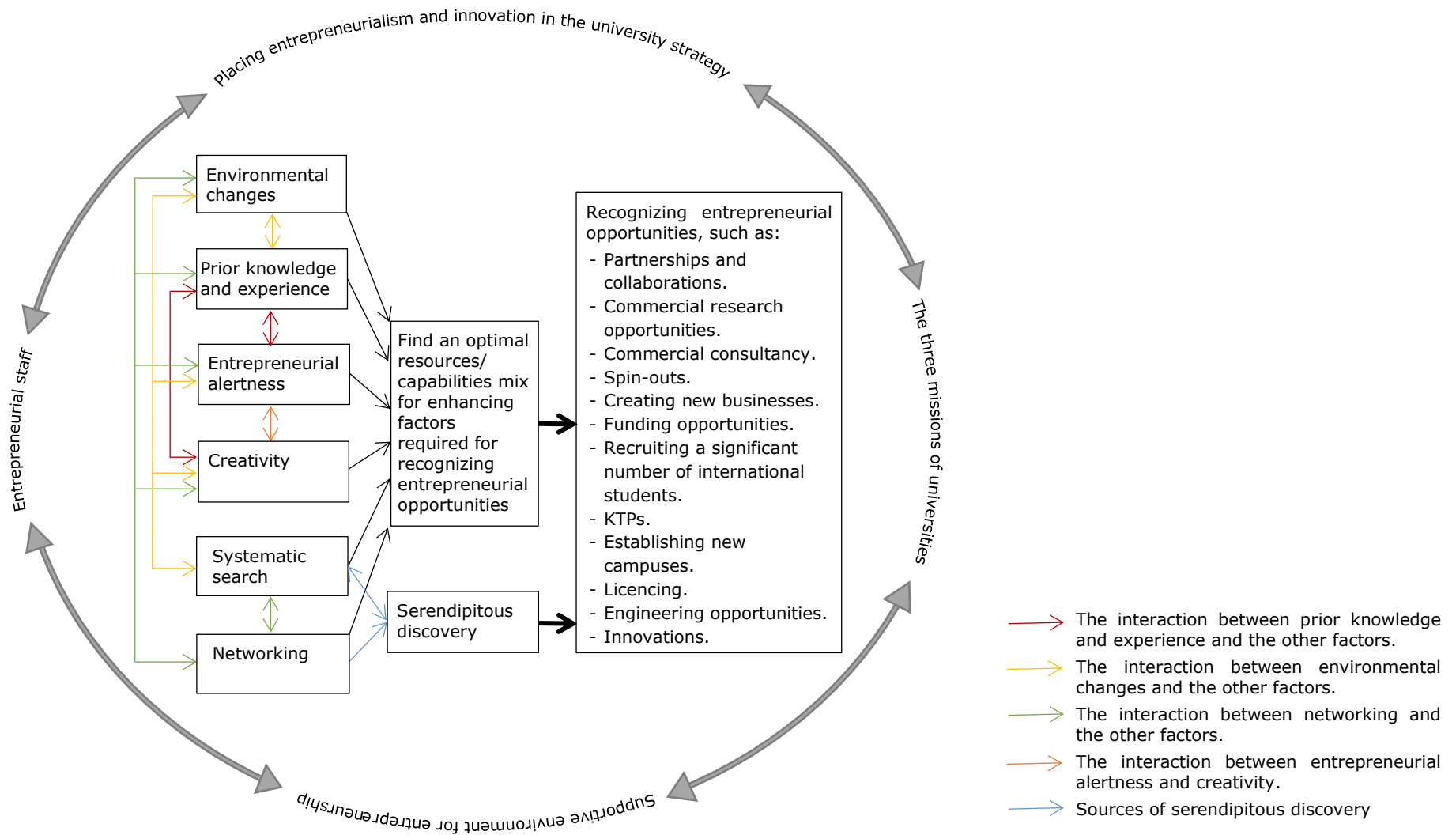
c. Identifying factors associated with the context in which opportunities are recognized: The context of this thesis is entrepreneurial universities, which may employ a number strategies and means that may be somewhat different from those employed by other universities. This may result in producing certain factors that affect the various activities of this type of university. Thus, it can be argued that the entrepreneurial OpRec process is impacted not only by the OpRec determinants, but also by factors related to the context (contextual factors), in which opportunities are recognized. However, the impact of these contextual factors on OpRec determinants is indirect. The contextual factors according to the developed model interact one with another and are distributed over four groups:

- (1) Placing enterprise, entrepreneurship and innovation within the university strategy.
- (2) A supportive environment for entrepreneurship encompasses support from the Chancellor and Vice-Chancellor for entrepreneurial activities, establishing entrepreneurial culture, encouraging and supporting students to be more entrepreneurial, setting up structures that promote entrepreneurship, establishing entrepreneurship, enterprise and innovation centres and ensuring that all faculties/schools have at least some entrepreneurial element.
- (3) The three missions of entrepreneurial universities involve being innovative and entrepreneurial in teaching, having impactful research and having positive and enormous impact of the economy and society.
- (4) Entrepreneurial staff include both current entrepreneurial staff, and those who will be recruited in the future.

d. Deciding resources and capabilities required for recognizing opportunities: In this step, there is a need to provide resources and develop capabilities that can help with dealing with entrepreneurial OpRec determinants. Doing so can help obtain the most benefits from these factors. Here, it is important to point out that deciding the above-mentioned resources and capabilities is directly impacted by step A and B, and also indirectly influenced by step C.

e. Finding an optimal resources/capabilities mix: Once resources are provided and capabilities are developed, opportunity recognizers need to think about finding an optimal mix from those resources and capabilities in a way that helps them to be effective and entrepreneurial in recognizing opportunities. Although this step is impacted by all the previous steps, step (b) can play a considerable role in determining the above-mentioned mix. Having such a mix suggests that various scenarios can be followed when recognizing opportunities.

f. Deciding the opportunities that need to be evaluated: The outcome of the above steps is recognizing a number of entrepreneurial opportunities. The most important of these, in the entrepreneurial universities context, are the partnerships and collaborations, commercial research opportunities, commercial consultancy, spin-outs, creating new businesses, funding opportunities, recruiting a significant number of international students, KTPs, establishing new campuses, licencing, engineering opportunities, and innovations. This step can be also considered the input or fundamental step of the larger process, which is the entrepreneurial process. Therefore, it is important to be most effective in the above-mentioned steps, in order to ensure that the best and most effective opportunities are recognized, which can also be exploited later on to gain competitive advantage.



Note: The order of the examples of entrepreneurial opportunities included in this figure is based on their importance for the sample of the present research.

Figure 6.1 The developed empirical model for entrepreneurial OpRec in the entrepreneurial universities context

Source: Author

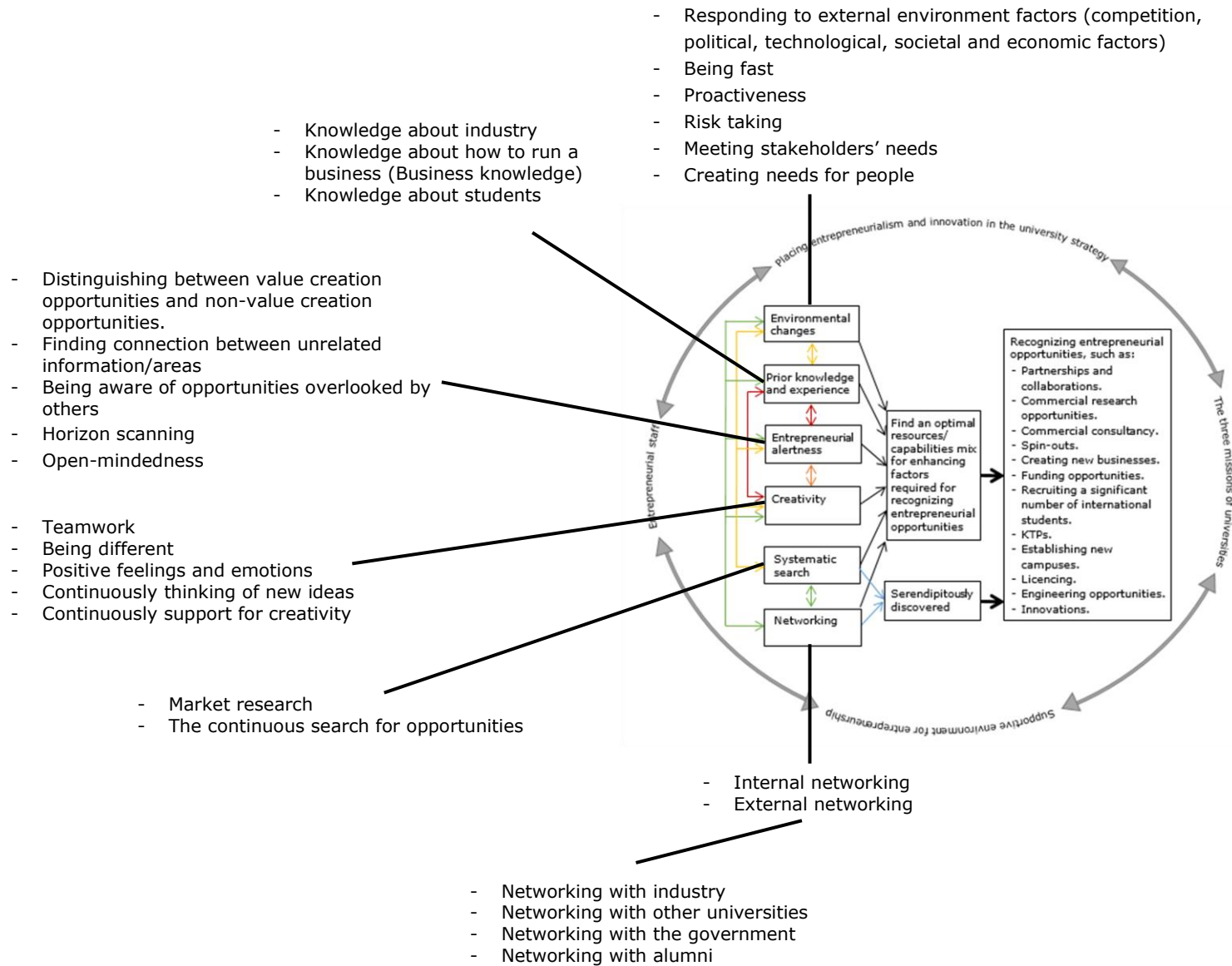


Figure 6.2 A detailed explanation of the factors that determine the OpRec process included in the developed empirical model

Source: Author

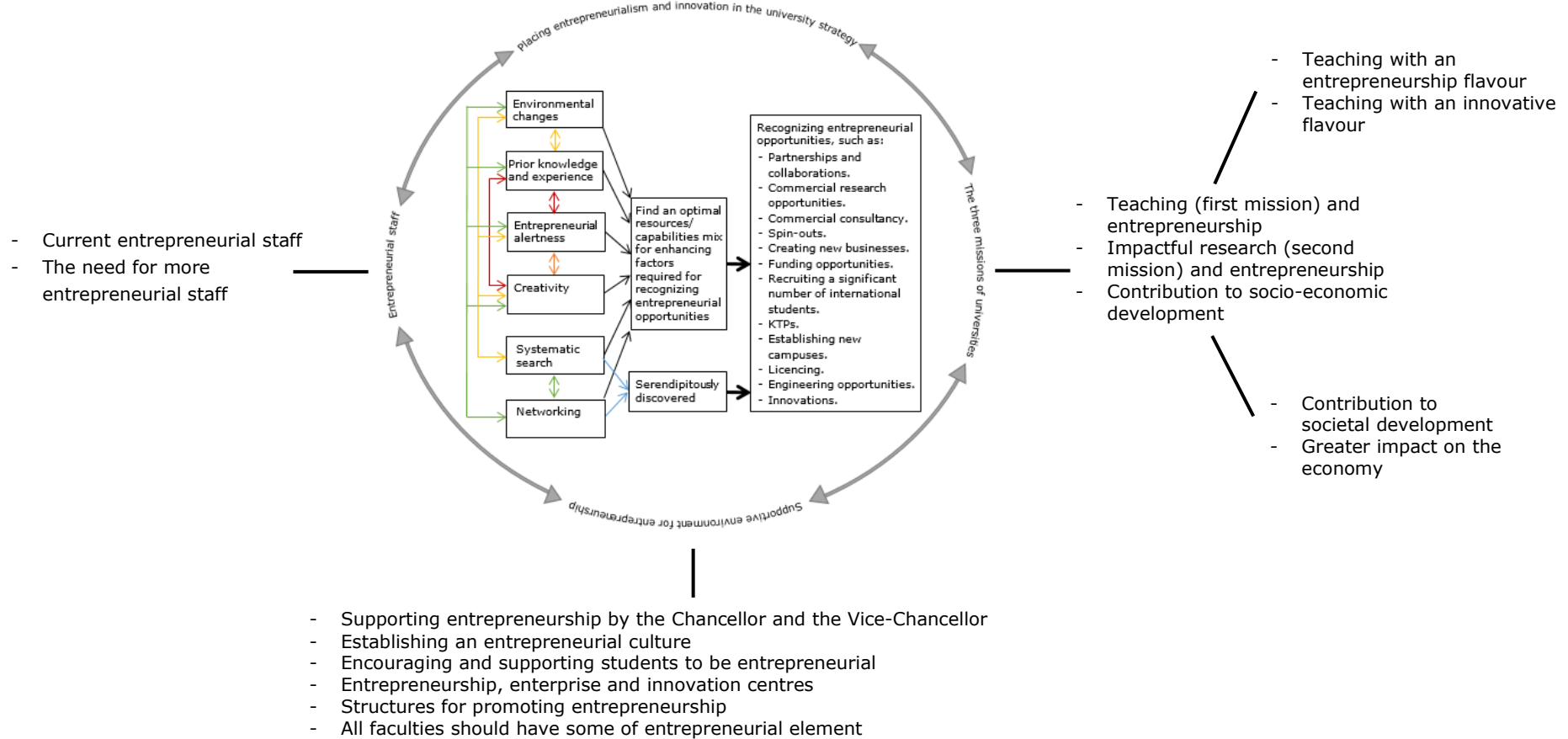


Figure 6.3 A detailed explanation of the contextual factors included in the developed empirical model

Source: Author

By comparing the empirical model to the conceptual framework, five differences can be observed:

- (1) The empirical model provides more detail on the OpRec process when compared to the conceptual framework.
- (2) Serendipitous discovery is included separately from systematic search in the empirical model.
- (3) New sub-themes have been considered in the empirical model for OpRec determinants. These sub-themes are: business knowledge, networking with alumni, luck and a systematic search mixture, distinguishing value creation opportunities from non-value creation opportunities.
- (4) The empirical model shows that entrepreneurial universities factors interact with each another, while in the conceptual framework, there is interaction between these factors.
- (5) The empirical model provided three new views on EntUni factors. Firstly, entrepreneurship, enterprise and innovation centres can contribute considerably to creating a supportive environment for entrepreneurship. Secondly, all faculties/schools of the entrepreneurial universities should have some of entrepreneurial element. Thirdly, entrepreneurial universities have a greater impact on the economy when compared to non-entrepreneurial universities.

6.8 Chapter Summary

In this chapter, the findings from this thesis have been discussed by comparing them with the literature of both entrepreneurial OpRec and entrepreneurial university to find the similarities and differences between them. Firstly, the validity of the entrepreneurial OpRec definition developed by this thesis has been ascertained by matching it with the other entrepreneurial OpRec definitions available in the literature. Secondly, the findings from the thesis regarding the six entrepreneurial OpRec factors and characteristics of the resources required to enhance them have been compared to those gained by previous studies. Thirdly, the definition of the entrepreneurial university produced by this thesis has been juxtaposed with the other EntUni definitions to reduce the gap between them. Then, the findings from this thesis relating to entrepreneurial university criteria have been placed side by side with the views of the entrepreneurship scholars concerned with this phenomenon. Finally, the details about the developed empirical model have been presented. Thus, this chapter has contributed to the clarification of the position of this thesis among the extant studies and has outlined its contribution towards a better understanding of both phenomena under study: entrepreneurial OpRec and entrepreneurial universities.

Chapter Seven: Conclusion

The main aim of this chapter is to critically reflect on the preceding chapters of this research. To achieve this aim, the objectives that have been achieved will be reviewed in a way that shows the key contributions of this case study research. Also, the main limitations of this research will be discussed. Doing all of the above will not only identify a direction specific to OpRec and EntUni, but will also throw light on the broader OpRec process.

7.1 Revisiting Research Objectives

The aim of this multiple case study is to explore how entrepreneurial opportunities are recognized in UK entrepreneurial universities. This aim has been achieved through three main objectives, which will be reviewed below.

a. To develop a conceptual framework for entrepreneurial OpRec in the entrepreneurial universities context: This objective has been addressed in Chapter Two (See Figure 2.2), by considering the most discussed factors relating to OpRec process within the entrepreneurship literature, as well as those contextual factors that indirectly impact on this process. In addition, this framework is viewed through the Resource-Based Theory (RBT) lens. Therefore, it considers the resources and capabilities required for recognizing entrepreneurial opportunities.

In developing the above-mentioned framework, the author has been inspired by having a large number of factors that determine the OpRec process, as well as having no consensus on which set of these factors should be of utmost consideration when recognizing entrepreneurial opportunities. The other inspiration for this framework is the context of this study, which motivated the researcher to consider the factors that can indirectly impact the OpRec process. These factors are those which distinguish entrepreneurial universities from other types of universities.

b. To explore how UK entrepreneurial universities define entrepreneurial OpRec and define being an EntUni: This objective has been addressed in Chapter Five. However, Chapter Four laid the foundations for the final definitions produced by this thesis for both entrepreneurial OpRec and the EntUni. The need to produce these definitions emerged from there being no agreement on a single definition for each of these phenomena. With respect to the definition of entrepreneurial OpRec, this focuses on four features: commercial intent, value creation, doing new things and findings gaps in the market. Gaining such a definition has helped in understanding the nature of the factors that determine the OpRec process and also aided in interpreting the findings gained by this thesis relating to these factors.

The definition of EntUni focuses on four features as well: business orientation, being innovative, value creation and being good at spotting opportunities. Producing such a definition has paved the way to understand how entrepreneurial universities are distinguished

from other universities, which also helps with, as was the case with the definition of entrepreneurial OpRec, interpreting the findings gained by this thesis regarding the criteria of EntUni.

c. To produce an empirical model for entrepreneurial OpRec in the entrepreneurial universities context: This objective has been achieved in Chapter Six by validating the conceptual framework developed in Chapter Two. However, the empirical model is relatively different from the theoretical framework on several points. The most important of these points are the details provided by the empirical model for each component considered within it, as well as the details relating to the stages of OpRec, in addition to the many details provided regarding resources and capabilities required for dealing with the factors that determine OpRec process. Another important difference is that serendipitous discovery is included in the empirical model, because this phenomenon has gained a great deal of attention from the respondents. Other significant differences are related to the eight new views provided by the empirical model regarding OpRec determinants and EntUni criteria, which are as follows:

- (1) The model suggests that possessing knowledge about how to run businesses (business knowledge) can play a considerable role in recognizing entrepreneurial opportunities within the context of universities.
- (2) It shows that alumni are one of the parties with whom networking may help in recognizing entrepreneurial opportunities.
- (3) Some of entrepreneurial opportunities are recognized as a result of a mixture of both random chance and systematic search.
- (4) The idea behind distinguishing value creation opportunities from non-value creating opportunities works better when recognizing entrepreneurial opportunities than when distinguishing profitable opportunities from non-profitable ones.
- (5) The establishment of entrepreneurship, enterprise and innovation centres is one of the main enablers for creating a supportive environment for entrepreneurship at entrepreneurial universities.
- (6) Encouraging and enabling all faculties/schools to have some entrepreneurial element can contribute markedly to the creation of a supportive environment for entrepreneurship at entrepreneurial universities.
- (7) Entrepreneurial universities have greater (or evident) impact on the economy when compared to other types of universities.
- (8) Factors relating to entrepreneurial universities interact one with another. This has been shown in Figure 6.1, in which the contextual factors element is drawn differently from the conceptual framework (Figure 2.2). In the developed empirical model, there is a set of arrows that indicate an interaction between the four contextual factors, while in the conceptual framework, there is no indication of interaction between these factors.

By comparing the empirical model of this study with the other OpRec models, it can be said that it is different in that it considers the context in which the study is conducted, while the other models have not directly considered the significance of context.

7.2 Key Contributions

Since entrepreneurial OpRec is an area in which diverse and rival views exist, this thesis covers most views on OpRec in order to develop a more comprehensive model for entrepreneurial OpRec than has yet been provided by previous entrepreneurship scholars. This model considers the context (entrepreneurial universities) in which these opportunities are recognized. Therefore, this will help provide a clearer picture about the main factors that determine OpRec in entrepreneurial universities. These factors may differ from those that determine OpRec in large organizations, due to the uniqueness of the 'university mission'.

a. Theoretical contribution: This research has made four significant theoretical contributions. The main contribution is the expansion of the phenomenon of OpRec to cover the universities context. This adds to the EntUni body of knowledge, because there have been very few studies that investigate the OpRec in the universities context. Thus, this research can make the process of OpRec clearer and understandable where it relates to universities.

The second contribution is that this research adds more clarity to the concept of entrepreneurial OpRec. Such clarity results from asking the interviewees directly about how they define this concept, and then matching their views with the OpRec definitions available in the literature. Thus, the definition developed by this thesis makes a strong contribution to a better understanding of this concept, not only from an EntUni perspective, but also in general.

Similarly, the definition produced for EntUni in this thesis can contribute to a comprehensive understanding of this phenomenon, because it considers the views of the individuals who have a senior position in their entrepreneurial universities, and it has been compared with the other EntUni definitions in order to be validated and more widely accepted.

The third contribution concerns the empirical model developed by this thesis for the OpRec process. The significance of this model lies in two points. Firstly, it has revealed the importance of finding an optimal mix of resource and capabilities to ensure effectiveness in recognizing entrepreneurial opportunities. No other models of OpRec have considered such a mix. Such a contribution results from employing the RBT lens, which helps in thinking about the importance of identifying the resources and capabilities required for enhancing the factors that impact the OpRec process. In addition, it also helps in drawing attention to the value of applying the principals of this theory to the empirical model developed by this thesis. Such an application helps in considering the idea of finding an optimal resources/capabilities mix for enhancing the factors required for recognizing entrepreneurial opportunities in the above-

mentioned model. This, in fact, will help to extend the RBT to a theory that includes a new set of resources used by universities, with a view to gain opportunities. The second significant point of the above-mentioned model is that it has considered the context in which opportunities are recognized. This contributes to developing an integrated model because it takes into account both direct and indirect factors that impact the OpRec process. The indirect factors are those that relate to the context of entrepreneurial universities. This can actually have an additional contribution, which is drawing the attention of scholars to develop such integrated models within the specific context in which they conduct their studies.

The fourth contribution is related to the criteria that can be used to decide whether a university is entrepreneurial. These criteria have not been adequately clarified in the literature. Therefore, this thesis can contribute to filling this gap and opening the door for other researchers to investigate deeper in this area, thus gaining a more rigorous framework for the above-mentioned criteria.

b. Methodological contribution: The main methodological contribution of this thesis has resulted from the combination between the main research strategy (multiple case study) and the analysis technique (Template Analysis (TA)). Recently, this technique has been used increasingly in qualitative research, but not in qualitative multiple cases. The present research provides comprehensive details regarding employing the TA technique for qualitative case study research. These details relate to a priori themes, coding, categories and developing initial and final template versions.

More importantly, the present thesis introduces two new ideas for using TA in multiple case studies. The first one is that there is a need to develop the ultimate version template in addition to the final version templates. This is because in multiple case studies the researchers need to produce a final version template for each case. Then, as part of the cross-case analysis, there should be a template that links these final version templates. This template is called the ultimate template, which is, according to this thesis, a product of the overall commonalities between the final version templates of each case. The second idea is that it is possible to use two main sections in the template(s) developed. All previous studies that employed TA only used one main section in their developed templates. Having more than one main section in the template makes TA even more of a flexible technique.

c. Contribution to practice (practical contribution): Conducting this research results in two significant contributions to practice. The first contribution is that it will help senior staff at UK universities to have a better understanding regarding the mechanism of the recognition of entrepreneurial opportunities. This includes both the factors that need to be considered, as well as the optimal resources and capabilities they need to assemble when they seek for opportunities. Having such an understanding contributes to enhancing the ability of recognizing opportunities in a more effective and efficient way.

This research will also help senior staff at UK universities gain an in-depth understanding of what makes a university more entrepreneurial. This, in turn, will help senior staff at non-entrepreneurial universities shift their universities towards becoming entrepreneurial. On the other hand, it helps those at entrepreneurial universities in maintaining their entrepreneurial position and maybe become even more entrepreneurial.

The second practical contribution is that the outcomes of this thesis regarding the EntUni criteria may benefit the NCEE, which, as mentioned in Chapter One, sponsors the THE EntUni of the Year Award. The latter is provided for universities who demonstrate entrepreneurialism in action. This award is dependent on a number of criteria used to judge which university in the UK is the most entrepreneurial. These criteria are very similar to those found by this thesis, however, the latter provides more detail about each criterion, with some new themes under it. Therefore, the NCEE could consider updating the criteria they used by considering the criteria found by this thesis. The validity of the latter is due to the fact that they have been produced as a result of considering the views from those universities who are the winners of the THE EntUni of the Year Award.

7.3 Limitations of the Research

Despite the theoretical, methodological and practical contributions, this research has several limitations, which can be summarised into three groups, as follows:

a. Limitations relating to the theoretical underpinning: The first limitation is in employing only the RBT lens, and thus gaining no potential advantages of theory triangulation. However, the RBT lens has been shown through other studies to offer a robust framework. In this regard, it can be said that despite the great role played by this theory in conducting the present research, employing other theories could have contributed to enhancing its findings. This is due to the fact that both OpRec and EntUni are developing phenomena. The justification for employing a single lens in the present research is that the main focus of the research was on the resources and capabilities required for enhancing the ability of the universities to deal with different factors that determine their OpRec process, thus finding an optimal mix of these resources and capabilities in a way that helps with being effective in recognizing entrepreneurial opportunities.

b. Limitations relating to generalization: Despite the fact that the evidence from multiple case studies is, often more persuasive than from a single case study, the results from this thesis can only provide limited generalization to a universal population. There are three main reasons for this. First, the research population of the present research includes only five universities. Second, there is no control group of universities, which could potentially be the universities that have not been awarded the status of EntUni. The third reason is related to the context of research, which is entrepreneurial universities. This type of university varies

from one country to another. For example, what is considered an EntUni in developing countries may not be considered the same in developed countries. Even in the context of developing countries, not all of them view entrepreneurial universities in the same way.

Notwithstanding the above limitation, the selection criteria of the case study, data collection and analysis, provide a rich description of the phenomena under study. Therefore, the outcomes may be useful to those who are interested. Hence, it can be said that this present research provides a strong basis for disseminating the findings from this thesis.

c. Limitations relating to the respondents of this research: There are three points that need to be considered here, which are as follows:

(1) Because of the nature of their position at the university, one may argue that the data provided by these senior staff is not valid, because they will only speak positively about their universities; they will avoid mentioning the weaknesses of their organizations. This produces biased findings and reduces their contribution to the study. This limitation was minimised through three means. The first is that the interview questions were carefully formulated in a way that avoids focusing on the strengths and weaknesses of the universities considered. The focus of the questions was on the view of the interviewees in terms of how entrepreneurial opportunities are recognized and what makes universities more entrepreneurial. The second mean is employing multiple sources (interviews, document secondary data and website content) of data collection. This helps support the interviewees' views, using the facts about universities available in their websites and documents. The third mean is assuring the respondents that the data collected will be strictly anonymized and confidential.

(2) Most of the respondents have an academic background, not a business/entrepreneurial background. This may have meant that they were not the most appropriate people to provide evidence to answer the questions of this research. To minimize this limitation, it is worth mentioning three facts about these respondents. First, at least four of them have attended the EULP, which, as was shown in Chapter One, is provided for university leaders with senior positions. Second, at least three of these senior staff have experienced running a business or have had industry experience. Third, they have played a significant role in gaining opportunities and establishing entrepreneurial activities in their respective universities.

(3) Some would argue that the respondents represent only one organizational level of the university (top level); thus the data gained from them does not provide the whole picture about the case, because the views of staff in the other two levels are not considered. What minimizes this limitation is the fact that the position of these respondents is not at the very top, but rather is pivotal between the very top (Vice-Chancellors) and the middle management (Heads of Departments) level. In addition, the literature, as has been shown in Chapter Three, shows that people at the top/middle management level play a remarkable role in both recognizing entrepreneurial opportunities and shifting towards the EntUni mode.

7.4 Recommendations for Future Research

Conducting this research has drawn the author's attention to some future studies that could make a significant contribution to the OpRec and EntUni body of knowledge. This section will provide six recommendations for future research. The first recommendation would be conducting a study that explores, in greater detail, the role of networking in facilitating the process of OpRec within the universities context, which also investigates the role of networking in shifting towards an EntUni mode. This recommendation is inspired by the findings from this thesis, which reveal the exceptional importance of networking for both the OpRec process and for entrepreneurial universities.

With respect to the significance of networking, it also worth conducting a study that focuses on the role of networking with alumni for gaining more entrepreneurial opportunities. The validity of this recommendation comes from the findings from this thesis, which highlight the important role played by networking in recognizing entrepreneurial opportunities, yet the literature has not provided adequate detail about this role at present. Thus, understanding how networking with alumni facilitate the entrepreneurial OpRec process can have significant implications for universities, especially these with an entrepreneurial orientation.

The second recommendation is to further explore the contribution of business knowledge to the entrepreneurial OpRec process of the universities. This recommendation is based on one of the findings from this thesis, which shows that business knowledge is one of the main types of knowledge required for gaining opportunities by senior staff within the university context. Despite such findings, entrepreneurship scholars have, to date, provided very little support for this factor. Therefore, any endeavours in this regard would have a significant contribution to the EntUni body of Knowledge.

One of the interesting findings from this thesis is related to the third approach for finding opportunities. This approach combines a systematic search for opportunities with serendipitous discovery. Understanding more about how this approach works could have some significant implications. Therefore, the third recommendation for future research is to consider this approach in the frameworks of future research relating to OpRec, with a view to ensure its effectiveness.

The fourth recommendation would be conducting a study that explores the mechanism of and resources required for making all faculties/schools of a university more entrepreneurial, and identifying which faculties/schools can have a greater role in moving the university towards becoming more entrepreneurial. This recommendation is inspired by the findings of the present thesis, which show that creating a supportive environment for entrepreneurship requires spreading entrepreneurialism in all faculties/schools of an EntUni, at least to enable them to have some entrepreneurial element.

This research highlights the significant role played by entrepreneurship and innovation centres in enhancing the ability of the university to gain entrepreneurial opportunities, as well as in establishing a supportive environment for entrepreneurship. Thus, there is a need for further research, by which the above role can be elucidated in more detail. Then, the fifth recommendation is conducting two studies - the first one could focus on the role of the above-mentioned centres in facilitating the OpRec process, and the second study could explore the significance of these centres in shifting towards an EntUni mode, and also in maintaining the universities' entrepreneurial status.

The findings from this thesis cast a new light on the universities in the development of the economy, by showing that all UK universities have a positive impact on the economy. However, entrepreneurial universities can have greater or more evident impact in comparison with other types of universities. Therefore, the final recommendation would be conducting a comparative study between entrepreneurial universities and non-entrepreneurial universities concerning their role in developing their economic region.

7.5 Chapter Summary

In this chapter, the conclusion of this research was explained. Firstly, the three main research objectives were revisited. Secondly, the theoretical, methodological and practical contributions were presented, which in turn demonstrated the importance of this research. Then, the three limitations of this research were discussed. These limitations are related to the theoretical underpinning, generalization issues and respondents of this research. Finally, six recommendations for future research were provided.

In summary of this thesis, it has investigated how entrepreneurial opportunities can be recognized in the context of entrepreneurial universities. Then, it has provided a clear framework for both the researcher and other practitioners regarding the factors that determine the above-mentioned process, as well as the resources and capabilities required for facilitating this process. It has also provided a clear picture regarding the main steps included in the entrepreneurial OpRec process.

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Appendices

Appendix A: Information Sheet

Information Sheet

Developing a framework for understanding the opportunity recognition process in UK entrepreneurial universities: A study of five winners of the Times Higher Education Entrepreneurial University of the Year Award

You are being invited to take part in a research project. Before you decide, it is important for you to understand why this research is being done and what it will involve. Please take time to read the following information and discuss it with others if you wish. Ask if there is anything that is not clear or if you would like more information. May I take this opportunity to thank you for taking time to read this.

What is the purpose of the project?

The purpose of this research is to explore how entrepreneurial opportunities are recognized in the context of entrepreneurial universities in the developed countries context.

Why have I been chosen?

The interview's questions will be answered by the deans and directors of entrepreneurship/enterprise in those UK universities who have been winners of the THE Entrepreneurial University of the Year Award.

Do I have to take part?

Participation on this study is entirely voluntary, so please do not feel obliged to take part. Refusal will involve no penalty whatsoever and you may withdraw from the study within two months of the interview without giving an explanation to the researcher.

What do I have to do?

You will be invited to take part in an interview. This should take no more than one hour of your time.

Are there any disadvantages to taking part?

There should be no foreseeable disadvantages to your participation. If you are unhappy or have further questions at any stage in the process, please address your concerns initially to the researcher if this is appropriate. Alternatively, please contact Dr. John Day (j.day@hud.ac.uk/01484 473355) at the Business School, University of Huddersfield.

Will all my details be kept confidential?

All information which is collected will be strictly confidential and anonymised before the data is presented in any work, in compliance with the Data Protection Act and ethical research guidelines and principles.

What will happen to the results of the research study?

The results of this research will be written up in doctoral thesis. If you would like a copy please contact the researcher.

What happens to the data collected?

The information from these interviews will be collated and published in the researcher's PhD and other academic publications in which the participant's identity will remain confidential.

This research has been approved by the Business School Research Ethics Committee.

Name & Contact Details of Researcher:

Alvin Aldawod

E-mail Address: alvin.aldawod@hud.ac.uk

Mobile Number: +44(0)7448857174

Appendix B :Participant Consent Form

Participant Consent Form

Title of Research Study: Developing a framework for understanding the opportunity recognition process in UK entrepreneurial universities: A study of five winners of the Times Higher Education Entrepreneurial University of the Year Award

Name of Researcher:

Participant Identifier Number:

☐ I confirm that I have read and understood the participant Information sheet related to this research, and have had the opportunity to ask questions.

☐ I understand that my participation is voluntary and that I am free to withdraw within two months of interview without giving any reason.

☐ I understand that all my responses will be anonymous.

☐ I give permission for members of the research team to have access to my anonymous responses.

☐ I agree to take part in the above study

Name of Participant:

Signature of Participant:

Date:

Name of Researcher:

Signature of Researcher:

Date:

Appendix C: Supportive letter from the Post Graduate Research Administrator

University of
HUDDERSFIELD
Inspiring tomorrow's professionals

2013
THE AWARDS
AWARD WINNER
UNIVERSITY OF THE YEAR

16th March 2017

To Whom It May Concern

REF: 1369692

Student Name: Alvin Nader Jajo Aldawod

This is to confirm that Mr Aladawod is registered as a full-time research student at the Huddersfield Business School in the University of Huddersfield, undertaking a programme of work leading to the award of PhD. The programme of research is entitled: *Entrepreneurial Opportunity Recognition in the Context of Entrepreneurial University: Learning from the UK entrepreneurial universities*. Mr Aldawod registered on this programme on 1st October 2014 and has an expected end date of 30th September 2018.

Mr Aldawod is wishing to conduct his data collection with your university, we would be grateful if you could provide him the necessary access to achieve his research aims.

If you require any further information please do contact Mr Aldawod at the following email address:

Alvin.Aldawod@hud.ac.uk

Yours faithfully,

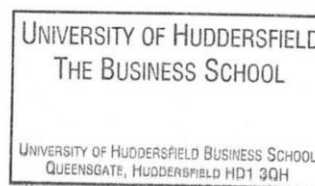


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Chancellor: HRH The Duke of York, KG

Vice-Chancellor: Professor Bob Cryan CBE DL MBA DSc CEng FIET FHEA



Appendix D: Example of the Case Study Protocol

The case study protocol of University A

a. Overview of the case study

This case aims at exploring how entrepreneurial opportunities are recognized in University A. To achieve this aim, the following three objectives are considered:

- (1) To explore how does University A define both entrepreneurial OpRec and EntUni.
- (2) To identify the determinants of the OpRec process in this university.
- (3) To identify the resources, and their characteristics, required for enhancing the factors that determine OpRec in this university.
- (4) To decide the contextual factors that impact on the OpRec process in this university.

The conceptual framework developed for the present (see Figure 2.2) will be used for conduct this case.

b. Data collection procedure

It is expected to collect the data from three sources of evidence: semi-structured in-depth interviews with dean and directors of entrepreneurship/enterprise centres, website content, document secondary data. The researcher gathered enough information about both the university and the participants prior to the interviews. Such information is not presented in this section because the author wants to ensure a high level of confidentiality and anonymity.

c. Data collection questions.

The below questions will be used in the interviews:

1. What does the term entrepreneurial opportunity recognition mean to you?
2. How do you believe that prior knowledge and experiences help in recognizing entrepreneurial opportunities?
3. What types of knowledge can help in recognizing entrepreneurial opportunities?
4. How do you believe that networking helps your university in recognizing entrepreneurial opportunities?
5. Who are the most important parties with whom strengthening relationships helps in recognizing opportunities?
6. Are you always alert to entrepreneurial opportunities?
7. In your opinion, what are the main characteristics that senior staff need to be more alert to the entrepreneurial opportunities?
8. To what extent does a quick response to the changes in the external environment help in recognizing opportunities?
9. Which external environment factors have had the greatest impact on the entrepreneurial OpRec process in your university?

10. Do you actively search for opportunities or you accidentally find them?
11. How do you believe that creativity contributes to recognizing entrepreneurial opportunities?
12. How do you characterise the resources of your university? What are their main attributes?
13. What does the term entrepreneurial university mean to you?
14. What attention does the office of Vice-Chancellor pay to entrepreneurship? And how has it resourced?
15. In your opinion what are the main criteria that can be used to decide whether a university is entrepreneurial?

e. Guide for the case study report

The present research will follow the procedure suggested by Yin (2014) for writing cross-case report (See Figure 3.4)