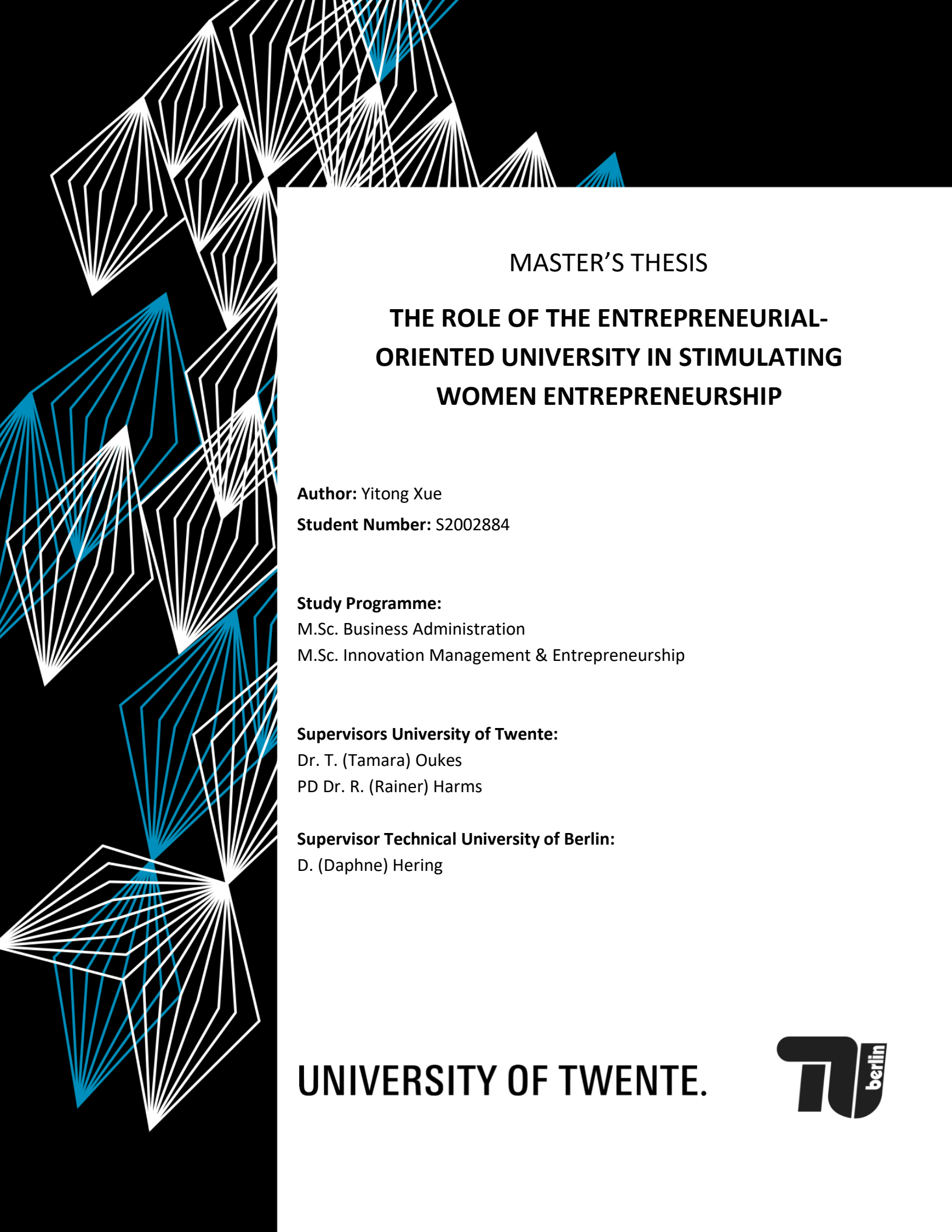




MASTER'S THESIS

**THE ROLE OF THE ENTREPRENEURIAL-
ORIENTED UNIVERSITY IN STIMULATING
WOMEN ENTREPRENEURSHIP**

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Abstract

The objective of this paper is to investigate the main obstacles that are faced by (potential) women entrepreneurs, and how entrepreneurial universities stimulate women entrepreneurship through their various entrepreneurial offerings. Based on preliminary research on existing literature, there are three main entrepreneurial practices that significantly facilitate women entrepreneurship: entrepreneurial education, entrepreneurial climate and the networking capability of a university. A quantitative research study, focused on the female perspective, has been conducted in the form of a questionnaire with a sample size of 106 valid respondents. The data has been processed through IBM SPSS 25 to discover the potential patterns and trends to answer the research question. The results firstly identified the most concerned issues by women in entrepreneurship which are: financial problems, finding the right contact, and combining work and family life. Secondly, the results revealed that the entrepreneurial education and entrepreneurial climate of the university are positively encouraging the development of women entrepreneurship. Nevertheless, the results did not discover any significant relationship between the networking capability of a university and the entrepreneurial intention among female students. Possible reasons of the results have been discussed in this paper as well. Lastly, a guideline on how to effectively stimulate women entrepreneurship in the entrepreneurial university has been developed and explained in detail. The guideline can be utilized by entrepreneurial-oriented universities to systematically evaluate and improve the effectiveness of their entrepreneurial practices.

Key Words: entrepreneurial university, women entrepreneurship, entrepreneurial intention, entrepreneurial education, entrepreneurial climate, entrepreneurial obstacles, student entrepreneurship

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The submission of this master's thesis means a new beginning of my life. It is finally the time I need to say goodbye to my student life. If I look back at myself five years ago, on my first day arriving in Europe, I would never believe I turned into the person I am today. After living three years in Finland obtaining my bachelor's degree in Business Administration, I moved to Germany for a master's degree in the Technische Universität Berlin. Here is where I discovered the great opportunity for a double-degree master programme with the University of Twente which has brought me to the Netherlands today. For me personally, I have always been interested in entrepreneurship and to be devoted to becoming an entrepreneur one day myself. Therefore, I want to research on the topic of entrepreneurial universities and women entrepreneurship. This master thesis represents my work in the last five months.

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List of key definitions

Entrepreneurship: entrepreneurship is an activity that involves the discovery, evaluation and exploitation of opportunities (Shane, 2003, p.4)

Women entrepreneur: a woman entrepreneur is a person who is an enterprising individual with an eye for opportunities and an extraordinary vision, sensitivity for commercial chances, extremely perseverance, willingness of taking unknown risks, and adventurous spirit (Vinze, 1987, p.112)

Entrepreneurial university: entrepreneurial university is a natural incubator that provides support structures for teachers and students to initiate new ventures: intellectual, commercial and conjoint (Etzkowitz, 2003)

Entrepreneurial education: entrepreneurial education is a process of providing individuals with the ability to recognize commercial opportunities and the insight, self-esteem, knowledge and skills to act on them (Jones and English, 2004, p. 2).

Entrepreneurial climate: on the institutional level, entrepreneurial climate refers to an environment that recognizes the importance of entrepreneurship and supports entrepreneurial thinking among its members (Etzkowitz, 2003; Jansen et al., 2015).

Networking capability: the resources and activities of a focal organization to generate, develop, and manage networks in order to take advantage of single relationships and the network as a whole (Walter et al., 1997)

1. Introduction

1.1 Background

Entrepreneurship is considered one of the main sources of innovation nowadays that cannot be underestimated in both the academic and commercial world. The impact of entrepreneurship on encouraging economic growth has been proved through entrepreneurs being dedicated in discovering technology breakthroughs (Holmes and Schmitz, 1990), fostering technology transfer, and exploiting commercialize opportunities of innovations (Braunerhjelm et al., 2010).

Student entrepreneurship, as one of the most important components of entrepreneurship, has received quite a lot of attention in recent years. Many universities across the world are reforming towards entrepreneurial-oriented universities through changes of organizational structure and governance in order to maintain competitiveness and be more involved in the collaboration with public sectors and various industries (Jansen et al., 2015). The origin of entrepreneurial universities can be traced back to the 1980s when Etzkowitz first brought up with the discussion on how to transfer scientific results into commercial use. Since then, the concept of the entrepreneurial university has been further researched and defined. In 1998, Clark defined the entrepreneurial university as an organization which emphasises the quality of knowledge and the flexibility between different programmes, as well as eventually setting and accomplishing the university's organizational goal (Clark, 1998). Later on, researchers linked the entrepreneurial university to the "Triple Helix Model" proposed by Etzkowitz (2008), which involves university, industry and government, and the continuous collaboration and interaction among these three players which fosters knowledge generation and transformation, therefore enhancing the process of innovation (Tuunainen, 2005). Since then, the focus has been shifted to the interaction between universities and other players, which is considered as one of the most essential elements in terms of knowledge development. (Etzkowitz & Klofsten, 2005).

The phenomenon of student entrepreneurs is not only observed among male students, but also among female students. This can be attributed to the changing role of women through the development of society where more and more female students pursue a business education. It's a noticeable phenomenon that the proportion of female entrepreneurs is growing in the last two decades and this trend is expected to continue (Rauth Bhardwaj, 2014). However, female entrepreneurs are facing a greater number of challenges compared to male entrepreneurs. Some examples include social and cultural factors, work-family balance, and access to finance (Ahl, 2006).

Nevertheless, the topic of women entrepreneurship has not been thoroughly studied until now. From 1900 to 2016, there are only 185 scientific research papers on women entrepreneurs have been published in entrepreneurship journals (Yadav & Unni, 2016). Specifically, on the topic of how entrepreneurial universities help female students to overcome the existing barriers and participate in entrepreneurship is under-developed. Since gender differences play a role in the difference among entrepreneurial intentions of men and women (Auchter & Kriz, 2013), issues like whether female students are motivated by the entrepreneurial offerings of the university and whether female students received support while starting new business still needs to be researched further. The entrepreneurial intention of female students has been proposed as one of the main indicators of women entrepreneurship. The entrepreneurial intention is a set of personalities, objectives, interests or desires that may lead to business formation (Thompson, 2009). And previous findings have considered the entrepreneurial intention among students as a valid reflection on student entrepreneurship as well as the foundation of the entrepreneurship process (Küttim et al., 2014).

1.2 Research goal and research question

The role of universities has been reformed in recent decades where these institutions not only offer a traditional academic curriculum, but also are becoming more entrepreneurial and internationally oriented. Meanwhile, there is less evidence of the role of the entrepreneurial university in facilitating women in entrepreneurship and understanding what is currently offered to female students that help this demographic conquer the existing barriers that they face.

The main goals of this research are:

- 1) To discover what barriers are faced by (potential) women entrepreneurs
- 2) To identify the awareness and usefulness of the entrepreneurial offering among students, especially if female students received adequate support or not
- 3) To develop a guideline for entrepreneurial universities regarding how to effectively stimulate student entrepreneurship, especially among female students.

Many research has been conducted in order to investigate the relationship between entrepreneurial education and entrepreneurship, and majority findings have shown that the entrepreneurial education plays an essential role, which facilitates entrepreneurship due to the professional knowledge and resources provided (Tiago et al., 2015). Furthermore, universities are dedicated to creating a supportive entrepreneurial climate, which significantly encourages women to actively become entrepreneurs during or after their study (Jansen et al., 2015). Furthermore, universities are devoting to expand their network through partnering and providing joint programs with industries and other universities. Especially the collaboration between

academia and industry brings new innovation which facilitates the exchange of knowledge (Guimón, 2013). Whereas, the impact of the network of the university is underestimated in the academic world since it is not only connecting the academia with industries and public sectors, but also provide networking opportunities to students, and connect them with right people (Stal et al., 2016). Thus, the researcher would like to focus on investigating what are the influences of the network of the university on women entrepreneurship as well.

Based on the prior research and research objective, the main research question is formulated that,

To what extent does the entrepreneurial education, entrepreneurial climate, and networking capability stimulate women entrepreneurship in an entrepreneurial-oriented university?

To assist answering the focal research question, the following sub-research questions have been formulated

1. What are the main barriers of entrepreneurship among female students?
2. What is the effectiveness of the entrepreneurial offerings of the university among female students?

1.3 Academic and practical relevance

The research has both theoretical and practical contributions. The research enriches the existing literature of the role of the entrepreneurial university in innovation through encouraging student entrepreneurship as well as the theories of motivating students to pursue entrepreneurship through not only education, but also through broader practices (Navarro & Jiménez, 2016; Jansen et al., 2015; Ganzarain et al., 2014). Furthermore, the findings will contribute to the theories of university's role and activities to be a catalyst and support women entrepreneurship, which also leads into new directions for women entrepreneurship for future research (Stal et al., 2016; Ahl, 2006). Most importantly, this research tested the role of the university network on women entrepreneurship, which has never been addressed before. In addition, this research filled the blank in the academic world regarding the interaction effect between the main entrepreneurial practices.

In practice, the research findings aim to provide universities a guideline on how to effectively motivate female students to consider entrepreneurship as a career option while at the same time consider improvements in the insufficiency of the current entrepreneurial practices (Jansen et al., 2015; Tiago et al., 2015; Rasmussen et al., 2014). Furthermore, the research findings enable the potential of women entrepreneurs to gain a deeper understanding on how to efficiently

utilize the resources of a university for their business endeavours in the future (Linan et al., 2011). More broadly, the research contributes to the awareness and importance of women entrepreneurship in the university and society. Furthermore, it promotes the awareness of the changing role of women in the society and the importance of the development of women (Ahl, 2006).

1.4 Outline of the thesis

In order to answer the research questions, the following steps will be performed in the next sections. The second chapter provides a comprehensive overview regarding the existing research and literature on women entrepreneurship in universities through systematic literature review. Meanwhile, the hypotheses will be formulated based on the research goal and found literature in the same chapter. Chapter three reviews the design of the research, measurements of variables, data collection and analysis to test the hypotheses and research questions. Then the next chapter describes the results of this study. The last chapter will conclude the research based on the main findings, discuss the limitation of the current research, indicate academic and practical implication, and give recommendations on future research.

2. Theoretical Framework and Hypothesis

The theoretical framework is developed based on a systematic literature review (SLR) approach, which contributes to a comprehensive overview and uncovers the gap of the research topic. The purpose of the SLR is to firstly provide a coherent understanding of the key concepts, and secondly structurally discover how the previous studies examine the role of entrepreneurial-oriented universities in stimulating women entrepreneurship. Furthermore, it explores the neglected elements in past research that can be taken into consideration in this research. In addition, it builds the scope of the research and provides possible directions on the research methodology in terms of collecting and analysing data. The procedure of SLR is presented in Appendix 1, and the list of whole literature in Appendix 2A and 2B. Based on the review of prior studies, the entrepreneurial-oriented universities positively stimulate women entrepreneurship through three main practices, which are entrepreneurship education, entrepreneurship climate and the networking capability of a university. The list of included literature is presented in Appendix 2C. The detailed review on related studies is displayed in the following sections of this chapter while forming the hypotheses of the current research.

2.1 Background of women entrepreneurship

2.1.1 Definition of entrepreneurship

The definition of entrepreneurs and entrepreneurship are various and can be traced back to the last century. Cantillon (1755) defined entrepreneurs as those who gain non-fixed and uncertain amount of income under known costs of production (cited by Tarasocio 1985). Later Say (1803) described an entrepreneur as someone who transfers the commercial resources from areas that have low productivity and profit to higher ones. The official definition of entrepreneurship in the Oxford dictionary is the activity of establishing a business and wish for profit, while taking financial risks. Shane (2003, p.4) represents entrepreneurship as “an activity that involves the discovery, evaluation and exploitation of opportunities”, which is seen as one of the modern and acceptable definitions of entrepreneurship under the contemporary economy.

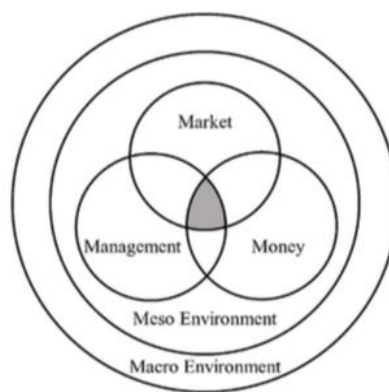
There is an ongoing debate among entrepreneurship: Are entrepreneurs born or made? Many scholars believed that whether individuals can be an entrepreneur or not is heavily dependent on the personality traits of the individual, in other words, they are born to be entrepreneurs (Matthews et al., 2011). Carter et al. (2003) concluded six personality traits that distinguished entrepreneurs with non-entrepreneurs which are: *innovation, independence, recognition, roles, desire of financial success* and *self-realization*. Yet, many scholars hold the opposite opinion that,

rather than a personality profile, successful entrepreneurs require *guts, brain* and *capital*, which can be learned and improved (Holland, 2010). You are not born with knowledge and experiences, instead you need to learn and develop towards perfection. The entrepreneur needs to understand the rapidly changing situation, and give an agile innovative solution, hence survive the company from unexpected crisis during the business development stage. Therefore, continuous learning is one of the most essential success factors for entrepreneurs (Van Popta, 2002). There is no clear-cut answer of the debate whether entrepreneurs are born or made. I agreed with the opinion that certain personality traits will increase the possibility of being an entrepreneur, yet individuals do not need to be “born” to be entrepreneurs. Factors such as professional knowledge, entrepreneurial mindset etc., can be developed and taught and can be even more important to determine the success of entrepreneurs. The mainstream trend of entrepreneurial education nowadays is to focus on the generation and management of small firms through a more integrated and action-oriented way of education (Koch, 2002).

2.1.2 Influential factors of women entrepreneurship

As a topic with an increasing awareness in the society as well as the academic circle, women entrepreneurship received further research to achieve a higher level of understanding. Researchers are intrigued and discovered influencing factors of what is considered successful women entrepreneurship, and what barriers women are facing when starting their own businesses. Build on the “5M” Gender-aware framework (Brush et al., 2009), Berger and Kuckertz (2016) proposed a 5M model describing the influential factors of women entrepreneurship in the twenty most successful start-up ecosystems, see Figure 1. The purpose of the original “5M” framework for female entrepreneurs is to recognize the sources of the challenges within the business on an individual, institutional and societal level. In addition to this, policy makers can develop an integrated approach for more efficiently stimulating women entrepreneurship rather than only focusing on the social structure reformation and gender asymmetries (Brush et al., 2009).

Figure 1. Gender-aware framework (Brush et al., 2009)



The 5M model includes three layers: the micro, meso and macro environment. The micro environment indicates the business environment which consists of the present market, money in terms of funding and management in terms of accessible human capital. More specifically on human capital, Berger and Kuckertz (2016) believed that the entrepreneurial education, knowledge and experience results in talented female entrepreneurs, which supports my hypothesis that entrepreneurial education can trigger women entrepreneurship. Similarly, Pèrez-Pèrez and Avilés-Hernández (2016) concluded four types of explanatory factors of female entrepreneurship: external reasons, internal reasons, family reasons and cultural change and development of women. It also indicated that the lack of proper entrepreneurial training and culture is considered as part of the reason that limits female entrepreneurship (Pèrez-Pèrez & Avilés-Hernández, 2016).

2.1.3 Barriers of women entrepreneurship

Besides the lack of business and managerial skills, other barriers of entrepreneurship especially for women has been discussed in academia and society. One of the biggest obstacles of women entrepreneurship is accessing capital, not only in the startup phase, but also when scaling the business. This is especially true when the role of a supporting government is missing making the situation even more difficult in terms of obtaining investment. In addition, the family responsibility has been cited as another element that restrains female entrepreneurship (Winn, 2005). The balance between taking care of families and pursuing career goals is essential for women to decide whether to participate in entrepreneurship and maintain the business (Loscocco & Robinson, 1991). Similarly, the existing social and cultural norms have a strong impact on women's empowerment and self-confidence, therefore, influencing women entrepreneurship (Matthew, 2010). The lack of a business network also negatively affects women entrepreneurship since women entrepreneurs may lack of the access to critical resources, investment, market information, et cetera (Berger & Kuckertz, 2016).

Furthermore, even though some scholars believed that the gender differences in entrepreneurship is minor and can be neglected, many scholars argue some differences such as cognitive perspectives (Brush, 1992), psychological traits (Sexton & Bowman-Upton, 1990), and motivations of participation (Maes et al., 2014) still need to be considered when researching entrepreneurship. Also, one of the most important elements that influences personal attitude on participating in entrepreneurship among women is the balance between work and family, which is normally not the case for men (Maes et al., 2014). Therefore, the entrepreneurial intention and actual involvement of entrepreneurial activities of women can be different than for men (Shirokova et al., 2015).

2.2 Entrepreneurial education and women entrepreneurship

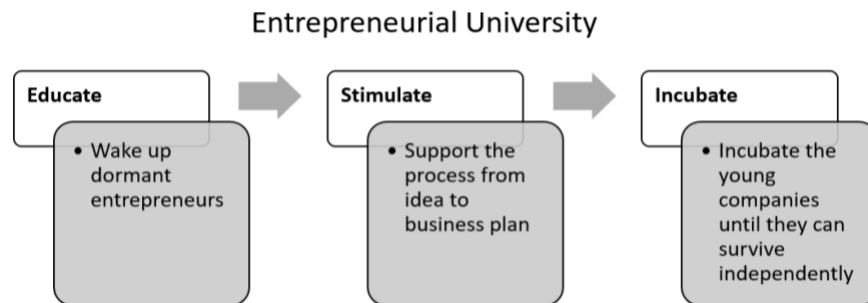
A university education can contribute to a higher return on entrepreneurship than normal paid job in companies in the US. And start-ups where founders have a university education achieve better economic performance overall than those founders without a university education. (Åstebro et al., 2012).

Furthermore, the entrepreneurial education can be defined based on different levels. On the narrow perspective, entrepreneurship has been defined as the process of opportunity recognition, resources collection, and business creation while the entrepreneurs are bearing uncertain levels of risk. Therefore, the entrepreneurial education is composed of teaching activities that instruct, train and teach students who have the intention of starting a business or developing an existing business (Küttim et al. 2014). Additionally, entrepreneurial education programs intend to develop an “entrepreneurial perspective” or “entrepreneurial mind-set” among students (Kirkwood et al., 2014), which includes actively seeking for business opportunities, persistence on transforming a draft idea into reality, and the willingness of stepping outside of their comfort zones (Kurato, 2005). Entrepreneurship has been seen as a modern career option that is flexible and multifaceted and addresses the fast-changing contemporary labour market as well (Gelderen et al., 2008). Whereas the entrepreneurial education on a broader level is not only targeting “entrepreneurial person” and students, but also anyone who has the intention to pursue entrepreneurship and innovation (Jone & English, 2004).

Jansen et al. (2015) researched which entrepreneurial offerings of university are most effective in terms of contributing to the decision of a student pursuing entrepreneurship. Jansen et al. proposed a three-stage encouragement model that categorized the offerings of an entrepreneurial university into three stages: educate, stimulate and incubate, all with their own specific objectives and activities. The model is presented in Figure 2. The main goal of the entrepreneurship education is not only providing professional knowledge and skills, but also increase awareness of entrepreneurship as a career option among students. On the stimulation phase, the objective is to provide support for students on transforming their ideas into a feasible business plan. The last stage, incubation, emphasizes launching new firms where the support of the university is focused on the early stage of new companies. Therefore, entrepreneurial education is one the most fundamental steps of universities in stimulating student entrepreneurship. Under the stage of educate, business plan development courses and entrepreneurship skills courses increase students’ awareness of choosing entrepreneurship as a career option. Learning specific skills is also necessary to be an entrepreneur, such as pitching

practices, understanding entrepreneurial finance, business strategy, sales and marketing, et cetera (Jansen et al., 2015). Also, the tenacity of students that applied business plan practices tend to achieve a higher rate of success (Jones, 2010).

Figure 2. Three-stage Student Entrepreneurship Encouragement Model-SEEM (Jansen et al., 2015)



Previous findings related to women entrepreneurship and university education have shown that education, training and professional experiences are positively related to the performance of women entrepreneurs (Maresch et al., 2016). Gaining an appropriate entrepreneurial education acts as a catalyst for female students to come up with more innovative ideas and apply into a real business (Rauth Bhardwaj, 2014). Holienka et al. (2016) commented that there are two types of women entrepreneurs, opportunity- and necessity-driven women entrepreneurs. In particular, the opportunity-driven women entrepreneurs are positively influenced by business factors such as alertness, and personal factors such as social status, self-confidence and education level. Higher education provides access to different types of knowledge, and a larger knowledge base will increase the chance to connecting the knowledge to potential businesses (Premand et al., 2016). Hence, gaining appropriate entrepreneurial education can positively improve business opportunity recognition. Opportunity recognition is the first step in firm creation, therefore, the education level is positively related to women entrepreneurship (Ramos-Rodríguez et al., 2010).

Currently the definition of entrepreneurial education is on a narrower level where the emphasis is on the intention of students to start their own business or become self-employed, while fully acknowledging that entrepreneurial education can be defined in a wider perspective. Most existing literature does not focus on gender differences in the context of entrepreneurial education in universities. Therefore, I propose that:

Hypothesis 1: Entrepreneurial education of the university positively stimulates entrepreneurial intention among female students.

2.3 Entrepreneurial climate and women entrepreneurship

The entrepreneurial climate refers to the entrepreneurial culture and environment of the university (Al-Dajani et al., 2014). A positive and inspiring climate available at the university is essential in encouraging student entrepreneurship on a fundamental level, which helps to create an entrepreneurial mind-set among students (Rasmussen et al. 2014). Furthermore, the supports of the faculty is one of the most essential elements that affects the intention of student entrepreneurship (Dodescu et al., 2014). It has a great impact on venture creation and spin-offs creation in the university, especially in the early stages (Rasmussen et al. 2014).

The supportiveness of faculty is multifaceted. On one hand, events and activities (e.g. a business plan competition) organized by the faculty can effectively increase the awareness of entrepreneurship as a career option among students (Jansen et al. 2015). On the other hand, academic peers and representatives of faculties have a powerful impact on the intention of being entrepreneurs on the individual level (Marques et al., 2014). The supporting members or professors of the entrepreneurship department that provide advice to students can not only increase the willingness of students being entrepreneurs, but also help students to overcome the barriers of establishing their own businesses (Jansen et al. 2015). The decision of engaging in entrepreneurship is also influenced by the social context within the university. Especially for non-business students, the successful entrepreneurial experience of previous faculty members will deliver a message to other academics that entrepreneurship is a feasible and acceptable activity no matter the discipline (Mariada et al. 2017).

Previous studies reveal that in Europe, the proportion of women entrepreneurship is half of that of men entrepreneurship, which illustrated that entrepreneurship is a male-dominated activity. The reasons behind this phenomenon can be traced back to past stereotypes and gender roles of women (Navarro & Jiménez, 2016). To address this, universities introduce role models that can inspire and motivate students to achieve their career goal as entrepreneurs. Additionally, mentor programs are highly valuable especially for people who have little-to-no experience in entrepreneurship. Experienced entrepreneurs can successfully deliver professional consultation, knowledge and emotional support to potential entrepreneurs (Mat et al., 2014). More specifically, the mentors have the ability to increase the awareness of students, enhance their self-image and take the role of the “unbiased mirror” through giving direct feedback to future entrepreneurs (Navarro & Jiménez, 2016). Furthermore, mentor programs are also beneficial in enhancing the transformation of knowledge and developing the core competences that are necessary for future entrepreneurial activities (Linan et al., 2010).

For the academics, mentoring provides significant support not only on the professional skills level, but also in the level of self-motivation and confidence building (Fernandez-Perez et al., 2015). Particularly women entrepreneurs, the role model motivates female students to overcome the challenges that are more specifically faced by women and pursue their business opportunities in the future (Ahl, 2006). The form of role models can take various forms, such as guest speakers in class or invited mentors within the university. By sharing their experiences, students are encouraged to take their business ideas into action (Jansen et al. 2015). To conclude, a university providing a favourable and supporting entrepreneurial culture and environment can motivate and inspire students to join entrepreneurship, especially for female students. Hence, I propose:

Hypothesis 2: Entrepreneurial climate of the university positively stimulates entrepreneurial intention among female students.

2.4 Networking capability and women entrepreneurship

We referred the networking capability on the organization level, as the resources and activities of an organization to generate, develop, and maintain networks in order to take advantage of single relationships and the network as a whole (Walter et al., 1997). Universities expand their networks through collaboration with other universities as well as companies, especially through university-industry collaboration, which provides support to students in terms of firm formation (Ganzarain et al., 2014). Perkmann and Walsh (2007) concluded the main ways of university-industry collaboration, which has shown in Table 1.

Table 1. University-industry collaboration (Perkmann & Walsh,2007)

Research partnership	Inter-organizational arrangements for conducting collaborative R&D
Research services	Activities commissioned by companies, including contract research and consulting
Academic entrepreneurship	Development and commercial exploitation of technologies by academic scientists through the creation of firms (alone or with partners)
Human resource transfer	Multi-context learning mechanisms such as training of companies' employees at the university; post graduate activities in firms etc.
Informal interaction	Formation of social relationships and networks at conferences, etc.
Commercialization of property rights	Licensing of university-generated intellectual property (patents) to firms
Scientific publications	Use of codified scientific knowledge within industry

The form of academic entrepreneurship is considered as one of the most essential schemes of partnership in the 1990s, along with the increasing number of business incubators in universities (Stal et al., 2016). In addition, different than traditional cooperation such as licensing university

intellectual property or creating joint ventures, start-ups or spin-offs are considered as one of the most effective ways to commercialize and exploit the up-to-date knowledge and technologies which also foster the diffusion of technology (Leyden et al., 2014).

There is no doubt that incubator services play a significant role in encouraging student entrepreneurship, especially for technology-based start-ups (Matt et al., 2014). The incubators provide a positive environment for small-sized firms, including supporting facilities and services, access to the newest information of the market and technologies, legal support, access to funding, professional assistance regarding how to leverage existing resources, et cetera (Stal et al., 2016). Gaining timely information about current markets, technologies and customer needs through the close interaction with business partners is positively associated to entrepreneurship and professional skills (van Berg et al., 2008). From the individual's point of view, personal social networks may significantly influence the cognitive perceptions towards various entrepreneurial activities (Linan et al., 2011). While on a broader level, the business world has an intricate linkage with the academic circle. The business network can increase the awareness of researchers regarding commercial potential of their works, thus, encouraging scholars to participate in entrepreneurship and discover its potential. In other words, academics will have access to market-related knowledge, resources, and useful information by being actively involved in the business networks (Ganzarain et al., 2014). The business network also can foster scholars to obtain a deeper understanding regarding the practical application of their work in the real world. Therefore, academics have a higher likeliness to become entrepreneurs. For instance, a researcher who is closely collaborating with a company is more likely to recognize the commercial potential of the research and is more likely to apply patents for the research findings (Fernandez-Perez et al., 2015).

Like incubators, science parks and entrepreneurship centres are all different forms of university-industry collaboration. Universities and companies are partners where both parties have access to new sources of knowledge and share research infrastructures (Ganzarain et al., 2014). The university-industry partnership can successfully promote knowledge generation and transmission and stimulate student entrepreneurship such as the creation of start-ups and spin-offs (Stal et al., 2016). Moreover, the networks of incubators are connecting young entrepreneurs and students with the right people, including investors, potential partners and customers etc., which can also help female entrepreneurs overcome existing barriers (Tiago et al., 2015). Networking is essential in terms of access to funds for small firms. Universities that offer common work space with external entrepreneurs, such as Centre of Entrepreneurship, provides students the opportunity to get to know the life of young entrepreneurs and start-up founders and be motivated by them (Jansen et al. 2015).

In addition, the networking capability of the university benefits students through personal network development in the seed and early stages of entrepreneurship. From an individual's perspective, on one hand, entrepreneurship programs provide students immediate benefits to students including professional skills and knowledge, self-confidence, the ability to develop practical solutions for business problems. On the other hand, it also offers long-term value including continuous innovation, idea generation and networking (Kirkwood et al., 2014). University plays a significant role in expanding the personal network of students through various course and practical offerings (Kirkwood et al., 2014). A university can offer mentoring programs (Jansen et al. 2015) and invite guest speakers in the class who are often willing to give free advice to students (Kirkwood et al., 2014). Moreover, universities gather experienced entrepreneurs and potential entrepreneurs together which implicitly offers the opportunity to bridge the social connections between them. (Jansen et al. 2015). Nevertheless, the role of the university is as an intermediary, which only provides the networking opportunity for students; networking skills are not officially being taught in the university. Furthermore, not many students realize the long-term benefits of networking. Particularly, most students do not acknowledge the value of networking until the start of their business or other business-related careers (Kirkwood et al., 2014).

The gender difference has not been sufficiently studied before regarding the network of universities stimulating entrepreneurship. Some studies illustrate that the networking behaviour is comparable between males and females and that the only difference is that women are more likely to participate in the network when it consists of other women (Carter et al., 2007). Additionally, the motivations of networking are divergent. The value of networking can be seen as extending business opportunity recognition and exploitation as well as gaining indispensable resources and connections in order to pursue entrepreneurship as a career (Holienska et al., 2016). Some discrepancies have been observed between male and female students in terms of the reflection on a university's entrepreneurship offerings (Kirkwood et al., 2014). The results of women entrepreneurship might be slightly different than entrepreneurship in general. Thus, I propose that:

Hypothesis 3: The networking capability of the university positively stimulates entrepreneurial intention among female students.

Interaction effects

The network of a university and its entrepreneurial climate are interrelated. Previous research suggests that the collaboration between an entrepreneurial university and companies stimulate the process of knowledge generation and technology transfer, therefore, the close collaboration

between academia and the business world stimulates the creation of a favourable entrepreneurial environment within a university (Stal et al., 2016). In addition, the networking offerings of a university not only provide a positive incubating environment for students' start-ups and spin-offs, but also provide the networking opportunities on individual level that enhance the development of a favourable entrepreneurial environment (Kirkwood et al., 2014). In other words, the better the networking capability of the university, the better the entrepreneurial environment of the university. Furthermore, as mentioned earlier, the entrepreneurial culture and environment can be catalysed through mentoring programs, which potentially bring industries and universities closer together (Ganzarain et al., 2014). Hence, the supporting climate of the university can stimulate the networking capability of the university. As a result, the entrepreneurial climate and the networking capability of a university may enhance each other's influences on women entrepreneurship, which is in line with the definition of the moderation effect. The moderation effect represents an interaction effect where the relationship between two variables is changed by the interference of a moderator variable (Fairchild & MacKinnon, 2009; Hayes & Matthes, 2009). Therefore, I hypothesize that:

Hypothesis 4: The entrepreneurial climate and networking capability strengthen each other's positive effect on the entrepreneurial intention among female students.

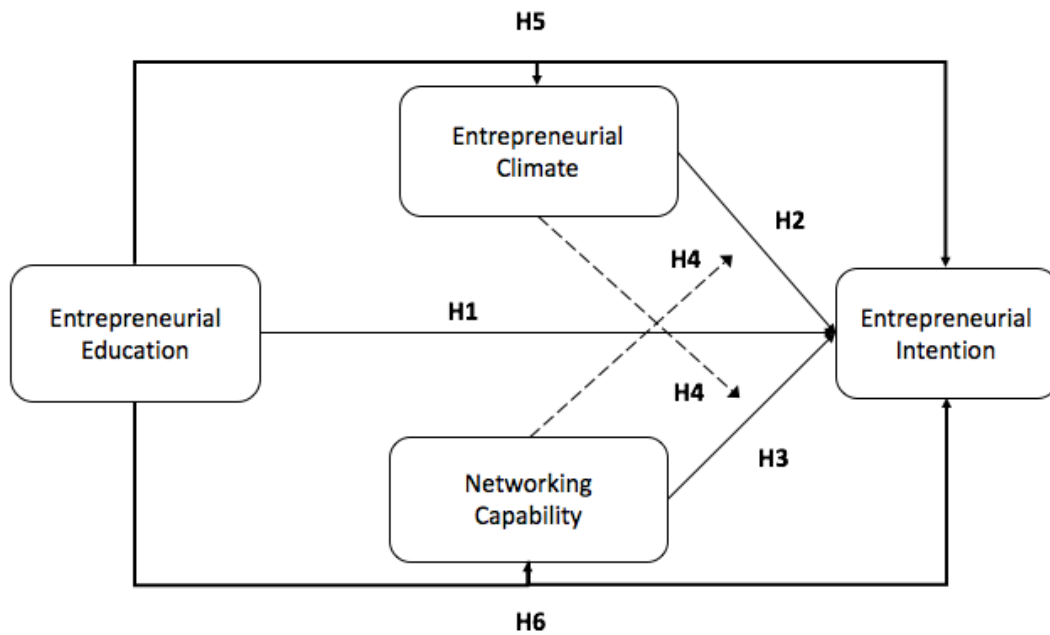
Furthermore, Jansen et al. (2015) indicates that entrepreneurial education encourages the establishment of the entrepreneurial environment across the university, which in turn reinforces student entrepreneurship. In addition, the universities expanding their network through course offerings as well, for example, invited guest speakers from cooperating industries, can result in students participating in entrepreneurship (Tiago et al., 2015). Hence, it is reasonable to suspect the direct relationship between entrepreneurial education and entrepreneurial intention is weaker than the indirect impact of entrepreneurial education on entrepreneurial intention mediated by entrepreneurial climate and networking capability. Therefore, a possible mediation effect might be observed. Based on Field (2009), the mediation effect refers to the situation that the impact of one independent variable on the dependent variable can be better explained by their relationship with a third variable (p.408). Given the previous hypotheses, the research hypothesis that:

Hypothesis 5: The impact of entrepreneurial education on the entrepreneurial intention among female students is mediated by the entrepreneurial climate of the university.

Hypothesis 6: The impact of entrepreneurial education on the entrepreneurial intention among female students is mediated by the networking capability of the university

The overall theoretical framework and hypotheses is presented in Figure 3.

Figure 3. Visualization of theoretical model and hypotheses



3. Research Methodology

This chapter highlights the research methodology by illustrating the research design, sample selection and description, measurements of variables, data collection process and data analysis principles.

3.1 Research design

The goal of the current study is to identify the role of an entrepreneurial university in stimulating women entrepreneurship. Therefore, the main research question has been formulated as: **To what extent does the entrepreneurial-oriented university stimulate women entrepreneurship?** In this study, following a deductive approach, a structured review on the existing literature on women entrepreneurship and university has been carried out first to provide a foundation for developing the conceptual framework and research assumptions. Furthermore, a questionnaire has been chosen as the form of quantitative research method which contains questions pertaining to the research questions and hypotheses. The structured questionnaire has been chosen as the method of data collection for the current study, and the main reasons are listed below:

- 1) The hypotheses need quantitative data to test the assumptions and a questionnaire is the least expensive technique to collect feedback from the greatest number of participants.
- 2) A questionnaire can collect data in a short period of time and there is no restriction on the geographic location of the respondents. Therefore, students who have attended related courses or events before also have access to this research.
- 3) The anonymous characteristic of a questionnaire encourages respondents to give honest and open feedback and evaluation on the entrepreneurial offerings at the University of Twente.
- 4) In terms of data analysis, the questionnaire data can be relatively easily processed by analysis software such as SPSS. The identification of the patterns and trends that are necessary to answer the research questions are relatively easy to achieve.

3.2 Sample

Prerequisite: Entrepreneurial-oriented University

Since the research goal and questions are based on the entrepreneurial university, the prerequisite of conducting research is an entrepreneurial university where the University of Twente has been chosen.

The definitions on an entrepreneurial-oriented university are various in existing literature and therefore is difficult to reach a consensus - I referenced that an entrepreneurial university is “a natural incubator that provides support structures for teachers and students to initiate new ventures: intellectual, commercial and conjoint”, which is originally defined by Etzkowitz in 2003. This definition is the most suitable for the current research in focusing on the role of the university in supporting and stimulating women and student entrepreneurship. There is no universal definition of an entrepreneurial university since many existing definitions make it difficult to reach cohesion. And the definition of an entrepreneurial university alone is not sufficient in terms of evaluating whether the university is entrepreneurial-oriented or not. Therefore, an assessment tool of entrepreneurial university is necessary (Stal et al., 2016).

Based on the “Triple Helix Model” (Etzkowitz, 2008), Stal et al. (2016) proposed a four-pillar model which provides omnidirectional support for entrepreneurial universities including the academic leadership, legal control of the resources, organizational ability and entrepreneurial “ethos”. More specifically, the entrepreneurial university can define entrepreneurial mission and vision, then strategically achieving the goals. Furthermore, the entrepreneurial university could legally control its resources including infrastructures and intellectual property emerged from research. The organizational ability refers to the capability of the university regarding to the transformation of technology and knowledge into patents and business incubations. The last pillar is entrepreneurial “ethos”, which means the university supports the establishment of the entrepreneurial community for students and faculty, and creates a favourable atmosphere for entrepreneurship (Etzkowitz, 2008). This model can be used to distinguish the non-entrepreneurial and entrepreneurial universities especially since some universities only emphasize activities such as teaching and researching rather than focusing on the exploitation of market potential (Stal et al., 2016).

Furthermore, OECD (2012) developed an assessment framework that involves seven main characteristics of an entrepreneurial university. Together, these characteristics created a framework of an entrepreneurial university which can be used for self-assessment by universities. The framework enables universities to evaluate their current condition and what the potential

areas that are needed to be further developed while considering the local and national environment. The characteristics, definition and the score of the University of Twente are listed in Table 2, furthermore, the detailed analysis on scoring is presented in Appendix 3.

Table 2. The characteristics of entrepreneurial university based on OECD framework and the score of UT

Characteristics	Definition	Scoring
1. Leadership and Governance	The university needs to have powerful leadership and governance when creating and implementing a culture of entrepreneurship.	9
2. Organisational Capacity, People and Incentives	The university can reduce constraints brought on by various organizational structures while implementing entrepreneurial strategic goals which include: optimizing financial strategy, maintaining talents and motivating entrepreneurial activities on a personal level.	8.5
3. Entrepreneurship development in teaching and learning	Universities promote entrepreneurship through entrepreneurial education through all the faculties and departments, from students to staff. A supporting organizational structure is necessary for entrepreneurial development and providing appropriate mechanisms to achieve the teaching and training objectives, within the internal and external environments.	8.5
4. Pathways for entrepreneurs	An entrepreneurial university supports potential entrepreneurs (staff and students) in the process - from ideas to firm creation.	9
5. University – business/external relationships for knowledge exchange	The partnership with other key players (e.g. local government, industries, academic institutions and alumni) is significant in terms of value creation for the university and society and also the ability to exploit the university in terms of entrepreneurial research, teaching and other activities.	8.5

6. The Entrepreneurial University as an internationalised institution	Internationalisation becomes increasingly important for entrepreneurial universities in terms of strategic decisions and institutional directions. Internationalisation and entrepreneurialism are inseparable for a university. The internationalisation environment has great influence on an entrepreneurial university regarding teaching, researching and culture creation.	9
7. Measuring the impact of the Entrepreneurial University	The impact of changes need to be measured, which including the impact internally(students/staff) and externally (local communities/industries). The measurement of impact is immature and most of the literature measures the spin-offs, research outcomes and IP. More importantly, the essence is what the university wants to measure.	9

The overall score of the University of Twente is 8.79 according to the OECD entrepreneurial university framework which close enough to a perfect score and indicated that the University of Twente is an entrepreneurial-oriented university with no doubt.

Respondents of questionnaire

After achieving the precondition of the research, the selection of participants for the questionnaires need to meet certain criteria as well. The selection criteria are: 1) female students who are currently studying or used to study in the University of Twente; 2) female students with different study background in the University of Twente.

At the University of Twente, women account for 30% of the overall academic staff in the university, and female students account for almost 40% of the student population. The female students have been chosen because the research focuses on the female perspective regarding the entrepreneurial offerings of the university and how female students interpret the assistance they have received. The university offers entrepreneurial-oriented courses starting from the bachelor's program. Also, the university is promoting entrepreneurship not only through education, but also through creating an entrepreneurial environment. The entrepreneurial culture is established within the whole university across all departments and faculties (Dodescu et al., 2014). Therefore, there are no restrictions on the study background (e.g. field of study, level of study et cetera.) of the participants in this survey.

3.3 Measurements

The scope of the research is to identify the barriers of women entrepreneurship and examine the awareness and effectiveness of the entrepreneurial offerings of an entrepreneurial university among female students. The questionnaire has been approved by the Ethics Committee of the University of Twente first, then distributed to the audience.

3.3.1 Research instrument

The questionnaire was developed through the online survey software Qualtrics. The survey was conducted among students of the University of Twente. The questionnaire contained six blocks and eighteen questions in total where seventeen questions were mandatory to answer (see Appendix 4). The first block of questions covered the respondents' perception on the level of entrepreneurial-oriented of the University of Twente and the most identified barriers of women entrepreneurship. The second block consisted of questions regarding the entrepreneurial education of the University of Twente, including the entrepreneurial course offerings and the outcome of those courses. For the third block, the questions associated with the entrepreneurial climate variable have been asked to the respondents, while the fourth block examined the networking capability of the University of Twente. The fifth block emphasized the female perspective on the usefulness of the existing entrepreneurial offerings of the University of Twente, taking into context the barriers that are specifically faced by women and the entrepreneurial intention among respondents. And finally, a group of demographic information has been covered in the questionnaire such as age, gender, field and level of study.

3.3.2 Dependent variable

As illustrated in Figure 3 earlier, the outcome of the university offering in encouraging women entrepreneurship is indicated by the entrepreneurial intention among female students. This is the dependent variable of the research as well.

In the questionnaire, the entrepreneurial intention is measured by the seven-point Likert scale adopted from Liñán and Chen (2009), which measures the behavioural intention and provides better prediction on behaviours (Armitage & Conner, 2001). The participants of the questionnaire are required to indicate the agreement of the following statements: *"I am ready to do anything to be an entrepreneur"*, *"My professional goal is becoming an entrepreneur"*, *"I will make every effort to start and run my own firm"*, *"I am determined to create a firm in the future"*, *"I have very*

seriously thought of starting a firm", and *"I got the firm intention to start a firm someday"*. To obtain the resulting values of the multi-component variable, the average score on all the components is calculated.

3.3.3 Independent variables

Entrepreneurial education

The effectiveness of the education offering is assessed through a seven-point Likert scale adopted from Franke and Lüthje (2004), which the participants are offered to indicate the agreement of the following statements regarding the entrepreneurial courses: *"Enhanced my ability to identify business opportunities"*, *"Improved my professional knowledge and skills that are required to start a new company"*, *"Increased my understanding of the attitudes, values and motivations of entrepreneurs"*, and *"Prepares me well for self-employment in the future"*. The mean of the multi-items variable has been calculated as the final value for further research.

Moreover, the entrepreneurial education of the University of Twente is measured by the checklist of existing courses that are adopted from the course category of the University of Twente and Küttim et al. (2014). The respondents were asked to evaluate the usefulness of each course category, for example, the business planning related courses (on a five-point scale of very useful to very useless).

Entrepreneurial climate

I subjectively examined the entrepreneurial environment in the University of Twente through a seven-point Likert scale adopted from Franke and Lüthje (2004). The participants are required to indicate the agreement with the following statements: *"In my university, there is a well-functioning support infrastructure to support the start-up of new firms"*, *"The atmosphere at my university inspires me to develop ideas for new businesses"*, *"There is a favourable climate for becoming an entrepreneur at my university"*, *"At my university, students are encouraged to engage in entrepreneurial activities"*, and *"My academic peers participated in entrepreneurship influences my attitudes towards entrepreneurship"*. The final values of this multi-component variable are measured by the average score on all the components.

Furthermore, the measurement of the entrepreneurial climate is in essence an examination of the supportiveness of the environment towards entrepreneurship at the university. The university provides entrepreneurial activities such as business plan workshops/contests, mentoring and coaching programs to incubate an entrepreneurial culture in the university. In order to assess the awareness of the entrepreneurial activities in the University of Twente, the

participants are required to answer the awareness and experience with the following activities: *"Business plan contests/workshops"*, *"Mentoring and coaching programs"*, and *"Others entrepreneurial activities (please specify)"*, with the available options of: *"Participated at least once"*, *"Know it, but never participated"*, and *"Never heard about it"*.

Networking Capability

The outcome of the networking opportunities is evaluated by a seven-point Likert scale adopted from Kirkwood et al. (2014), Jansen et al. (2015), and Stal et al. (2016). The participants of the questionnaire are asked to illustrate the agreement of the following statements: *"Enhanced my ability to develop networks"*, *"Received more assistance from professionals"*, *"Better access to timely information on the current market"*, and *"Connected me closer to the business world"*. The resulting values will be calculated by the average score of all the listed items.

In addition, the participants are offered to answer the networking opportunities that have been offered by the University of Twente: *"Workshops/Networking with experienced entrepreneurs"*, *"Connecting with right people (legal support/business development)"*, *"Contact point for entrepreneurial issues"*, *"Seed funding / financial support"*, and *"Other networking opportunities (please specify)"*, with the available options of *"Yes"*, *"Maybe"*, and *"No"*.

One thing that needs to be highlighted is that the seven-point Likert scale indicates that 1 means "strongly agree" and 7 is "strongly disagree", therefore, the higher the score, the lower the entrepreneurial intention among female students, as well as the entrepreneurial education, entrepreneurial climate and networking capability of the university. In this research, instead of the traditional thinking of higher scores meaning better results, the interpretation of the results needs to be reversed.

3.3.4 Control variables

The control variable of the research is two dummy variables, which the dummy variable is a numerical variable that contains only the values of "one" and "zero", and is mainly used in regression analysis in order to represent categorical data of the sample (Field, 2009). The dummy variable is able to represent more than one group in the simple regression equation (Field, 2009). In the current study, the dummy variables are the age group and the level of study of respondents in order to discover the influence of age group and level of study on the entrepreneurial intention among female students. The age group of the respondents is recoded into *"Above 25" (by coding age above 25 as 1 and else as 0)*. Meanwhile, the level of study is recoded into *"Master+" (by coding pre-master, master and Ph.D. level as 1 and else as 0)*.

3.4 Data collection

The questionnaires have been distributed through online and offline channels in order to collect sufficient amount of responses, which are in the form of online questionnaires, emailed questionnaires, and face-to-face questionnaires.

The questionnaires are first distributed through online channels. The online questionnaire has been delivered to targeted audiences through social media which includes posts on student groups across the University of Twente on Facebook, WeChat and WhatsApp to achieve a diverse background of the respondents. As an example, the online questionnaire was posted in the University of Twente-International group and Buddy programme 2017 group on Facebook. Moreover, questionnaires have been emailed to all the students who are registered in certain master's program organizations on Blackboard. After distributing the questionnaire on many possible online platforms, the received respondents are still not sufficient for a statistically significant number of respondents for a scientific research study ($n=96$). Therefore, the offline questionnaire has been delivered to the targeted via face-to-face where I have reached out to students in the common study area at the University of Twente ($n=35$). It is worth to mention that even though the offline questionnaires are distributed in person, the respondents remain anonymous and undisrupted while filling in the questionnaire, and the questionnaires were filled in by mobile devices.

In total, 131 people filled in the online questionnaire. Some participants did not fulfil the inclusive criteria, as they are not studying in the University of Twente, not female or provided invalid answers. Therefore, the final sample of the research contains 106 valid respondents (drop-off-rate 19.08%). To be noted, only the respondents answered all the questions in the entrepreneurial education, entrepreneurial climate and networking capability blocks were included in the regression analysis. According to the Facts & Figures (2018), 52.6 percent of students study at the University of Twente are bachelor students, and rest of the students are attending master programmes, including pre-master and post-master programmes. In the current research, two-third of the collected respondents are master students (including pre-master), which was unfortunately not a perfect representation of the overall student population

3.5 Data analysis

The data was analysed to answer the research question on to what extent does the entrepreneurial university stimulate women entrepreneurship. First, factor analysis, reliability analysis and assumption testing were performed in order to confirm that the assumptions were not violated and therefore did not influence the conclusion of the respective analysis. Secondly, the research findings were represented by descriptive statistics, collinearity tests, and regression analysis. The current study measures the effect of multiple explanatory variables (entrepreneurial education, climate and networking capability) on the dependent variable (entrepreneurial intention), which makes the multiple regression technique suitable for data analysis (Cohen, Manion & Morrison, 2002). In addition, the moderating effect and mediating effect were examined as well. The analysis of the data has been completed through the statistical program IBM SPSS Statistics.

Factor Analysis

The Principle Component Analysis (PCA) was conducted on the 19 items with orthogonal rotation (varimax). The determinant value of the correlation matrix is 6.324E-05, which is higher than the necessary value .00001, and all items are correlated and none of the coefficients are particularly large. Therefore, the multicollinearity and singularity of the items were not potential problems of this data set. The Kaiser-Meyer-Olkin (KMO) test value equals to .906, which is “superb” according to Hutcheson and Sofroniou (1999,). The KMO value is close to 1 represents the high level of reliability and distinction of this factor analysis. The Bartlett’s test of sphericity χ^2 (253) = 1182.388, $p < .001$, which can be interpreted that the correlations between items were sufficiently large for PCA.

Before factor extraction, SPSS has identified 19 linear components in this data set. The first four components together explained 71.43% of the overall variance, where factor 1 accounted for 49.304% (factor 2, 3 and 4 were 10.852%, 5.923%, and 5.351%), which leave a small amount of variance that can be explained by the subsequent factors. It is also consistent with the factor extraction in the next step, which SPSS extracted four factors with eigenvalues higher than 1. After the rotation, the importance of the four extracted factors are modified, where factor 1 before rotation accounted for nearly half of the variance, but after rotation, it only explained 24.181% of the total variance. The other three factors accounted for 17.076%, 16.334%, and 13.838% respectively. According to the Kaiser’s criterion, there are four factors extracted. In general, most of the communality values after extraction are greater than 0.7, with an average communality value of 0.714. Therefore, the factor extraction is relatively accurate. As we can see from the rotated component matrix (Table 3), the items clustered under the same components

suggest that component 1 represents entrepreneurial intention, component 2 networking capability, component 3 entrepreneurial education y, and component 4 entrepreneurial climate.

Table 3. Rotated component matrix

	Component			
	1	2	3	4
I've got the firm intention to start a firm some day	.883			
I have very seriously thought of starting a firm	.813			
My professional goal is becoming an entrepreneur	.801			
I will make every effort to start and run my own firm	.776			
I'm determined to create a firm in the future	.761			
I'm ready to do anything to be an entrepreneur	.686			
Connected me closer to the business world		.794		
Received more assistance from professionals		.675		
Better access to timely information on the current market		.636		
Enhanced my ability to develop networks		.629		.404
Increased my understanding of the attitudes, values and motivations of entrepreneurs			.747	
Improved my professional knowledge and skills that are required to start a new company			.639	
Enhanced my ability to identify business opportunities			.564	
Prepares me well for self-employment in the future			.533	
My academic peers participated in entrepreneurship influences my attitudes towards entrepreneurship				.738
There is a favourable climate for becoming an entrepreneur at my university				.702
At my university, students are encouraged to engage in entrepreneurial activities			.421	.629

In my university, there is a well-functioning support infrastructure to support the start-up of new firms	.586
The atmosphere at my university inspires me to develop ideas for new businesses	.509

Reliability

The reliability of the research was measured by Cronbach's Alpha, and each variable has been calculated and listed on Table 4. As we observed from the reliability table, the entrepreneurial education and networking capability both consisted of 4 items ($\alpha = .775$; $\alpha = .891$), the entrepreneurial climate contained 5 items ($\alpha = .868$), and the entrepreneurial intention subscale consisted of 6 items ($\alpha = .963$). The variables of the research have a significantly high level of reliability, with Cronbach's α values at least greater than .775, based on the criteria of Cronbach's Alpha (Field, 2009), the reliability is more than satisfied.

Table 4. Reliability statistics

Variables	Cronbach's Alpha	Based on Standardized Items	N of items
Entrepreneurial Education	.775	.784	4
Entrepreneurial Climate	.868	.873	5
Networking Capability	.891	.892	4
Entrepreneurial Intention	.963	.963	6

Assumption Testing

There are several steps in assumption testing, first starting with the normality check, which was done by both statistical and graphical methods in the current research. The numerical test can provide judgement objectively, whereas it is also limited by the sample size in some cases. Therefore, the combination with graphical tests increases the reliability of the interpretation on normality.

Table 5a. Normality test

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Entrepreneurial Education	.146	91	.000	.947	91	.001
Entrepreneurial Climate	.123	91	.002	.938	91	.000
Networking capability	.156	91	.000	.943	91	.001
Entrepreneurial Intention	.118	91	.003	.920	91	.000

The numerical test of normality was conducted by Shapiro-Wilk Test, as illustrated in Table 5a. Based on the numerically testing, all the variables are non-normally distributed with all Sig values lower than .05. However, the graphically testing using Q_Q plot revealed that the plotted values are not vary far from the straight line (see Appendix 5), especially the entrepreneurial education, entrepreneurial climate and networking capability. In other words, the normal Q_Q plot indicated that the data are relatively normal distributed in the research. Furthermore, the residual histogram, scatterplots and normal P_P plot (see Appendix 5) show the assumptions of reasonable linearity, homogeneity of variance, and normality are present (Field, 2009). The residual histogram revealed a peak in the middle and symmetrical, the assumption of normality has been met. The scatterplot below does not observe any obvious pattern, and all the dots are relatively equally distributed above and below zero on the X axis and Y axis. Therefore, the homogeneity of variance of the assumptions has been met.

In addition, the collinearity test has been conducted through the tolerance and variance inflation factor (VIF). Tolerance represents the percentage of variance in the independent variable that cannot be accounted for by the other independent variables. The values of tolerance higher than 0.1 are favourable (Field, 2009). Furthermore, the VIF shows the level of influence of collinearity among the variables in the regression model. The values of VIF above 10 are often considered as indicating multicollinearity (Field, 2009). As illustrated on the Table 5b below, the VIF values are all below 10, and all the tolerance values above 0.1. Therefore, it showed that there are no multicollinearity symptoms in the variables (Field, 2009).

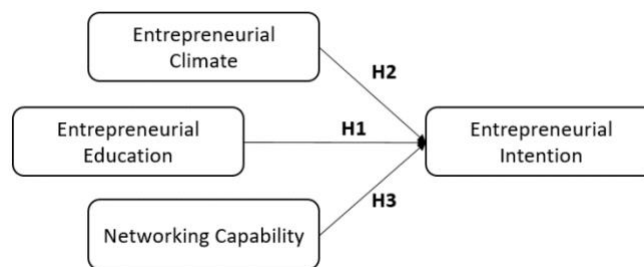
Table5b. Collinearity test

		Entrepreneurial Education	Entrepreneurial Climate	Networking Capability
Collinearity	Tolerance	.443	.419	.418
Statistics	VIF	2.260	2.338	2.394

*Dependent Variable: Entrepreneurial Intention

Measuring Direct Effect

The first three hypotheses of the research were tested by multiple regression analysis (see Figure 4). The multiple regression model has been applied after controlling the dummy variables to identify the significance of the independent variables in terms of predicting outcome variable and to what extent the independent variables predicting the outcome variable will be.

Figure 4. Hypotheses on direct effect

Measuring Moderation Effect

Based on the multiple regression analysis, all the independent variables were measured, whether significantly predicting the dependent variable or not. Under the condition that entrepreneurial climate and networking capability were testified as significant predictors for entrepreneurial intention, the moderation effect analysis will be performed. The interaction term of entrepreneurial climate and networking capability will be added and observed the changes (Field, 2009). The moderation hypothesis can be supported when the coefficients of the introduced interaction term is statistically significant, because the unique effect of entrepreneurial climate (or networking capability) on entrepreneurial intention is not limited by its own Beta value, but also depends on the values of the interaction term and networking capability (or entrepreneurial climate). After the potential moderation effect is approved, the modelling process tool “PROCESS¹ (A. F. Hayes, 2012)” will be used for the moderation effect analysis. The interaction plot will be created to visualize the moderation effect based on the data generated by PROCESS (Hayes & Matthes, 2009).

¹ Retrieved from <http://www.processmacro.org/index.html>

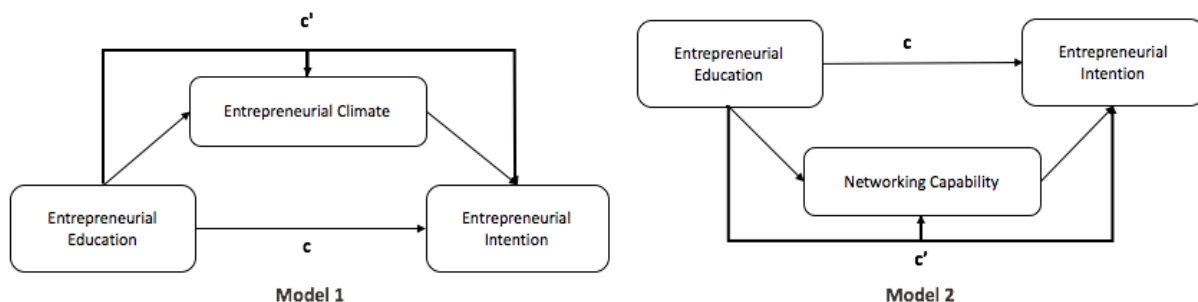
Measuring Mediation Effect

In this research, if the following conditions have been met, the mediation effect will be investigated (Field, 2009):

- Entrepreneurial education must be significantly predicting entrepreneurial intention.
- Entrepreneurial education must be significantly predicting entrepreneurial climate and networking capability.
- Entrepreneurial climate and networking capability must be significantly predicting entrepreneurial intention.

The PROCESS modelling tool has been implemented as well to statically test the mediation effect. **Model 1** below (Figure 5) indicated entrepreneurial intention as dependent variable, entrepreneurial education as the independent variable, and entrepreneurial climate as the mediating variable. If a difference between c and c' has been observed, a Sobel test will be further implemented to confirm the significance of the differences in the mediation effect (Preacher & Hayes, 2004). **Model 2** followed the same logic with Model 1, which the dependent variable and independent variable remains the same, only the networking capability has been considered as the mediating variable. A Sobel test will be necessary if the difference has been observed between c and c' (Preacher & Hayes, 2004).

Figure 5. Mediation relationship



4. Empirical Results

In this chapter, the results of the conducted questionnaires data are outlined. The structure of this chapter is as follows: the descriptive statistics of the variables and respondents is presented first, then followed by the correlation analysis among study variables. Subsequently, the regression analysis was demonstrated to explain the results on the hypotheses. Lastly, the results on the moderation and mediation effect will be presented.

4.1 Descriptive statistics

The first step was conducting univariate analysis in the form of descriptive statistics which describes all the variables of the research (including entrepreneurial education, entrepreneurial climate, networking capabilities and entrepreneurial intention among female students) and the characteristics of respondents.

In total, there were 106 valid response that have been collected. The descriptive statistics are listed in Table 6. N = 91 in entrepreneurial education represents there are 15 respondents did not receive any education on entrepreneurship so far. The mean values of the effectiveness of entrepreneurial education, entrepreneurial climate and networking capability of the University of Twente are almost on the same level 2.12 (SD = .65), 2.25 (SD = .88) and 2.46 (SD = .93), while 1 represents strong agreement and 7 represents strong disagreement based on the seven-points Likert scale. In addition, the data set revealed the average level of entrepreneurial intention among female students is 3.16 (SD = 1.27) - that is closest to the option of “somewhat agree”, which indicated most of the respondents are positive and open for being entrepreneurs in the future.

Table 6. Descriptive statistics of variables

	N	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness		Kurtosis	
						Std.		Std.	
						Statistic	Error	Statistic	Error
Entrepreneurial Education	91	1.00	3.50	2.1236	.65338	.468	.253	-.631	.500
Entrepreneurial Climate	106	1.00	5.00	2.2509	.87942	.952	.235	.701	.465
Networking Capability	106	1.00	5.00	2.4623	.93273	.537	.235	-.444	.465
Entrepreneurial Intention	106	1.00	7.00	3.1635	1.26867	1.370	.235	2.066	.465

Regarding the usefulness of entrepreneurial education, all respondents considered the entrepreneurial courses offered by the University of Twente as relatively important and useful. This is based on the patterns discovered in the questionnaire that all the respondents have chosen between the options “very useful” to “neutral”. The entrepreneurial marketing- and innovation-related courses saw that around 60% of the total respondents agreed that these courses are really useful. Whereas only one-third of the respondents believed that the economic-related courses are useful for entrepreneurship. In addition, few respondents indicated that the entrepreneurial leadership, supply chain and the real-life cases courses they attended in the University of Twente before are very useful (see Appendix 6).

In terms of the entrepreneurial climate of the University of Twente, it is well-established and favourable for women entrepreneurship. Nearly over 90 percent of respondents believed that the university provides a well-functioning infrastructure (90.57%) and atmosphere (89.62%) that encourages female students to generate innovative business ideas and become entrepreneurs (92.45%). Furthermore, students are actively encouraged to participate in the entrepreneurial activities organized by the university (86.79%). In addition, we also observed a significant impact of academic peers on entrepreneurship where almost 80 percent of participants indicated that their academic peers influence their attitudes towards entrepreneurship. Nevertheless, the awareness and participation of the entrepreneurial activities are lower than expected. With the mentoring and coaching programmes, approximately 60 percent of respondents never heard about these offerings at the university (see Appendix 6).

The participation of the networking programmes is surprising low, and most of the networking opportunities that have been offered by the University of Twente did not receive enough attention from students. Specifically, regarding the financial support, over 70 percent of respondents do not aware of the opportunity. And nearly half of the respondents were not familiar with other networking opportunities (see Appendix 6).

The profile of the respondents is outlined in Appendix 6 as well. The level of study among respondents are concentrated on bachelor’s and master’s level where almost 70 percent of the respondents are master’s students, and 27.4 percent of respondents are bachelor’s students. Furthermore, 97 percent of the respondents age ranged from 18 to 30 years old, and the age group 18-24 years old took the first place which accounts for over 70 percent of the overall participants. The top three fields of study among respondents are Business Study and Public Policy (48.1%), Social Sciences (18.9%) and Engineering & Technology (17%), as shown in Table 6d. In addition, nearly all of the respondents are currently not self-employed (N=102).

4.2 Correlation analysis

It is necessary to check the relationships between each independent variable and the dependent variable using correlations to test the relevancy of each independent variable on the dependent variable. The test of multicollinearity is essential for the research, which indicated whether the independent variables are closely related to each other. If a multicollinearity between independent variables has been observed during the test, then one of the variables must be redundant for the multiple regression later (Mason & Perreault, 1991). The correlation table has been presented in Table 7. Since the variables were measured through multi-items in the questionnaire (Likert scale), the mean value of the items has been calculated for the analysis. A Pearson correlation coefficient was computed to assess the relationship among all the variables.

As we can see from Table 7 below, there were significant relationships between all the variables. The entrepreneurial education was significantly correlated with entrepreneurial climate, $r = .690$, and networking capability of the university, $r = .691$, and entrepreneurial intention, $r = .636$ (all $p < .001$). Furthermore, the entrepreneurial climate was significantly correlated with networking capability, $r = .738$, and entrepreneurial intention, $r = .529$ (all $p < .001$). Lastly, a significant positive correlation has been observed between networking capability and entrepreneurial intention, where $r = .579$ ($p < .001$). The relatively high correlations among the independent variables may influence the accuracy of the analysis and interpretation of the results on the dependent variable. Nevertheless, the factor analysis and collinearity test did not reveal any concerns of multicollinearity.

Table 7. Correlation matrix on relationship between study variables

		Entrepreneurial Education	Entrepreneurial Climate	Networking Capability	Entrepreneurial Intention
Entrepreneurial Education	Pearson Correlation	1			
Entrepreneurial Climate	Pearson Correlation	.690**	1		
Networking Capability	Pearson Correlation	.691**	.738**	1	
Entrepreneurial Intention	Pearson Correlation	.636**	.529**	.579**	1
	N	91	106	106	106

** . Correlation is significant at the 0.01 level (2-tailed).

4.3 Regression analysis

I performed the multiple regression in a stepwise manner to test the effects of entrepreneurial education, entrepreneurial climate and networking capability on entrepreneurial intention among female students after controlling the age group and study level of respondents. The results of the regression analysis have been demonstrated in Table 8 below.

Table 8. Determinants of entrepreneurial intention among female students

	Model 1			Model 2			Model 3		
	B	s.e.	Sig.	B	s.e.	Sig.	B	s.e.	Sig.
Constant	3.34	0.14	0.00	0.80	0.26	0.00	0.80	0.26	0.00
Age group	-0.63	0.27	0.02	-0.12	0.17	0.15	-0.12	0.17	0.15
Study level	-0.12	0.28	0.23	-0.10	0.18	0.21	-0.10	0.18	0.21
Education				0.63	0.16	0.00	0.63	0.16	0.00
Climate				0.38	0.14	0.01	0.38	0.14	0.01
Network				0.02	0.13	0.88	0.02	0.13	0.88
Climate*Network							0.13	0.12	0.50

First of all, model 1 contained only the control variables, and the age group of respondents negatively and significantly influence the entrepreneurial intention among female students. Whereas, the level of study did not contribute to a significant variance to the entrepreneurial intention (analysis on dummy variables see Appendix 7). Model 2 represented the regression model with control variables and independent variables. The model 3 included the interaction term “Climate*Network” in the regression model. In model 2 and model 3, the control variables age group and study level are both negative yet insignificantly predicted the entrepreneurial intention. Secondly, as we can see in Table 8, the entrepreneurial education and entrepreneurial climates were two independent variables that can significantly predict the entrepreneurial intention among female students, with the significant p-value of .00 and .01 ($p < .05$). The result demonstrated **the hypothesis 1 and 2 are supported**. Nevertheless, it also indicated that the networking capability was not significantly predicting the dependent variable, with a p-value of .88, which is absolutely higher than the significant level of .05. More specifically, the networking capability of the university cannot predict the entrepreneurial intention among female students. The result indicated that the **hypothesis 3 of research is rejected**. Thirdly, the interaction term “Climate*Network” was positive yet insignificantly related to the entrepreneurial intention among female students. The detailed analysis of the moderation effect was illustrated in session 4.4.

To conclude, a multiple linear regression was calculated to predict entrepreneurial intention among female students based on entrepreneurial education, entrepreneurial climate and networking capability among female students. A significant regression equation was found ($F(2, 98) = 35.65, p < .000$), with an R^2 value of .448, which means the entrepreneurial education and entrepreneurial climate explained 44.8% of the variation of the entrepreneurial intention among female students. Participants' predicted entrepreneurial intention is equal to $0.80 + 0.32 * \text{Entrepreneurial Education} + 0.19 * \text{Entrepreneurial Climate}$. The Constant is the predicted value of the dependent variable when the values of all the independent variables equal to zero. In the research conducted, the predicted entrepreneurial intention among female students with zero entrepreneurial education and zero entrepreneurial climate was 0.80. Furthermore, the slope of entrepreneurial education was 0.31, which indicated that by every one unit increased in entrepreneurial education, the predicted entrepreneurial intention will be increased by 0.32 unit, after controlling for the entrepreneurial climate. With the same logic, the slope of entrepreneurial climate was 0.19, which means that by every one unit increase in entrepreneurial climate, the predicted entrepreneurial intention will be increased by 0.18 unit while controlling for the entrepreneurial education. Both entrepreneurial education and entrepreneurial climate were significant predictors of entrepreneurial intention among female students.

As explained in the previous chapter, a higher score represents a lower level of entrepreneurial intention, entrepreneurial education, entrepreneurial climate and networking capability. As we can see in the regression function, the lower the score of entrepreneurial education and entrepreneurial environment, the lower the score of the entrepreneurial intention. In other words, the more effective the entrepreneurial education and environment of the university, the stronger entrepreneurial intention among female students.

4.4 Moderation and mediation effect

To test the hypothesis regarding the moderation effect between networking capability and entrepreneurial climate on entrepreneurial intention, a hierarchical regression analysis was conducted. The interaction term between entrepreneurial climate and networking capability was first computed before conducting the analysis on moderation effect.

As presented in Table 9a and 9b, model 1 represented the entrepreneurial climate and networking capability accounted for a significant amount of variance in entrepreneurial intention where $R^2 = .358, F(2, 103) = 28.725, p < .001$. Model 2 indicated that the interaction term "Network*Climate" was included between entrepreneurial climate and intention. And the

regression model used after including interaction term accounted for a significant amount of variance in entrepreneurial intention, where $R^2 = .360$, $F(3, 102) = 19.104$, $p < .001$. The R^2 changed equals to .002, with a p-value equals 0.605, which indicated the model 2 including interaction terms did not account for significantly more variance than model 1. From Table 9c, we learned that the variance of the entrepreneurial intention among female students cannot explained by entrepreneurial climate ($B = 0.122$, $p = .772$), networking capability ($B = 0.408$, $p = .231$), nor the interaction term ($B = 0.070$, $p = .605$), due to all the p values were statistically insignificant. This means that there was no significant moderating effect between the networking climate and the entrepreneurial climate on entrepreneurial intention. Therefore, **Hypothesis 4 is rejected.**

Table 9a. Moderation effect analysis: ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	60.511	2	30.256	28.725	.000^b
	Residual	108.488	103	1.053		
	Total	168.999	105			
2	Regression	60.797	3	20.266	19.104	.000^c
	Residual	108.202	102	1.061		
	Total	168.999	105			

a. Dependent Variable: Intention

b. Predictors: (Constant), Network, Climate

c. Predictors: (Constant), Network, Climate, Network*Climate

Table 9b. Moderation effect analysis: Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.598 ^a	.358	.346	1.02629	.358	28.725	2	103	.000
2	.600 ^b	.360	.341	1.02995	.002	.269	1	102	.605

a. Predictors: (Constant), Network, Climate

b. Predictors: (Constant), Network, Climate, Network*Climate

Table 9c. Moderation effect analysis: Coefficient

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.454	0.832		1.747	0.084
Entrepreneurial climate	0.122	0.421	0.085	0.291	0.772
Networking capability	0.408	0.339	0.300	1.205	0.231
Network*Climate	0.070	0.135	0.239	0.519	0.605

a. Dependent Variable: Intention

Furthermore, as was already learned from the regression analysis, the networking capability was not a significant predictor for the entrepreneurial intention among female students. In other words, there was no direct effect between these two variables which does not satisfy the pre-condition of the mediation effect. Consequently, **hypothesis 6 is rejected**. Only the mediation effect of entrepreneurial climate was further investigated.

The mediation effect between entrepreneurial climate and entrepreneurial education on entrepreneurial intention has been inspected by the application of PROCESS as well. As illustrated in Table 10, in Step 1 of the mediation model, the regression of entrepreneurial climate on entrepreneurial intention ignoring the mediator, was significant, $b = 0.91$, $t(89) = 7.77$, $p = .0000$. Step 2 indicated that the regression of entrepreneurial climate with the mediator entrepreneurial climate, was also significant, where $b = 0.75$, $t(89) = 9.00$, $p = .0000$. Step 3 demonstrated the mediator, controlling for entrepreneurial education, was also significant, $b = 0.38$, $t(88) = 2.63$, $p = .0102$. The step 4 of the mediation process showed that controlling for the mediation, the entrepreneurial education was still a predictor of the entrepreneurial intention, $b = 0.63$, $t(88) = 4.00$, $p = .0000$. A Sobel test was implemented and discovered the non-fully mediation in the model ($z = 2.51$, $p = 0.122$). A summary of the findings on mediation test has been presented in Figure 6. Through this test, it was demonstrated that the entrepreneurial climate partially mediated the relationship between entrepreneurial education and entrepreneurial intention.

To conclude, there was a significant indirect effect of entrepreneurial education on overall entrepreneurial intention through entrepreneurial climate, $ab = 0.285$, BCa CI [0.0029, 0.4854]. Therefore, **hypothesis 5 is supported**. The mediator could account for nearly one-third of the total effect, $PM = 0.31$. Additionally, Table 11 summarized all the results of hypotheses.

Table 10. Mediation effect analysis

Outcome: Entrepreneurial Climate						
	coeff	se	t	p	LLCI	ULCI
Entrepreneurial Education	.7484	.0832	8.9970	.0000	.5832	.9137
Outcome: Entrepreneurial Intention						
Entrepreneurial Climate	.3785	.1442	2.6258	.0102	.0920	.6650
Entrepreneurial Education	.6246	.1563	3.9954	.0001	.3139	.9353
Outcome: Entrepreneurial Intention						
Entrepreneurial Education	.9079	.1168	7.7720	.0000	.6758	1.1400
Indirect effect of X on Y						
	Effect	Boot SE	BootLLCI	BootULCI		
Entrepreneurial Climate	.2833	.1814	.0102	.7276		
Completely standardized indirect effect of X on Y						
	Effect	Boot SE	BootLLCI	BootULCI		
Entrepreneurial Climate	.1984	.1203	.0048	.4698		
Ratio of indirect to total effect of X on Y						
	Effect	Boot SE	BootLLCI	BootULCI		
Entrepreneurial Climate	.3120	.1947	.0075	.7494		
Normal theory tests for indirect effect						
	Effect	SE	Z	p		
	.2833	.1130	2.5064	.0122		

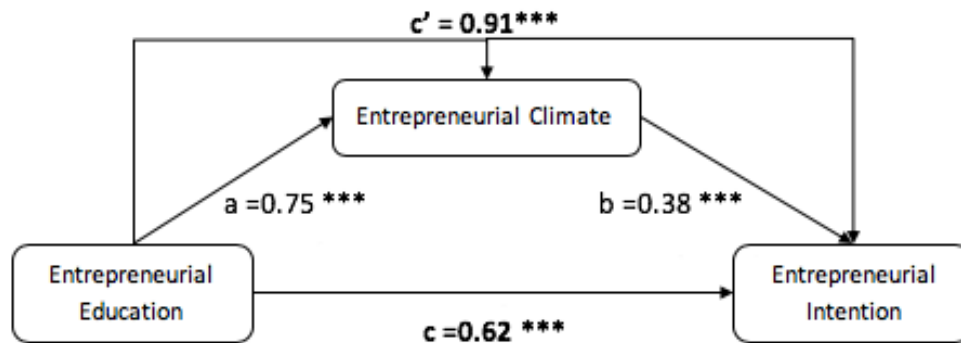
Figure 6. Summary of mediation effect

Table 11. Summarization of results on hypotheses

H1	Entrepreneurial education of the university positively stimulates entrepreneurial intention among female students.	Supported
H2	Entrepreneurial climate of the university positively stimulates entrepreneurial intention among female students.	Supported
H3	Networking capability of the university positively stimulates entrepreneurial intention among female students.	Rejected
H4	The entrepreneurial climate and networking capability strengthen each other's positive effect on entrepreneurial intention among female students.	Rejected
H5	The impact of entrepreneurial education on the entrepreneurial intention among female students is mediated by the entrepreneurial climate of the university.	Supported
H6	The impact of entrepreneurial education on the entrepreneurial intention among female students p is mediated by the networking capability of the university	Rejected

5. Discussion and Conclusion

The following chapter covers the discussion and conclusion of this master's thesis. The discussion of the main findings regarding the research questions will be outlined first, including the barriers of women entrepreneurship, as well as the effectiveness of entrepreneurial offerings on women entrepreneurship. Subsequently, the academic and practical contribution of this research will be discussed where a guideline on how to effectively stimulate women entrepreneurship will be presented based on research findings. The last section of this chapter focused on the limitations of the current research as well as some suggestions for future research.

5.1 Discussion on findings

5.1.1 Discussion on barriers of women entrepreneurship

The research was conducted in the University of Twente in the form of questionnaire, and 106 valid respondents have participated. The research goal of discovering the barriers that are faced by (potential) women entrepreneurs has been reached. After analysing the data of the questionnaire, the barriers that are faced by (potential) women entrepreneurs from the female perspective become evident (see Appendix 8). Most obstacles were distributed evenly, only the financial problems and finding the right contact for a business are a slightly higher concern for (potential) female entrepreneurs (19%). Also, the concern of combining family and work life (18%) takes the third place. The researching findings are aligned with prior research that the family responsibility, access to capital, and finding right business contacts have been considered as one of the main restrictions that influence the participation of women entrepreneurship (Winn, 2005; Berger & Kuckertz, 2016).

In addition, most participants believed that the University of Twente is an entrepreneurial university and it has provided effective supports in terms of overcoming the barriers in women entrepreneurship. As presented in Table 14 (see Appendix 8), the level of agreement of female students on the help they received from the University of Twente on each obstacle has similar patterns. Nevertheless, the assistance provided on the top three obstacles were not sufficient enough, especially for “combing family and work life”, which most female students indicated neither agree nor disagree on the level of support. It is possible that currently the university focused on the participation of women entrepreneurship, whereas, neglected the gender differences in the process. Furthermore, 11.32% of respondents expressed slight disagreement on the financial support of the University of Twente for female entrepreneurs where it was indicated that the support offered by the University of Twente can be improved further, and also in addressing the access of capital.

5.1.2 Discussion on the effectiveness of entrepreneurial offerings

The research goal of identify the awareness and effectiveness of the entrepreneurial offerings has been reached. The hypotheses of this research have been tested in the University of Twente and the results revealed that the entrepreneurial education and entrepreneurial climate of the university successfully encourage the entrepreneurial intention among female students.

We noticed that the influential size of entrepreneurial education is almost double as much as the impact of entrepreneurial climate on women entrepreneurship. Universities provide entrepreneurial education as the most fundamental step in encouraging student entrepreneurship. As mentioned by Fayolle and Gailly (2009), the purpose of entrepreneurial education is establishing an entrepreneurial mindset, attitudes, and skills among students that are necessary though idea generation, firm establishment, and business expansion. After continuously improvements, the education system of entrepreneurial universities has been developed into the mature stage. The entrepreneurial courses offered provided students the most recent information on the market, technology, and innovation (Premand et al., 2016). Not only for the business students but also students from other fields of study learned about exploiting the commercialization of technology and fostering the exchange of knowledge (Marques et al., 2014). The entrepreneurial education is developing an entrepreneurial ethos and encouraging "portfolio careers" among students (Stamboulis & Barlas, 2014). From the results of the entrepreneurial education, we can conclude that the University of Twente provides a variety of courses that cover all of the elements of entrepreneurship and therefore prepares female students well for self-employment in the future. In return, the entrepreneurial universities strongly encouraged women entrepreneurship through the educational offerings.

The existing literature argued that the lack of entrepreneurial role models and entrepreneurial culture across faculties are one of the main challenges that faced by the entrepreneurial-oriented university while developing a supportive entrepreneurial environment (Philpott et al., 2011). Hence, universities organized various entrepreneurial activities and programmes that encouraged the dissemination of the entrepreneurial environment across the university (Linan et al., 2010). Regarding the current research, the entrepreneurial climate was a significant predictor for the entrepreneurial intention among female students, yet, the influential size was much smaller compared with entrepreneurial education. Possible explanations of the low prediction rate are that firstly, the awareness of the entrepreneurial activities among female students was relatively low. Secondly, a rewarding system for participating in these activities was not well-established. The advantages of the entrepreneurial activities were not delivered to female students, which resulted in a lack of motivation. Accordingly, universities should develop a better system to increase involvement and awareness of students in these activities.

One unexpected result of this research is that the networking capability of the university is not significant in stimulating female entrepreneurship. As it was hypothesised earlier, the university provides networking opportunities that help students' self-development on both a personal and a professional level (Linan et al., 2011; Ganzarain et al., 2014). The networking capability supposed to provide female students more assistance regarding establishing new ventures (Carter et al., 2007). The results from this study contradicted with prior research that argued networking positively stimulates entrepreneurship (Holienka et al., 2016). Possible reasons to explain this result are that firstly, the awareness and participation of networking programs and opportunities within the University of Twente was relatively low. Secondly, the respondents are not familiar with the content of programmes; for instance, on the type of support the university provides to students. Even though roughly 65 percent of the respondents know the existence of the networking programs such as the Centre of Entrepreneurship and Start-up Support, whereas, two-thirds of the respondents do not know that these programmes offer financial support for student entrepreneurs. Hence, female students are not aware of the resources they can use for starting a business. The university should be more devoted in advertising the entrepreneurial networking programs across faculties. In addition to the lack of advertising, another possible explanation of why students are not actively participating in these programs is that the importance of long-term benefits of networking has been overlooked. As mentioned by Kirkwood et al. (2007), most students realize the importance of networking when they actually starting a new business. Universities provided a platform of networking that allows the most concerned barriers of women entrepreneurship (e.g. finding right contact and information) can be overwhelmed (Bienkowska et al., 2016). Lastly, in the current research, the indication of women entrepreneurship is measured by the entrepreneurial intention, however, networking can be more important for students who already have an entrepreneurial mindset (Kirkwood et al., 2007). Students who have no entrepreneurial intention and mindset may not be interested in these activities, therefore, resulted in the low participation rate in networking programmes.

Furthermore, research results indicated there was no moderation effect between entrepreneurial climate and networking capability on women entrepreneurship, which was countered with prior literature. Existing literature argued that the establishment of academic-business networks facilitates the development of the entrepreneurial environment at the university (Kirkwood et al., 2014). The reasons for this result are that first of all, there was no positive significant relationship between networking capability and entrepreneurial intention. The variance of the entrepreneurial climate on entrepreneurial intention cannot be explained by networking capability. Secondly, according to Ganzarain et al. (2014), the entrepreneurial activities that facilitate the development of a favourable entrepreneurial environment (e.g. mentoring programme), also connect the university and business world simultaneously. Nevertheless, in our sample, the awareness and participation in the entrepreneurial activities

and networking programmes is quite low, the connection with the business world is not visible for female students. Therefore, the entrepreneurial climate and networking capability do not strengthen each other' effect on entrepreneurial intention among female students.

At last, the mediation effect between entrepreneurial education and climate cannot be neglected. The entrepreneurial climate is partially mediated by the relationship between entrepreneurial education and women entrepreneurship. More specifically, the entrepreneurial climate of the university enhances the relationship of entrepreneurial education on female entrepreneurship, which was aligned with previous research. Navarro and Jiménez (2016) discussed that the entrepreneurial courses provided necessary knowledge and skills for self-employment, and the supportive entrepreneurial environment across university motivated students take actions on their ideas. In this research, one possible reason for this pattern is that the university provides a favourable environment for developing student entrepreneurship through the form of education. For example, some courses invite guest speakers who are already entrepreneurs themselves to share their experiences and stories of being entrepreneurs. Especially female students will be more motivated by female guest speakers (Carter et al., 2007). Therefore, the university is establishing an entrepreneurial environment while inspiring students to consider entrepreneurship. It is difficult to completely isolate these two success factors for female entrepreneurship specifically.

5.1.3 Discussion on the guideline of the entrepreneurial university stimulates female entrepreneurship

Based on the existing literature and research results, the research goal of developing a guideline on how entrepreneurial university positively encourage women entrepreneurship through the entrepreneurial education, supporting environment and networking has been reached.

Entrepreneurial Education: The education of entrepreneurship enables students to acquire the essential knowledge needed for venture creation, and more importantly, to develop the entrepreneurial mindset of students that allow them to be more alert in the identification of innovative business opportunities (Javier et al., 2017; Jansen et al., 2015; Tiago et al., 2015; Küttim et al., 2014). Entrepreneurial marketing-, innovation-, and finance-related courses were considered as the most useful courses. In the future, universities can involve successful entrepreneurs in classes more often, hence giving students a better understanding of the motivation and potential problems of entrepreneurship. On the other hand, the economic-related courses are seen as less useful by most respondents which indicated that the re-evaluation and reformation of these courses might be necessary to improve the quality of education.

Supporting Environment: The favourable entrepreneurial environment refers to a university creating a well-functioning infrastructure, inspiring atmosphere, and supportive faculties that encourage women entrepreneurship from idea generation to venture creation (Al-Dajani et al., 2015; Rasmussen et al., 2014; Linan et al., 2011). A university can establish an entrepreneurial climate through multiple channels such as mentoring programs and business plan contests (Jansen et al., 2015). However, the participation of the entrepreneurial activities among women needs to be encouraged further. For women entrepreneurship specifically, universities can organize events targeting female students which would encourage a higher level of involvement in these entrepreneurial activities. It can therefore significantly encourage entrepreneurial intention among female students. Furthermore, in combination with entrepreneurial education, introducing role models for potential female entrepreneurs to motivate them to believe in themselves can solve the obstacle of lack of self-confidence as well.

Networking: The networking services should address the obstacles in women entrepreneurship such as raising capital and finding the right business contacts (Carter et al., 2015; Dodescu et al., 2014). With entrepreneurial culture spreading across an entire campus, the willingness of female students to participate in entrepreneurship also increases (Bienkowska et al., 2016). Nevertheless, many offerings of the university are not aware by students, especially the networking opportunities that help female entrepreneurs overcome existing barriers. Universities should fully inform students about what kind of support and opportunities are offered to students and how to gain access to these offerings. In addition, the long-term importance of networking programs should be delivered to students. For example, programs like seed funding and connecting programs with other fellow entrepreneurs are essential for network building in terms of future venture creation for potential entrepreneurs. Nevertheless, this stage is more effective and more interesting for students who have the intention of being entrepreneurs (Kirkwood et al., 2007). Therefore, the university should also pay extra attention to attracting female students who are non-entrepreneurial yet participate in these networking programs.

The most important takeaway is that each element individually cannot create a successful ecosystem to facilitate women entrepreneurship at a university. Education, environment, and networking complement each other in the sense that universities provide offerings that cover entrepreneurial education, environment and networking successfully encourage female students to participate in entrepreneurship (Jansen et al., 2015). Particularly, based on the study results, the events including both entrepreneurial education and climate aspects can effectively boost the entrepreneurial intention among female students.

5.2 Academic and practical implication

Academically, this research contributes to the theory on entrepreneurial universities and student entrepreneurship that proved that with exception to entrepreneurial education, women entrepreneurship can be influenced by other practices such as the entrepreneurial environment of a university (Navarro & Jiménez, 2016; Jansen et al., 2015; Ganzarain et al., 2014). Furthermore, the results on the effectiveness of entrepreneurial offerings contribute to the theory of clarifying the role and tasks of the university in facilitating women entrepreneurship (Stal et al., 2016; Jansen et al., 2015). More importantly, this research discovered the mediation effect among different entrepreneurial practices which has not been studied before. The entrepreneurial climate can significantly enhance the positive significant relationship between entrepreneurial education and women entrepreneurship.

In practice, this research can aid in creating a guideline on how entrepreneurial universities can effectively stimulate women entrepreneurship through education, environment, and networking, as discussed in section 5.1.3. The guideline is not only suitable for entrepreneurial universities, but also potential women entrepreneurs. Through the guideline, female students can understand better of the resources and entrepreneurial opportunities that are accessible at a university which can assist them to pursue their career objectives as entrepreneurs (Linan et al., 2011). From a broader level, this research helps to gain an increasing awareness on the importance of women entrepreneurship on both academia and business world, as well as gives more attention to the changing role of women in society (Ahl, 2006).

5.3 Limitation and future research

There are several limitations of the current study that can be investigated further for future research. First of all, the research has been only focused on one entrepreneurial university, which is the University of Twente, hence, the differences among entrepreneurial universities in terms of entrepreneurial offerings have not been investigated. Thus, cross-university analysis on this topic in the future may discover distinct results. Secondly, gender differences in terms of the reflection of entrepreneurial offerings can be included in the future research, since the current research examined the female perspective only. A sample combined both male and female students can clearly visualize the differences. Thirdly, the respondents of the current research were not representative enough of the overall population. Future research can take the nationality of the respondents into consideration in order to appropriately present the student population. Fourthly, only quantitative research method has been applied to answer the research questions. Nevertheless, qualitative research method can also be applied to this topic as well; for example, through interviews with women entrepreneurs that used to study in the University of

Twente can gain more insights of how university helps in overcoming the barriers of women entrepreneurship. Fifthly, the respondents of the questionnaire are mostly master's and bachelor's students, therefore, the impact on students with other levels of study were not fully examined. Sixthly, the determinants of entrepreneurial intention are not only on the institutional level, but factoring in the personal and regional levels can be also considered in future research. Seventhly, entrepreneurial intention as an indicator of women entrepreneurship cannot completely represent women entrepreneurship. Therefore, adopting another indicator may gain different results on the relationship between networking capability and women entrepreneurship. Lastly, for the future research, researchers can concentrate on a cross-country analysis, since the culture and societal differences may result in a variety of impressions on the inspected aspects, for example, distinctive forms of networking activities. Accordingly, the results can be divergent because of different cultural backgrounds.

5.4 Conclusion

To conclude, a quantitative research has been conducted to understand “how does an entrepreneurial-oriented university facilitate women entrepreneurship”. The results discovered that the entrepreneurial-oriented universities can positively stimulate women entrepreneurship through distinctive entrepreneurial practices, especially entrepreneurial education and entrepreneurial climate which are aligned with existing literature. Different than originally hypothesised, the networking capability of the university is not positively encouraging entrepreneurial intention among female students. Nevertheless, the benefits of networking on entrepreneurship cannot be ignored, however, entrepreneurial universities need to provide networking opportunities for women in particular so that female students can exploit the resources available and see the benefits of networking. Meanwhile, the research uncovered the main barriers that are faced by female entrepreneurs and how can the university more effectively stimulating women entrepreneurship and student entrepreneurship through entrepreneurial practices.

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Appendices

Appendix 1. Procedure of Systematic Literature Review (SLR)

To develop the theoretical framework of this research, a SLR is conducted based on the guiding question “how the entrepreneurial-oriented universities stimulate women entrepreneurship through entrepreneurial education, entrepreneurial climates and the network of university”. In order to systematically review and analyse the prior studies, the author followed the process of SLR according to the guidebook of SLR written by Petticrew and Roberts (2006) and the manuscript of SLR created by Oukes (2016).

First step of a systematically literature review is the selection of primary research sources. Two extensive academic literature databases have been chosen in this research, including Scopus and Web of Science, which both databases contain research articles in the field of business and management and accessible at the University of Twente.

Secondly, in order to develop appropriate search strings, the synonyms and related terms of the key terms that identified by decomposing the research questions are listed. See Table 13 below:

Table 12. Synonyms and related terms of the key terms

Women	women, female, student
Entrepreneurship	self-employed, start-up, entrepreneurs, entrepreneurship, business
Entrepreneurial-oriented university	academia, innovation, student, education, entrepreneurial
Stimulate	encourage, inspire, promote, motivate
Entrepreneurial education	education, course, training, skill, theory, practice
Entrepreneurial climate	climate, environment, culture, supporting facilities
Networking capability	collaboration, partnership, network, connections, centre of entrepreneurship, incubator

The combination of different terms constructs different search strings. Since the applications of proximity indicator, wild cards and Boolean indicators are different based on each database, the search strings are various accordingly. The search strings for Scopus and Web of Science are displayed in Table 14.

Table 13. Search strings for systematic literature review

Database	Search String
Scopus	#1 TITLE-ABS-KEY (wom?n OR female OR student) AND SUBJAREA (mult OR busi AND ordec OR econ OR soci)
	#2 TITLE-ABS-KEY (start-up OR self-employed OR entrepreneurship OR entrepreneur OR business) AND SUBJAREA (mult OR busi AND ordec OR econ OR soci)
	#3 TITLE-ABS-KEY (stimulate OR motivate OR encourage OR inspire OR promote) AND SUBJAREA (mult OR busi AND ordec OR econ OR soci)
	#4 TITLE-ABS-KEY (university OR innovation OR education OR academia OR student OR entrepreneurial-orientated) AND SUBJAREA (mult OR busi AND ordec OR econ OR soci)
	#5 TITLE-ABS-KEY (course OR training OR skill OR theory OR practice OR education) AND SUBJAREA (mult OR busi AND ordec OR econ OR soci)
	#6 TITLE-ABS-KEY (climate OR environment OR culture OR "supporting facilities") AND SUBJAREA (mult OR busi AND ordec OR econ OR soci)
	#7 TITLE-ABS-KEY (network OR connections OR incubators OR collaboration OR partnership OR "cent? of entrepreneurship") AND SUBJAREA (mult OR busi AND ordec OR econ OR soci)
	#8 TITLE-ABS-KEY (wom?n OR female OR student) AND SUBJAREA (mult OR busi AND ordec OR econ OR soci) AND

		TITLE-ABS-KEY (start-up OR self-employed OR entrepreneurship OR entrepreneur OR business) AND SUBJAREA (mult OR busi AND ordec OR econ OR soci) AND TITLE-ABS-KEY (stimulate OR motivate OR encourage OR inspire OR promote) AND SUBJAREA (mult OR busi AND ordec OR econ OR soci) AND TITLE-ABS-KEY (university OR innovation OR education OR academia OR student OR entrepreneurial-orientated) AND SUBJAREA (mult OR busi AND ordec OR econ OR soci) AND TITLE-ABS-KEY (course OR training OR skill OR theory OR practice OR education) AND SUBJAREA (mult OR busi AND ordec OR econ OR soci) AND TITLE-ABS-KEY (climate OR environment OR culture OR "supporting facilities") AND SUBJAREA (mult OR busi AND ordec OR econ OR soci) AND TITLE-ABS-KEY (network OR connections OR incubators OR collaboration OR partnership OR "cent? of entrepreneurship") AND SUBJAREA (mult OR busi AND ordec OR econ OR soci)
Web of Science	#1 TS=(wom?n OR female OR student) <i>DocType=All document types; Language=All languages;</i> #2 TS= (self-employed OR start-up OR entrepreneurs OR entrepreneurship OR business) <i>DocType=All document types; Language=All languages;</i> #3 TS=(stimulate OR motivate OR encourage OR inspire OR promote) <i>DocType=All document types; Language=All languages;</i> #4 TS= (university OR innovation OR education OR academia OR student OR entrepreneurial-orientated) <i>DocType=All document types; Language=All languages;</i> #5 TS=(course OR training OR skill OR theory OR practice OR education) <i>DocType=All document types; Language=All languages;</i> #6 TS=(climate OR environment OR culture OR "supporting facilities")	

	<i>DocType=All document types; Language=All languages;</i>
#7	TS=(network OR connections OR incubators OR collaboration OR partnership OR "cent? of entrepreneurship") <i>DocType=All document types; Language=All languages;</i>
#8	#7 AND #6 AND #5 AND #4 AND #3 AND #2 AND #1 <i>DocType=All document types; Language=All languages;</i>

Furthermore, the initial search in two databases result in an enormous number of articles, which are 21 articles in Scopus and 192 articles in Web of Science. Therefore, the application of the inclusion and exclusion criteria aim to downsizing the search results into the most relevant articles for the research. The inclusion and exclusion criteria are listed below:

- *Inclusion criteria:*
 - IC1: Article is connected to student, university, and entrepreneurship
 - IC2: Article is studying female entrepreneurship
 - IC3: Article is focused on how university stimulate entrepreneurship
- *Exclusive criteria:*
 - EC1: Article is not published
 - EC2: Article is not generating scientific knowledge
 - EC3: Article is not considering IC1, IC2, and IC3
 - EC4: Article is not focusing on student entrepreneurship
 - EC5: Full text of the article is not available

The determination of the inclusive articles will be completed in two rounds. In the first round the inclusion and exclusion criteria will be addressed to review the title and abstract of the initial search results. In total it contains three steps, firstly the title and abstract is reviewed for EC1 and EC2, therefore, the article will be excluded if it matches any of these two ECs. Secondly, the title and abstract of articles will be reviewed for IC1, IC2 and IC3, the article is required to meet all three IC, otherwise it is excluded according to EC3. The last step is to check the title and abstract for EC4, if the article meets EC4 then it will be excluded. The remaining articles will be screened in the second round. First the articles are reviewed for EC5, which assure the accessibility of the article. And secondly, EC3 and EC4 will be applied through the whole text of the articles. The articles meet the ECs will be excluded even the title and abstract did not meet the ECs.

Appendix 2A. Whole list of articles on Scopus and reason of exclusion

Nr.	Author	Year	Title	Reason of exclusion
1	Olokundun, M.A., Olaleke, O., Peter, F., Ibidunni, A.S., Amaihian, A.B.	2017	Examining the link between university support systems, knowledge sharing and innovation: A focus on nigerian university students	#EC4
2	Lahl, K., Plumanns, L., Vossen, R., Jeschke, S.	2017	On the relevance of digital learning cultures within online business education	#EC3
3	Arkko-Saukkonen, A.	2017	Connecting businesses, emerging creative talents, and learning environments in an entrepreneurial university setting: The case study of the creative steps	#EC5
4	Gielnik, M. M., Uy, M. A., Funken, R., & Bischoff, K. M.	2017	Boosting and sustaining passion: A long-term perspective on the effects of entrepreneurship training	
5	Tormo-Carbó, G., Seguí-Mas, E., Oltra, V.	2016	Accounting Ethics in Unfriendly Environments: The Educational Challenge	#EC3
6	Bianchi, M., Parisi, V., Salvatore, R.	2016	Female entrepreneurs: motivations and constraints. An Italian regional study	#EC5
7	Premand, P., Brodmann, S., Almeida, R., Grun, R., & Barouni, M. (2016)	2016	Entrepreneurship education and entry into self-employment among university graduates	
8	Maresch, D., Harms, R., Kailer, N., Wimmer-Wurm, B.	2016	The impact of entrepreneurship education on the entrepreneurial intention of students in science and engineering versus business studies university programs	
9	Fernández-Pérez, V., Alonso-Galicia, P.E., Rodríguez-Ariza, L., Fuentes-Fuentes, M.D.M.	2015	Professional and personal social networks: A bridge to entrepreneurship for academics?	
10	Jansen, S., van de Zande, T., Brinkkemper, S., Stam, E., Varma, V.	2015	How education, stimulation, and incubation encourage student entrepreneurship: Observations from MIT, IIT, and Utrecht University	
11	Raineri, E., Fudge, T., Hall, L.	2014	Are universities unsocial with social media?	#EC3
12	Al-Dajani, H., Dedoussis, E., Watson, E., Tzokas, N.	2014	Graduate Entrepreneurship Incubation Environments: A Framework of Key Success Factors	
13	Merle Küttim, Marianne Kallaste, Urve Venesaar, Aino Kiis	2014	Entrepreneurship Education at University Level and Students' Entrepreneurial Intentions	
14	Kirkwood, J., Dwyer, K., & Gray, B.	2014	Students' reflections on the value of an entrepreneurship education	
15	Schumann, F., Nguyen, L.	2013	Challenges of a chinese restaurant in a small community: Yummy tummy restaurants struggle to survive	#EC3
16	Evans, D., Nyamapfene, A.	2012	Student projects: Preparing future engineers through collaboration with industry	#EC4
17	Penaluna, A., Coates, J., Penaluna, K.	2010	Creativity-based assessment and neural understandings: A discussion and case study analysis	
18	Rae, D., Gee, S., Moon, R.	2009	Creating an Enterprise Culture in a University: The Role of an Entrepreneurial Learning Team	#EC5
19	Mustar, P.	2009	Technology management education: Innovation and entrepreneurship at MINES Paris tech, a leading French engineering school	#EC5
20	Héraud, J.-A., Lévy, R.	2005	University-industry relationships and regional innovation systems: Analysis of the French procedure cifre	#EC5
21	Currie, D.M., Krbec, D., Matulich, S.	2005	The use of global work-directed teams in promoting international competence: The case of Croatia	#EC3

Appendix 2B. Whole list of articles on Web of Science and reason of exclusion

	Author	Year	Title	Reason of Exclusion
1	Lafford, Barbara A.	2018	The Evolution of Future Spanish Graduate Programs to Meet Diverse Student Needs	#EC3
2	Chang, Yung-Chia; Chang, Kuei-Hu; Lu, Mei-Te	2018	A NOVEL NETWORK SIMULATION SOFTWARE FOR SUPPLY CHAIN MANAGEMENT COURSES	#EC4
3	Fichter, Klaus; Tiemann, Irina	2018	Factors influencing university support for sustainable entrepreneurship: Insights from explorative case studies	#EC4
4	Chen, Ming-Huei; Agrawal, Somya	2017	Do communication barriers in student teams impede creative behavior in the long run? A time-lagged perspective	#EC3
5	Chang, Dian-Fu; Huang, Yu-Lan; Wu, Berlin	2017	Analyzing the Functions and Benefits of Using Mobile Facebook as a Supplemental LMS in Higher Education	#EC3
6	Cao, Zhen	2017	Thought and Practice on the Innovation and Entrepreneurship Education for College Students	#EC5
7	Isopescu, Dorina-Nicolina; Covatariu, Gabriela; Stefan, Mariana	2017	INNOVATIVE MEASURES TO IMPROVE THE CHANCES OF INTEGRATING GRADUATES INTO THE LABOUR MARKET OF CONSTRUCTION SECTOR	#EC3
8	Wang, Jin	2017	Teaching of Intercultural Communication for Business Professionals in Business Training Project	#EC3
9	Li, Yen-Yi; Chen, Hsin-Hao; Shao, Wen-Cheng;	2017	Practices of Innovative Technology and Education for Sustainability in Taiwan Sustainable Campus Program	#EC4
10	Li, Chunpeng; Wang, Yinyin	2017	Comparative Study on Fujian and Taiwan College Students' Network Entrepreneurship Environment	#EC5
11	Vondra, Zdenek	2017	QUALITY CONTROL AND IMPROVEMENTS MECHANISM OF STUDY FIELD - FOCUSED ON PROFESSIONAL STUDY FIELD	#EC3
12	Javier Miranda, Francisco; Chamorro-Mera, Antonio; Rubio, Sergio	2017	Academic entrepreneurship in Spanish universities: An analysis of the determinants of entrepreneurial intention	
13	Silva, Susana; Silva, Candida; Martins, Dora	2017	ERASMUS STUDENTS EXPECTATIONS: A QUALITATIVE STUDY IN PORTUGUESE CONTEXT	#EC4
14	Li, Xingsen; Liu, Wei; Zhou, Yingying	2017	How Extenics Promote Innovation and Entrepreneurship in Colleges on the Background of the Mobile Internet	#EC4
15	Saulich, Christina; Lehmann, Tine	2017	Boosting the Employability of Students and Staff at European Higher Education Institutions: An Educational Framework for Entrepreneurship, Internationalisation and Innovation	#EC5
16	Bostan, Carmen-Gabriela	2017	"THE ELSE SCHOOL", CONTRIBUTIONS TO APPLICATION OF THE CURRICULUM AT SCHOOL LEVEL	#EC3
17	Kothari, Tanvi	2017	Women entrepreneurs' path to building venture success: lessons from India	#EC5
18	Kothari, Tanvi	2017	Design Thinking and Computational Modeling to Stop Illegal Poaching	#EC3
19	Secundo, Giustina; Del Vecchio, Pasquale; Schiuma, Giovanni; et al.	2017	Activating entrepreneurial learning processes for transforming university students' idea into entrepreneurial practices	#EC5
20	Pransky, Joanne	2017	The Pransky interview: Gianmarco Veruggio, Director of Research, CNR-IEIT, Genoa Branch; Robotics Pioneer and Inventor	#EC2
21	Biedermann, Anna; Munoz Lopez, Natalia; Serrano Tierz, Ana	2017	Developing students' skills through real projects and service learning methodology	#EC4
22	Hashemifardnya, Asadollah; NamazianDoost, Islam; Tamim, Anwar Bani	2016	THE IMPACT OF CHATTING WITH NATIVE SPEAKERS IN SOCIAL NETWORKS ON YOUNG IRANIAN ENGLISH UNIVERSITY STUDENTS' INTRINSIC MOTIVATION TOWARD LEARNING SPEAKING SKILL	#EC4
23	Kron, P.; Linecker, M.; Graf, R. et al.	2016	Leadership in the 21st century Selection of the future chair and training of the next generation	#EC4
24	Tormo-Carbo, Guillermina; Segui-Mas, Elies; Oltra, Victor	2016	Accounting Ethics in Unfriendly Environments: The Educational Challenge	#EC4
25	Bienkowska, Dzamila; Klofsten, Magnus; Rasmussen, Einar	2016	PhD Students in the Entrepreneurial University - Perceived Support for Academic Entrepreneurship	

26	Palmero Camara, Carmen; Camino Escolar Llamazares, M.; Isabel Luis Rico, M.; et. al	2016	Strategic and formative collaboration between companies and university of Burgos. Anatomy of the best practice	#EC5
27	Playfoot, Jim	2016	EXPLORING THE ROLE OF GAMIFICATION WITHIN STEM TEACHING AS A MECHANISM TO PROMOTE STUDENTENGAGEMENT, DEVELOP SKILLS AND ULTIMATELY IMPROVE LEARNING OUTCOMES FOR ALL TYPES OF STUDENTS	#EC4
28	Rushton, Diane; Wilmot, Natalie; Metselaar, Carine. et al.	2016	INDONESIAN MYTHOLOGY ENABLING 21ST CENTURY BUSINESS STUDENTS TO BALANCE STRATEGIC AND RELATIONSHIP CHALLENGES	#EC5
29	Ivascu, Larisa; Cirjaliu, Bianca; Draghici, Anca	2016	Business model for the university-industry collaboration in open innovation	#EC4
30	Zhang, Bo; Cubukcu, Cagri; LeMoine, Julie	2016	THE AFFORDANCES OF VIRTUAL COLLABORATIVE TOOLS AND AUGMENTED VIRTUAL REALITY GAMIFICATION TOOLS TO ENHANCE INTERCULTURAL EDUCATION LIVE & ONLINE	#EC3
31	Smith, R.; Welton, R.	2016	DEVELOPING AN ETHICAL FRAMEWORK FOR GRADUATES VIA THE OATH PROJECT	#EC3
32	Wardani, A. Krisna; Mahatmanto, T.; Purwantiningrum, I.	2016	FOOD PRODUCTION AND TRAINING CENTRE: AN ENTREPRENEURIAL APPROACH FOR EDUCATION SYSTEM IN FOOD SCIENCE	#EC3
33	Auer, D.; Brandl, P.; Mittenecker, G.	2016	THE NET: FORCE! SNIPPET TOOLBOX - A HANDS-ON APPROACH TO LOW LEVEL NETWORK PROGRAMMING	#EC3
34	Ha, Congying; Zhang, Youguang	2016	Exploration and Practice on the course of "Analysis of Electronic Information Business Case"	#EC4
35	Efimova, Maria; Krasnova, Evgeniya; Marchenko, Svetlana	2016	TEACHING FOREIGN LANGUAGES AS A PART OF POLYLINGUAL EDUCATION	#EC3
36	Wang Ling; Zhou Yumei	2016	The Optimization Setting of Innovation and Entrepreneurship Education Course for Master of Physical Education Student	#EC5
37	Mititelu, Cristina; Fiorani, Gloria; Litardi, Irene	2016	FOSTERING SUSTAINABLE DEVELOPMENT, ENTREPRENEURSHIP, AND SOCIAL INNOVATIONTHROUGH CSR: THE NEW ROLE OF UNIVERSITY	#EC4
38	Navarro, M. J. P., & Jiménez, A. M.	2016	Moderators elements of entrepreneurship. Gender differences	
39	EvaStala, TalesAndreassi, AsaFujino	2016	The role of university incubators in stimulating academic entrepreneurship	
40	Kolehmainen, Sirkka-Liisa	2016	HYRRAT: Promoting Entrepreneurship in Welfare Services	#EC4
41	Gilmartin, Shannon K.; Shartrand, Angela; Chen, Helen L; et al	2016	Investigating Entrepreneurship Program Models in Undergraduate Engineering Education	#EC5
42	Holienka, M., Jančovičová, Z., & Kovačičová, Z. (2016).	2016	Drivers of women entrepreneurship in Visegrad countries: GEM evidence	
43	Soares, Liliana; Aparo, Ermanno; Santos-Rodrigues, Helena	2016	CRAFT-DESIGN COLLABORATION BETWEEN DESIGN EDUCATION AND THE LOCAL CONTEXT: A CASE STUDY	#EC4
44	Bianchi, Marina; Parisi, Valentino; Salvatore, Renato	2016	Female entrepreneurs: motivations and constraints. An Italian regional study	#EC5
45	Onete, Bogdan; Teodorescu, Ioana; Vasile, Viorel	2016	ENHANCING E-LEARNING USING SOCIAL MEDIA TOOLS	#EC3
46	Dabic, Marina; Vljacic, Davor; Novak, Ivan	2016	Entrepreneurial management education needs in the Republic of Croatia, Poland and the United Kingdom	#EC5
47	Lorange, Peter; Thomas, Howard	2016	Pedagogical advances in business models at business schools - in the age of networks	#EC4
48	Luoju, Satu; Kauppinen, Sami; Lahti, Janne	2016	UNIVERSITY - AN ESSENTIAL PART OF THE OPEN INNOVATION FRAMEWORK?	#EC4
49	Silva, Paulino; Bertuzi, Rui; Elger, Martin	2016	USING A CHANGE MANAGEMENT GAME TO IMPROVE HUMAN RESOURCES MANAGEMENT SKILLS	#EC3
50	Fornasari, Alberto	2016	THE ROLE OF UNIVERSITIES' THIRD MISSION IN A GLOBALIZED WORD: CONTINUING EDUCATION, SOCIAL ENGAGEMENT, TECHNOLOGY TRANSFER TO RELATE SCIENCE AND SOCIETY. AN INTERNATIONAL CASE STUDY: IF4TM PROJECT	#EC4

51	Eliche-Quesada, D.; La Rubia, M. D.; Rus-Casas, C. et al.	2016	WEB 2.0 AND SOCIAL NETWORKING TOOLS FOR THE MATERIALS SCIENCE TEACHING-LEARNING PROCESS	#EC3
52	Walter, S. G., & Block, J. H.	2016	Outcomes of entrepreneurship education: An institutional perspective	
53	Patel, Chetna; Rodriguez, Alma	2016	IMPACT ON A UNIVERSITY BY HAVING A STEM SCHOOL ON CAMPUS	#EC4
54	Gould, Ethan; Marschall, Wythe	2015	BEYOND U (TM): The organism that therefore the academy is	#EC3
55	Kuo, Ping-Shu; Hwu, Shiow-Lin; Lo, Chih-Min	2015	Improvement of Studying Satisfaction Using a FB-Based e-learning Interaction Module	#EC3
56	Yang, Ya-Ting Carolyn	2015	Virtual CEOs: A blended approach to digital gaming for enhancing higher order thinking and academic achievement among vocational high school students	#EC4
57	Mustata, Cristian	2015	SOCIAL, CULTURAL AND ETHICAL DIMENSIONS OF THE BUCHAREST INTEGRAL-MANAGEMENT MODEL IMPLEMENTED WITH THE GENERAL MANAGEMENT II BUSINESS SIMULATION GAME	#EC3
58	Chicioreanu, Teodora Daniela; Burcea, Maria; Wodala, Barnabas	2015	TOP 10-WEB 2.0 TOOLS USEFUL IN TEACHING ACTIVITY	#EC3
59	Wongpreedee, Kageeporn; Kiratisin, Amonmat; Virutamasen, Porngrarm	2015	Entrepreneurial Mindsets for Innovative Brand Development: Case Studies in Jewellery Education	#EC5
60	Samarina, Elvira; Zimin, Alex; Kistrina, Elegiia	2015	Non-commercial Partnership as an Efficient Instrument of Inclusion of Physically Challenged People into the Educational Environment of a University (analysis conducted in Ryazan, Russian Federation)	#EC4
61	Dominguez, A.	2015	BUILDING BUSINESS COMMUNICATION PEDAGOGIES: A COMMUNICATION ACROSS THE CURRICULUM CASE STUDY	#EC3
62	Garcia, Fernando; Guijarro, Francisco; Oliver, Javier	2015	THE ENTREPRENEURSHIP ACTIVITIES IN THE CLASSROOM IN THE GRADE OF BUSINESSADMINISTRATION AND MANAGEMENT	#EC5
63	Cerezo, Yolanda; Valbuena, Consuelo; Arce, Guillermo	2015	THE UFV ADAPTED QUINTUPLE HELIX MODEL "CICLIA" A NEW GLOBALIZED EDUCATIONAL PROPOSAL	#EC3
64	Epure, M.; Vasilescu, R.; Mihaes, L.	2015	ADAPT2JOBS-A SOLUTION FOR RAISING ACCOUNTABILITY AND PROVIDING PROJECT SUSTAINABILITY	#EC3
65	Cerezo, Yolanda; Puebla, Inmaculada	2015	FLIPPED LEARNING RESULTS: A CASE STUDY IN MATHEMATICS	#EC3
66	Bogdanovic, Z.; Labus, A.; Simic, K	2015	HARNESSING CROWDVOTING TO SUPPORT STUDENTS' CREATIVITY	#EC4
67	Eisenberg, Marco; Oladiran, Tunde; Uziak, Jacek; et al.	2015	PROMOTING ENTREPRENEURSHIP FOR SOUTHERN AFRICAN YOUTH THROUGH LOCALISED ENTREPRENEURIAL ACADEMIC PROGRAMME (LEAP)	#EC3
68	Jiang, Chunyan; Guo, Ping; Jiang, Xiulan	2015	Research on the problems and Countermeasures of innovation and entrepreneurship education of universities in Hebei Province	#EC5
69	Winey, Tracey; Howe, John; Fogarty, Ian	2015	ONE MILLION LIGHTS: SOLVE AUTHENTIC PROBLEMS THROUGH MULTI-AGE STUDENT COLLABORATION, INNOVATIVE ENGINEERING, AND 3D PRINTING. ENGINEERING AND HUMANITY MERGE TO MAKE THE WORLD A BRIGHTER PLACE	#EC3
70	Parmaxi, Antigoni; Vasiliou, Christina	2015	COMMUNITIES OF INTEREST FOR ENHANCING SOCIAL CREATIVITY: THE CASE OF WOMENPOWER PLATFORM	#EC3
71	Nieminen, Lenita; Lemmetyinen, Arja	2015	A value-creating framework for enhancing entrepreneurial learning in networks	#EC4
72	Tiago, T., Faria, S., Couto, J. P., & Tiago, F.	2015	Fostering innovation by promoting entrepreneurship: from education to intention	
73	Mikhaylov, Natalie S.; Fierro, Isidro	2015	Social capital and global mindset	#EC3
74	Dodescu, Anca Otilia; Pop-Cohut, Ioana Crina; Chirila, Lavinia Florentina	2014	Do practice stages encourage students in Economics to practice entrepreneurship? Practeam project	

75	Oproiu, Gabriela Carmen	2014	NETWORKING - AN EFFECTIVE WAY TO DEVELOP ENTREPRENEURIAL SKILLS USED INFORMATION AND COMMUNICATIONS TECHNOLOGY	#EC4
76	Portillo, Martin	2014	For a Better Understanding of Live Working	#EC3
77	Kovacs, Liciniu A.	2014	Project for a Model of Teamwork Formula for Elaborating a Bachelor's/Master's Thesis	#EC3
78	Marques, Ana Paula; Moreira, Rita; Ramos, Sandra	2014	Higher Education, Stakeholders and Collaborative Work for Entrepreneurial Learning	
79	Alcaraz-Rodriguez, Rafael; Villasana, Marcia; Moises Alvarez, Mario	2014	Fine-tuning Entrepreneurship Education: How do Programs Impact Entrepreneurial Characteristics in Students?	#EC5
80	Heldal, Ilona; Soderstrom, Eva; Brathe, Lars	2014	TSM: An Instrument That Supports Industrial Doctoral Projects	#EC3
81	Kalemis, Konstantinos	2014	Scope and Aims of Intellectual Capital Management and Reporting	#EC3
82	Matt, Dominik T.; Rauch, Erwin; Dallasega, Patrick	2014	Mini-factory - a learning factory concept for students and small and medium sized enterprises	
83	Bate, Emily; Hommes, Juliette; Duvivier, Robbert	2014	Problem-based learning (PBL): Getting the most out of your students - Their roles and responsibilities: AMEE Guide No. 84	#EC4
84	Leyden, Dennis P.; Link, Albert N.; Siegel, Donald S.	2014	A theoretical analysis of the role of social networks in entrepreneurship	
85	Ktoridou, Despo	2014	Designing Learning Experiences that Tap into What Students Value: A Cloud-based, Studentt-Centered Learning Enviroment	#EC3
86	Jin Ye-ying; Huang Jun	2014	Practice of Entrepreneurship Education in Developing Professional Competences for Computing Students	#EC5
87	Sendelj, Ramo; Ognjanovic, Ivana	2014	PERSONALIZED RECOMMENDATION STRATEGIES FOR ELEARNING: AN AHP APPROACH	#EC3
88	Crossan, Mary; Johnson, Dagmar	2014	A CONJECTURAL PAPER ON INNOVATION AND ONLINE INTERNATIONAL LEARNING (OIL) TO DEVELOP INTERNATIONALISED SUBJECT AND CULTURAL LEARNING, SUPPORTING THE GLOBAL GRADUATE'S VISION	#EC3
89	Dall'O, Virginia	2014	FACE TO FACE, IN ACTION, ON LINE: AN INTEGRATED MODEL OF DISCIPLINARY DIDACTIC LAB FOR THE TEACHING QUALIFICATION IN BUSINESS ECONOMICS AND ADMINISTRATION	#EC3
90	Peinado, A.; Ortiz, A.; Barbancho, A. M	2014	THE TECHNOLOGICAL CHALLENGE AS A DYNAMIZATION ELEMENT IN THE LEARNING PROCESS AT TELECOMMUNICATION ENGINEERING	#EC3
91	Stan, Rodica Silvia	2014	GLOBALIZATION AND ENGLISH FOR SPECIFIC PURPOSES	#EC3
92	Konwar, S. G.	2014	UNLEASHING THE POWER OF NETWORK IN RAISING THE QUALITY OF HIGHER EDUCATION	#EC3
93	Ignacio Igartua, Juan; Errasti, Nekane; Ganzarain, Jaione	2014	ASSESSING INDUSTRY-BASED PROBLEM-BASED LEARNING WITH ENGINEERING STUDENTS: LESSONS LEARNED	#EC3
94	Ganzarain, J.; Markuerkiaga, L.; Gutierrez, A.	2014	LEAN STARTUP AS A TOOL FOR FOSTERING ACADEMIC & INDUSTRY COLLABORATIVEENTREPRENEURSHIP	
95	Barrena-Martinez, Jesus; Lopez-Fernandez, Macarena; Miguel Romero-Fernandez, Pedro	2014	THE USE OF SOCIAL NETWORKS, BLOGS AND PROFESSIONAL PROFILES IN THE BACHELOR OF BUSINESSADMINISTRATION: A PILOT STUDY ON THE SUBJECT OF MANAGERIAL SKILLS	#EC4
96	Rasmussen, E., Mosey, S., & Wright, M.	2014	The influence of university departments on the evolution of entrepreneurial competencies in spin-off ventures	
97	Waq, Gade; Moodie, Marj; Schultz, Jimaima	2013	Process evaluation of a community-based intervention program: Healthy Youth Healthy Communities, an adolescent obesity prevention project in Fiji	#EC3
98	Reeves, Lilith; Dunn-Jensen, Linda M.; Baldwin, Timothy T.; et al.	2013	Partnership between CTSI and Business Schools Can Promote Best Practices for Core Facilities and Resources	#EC4
99	Lozano, Rodrigo; Lozano, Francisco J.; Mulder, Karel	2013	Advancing Higher Education for Sustainable Development: international insights and critical reflections	#EC4
100	Liburd, Janne J.; Christensen, Inger-Marie F	2013	Using web 2.0 in higher tourism education	#EC3

101	Hvorecky, Jozef	2013	An Integral Approach to Online Education: An Example	#EC3
102	Hajdikova, Tatana; Polanecka, Sarka	2013	Science Marketing: Research of the Use of Marketing Communications Tools in the Higher Education Environment	#EC3
103	Andrea, Katic; Ivana, Milosev; Sasa, Raletic	2013	ICT Sector in Vojvodina (Serbia) as a Potential for Mitigation of Crisis Effects	#EC3
104	Anid, Nada Marie; Billis, Steven H.; Panero, Marta Alicia	2013	Entrepreneurship and Technology Innovation Center: Bringing Together Industry, Faculty, and Students	#EC5
105	Medina Vidal, Fernando; Hernandez Gomez, Elena	2013	EDUCATIONAL INNOVATION PROPOSALS: RESEARCH AND EXPERIMENTATION OF THE ICT IN EDUCATION. USING AUTHORING TOOLS EXE-LEARNING AND CMAPTOOLS FOR THE CREATION OF DIGITAL RESOURCES IN THE BILINGUAL PROGRAM	#EC4
106	Hernandez Lopez, Maria Sandra; Pastrana Palma, Alberto; Castaneda Olalde, Arturo	2013	KNOWLEDGE MANAGEMENT IN TECHNOLOGY PROJECTS IN MY FIRST COMPANY IN ELEMENTARY EDUCATION	#EC3
107	Morales, Lucia; Soler-Dominguez, Amparo	2013	A REFLECTION ON THE USE OF EPORTFOLIOS IN FINANCIAL DISCIPLINES	#EC3
108	Ignacio Igartua, Juan; Ganzarain, Jaione; Errasti, Nekane	2013	TECHNO-CUBE, DEVELOPMENT AND RESULTS OF A NEW UNIVERSITY - INDUSTRY COLLABORATION APPROACH	#EC4
109	Errasti, Nekane; Ignacio Igartua, Juan; Markuerkiaga, Leire	2013	VIRTUAL WEB LAB FOR DEVELOPING ENTREPRENEURIAL SKILLS	#EC4
110	Perez-Jimenez, A.; Reyes-Zurita, F.; Trenzado, C	2013	FEEDBACK BETWEEN UNIVERSITIES AND COMPANIES	#EC4
111	Gonzalez-Gascon, Elena; De Juan Vigaray, Maria D.; Carmona, Julio	2013	SPANISH AND EXCHANGE STUDENTS: AN ANALYSIS OF THEIR TRANSFERABLE SKILLS IN MARKETING MODULES	#EC4
112	Chauncey, Sarah A.; Small, Ruth V.; Arnone, Marilyn P.	2013	CAN YOU HEAR US NOW? INVESTIGATING THE EFFECTS OF A WIRELESS GRID SOCIAL RADIO STATION ON COLLABORATION AND COMMUNICATION IN FRAGILE POPULATIONS	#EC3
113	da Costa, Jose Wilson; Ribeiro Grossi, Marcia Goretti; Brescia, Amanda Tolomelli	2013	AN ANALYSIS OF EXPERIENCES ON THE USAGE OF THE SOCIAL NETWORKING IN EDUCATION	#EC4
114	Daspit, Joshua J.; D'Souza, Derrick E.	2012	Using the Community of Inquiry Framework to Introduce Wiki Environments in Blended-Learning Pedagogies: Evidence From a Business Capstone Course	#EC4
115	Hannig, Andreas; Kuth, Nicole; Oezman, Monika	2012	eMedOffice: A web-based collaborative serious game for teaching optimal design of a medical practice	#EC3
116	Wang, Shwu-huey	2012	Applying a 3D situational virtual learning environment to the real world business-an extended research in marketing	#EC3
117	Fondevila-Gascon, Joan-Francesc; del Olmo Arriaga, Josep-Luis	2012	THE UNIVERSITY AND THE ANALYSIS OF THE INTERNET TOPICS	#EC3
118	Imperadori, Marco; Salvalai, Graziano; Meoli, Alessio	2012	THE INNOVATION INCUBATOR: SIX YEARS OF ACHIEVEMENTS	#EC4
119	Vuori, Johanna; Kaski, Timo	2012	PREPARING HIGHER EDUCATION STUDENTS FOR THE SERVICE ECONOMY	#EC3
120	Shapiee, Rohimi; Nor, Mahmud Zuhdi Mohd; Hassima, Jady Zaidi;	2012	Home-grown' business and economic law clinic - balancing skills with business culture, ethics and integrity	#EC4
121	Bremze, Sarmite	2012	PEDAGOGICAL ASPECTS OF E-LEARNING IN HIGHER EDUCATION	#EC3
122	Ahmad, Shoaib Nabi	2012	THE IMPORTANCE OF ARTS EDUCATION IN THE GULF REGION AND SOUTH EAST ASIA	#EC4
123	Fawson, K.; Naffziger, L.	2012	FROM STUDY ABROAD TO GLOBAL LEADERSHIP: WHAT OUR STUDENTS NEED KNOW AND DEMONSTRATE TODAY FOR SUCCESS	#EC3
124	Omogbolahan, Araba Steve	2012	ENTREPRENEURIAL EDUCATION AS A TOOL FOR REDUCING UNEMPLOYMENT IN NIGERIA	

125	Peng Wei-bin; Chen Xiao-hui	2012	Study on the Optimization of Undergraduates' Internet Entrepreneurship Environment in China	#EC4
126	Cordea, Claudia	2012	Integrating Entrepreneurship Education: Challenges for Academic Institutions in the West University of Timisoara	#EC4
127	Pharo, E. J.; Davison, A.; Warr, K.; Nursey-Bray, M.; Beswick, K.; Wapstra, E.; Jones, C.	2012	Can teacher collaboration overcome barriers to interdisciplinary learning in a disciplinary university? A case study using climate change	#EC3
128	Ku, Fred; Ho, Eric; Lam, Paul	2012	Facebook for Teaching and Learning and its Effect on Social Presence and Sense of Community	#EC3
129	Zailskaite-Jakste, Ligita; Kuvykaite, Rita	2012	Implementation of Communication in Social Media by Promoting Studies at Higher Education Institutions	#EC4
130	Peric, Julia	2012	DEVELOPMENT OF UNIVERSITIES' SOCIAL RESPONSIBILITY THROUGH ACADEMIC SERVICE LEARNING PROGRAMS	#EC4
131	Carpenter, Jenna P.; O'Neal, D. Patrick; Bakken, Lori L.	2012	MENTORING WOMEN FACULTY IN STEM: A MULTI-PRONGED APPROACH	#EC4
132	Fry, Cynthia C.; Condoor, Sridhar S.; Kriewall, Timothy J.; Kitts, Christopher	2012	WORKING COLLABORATIVELY AMONG UNIVERSITIES: A DENSE NETWORK APPROACH	#EC4
133	Åstebro, T.; Bazzazian, N., & Braguinsky, S.	2012	Startups by recent university graduates and their faculty: Implications for university entrepreneurship policy	
134	Molera, L.; Arnaldos, F.; Diaz, M. T.; Faura, U.; Parra, I.; Perez, J. J.	2012	A VIRTUAL COLLABORATIVE ENVIRONMENT FOR COORDINATING THE TEACHING OF STATISTICS IN THE BUSINESS DEGREE	#EC4
135	Schwartz, Marc S.; Gerlach, Jeanne	2011	Guiding Principles for a Research Schools Network: Successes and Challenges	#EC4
136	West, Richard E.; Hannafin, Michael J.	2011	Learning to design collaboratively: Participation of student designers in a Community of Innovation	#EC3
137	Eisenmann, Joey C.; Alaimo, Katherine; Pfeiffer, Karin; Paek, Hye-Jin; Carlson, Joseph J.; Hayes, Heather; Thompson, Tracy; Kelleher, Deanne; Oh, Hyun J.; Orth, Julie; Randall, Sue; Mayfield, Kellie; Holmes, Denise	2011	Project FIT: Rationale, design and baseline characteristics of a school- and community-based intervention to address physical activity and healthy eating among low-income elementary school children	#EC4
138	Schout, Henk; Golriz, Damon Hassanpur; Harkema, Saskia	2011	Entrepreneurs as Agents of Change: Sustainable Innovation in the Dutch Construction Industry	#EC3
139	Moizer, Jonathan; Lean, Jonathan	2011	Ideas for Using Critical Incidents in Oral Debriefing From a Business Strategy Simulation Game	#EC3
140	Tobail, Ayman; Crowe, John; Arisha, Amr	2011	LEARNING BY GAMING: SUPPLY CHAIN APPLICATION	#EC4
141	Long, Joseph; Boulware, Hunter; Long, Ashley	2011	TEACHING SPORT IN A GLOBAL CONTEXT: A CROSS DISCIPLINE COLLABORATION ACROSS THE POND	#EC4
142	Bunts-Anderson, K.	2011	CROSSING THE DIVIDE: HOW GULF TERTIARY STUDENTS AND INSTRUCTORS PERCEIVE AND USE TECHNOLOGY TO SUPPORT CLASSROOM LEARNING AND DEVELOPING	#EC4
143	Dai, Wenjie; Liu, Tin	2011	Teaching Innovation of Business Management Courses in the Multimedia and Internet Environment	#EC5
144	French, Erica	2011	BUILDING ORGANIZATIONAL CAPABILITY THROUGH A QUALITY ASSURANCE PROGRAM WITHIN A BUSINESS SCHOOL AND ENCOURAGING ORGANIZATIONAL CULTURE CHANGE	#EC3
145	Echebarria, Carmen; Barrutia, Jose M.; Aguado, Itziar	2011	COLLECTIVE INTELLIGENCE SYSTEMS AND COLLABORATIVE LEARNING	#EC3
146	Linan, Francisco; Urbano, David; Guerrero, Maribel	2011	Regional variations in entrepreneurial cognitions: Start-up intentions of university students in Spain	
147	Arquilla, Venzazio; Motta, Ruggero	2011	STUDENT BRAIN: TOOLS AND METHODS TO SUPPORT THE STUDENTS CREATIVITY AND TO IMPROVE THE LEARNING AND CO-LEARNING PROCESSES - THE POLIBRAIN CASE	#EC4
148	Monteagudo, J. M.; Lopez-Fidalgo, J. F.; Rodriguez, G; et al.	2011	INDUSTRY-UNIVERSITY COLLABORATION AT THE INDUSTRIAL ENGINEERING EDUCATION IN THE UNIVERSITY OF CASTILLA-LA MANCHA	#EC5

149	Hodgins, Margaret; Battel-Kirk, Barbara; Asgeirsdottir, Asa G.	2010	Building capacity in workplace health promotion: the case of the Healthy Together e-learning project	#EC3
150	Jackson, Hudson; Tarhini, Kassim; Zapalska, Alina; Zelmanowitz, Sharon	2010	Strategies to Infuse Global Perspectives and Industrial Collaboration in Engineering Education	#EC4
151	Mihai-Yiannaki, Simona; Savvides, Savvas	2010	CREATIVITY IN BUSINESS SCHOOLS-POST FINANCIAL CRISIS IMPLICATIONS	#EC3
152	Nunez Gomez, P.; Garcia Guardia, M.	2010	DIGITAL NATIVES, DIGITAL MEDIA, A NEW WAY TO LEARN: THE USE OF THE SOCIAL NETWORKS AT UNIVERSITY CLASSROOM	#EC4
153	Thompson, Jane	2010	INSPIRE CURIOSITY IN LEARNING - GLOBAL COMPETENCY FOR HIGH SCHOOL STUDENTS	#EC3
154	Civcisa, Guna; Janauska, Jolanta; Mezinska, Iveta; Mazais, Janis; et al.	2010	ENGINEERING EDUCATION - NEW APPROACH AND NEW STYLE	#EC4
155	Eaton, Lynn Jones; Guerra, Mario; Corliss, Stephanie	2010	A STATEWIDE UNIVERSITY SYSTEM (16 CAMPUSES) CREATES COLLABORATIVE LEARNING COMMUNITIES IN SECOND LIFE	#EC4
156	Pertegal Felices, Maria Luisa; Navarro Soria, Ignacio Javier; et al.	2010	DEVELOPMENT OF MULTIDISCIPLINARY PRACTICAL LESSONS THROUGH RESEARCH-ACTION METHODOLOGY IN THE FACULTIES OF COMPUTER SCIENCE AND EDUCATIONAL PSYCHOLOGY	#EC4
157	Zhao, Y.; Zeng, W.; Wan, Z. C.	2010	The Research of Industry-University Collaboration in Market Economy	#EC5
158	Narbutas, Valdas	2010	TEACHING OF ENGLISH AS A SECOND LANGUAGE IN ICT-BASED LEARNING SETTINGS	#EC3
159	Teodorescu, Gabriela; Fratila, Camelia	2010	Development of Education and Potential Opportunities for Entrepreneurship in Romania	#EC5
160	Dumouchel, Lian	2010	Knowledge Transfer and Relationship Building Among Students, the Small Business Community and the University	#EC5
161	Ott, Alexander; Sethmann, Richard	2010	Hacking for fun and Education: ELearning on Network Security	#EC3
162	Mustar, Philippe	2009	Technology Management Education: Innovation and Entrepreneurship at MINES ParisTech, a Leading French Engineering School	#EC5
163	Sinclair, Lynne B.; Lingard, Lorelei A.; Mohabeer, Ravindra N.	2009	What's So Great About Rehabilitation Teams? An Ethnographic Study of Interprofessional Collaboration in a Rehabilitation Unit	#EC3
164	Harwood, Pamela	2009	SPATIAL AND EDUCATIONAL PATTERNS OF INNOVATION FOR CHARTER SCHOOLS	#EC4
165	Mario, Allegra; Giovanni, Fulantelli; Manuel, Gentile; Dario, La Guardia; Davide, Taibi	2009	On line environments to enhance entrepreneurial mindsets in young students	#EC5
166	Culkin, Nigel	2009	From "Knowledge Transfer Model" to "Entrepreneurial University" - the Case Study of the University of Hertfordshire	#EC5
167	Naia, Ana; Rodrigues, Pedro	2009	Impact of Undergraduate Training on the Development of Entrepreneurship in the Faculty of Human Kinetics: a Case Study of Former Students	#EC4
168	Piki, Andriani	2009	Portraits of Learners: an Ethnographic Study of Computer-Supported Collaborative Learning (CSCL) Practices	#EC3
169	Molesworth, Mike; Nixon, Elizabeth; Scullion, Richard	2009	Having, being and higher education: the marketisation of the university and the transformation of the student into consumer	#EC3
170	van Burg, Elco; Romme, A. Georges L.; Gilsing, Victor A.	2008	Creating university spin-offs: A science-based design perspective	
171	Alexander, D.; Clarkson, J.; Buchanan, R.; Chadwick, G.; et al.	2008	Exploring opportunities for collaboration between the corporate sector and the dental education community	#EC4
172	Ziv, Nina D.	2008	Redefining Technology Management Education: The New Managerial Imperatives	#EC3

173	Milne, Mark; Horner, Martyn; Benjamin, Jared; Monteith, Gayle	2008	Virtual Work Experience: From Classroom to Workplace	#EC3
174	Fry, Nadine; Love, Nia	2008	Business Students' Perceptions of Computer-Assisted Learning and Simulations	#EC4
175	Nelson, James; Carpenter, Jenna; Napper, Stan; Ramachandran, Bala	2008	Innovative Administration Supports Innovative Education	#EC4
176	Vilas Boas, Ana Alice; Bernardes de Andrade, Rui Otavio	2008	The Organizational Environment as an Element of Productivity: a case study of the "Management and Business Strategy" Post-Graduation Course of UFRRJ	#EC3
177	Millman, Cindy; Martin, Lynn M.	2008	Female entrepreneurship: Insights from UK and Chinese small high-tech case studies	#EC5
178	Abd-Elrazek, Essam	2008	Computer Based Medicine: I - The Future	#EC3
179	Marian, L.; Boarescu, G.; Ciotea, F.	2007	Student entrepreneurship. Project SE 2003	#EC5
180	Ferington, Diane	2007	Intellectual property protection in a combined academic and private enterprise collaborative environment	#EC3
181	Martins, Blanca; Huertas, Ruben	2007	Making a case on statistical design of experiments as a tool to predict a firm's awareness of intellectual capital	#EC3
182	Manring, SL; Moore, SB	2006	Creating and managing a virtual inter-organizational learning network for greener production: a conceptual model and case study	#EC3
183	Ahl, H. (2006)	2006	Why Research on Women Entrepreneurs Needs New Directions	
184	Mollaghasemi, M; Georgiopoulos, M; Donnelly, A; Cope, D; Steele, M	2004	Educating middle and high school students in space operations: The simulation approach	#EC4
185	Li, JB; Fung, CC	2003	Teaching computational intelligent techniques with real-life problems in stock trading	#EC3
186	Visram, Z; Elson, B; Sims, M	2003	An object-oriented, associated systems approach to the designing of B2B XML integrated, open systems applications	#EC3
187	Raine, JK; Beukman, CP	2002	University technology commercialisation offices a New Zealand perspective	#EC3
188	Wyn, J; Cahill, H; Holdsworth, R; Rowling, L; Carson, S	2000	MindMatters, a whole-school approach promoting mental health and wellbeing	#EC3
189	Newton, MJ	2000	International engineering education through collaboration	#EC4
190	Djuric, M	2000	Ethical response of teachers and managers to unmotivated learning and work situations	#EC3
191	Dugdale, C	1999	Actively encouraging the use of electronic resources at a UK academic library	#EC3
192	Wilson, JM	1997	How computing and communications are changing physics education	#EC4

Appendix 2C. Checklist of included articles in each category

Nr.	Author	Year	Title	Student Entrepreneurship	Education	Climate	Networking
1	Gielnik, M. M., Uy, M. A., Funken, R., & Bischoff, K. M.	2017	Boosting and sustaining passion: A long-term perspective on the effects of entrepreneurship training	×	×		
2	Javier Miranda, Francisco; Chamorro-Mera, Antonio; Rubio, Sergio	2017	Academic entrepreneurship in Spanish universities: An analysis of the determinants of entrepreneurial intention	×	×		
3	Bienkowska, Dżamila; Klostén, Magnus; Rasmussen, Einar	2016	PhD Students in the Entrepreneurial University - Perceived Support for Academic Entrepreneurship	×	×	×	×
4	Navarro, M. J. P., & \, A. M.	2016	Moderators elements of entrepreneurship. Gender differences	×	×	×	×
5	Eva Stal, Tales Andreassi, Asa Fujino	2016	The role of university incubators in stimulating academic entrepreneurship	×		×	×
6	Holienka, M., Jančovičová, Z., & Kovačičová, Z.	2016	Drivers of women entrepreneurship in Visegrad countries: GEM evidence	×	×	×	×
7	Walter, S. G., & Block, J. H.	2016	Outcomes of entrepreneurship education: An institutional perspective	×	×		
8	Maresch, D., Harms, R., Kailer, N., Wimmer-Wurm, B.	2016	The impact of entrepreneurship education on the entrepreneurial intention of students in science and engineering versus business studies university programs	×	×		
9	Premand, P., Brodmann, S., Almeida, R., Grun, R., & Barouni, M.	2016	Entrepreneurship education and entry into self-employment among university graduates	×	×		
10	Fernández-Pérez, V., Alonso-Galicia, P.E., Rodríguez-Ariza, L., Fuentes-Fuentes, M.D.M.	2015	Professional and personal social networks: A bridge to entrepreneurship for academics?	×			×
11	Jansen, S., van de Zande, T., Brinkkemper, S., Stam, E., Varma, V.	2015	How education, stimulation, and incubation encourage student entrepreneurship: Observations from MIT, IIIT, and Utrecht University	×	×	×	×
12	Tiago, T., Faria, S., Couto, J. P., & Tiago, F.	2015	Fostering innovation by promoting entrepreneurship: from education to intention	×	×		
13	Al-Dajani, H., Dedoussi, E., Watson, E., Tzokas, N.	2014	Graduate Entrepreneurship Incubation Environments: A Framework of Key Success Factors	×		×	×
14	Merle Küttim, Marianne Kallaste, Urve Venesaar, Aino Kiis	2014	Entrepreneurship Education at University Level and Students' Entrepreneurial Intentions	×	×		
15	Kirkwood, J., Dwyer, K., & Gray, B.	2014	Students' reflections on the value of an entrepreneurship education	×	×		
16	Dodescu, Anca Otilia; Pop-Cohut, Ioana Crina; Chirila, Lavinia Florentina	2014	Do practice stages encourage students in Economics to practice entrepreneurship? Practicum project	×		×	×
17	Marques, Ana Paula; Moreira, Rita; Ramos, Sandra	2014	Higher Education, Stakeholders and Collaborative Work for Entrepreneurial Learning	×	×	×	
18	Matt, Dominik T.; Rauch, Erwin; Dallasega, Patrick	2014	Mini-factory - a learning factory concept for students and small and medium sized enterprises	×		×	
19	Leyden, D. P., Link, A. N., & Siegel, D. S.	2014	A theoretical analysis of the role of social networks in entrepreneurship	×			×
20	Ganzarain, J.; Markuerkiaga, L.; Gutierrez, A.	2014	Lean startup as a tool for fostering academic & industry collaborative entrepreneurship	×	×	×	×
21	Rasmussen, E., Mosey, S., & Wright, M.	2014	The influence of university departments on the evolution of entrepreneurial competencies in spin-off ventures	×		×	×
22	Omogbolahan, Araba Steve	2012	Entrepreneurial education as a tool for reducing unemployment in Nigeria	×	×		
23	Ástebro, T., Bazzazian, N., & Braguinsky, S.	2012	Startups by recent university graduates and their faculty: Implications for university entrepreneurship policy	×		×	
24	Linan, Francisco; Urbano, David; Guerrero, Maribel	2011	Regional variations in entrepreneurial cognitions: Start-up intentions of university students in Spain	×	×	×	
25	van Burg, Elco; Romme, A. Georges L.; Gilsing, Victor A.	2008	Creating university spin-offs: A science-based design perspective	×		×	×
26	Ahl, H. (2006)	2006	Why Research on Women Entrepreneurs Needs New Directions	×	×	×	×

Appendix 3. Analysis of the University of Twente based on the OECD entrepreneurial university framework

I applied the guiding framework for entrepreneurial university proposed by OECD (2012) in the assessment of the University of Twente. According to the framework, there are seven main characteristics of entrepreneurial university, and each characteristics has its own parameters in evaluation. The scoring of the University of Twente is based on my research on the existing information online regarding the main indicators. The online resources including official website of the University of Twente, Facts & Figures, and reports from other media. The shortcoming of this evaluation is that the scoring was not completely subjective, since the information online are quite limited, some of the parameters need more evidence to support which I do not have the permission to access.

Characteristics	Main parameters	Reason for scoring
1. Leadership and Governance Score: 9	• More than just include “entrepreneurship” in the statement of mission or vision, it is necessary to established the entrepreneurial activities in the strategy of the university. • The strategy of university will include entrepreneurship goals especially, with performance parameters. • The commitment level of implementing and agilely adjusting the entrepreneurial strategy based on the changes of situation. • The entrepreneurship structure covers all levels of the university, including individual, institutional, and local ecosystem levels. • The faculties have autonomy therefore overcome the bureaucratic challenges. • The entrepreneurial university	Based on the Vision 2020 that the University of Twente aims to be the leading university in entrepreneurship. The entrepreneurial activity is considered as one of the core values of the university, and the expansion of an entrepreneurial attitude among students and staff, which build up a community that facilitate development on both personal and professional level. In addition, the University of Twente is dedicated in creating a spirit of entrepreneurship, and developing a soil for student

	plays an important role in connecting the local communities, providing regional start-ups opportunities, and regulating the strategic directions on the local and regional level.	entrepreneurship.² As mentioned by Victor van der Chijs that the combination of entrepreneurial culture and international orientation results in stronger social influences. In addition, it also aligned with the role of the University of Twente on the regional level, which encourage entrepreneurship therefore facilitate regional and local innovation.³
2. Organisational Capacity, People and Incentives Score: 8.5	• The university provides diverse funding sources, including external investment and adequate budget in supporting entrepreneurial activities. • Since students and staff are considered as internal stakeholders of the entrepreneurial objectives, the university should be capable to demolish the boundaries among faculties and department, instead, create connections among them. • The university include external stakeholders that bring new skills and knowledge, for example, shared infrastructure,	The university of Twente provides various funding possibilities for start-ups. A financial ecosystem is presented with a clear overview of all types of existing funding in Twente region, and which stages of business the funding related to.^{4 5} Some departments of the University of Twente cooperating and organizing cross-disciplinary project, which is called Product Co Creation Centers (PC3) that

² <https://www.utwente.nl/en/organization/about/vision/#entrepreneurship>

³ <https://www.utwente.nl/en/vision2020/news-archive/new-strategy-ut/>

⁴ <https://novelt.com/en/instruments/funding-for-startups>

⁵ <https://www.utwente.nl/en/business/support-for-start-ups/>

	opportunities for partnership, or guest professors.	studying the entrepreneurial ecosystems for the primary level innovators and social entrepreneurs specifically. For example, the “Startup Accelerator for Refugees” as a business incubation program, while collaborating with Mindt, the ROZ Group, TIB-advies and Delitelabs. ⁶ The University of Twente is a member of 4TU, which is a strategic cooperation among the four leading technical universities in the Netherlands (with Delft University of Technology, Eindhoven University of Technology, Wageningen UR), which create shared knowledge through the collaboration. ⁷
3. Entrepreneurship development in teaching and learning Score: 8.5	• The education of the university is organized in a way that develop entrepreneurial skills and ethos. • The university offers diverse entrepreneurial teaching approaches across departments, which encourage students to think in an entrepreneurial way. • The university facilitates entrepreneurial behavior through	The entrepreneurial education in the University of Twente focuses on the innovation and entrepreneurship process and establishing innovative and entrepreneurial mindset. The combination of state-of-art knowledge with practical

⁶ <https://www.utwente.nl/en/events/!/2018/6/18936/invitation-start-mini-symposium-supporting-entrepreneurial-refugees>

⁷ <https://www.utwente.nl/en/facts-and-figures/Partnerships/#strategic-partnerships>

	teaching and other activities, thus, students gain real experiences. For example, business game and simulation. • The entrepreneurial courses are constantly evaluated and updated in order to generate valid learning outcomes. In addition, the results of new entrepreneurial research will be included in teaching, which keeps the education constantly reviewed and updated. • The university established partnership with external stakeholders, and integrate the up to date information and experiences into the education and practices.	experience helps students also provide students to develop skills that are needed in the future career.⁸ University of Twente collects students' opinions on each offering courses by the end of the module, and then reports to the management level and teaching staff regarding to the milestones and operational challenges. The students' opinion and the accordingly improvement actions will be communicated among programme committees, teaching staff and programme management. The final results of student opinion and the improvements (that will be implemented in the next study year) will be published on Intranet and accessible for everyone.⁹ The University of Twente collaborates closely with successful international firms, such as, Google, Microsoft, Unilever, Shell, Siemens, and Philips etc., which allows the University
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<https://www.utwente.nl/en/education/master/programmes/business-administration/specializations/entrepreneurship-innovation-strategy/#double-degree>

⁹ <https://www.utwente.nl/en/psy/quality-assurance-education/>

		of Twente gained up to date commercial information, and allows the companies to access the pool of talent. ¹⁰
4. Pathways for entrepreneurs Score: 9	• The university increases the awareness of the importance of entrepreneurial capabilities among students and staff across all faculties and departments of the university. • The university constantly motivating individuals to develop an entrepreneurial mind and encouraging staff and students take the opportunities. • Opportunities such as experiencing entrepreneurship are offered by the university • The university supports entrepreneurship among individuals and teams through continuously assistance from idea generation to firm formation. • The university provides mentoring program to students or graduate entrepreneurs with experienced entrepreneurs or scholars. • The university provides networking opportunities for students and graduate entrepreneurs to access private investors and financing sources.	The Innovation and Entrepreneurship Minor (M9) is a multidisciplinary programme that enhances students' awareness and competences for entrepreneurship and business development. There are three introductory courses offered by the minor, which are entrepreneurship, innovation, and financial management, therefore, the students are able to participate in the business design and analysis.¹¹ In addition, there are other entrepreneurial activities organized by the University of Twente that successfully increase the awareness of the importance of entrepreneurial competences. For example, the UT Entrepreneurial Challenge, EntrepreneurialU

¹⁰ <https://www.utwente.nl/en/organization/collaboration/>

¹¹ Brochure: Innovation and Entrepreneurship Minor (M9)

	The university has internal or external business incubation services for students and staff.	Summer School.¹² The University of Twente is one of the founders of the Kennispark Twente, also known as the Twente Science Park, as an incubation service, it provides access to finance, networking opportunity with talented staff, shared research facilities with the University of the University of Twente, and business development opportunity for potential, young and experienced entrepreneurs.¹³ The entrepreneurship faculty of the University of Twente provide helps for students from opportunity recognition to the actualization of commercial products/services. Especially the transformation from ideas and innovation to marketable solutions.¹⁴
5. University – business/external relationships for	The university established policy in terms of knowledge exchange through the collaboration with industries, public sectors and	One of the core values of the University of Twente is focusing on the societal impact, which aims at

¹² <https://www.utwente.nl/en/organization/news-agenda/events-ceremonies/entrepreneurialday/UT-challenge/>

¹³ Facts and Figures 2016

¹⁴ <https://www.utwente.nl/en/education/master/programmes/business-administration/specializations/entrepreneurship-innovation-strategy/#what-will-you-learn>

knowledge exchange Score: 8.5	society. • The university is engaged in partnering with multiple stakeholders in order to support entrepreneurship. • The university is closely involved in business incubation facilities, which facilitates the knowledge exchange. • Students and staff have the access to opportunities like participate in entrepreneurial activities with external environment that are provided by the university. • The university supports students and staff mobility with external stakeholders • The university encourage the development of the knowledge circle among research, education and industry.	applying the research results on more social problems.¹⁵ As mentioned earlier, the University of Twente is actively involved in the collaboration with public and industries partners, and the incubation services like Kennispark Twente that facilitate the knowledge transfer among the loop of academic-industry-society.¹⁶ Scientific achievement is no longer the only most essential part of success for the University of Twente. Nevertheless, the University of Twente is dedicated in creating an integrated ecosystem of research, education and commercial knowledge transfer.¹⁷
6. The Entrepreneurial University as an internationalised institution Score: 9	• The internationalisation strategy of the university is aligned with the entrepreneurial goals. • The university is actively support the international mobility among students and staff. • The university focuses on attract international talented people. • The university creates teaching and learning environment that is specialized for international	The University of Twente established the Strategic Business Development unit, therefore devoted into the relationships with business community. The University of Twente collaborates closely with international public and industrial partners, for example, Fraunhofer

¹⁵ <https://www.utwente.nl/en/organization/about/vision/#entrepreneurship>

¹⁶ Facts and Figures 2016

¹⁷ <https://www.utwente.nl/en/facts-and-figures/#more-than-scientific-excellence>

	audience. • The university established international partnership on strategic level, and continuously developing international networks.	established its first representation in the Netherlands.¹⁸ Furthermore, the University of Twente provides students exchange opportunities in over 30 countries around the world. Besides, the University of Twente has strong connections with many international research universities, for example, WWU Münster (Germany), ITA (Brazil), Tec Monterrey (Mexico), IT Bandung (Indonesia) and USTC Hefei (China).¹⁹ One of the main indicators of the Times Higher Education Rankings (THE) is the degree of internationalisation of students, staff and research, which counts 7.5% of the overall ranking score. The University of Twente was ranked on the place of 179 in 2017, with detailed statistics that 27%²⁰ international students and 23% foreign staff. This can be considered as one of the evidence that proof the internationality
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¹⁸ Facts and Figures 2016

¹⁹ <https://www.utwente.nl/en/facts-and-figures/Partnerships/#strategic-business-development>

²⁰ <https://www.timeshighereducation.com/world-university-rankings/university-twente?ranking-dataset=589595>

		within the university. ²¹
7. Measuring the impact of the Entrepreneurial University Score: 9	• The university is actively assessing the current entrepreneurial strategy with evidence on activities. • The university is actively assessing the engagement in entrepreneurial teaching and learning, and the results will be reflected to the courses and staff development. • The university is actively assessing the impact of entrepreneurial teaching and learning activities on all stages of the activities. • The university is actively evaluating the knowledge exchange activities both internally and externally. • The university is actively evaluating the impact on start-up supporting activities, and whether they are carried out in an effective way.	After the strategic planning year 2014-2015, the University of Twente has shifted the key research areas of Strategic Business Development in the time of 2015-2020 with a stronger focus on key technologies development.²² There are over 1000 successful ventures over the last three decades, and over 5000 alumni around the world. Maintaining the connections with alumni is important for the relevance of teaching and research with society.²³ In 2007, the University of Twente has been voted as the most entrepreneurial university and the university with greatest impact in the Netherlands, based on the hard work for years in creating an ecosystem for start-ups and spin-offs.²⁴

²¹ <https://www.utwente.nl/en/organization/facts-and-figures/rankings/#times-higher-education-rankings-the>

²² <https://www.utwente.nl/en/vision2020/achievements/#strategic-business-development>

²³ <https://www.utwente.nl/en/facts-and-figures/Partnerships/>

²⁴ <https://www.utwente.nl/en/news/!/2017/12/312872/the-ut-has-the-highest-impact-in-the-netherlands-and-has-once-again-been-named-the-most-entrepreneurial-university>

Appendix 4A. Questionnaire

Block 1: Obstacles of women entrepreneurship

Q1.1 In your opinion, to what extent you think the University of Twente is an entrepreneurial-oriented university?

Not at all entrepreneurial-oriented										Extremely entrepreneurial-oriented	
0	1	2	3	4	5	6	7	8	9	10	
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	

Q1.2 In your opinion, what are the main obstacles for women entrepreneurs (or you) in their (or your) businesses? (you can check more than one answer)

☐	No obstacles
☐	A question of self-confidence (believing in their/your abilities)
☐	Lack of professional knowledge on entrepreneurship (education/training)
☐	Financial questions (raising capital)
☐	Lack of information / advice on how to start an enterprise
☐	Finding the right contacts for the business venture
☐	Combining family and work life
☐	Others (please specify): _____

Block 2: Entrepreneurial Education

Q2.1 Which of the following options fit your study at the University of Twente?

☐	I am studying in a specific programmed on entrepreneurship
☐	I have attended at least one entrepreneurship course as compulsory part of my studies
☐	I have attended at least one entrepreneurship course as elective part of my studies
☐	I have attend at least one entrepreneurship course as an extracurricular activity
☐	I have not attended a course on entrepreneurship so far

Skip Logic: If Q2.1 = "I have not attended a course on entrepreneurship so far", skip to the end of Block 2

Q2.2 Please indicate the entrepreneurial courses you have been attended at the University of Twente and evaluate them.

	Very useful	Useful	Neutral	Useless	Very useless	Not sure if UT offers it
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Business planning related courses						
Entrepreneurial marketing-related courses						
Economic related courses						
Finance related courses						
Innovation related courses						
Management related courses						
Technology related course						
Other courses (please specify):						

Q2.3 Please indicate your agreement with the following statements regarding the entrepreneurship courses offered by the University of Twente.

	Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree
Enhanced my ability to identify business opportunities							
Improved my professional knowledge and skills that are required to start a new company							
Increased my understanding of the attitudes, values and motivations of entrepreneurs							
Prepares me well for self-employment in the future							

Block 3: Entrepreneurial Climate

Q3.1 Please indicate your awareness and experience of the following entrepreneurial activities at the University of Twente

	Participated at least once	Know it, but never participated	Never heard about it

Business plan contests/workshops			
Mentoring and coaching programs			
Others entrepreneurial activities (please specify):			

Q3.2 Please indicate your agreement with the following statements regarding the entrepreneurial activities at the University of Twente.							
	Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree
In my university, there is a well-functioning support infrastructure to support the start-up of new firms							
The atmosphere at my university inspires me to develop ideas for new businesses							
There is a favourable climate for becoming an entrepreneur at my university							
At my university, students are encouraged to engage in entrepreneurial activities							
My academic peers participated in entrepreneurship influences my attitudes towards entrepreneurship							

Block 4: Network of University

Q4.1 Please indicate your awareness and experience of the following programs at the University of Twente			
	Participated at least once	Know it, but never participated	Never heard about it

Centre of Entrepreneurship (Kennispark Twente)			
Startup Support			
Other programmes (please specify):			

Q4.2 According to your knowledge, which of the following networking opportunities have been offered by University of Twente

	Yes	Maybe	No
Workshops/Networking with experienced entrepreneurs			
Connecting with right people (legal support/business development)			
Contact point for entrepreneurial issues			
Seed funding / financial support			
Other networking opportunities (please specify):			

Q4.3 Please indicate your agreement with the following statements based on the networking opportunities at the University of Twente.

	Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree
Enhanced my ability to develop networks							
Received more assistance from professionals							
Better access to timely information on the current market							
Connected me closer to the business world							

Block 5: Entrepreneurial Intention and supportiveness of women entrepreneurship

Q5.1 Please indicate your agreement of the support you received from University of Twente regarding to overcoming the obstacles

	Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree
A question of self-confidence (believing in their/your abilities)							
Lack of professional knowledge on entrepreneurship (education/training)							
Financial questions (raising capital)							
Lack of information / advice on how to start an enterprise							
Finding the right contacts for the business venture							
Combining family and work life							
Others (please specify):							

Q5.2 Please indicate your agreement with the following statements							
	Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree
I'm ready to do anything to be an entrepreneur							
My professional goal is becoming an entrepreneur							
I will make every effort to start and run my own firm							
I'm determined to create a firm in the future							
I have very seriously thought of starting a firm							

I've got the firm intention to start a firm some day							
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Block 6: Demographics

Q6.1 Please indicate your current level of study at the University of Twente	
	Bachelor
	Pre-master
	Master
	PhD
	Others (Please specify specify): _____

Q6.2 Please indicate your field of study at the University of Twente	
	Business Study and Public Policy
	Engineering & Technology
	Geo-Information Science and Earth Observation
	Information Technology (IT)
	Life Sciences & medicine
	Natural Sciences
	Social Sciences
	Others (please specify) _____

Q6.3 Are you currently self-employed?	
	Yes
	No

Q6.4 Please indicate your gender	
	Male
	Female

Q6.5 Please indicate your age group	
	below 18 years old
	18-24 years old

	25-30 years old
	30+ years old

Q6.6 Is there anything you would like to add in this questionnaire?

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Appendix 4B. References of the questionnaire

Question number	Reference
Q1.1	EUROCHAMBRES (2004). A survey on women entrepreneurs. Published in the frame of the project “ <i>Women in Business and in Decision-Making</i> ”.
Q2.1	Blackburn, R., & Iskandarova, M. (2014). Student entrepreneurship across the globe: intentions and activities. <i>Report for England 2013/2014</i> .
Q2.2	Küttim, M., Kallaste, M., Venesaar, U., & Kiis, A. (2014). Entrepreneurship education at university level and students’ entrepreneurial intentions. <i>Procedia-Social and Behavioral Sciences</i> , 110, 658-668.
Q2.3	Franke, N., & Lüthje, C. (2004). Entrepreneurial intentions of business students—A benchmarking study. <i>International Journal of Innovation and Technology Management</i> , 1(03), 269-288.
Q3.2	Wouter, D. (2004). Entrepreneurial intentions among FDEWB students'. <i>Master's thesis, University of Maastricht, Maastricht</i> , 76.
Q4.2	Küttim, M., Kallaste, M., Venesaar, U., & Kiis, A. (2014). Entrepreneurship education at university level and students’ entrepreneurial intentions. <i>Procedia-Social and Behavioral Sciences</i> , 110, 658-668.
Q5.1	EUROCHAMBRES (2004). A survey on women entrepreneurs. Published in the frame of the project “ <i>Women in Business and in Decision-Making</i> ”.
Q5.2	Liñán, F., & Chen, Y. W. (2009). Development and Cross-Cultural application of a specific instrument to measure entrepreneurial intentions. <i>Entrepreneurship theory and practice</i> , 33(3), 593-617.

Appendix 5. Assumption testing

Figure 7. Normal Q_Q plot

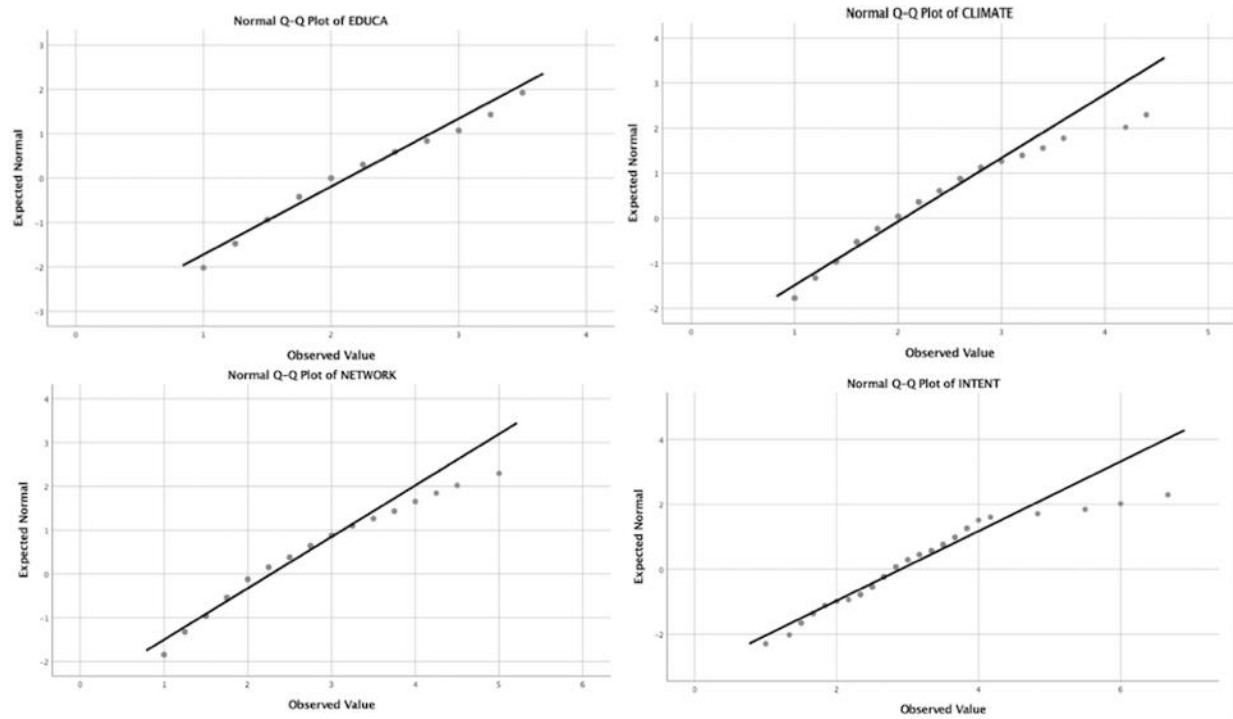
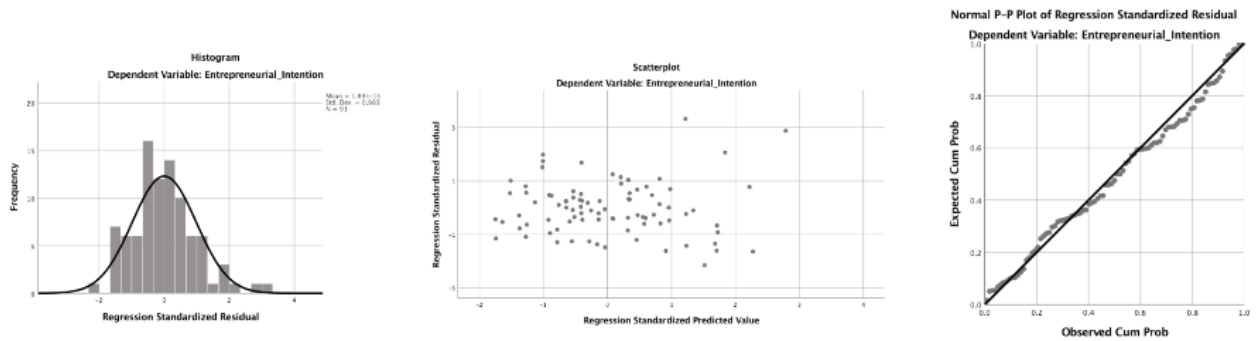


Figure 8. Residual histogram, scatterplots and normal P_P plot



Appendix 6. Descriptive statistics on entrepreneurial offerings and respondents

Table 14. awareness of entrepreneurial courses

	Very useful	Useful	Neutral	Useless	Very useless	Don't know
Business planning	18 (19.78%)	31 (34.07%)	39 (42.86%)	0 (0.00%)	0 (0.00%)	3 (3.30%)
Marketing	28 (30.77%)	36 (39.56%)	23 (25.27%)	1 (1.10%)	0 (0.00%)	3 (3.30%)
Economic	5 (5.49%)	29 (31.87%)	49 (53.85%)	1 (1.10%)	0 (0.00%)	7 (7.69%)
Finance	20 (21.98%)	36 (39.56%)	32 (35.16%)	1 (1.10%)	0 (0.00%)	2 (2.20%)
Innovation	23 (25.27%)	40 (43.96%)	22 (24.18%)	5 (5.49%)	0 (0.00%)	1 (1.10%)
Management	10 (10.99%)	41 (45.05%)	33 (36.26%)	4 (4.40%)	0 (0.00%)	3 (3.30%)
Technology	15 (16.48%)	36 (39.56%)	33 (36.26%)	2 (2.20%)	1 (1.10%)	4 (4.40%)
Other courses (please specify):	4 (4.60%)	6 (6.90%)	34 (39.08%)	0 (0.00%)	1 (1.15%)	42 (48.28%)

*Other courses: entrepreneurial leadership, supply chain, on-hand projects, real life case studies, partnerships, etc.

Table 15. Awareness of entrepreneurial activities

	participated at least once	Know it, but never participated	Never heard about it	Total (N)
Business plan contests	18 (16.98%)	54 (50.94%)	34 (32.08%)	106
Mentoring and coaching programs	3 (2.83%)	40 (37.74%)	63 (59.43%)	106
Others entrepreneurial activities (please specify):	6 (5.94%)	16 (15.84%)	79 (78.22%)	101

*Other activities: UT Challenge and Purchasing conference (networking event

Table 16. Awareness of networking programmes

	Participated at least once (N)	Know it, but never participated (N)	Never heard about it (N)	Total (N)
Centre of Entrepreneurship (Kennispark Twente)	19 (17.92%)	69(65.09%)	18 (16.98%)	106
Start-up Support	6 (5.66%)	67 (63.21%)	33 (31.13%)	106
Other programmes (please specify):	3 (2.94%)	27 (26.47%)	72 (70.59%)	102

*Other programmes: not specified or outside of UT

Table 17. Awareness of networking opportunities

	Yes	Maybe	No	Total
Workshops/Networking with experienced entrepreneurs	56 (52.83%)	49 (46.23%)	1 (0.94%)	106
Connecting with right people (legal support/business development)	52 (49.06%)	50 (47.17%)	4 (3.77%)	106
Contact point for entrepreneurial issues	51 (48.11%)	50 (47.17%)	5 (4.72%)	106
Seed funding / financial support	25 (23.58%)	76 (71.70%)	5 (4.72%)	106
Other networking opportunities (please specify):	4 (3.92%)	81 (79.41%)	17 (16.67%)	102

Other networking opportunities: Meetings/moocs

Table 18. Respondents level of Study

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bachelor	29	27.4	27.4	27.4
	Pre-Mater	3	2.8	2.8	30.2
	Master	72	67.9	67.9	98.1
	PhD	1	.9	.9	99.1
	Others (please specify)	1	.9	.9	100.0
	Total	106	100.0	100.0	

Table 19. Respondents Age group

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-24 years old	76	71.7	71.7	71.7
	25-30 years old	27	25.5	25.5	97.2
	30+ years old	3	2.8	2.8	100.0
	Total	106	100.0	100.0	

Table 20. Respondents field of study

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Business Study and Public Policy	51	48.1	48.1	48.1
	Engineering & Technology	18	17.0	17.0	65.1
	Geo-Information Science and Earth Observation	1	.9	.9	66.0
	Information Technology (IT)	11	10.4	10.4	76.4
	Life Sciences & medicine	2	1.9	1.9	78.3
	Natural Sciences	1	.9	.9	79.2
	Social Sciences	20	18.9	18.9	98.1
	Others (please specify)	2	1.9	1.9	100.0
	Total	106	100.0	100.0	

Appendix 7. Dummy variable analysis

Table 21. Dummy variable: Age group _ model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.225a	0.051	0.042	1.24203	0.051	5.552	1	104	0.020

a Predictors: (Constant), Above25

Table 22. Dummy variable: Age group _ coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.342	0.142		23.458	0.000
	Above25	-0.631	0.268	-0.225	-2.356	0.020

a Dependent Variable: Entrepreneurial intention

Table 23. Dummy variable: Level of study _ model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.175a	0.031	0.021	1.25514	0.031	3.274	1	104	0.073

a Predictors: (Constant), MasterAndHigher

Table 24. Dummy variable: Level of study _ coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.523	0.233		15.115	0.000
	MasterAndHigher	-0.495	0.273	-0.175	-1.81	0.073

a Dependent Variable: Entrepreneurial intention

Appendix 8. Barriers in women entrepreneurship

Figure 9. Main obstacles faced by women entrepreneurs

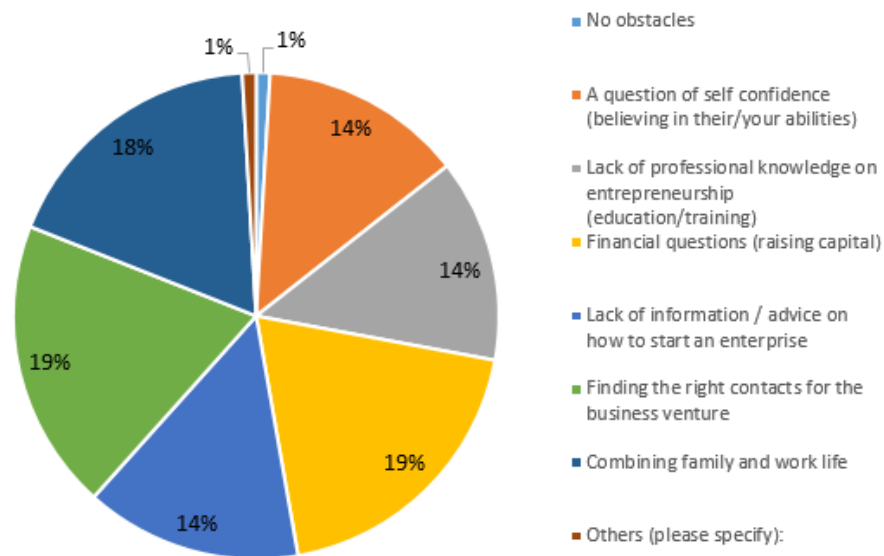


Table 25. Received support from the University of Twente

	Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree
A question of self confidence	3.77%	36.79%	45.28%	9.43%	2.83%	1.89%	0.00%
Lack of professional knowledge on entrepreneurship (education/Training)	29.25%	32.08%	19.81%	7.55%	10.38%	0.94%	0.00%
Financial questions (raising capital)	9.43%	33.02%	29.25%	15.09%	11.32%	1.89%	0.00%
Lack of information/advice on how to start an enterprise	26.42%	30.19%	25.47%	12.26%	4.72%	0.94%	0.00%
Finding the right contacts for the business	15.09%	38.68%	22.64%	19.81%	3.77%	0.00%	0.00%
Combining family and work life	2.83%	16.98%	33.96%	35.85%	4.72%	3.77%	1.89%